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E-LEARNING: THAILAND PERSPECTIVE

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Review of development and practice of e-Learning is covered as an opening note for the conference. Account is given on e-strategy for education in Thailand. In 1990's, to meet the needs for sharing library resources among the needed universities in the remote areas a Provincial University Library Network (PULINET) was created. Later, the Thailand Library Network (ThaiLINET) was established by expanding the connection to cover all universities. This first generation inter-campus connections were achieved via low speed modem linked dialed lines, and mainly served the purpose of inter-library accessibility. Subsequently, with availability of dark fibre infrastructure the inter-library linkages have been upgraded to become inter-university network (the UNINET) that covers all campuses throughout the country. UNINET can be regarded as academic internet similar to the Internet-2 in North America. It has direct access to Internet-2, as well as other similar networks in partner countries. Within less than two decades the bandwidth of UNINET has been increasing dramatically, from initially 2 megabit to presently tenths of gigabit, indicating ever increasing demand. While UNINET serves higher education connectivity a similar network, so-called SchoolNet is also available for fundamental education. There are functional linkages between the two networks. In addition to resource sharing function, both UNINET and SchoolNet also provide Thai education system with nationwide e-Learning infrastructure. However, the two networks are hardware connectivity. In order to make available the Virtual Learning Environment the Commission on Higher Education established Thailand Cyber University (TCU) project, which can be regarded as the national initiative. Apart from providing e-learning platform shared by all higher education sectors TCU also enhances development of virtual learning community, as well as accelerates development of learning resources. The future of TCU is now being debated.

GLOBAL POLICY CHALLENGES IN GENERATION 2.0: A USA PERSPECTIVE

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Online learning in the United States has grown, on average, 20% annually over the past five years. This growth has created new opportunities for learners, new markets of students for institutions and several policy challenges for leadership. This presentation will outline the growth in the U.S., the efforts of the Sloan Consortium (Sloan-C), a U.S.-based professional society for online learning, and the emerging policy challenges, many of which the international community has, or will, face in the coming years. The presentation will include results of Sloan-C's annual survey of online learning in the United States, the views of academic leaders about the strategic importance of online programming, faculty perceptions and challenges, the overall quality of online learning, and the future development and growth.

The history, role and services of Sloan-C will be outlined, including efforts called "academic continuity" where online learning is utilized to help institutions and students continue their learning in times of crisis. Sloan-C's efforts in the aftermath of Hurricane Katrina in 2005 ("Sloan Semester") to provide programming to thousands of students at campuses closed by the storm, will be presented and "lessons learned" that are now guiding efforts at many institutions in the U.S. will be outlined.

Four broad policy issues will be addressed, including: faculty considerations (development, workload, evaluation and recognition of online learning efforts); credit considerations (awarding of credit, recognition of credit earned online, and international credit issues); accreditation/quality assurance considerations (US system, international quality control and cross border programming); and administrative considerations (intellectual property, blended learning, tuition and fees and other cost considerations).

The presentation will conclude with the challenges of the emerging 2.0 generation of learners and the implications of social networking and mobile learning on higher education for both students and institutions.

Major Topics

- Growth of online learning; academic continuity; policy challenges; Generation 2.0

Keywords
Academic Continuity, Policy Challenges, Sloan Consortium, Sloan-C Annual Survey, Sloan Semester.

COOPERATION MODEL FOR NATIONAL E-LEARNING DEVELOPMENT IN ESTONIA

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In this article evolvement of the Estonian e-Learning Development Centre will be analysed during its five years of operation. Attention will be paid to processes that were the drivers behind the formation of the Estonian e-Learning Development Centre and contributed to its sustainability.

Keywords
Cooperation, networking, ICT competences of teachers and lecturers, educational technologists, e-Learning content development, e-Learning quality management, thematic networks

OPEN 2 THE NET? EXPLORING PEDAGOGY, PRAGMATICS AND RATIONALES

Dr. Peter Twining
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Dr Twining will provide a brief explanation of the traditional Open University (OU) model, which provides a context for understanding the impact of introducing web technologies into OU courses. A brief history of the use of information communication technology (ICT) in OU teaching will then be presented, and analysed in terms of three key questions related to the quantity of ICT use, the focus (or rationale) underpinning that use, and the impact that ICT use has on learning. Some issues relating to changes in the use of ICT, particularly Web technologies, within OU teaching will then be highlighted. These raise questions about our vision of education. The Computer Practice Framework (Twining 2002) is introduced as a tool to enhance thinking about one's vision for the use of new technologies in education.

Twining (2002) Enhancing the impact of investments in 'educational' ICT. PhD. Milton Keynes: The Open University.

GENERATION 2.0 AND E-LEARNING: A FRAMEWORK FOR DECISION-MAKING

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Claims that generation 2.0 are disappointed with, dissatisfied with and disengaged from current teaching practices are not uncommon in the popular press and amongst some commentators who call for major changes in schooling with greater integration of e-Learning.

Using activity theory and examination of some popular assumptions about the relationship between e-Learning and generation 2.0 this paper shows that education is not a neutral activity but is heavily influenced by socio-cultural heritage and by political interests. It is proposed that activity theory provides a way of unpacking this complex issue so that crude simplifications can be made explicit and more sophisticated decisions about the use of e-Learning can be made with due consideration to the needs of the major stakeholders including government, parents, industry, teachers and students.

Keywords
Activity theory, decision-making, e-Learning, Generation 2.0

THE EUROPEAN UNIVERSITY REFORM: KNOWLEDGE SOCIETY & INNOVATION & E-LEARNING

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The rapid development of new work and business cultures, along with more effective information transmission methods and the development of ICT-driven work methods, has become a fundamental paradigmatic trend. Knowledge management has turned into a pivotal part of every individual, every work community, and every nation.

As a consequence of internationalisation, different actors in the production of goods, services and information have transformed their business structures and methods. Activities are constructed as value chains and value networks, and many support and other ancillary activities are outsourced.
Competitiveness and success are increasingly built on effectiveness of processes and targeted development of core competencies.

There is no unique standard Knowledge Society model. However, we can learn immensely by benchmarking some of the latest innovation policy studies. European universities – in order to be able to respond proactively to the challenges of globalization – are forced to direct their in-house development, as well as their partnership policy towards:

1. Knowledge networking: More measures at university level and between universities need to be pursued in relation to knowledge creation processes to achieve the dissemination and utilization of results and best practices far more effectively than before.
2. Productivity: Creating and implementing measures focused on integration of ICT & productivity. The target needs to be to leverage European competitiveness as stated in the Lisbon strategy up to the level of "superproductivity".
3. Innovativeness: Especially innovation management and innovation leadership need to be brought into the spotlight abreast growth, employment and productivity. Innovations do not just happen. We have an urgent need to develop innovation processes and encourage people to be more innovative and through that to take steps towards radical innovations.

The role of universities in activities aiming to develop working life differs from that of the other educational institutions. The universities are best equipped to base their operations on the foresight knowledge produced by the academia as well as to operate also in other respects by benefiting from the best practices and latest developments of the knowledge economy. Starting with the vision of future learning, different dimensions and perspectives towards a learning space will be elaborated on in the presentation.

The knowledge society requires "research-based knowledge universities" with a new institutional attitude. This development, however, is not easy in the classical, social or academic higher education institutions. New roles, responsibilities and value networking must be defined and taken to use in the next years. The challenge necessitates an enormous amount of work – the work only university itself can conduct and develop successfully. With respect

to this, the activities towards the new Finnish innovation university, which can be recognized as the forerunner of the European University Reform, will be examined in the presentation.

In the new kind of knowledge economy, the attitude to knowledge is different from what it used to be. Knowledge is capital which need not and must not be saved. Knowledge is like joy: it multiplies when shared and is replenished only when squandered. The presentation will provide an answer to the question: what does the recent development mean for the creation of new practices and concepts in e-Learning. This will include, among others, reviewing the latest social web developments, as well as philosophizing on the most significant areas of research with respect to human interaction and continuous learning.

Information technology and information networks have made learning and knowledge independent of the constraints of time and place. Information is created and distributed globally online via social software. Some latest European projects and their results will be reviewed in the presentation. With respect to organisational learning, the main focus needs to be on knowledge creation theories and the preconditions for a learning organization. Technology impacts both individual and community learning by providing tools and support for the creation and distribution of knowledge. What does this mean for individuals, teams and networks, is a question to be discussed. Universities need to assume responsibility in conceptualizing new learning environments and formulating the relevant concepts of advanced e-Learning practices. Some core elements of the future scenario of creating a Knowledge Agora will be covered.

SECTORAL ANALYSIS OF E-LEARNING IN KOREA

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My talk will give you an overview of the past and the present of e-Learning in 4 sectors in Korea: individuals, corporations, public institutions, and regular education institutions. In this talk I will introduce legal foundations, government initiatives, and markets of e-Learning with the specific analysis of revenue, utilization, adoption ratio, and outcomes of e-Learning in 4 different categories. Then I will discuss the issues on quality e-Learning and the perspectives on e-Learning 2.0 in association with Social Networking Software (SNS). And I will conclude my presentation with the comments on the future of e-Learning.

LONG WIRELESS CONNECTION WITH 802.11G TO OFFER BROADBAND TO RURAL SCHOOLS

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Inequitable distribution of Internet by regions, and arbitrary pricing service has kept broadband beyond the reach of students in rural areas. In fact, world bursting broadband marked transformation of homepage web to Web 2.0 or Web 3.0, and it is expected to be used in education. However, novel developed services require strong dependence on network speed and stability. As a countermeasure, TCU tried a study to bridge a university and secondary schools by broadband. Here, we used “Long Distance WiFi (LD-WiFi)” technology. I this session, concrete ideas and actual techniques to install LD-WiFi are presented.

Major Topics

- HOW CAN WE CONNECT A RURAL SCHOOL BY LONG DISTANCE WIFI TECHNOLOGY?

Sub-topics

- Technical Preparation, Educational Preparation, Administrative Preparation, Model Site Example

Keywords
WiFi, Broadband, Rural ICT Enhancement, Affiliation, Education for Web2.0

Title: UE-learning – the fusion of u-Learning and e-Learning for sanook and serendipity (IEC2008)

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ABSTRACT

The objective of this paper is to look at how to make e-Learning more effective and enjoyable for our students. The 'Opening' to this paper looks at what not to do and why. Then some 'Basics of the Learning Process' are reviewed so everyone is starting from the same understanding of the learning process. This is followed by a discussion of some of the 'Fundamentals of e-Learning'. Next the 'Concepts of u-Learning' are examined. To enable us to make use of both approaches this paper moves onto to discussing 'How to bring u-Learning into e-Learning'. This results in the 'Top Ten Hot Tips for e-Learning' which will be useful to everyone involved in e-Learning as a checklist and standard by which to measure e-Learning resources.

Keywords

activity, basics, concepts, content, e-Learning, emotion, feedback, fundamentals, information technology, interaction, knowledge, learning, link, memory, monitoring, motivation, multimedia, positive, practice, praise, present, process, produce, project, recycle, resources, responsibility, revisit, sanook, self esteem, serendipity, student centred, students, task, tips, u-Learning

1) INTRODUCTION

1.1 Ski School

About 30 years ago I decided to challenge myself to ski. Therefore, I packed my bags and flew to Switzerland for a holiday and joined ski school. There we were given lots of rules how to ski. Then we practiced and practiced on the nursery slopes. It did not look very elegant. In fact they took a video of me. Can you guess what it showed? It showed wobbly knees – yes I was so worried about concentrating on all the rules how to ski and afraid of falling on what was only a nursery slope with a slight incline that this obstructed the messages from my brain to my limbs to tell them what to do. The result was a very faltering skier. Many years later I have learnt what was wrong, and I am going to tell you later – a good storyteller always keeps something for later. Back to the skiing, well I thought there had to be a better way. Therefore I looked around for an easier way to learn. That is when I discovered the inner game. What is the inner game? The inner game is focusing on enjoying an activity and because it is interesting we unconsciously try hard and achieve. With the inner game I was able to ski gracefully down even the intermediate ski slopes. Leave those steep, dangerous black ski slopes for the heroes. Perhaps you would like to know more about the inner game and how it helps you to learn. To do so you will have to read on, and all will be revealed. This could change your lifelong learning too.

1.2 Identifying what is wrong

First we will give you two examples that occur everyday in schools around the world. Your task is to find out what is wrong with them.

Example 1

- Please open your grammar books at page 58 and do exercises 3 and 4.
- When you have finished please put your books quietly on my table for marking.
- While you are doing your work please be quiet.

What is wrong?

Example 2

- Now listen to this and remember.
- There are simple sentences, compound sentences and complex sentences.
- Simple sentences can have a compound subject and / or a compound verb.
- Good English has a mixture of all of these.
- You will be tested next lesson.

What is wrong?

Answers to the above quiz

- It is boring
- Students learn very little
- Not interesting to learn
- One chance to learn
- Limited by time
- Students do not do activate knowledge
- No interaction

1.3 How to fix it

Can it be better? Yes it can! However, you are going to have to read the rest of this paper to find out.

1.4 Objective(s)

- You will know how to make e-Learning more effective and enjoyable for your students
- Hidden agenda – You will know ten secrets of inner game learning to apply to e-Learning
- Subliminal hidden agenda – You will be a better learner, so in turn your students will become better learners.

1.5 Revealing the secrets of learning

This is how I am going to reveal the secrets of accelerated learning using inner game techniques applied to e-Learning.

- Basics of the Learning Process
- Fundamentals of E-learning
- Concepts of U-learning
- How to bring U-learning into E-learning
- Top ten hot tips for E-learning

Yes, by the end of this paper you will have ten secrets of how to fast track students with supercharged e-Learning.

You may already be thinking this does not read like those boring academic papers I am used to reading. You are right, it does not read like them, because I have already started to play the inner game with your mind to engage you to read and know and use this paper.

2) UNDERSTANDING THE LEARNING PROCESS

2.1 The Basics of the learning process

You expected us to just tell you this. No, it is not that easy. First you have to do a quiz, and then all will be revealed.

2.2 Learning quiz

2.2.1 What is learning?

2.2.2 Who is learning?

2.2.3 Who is responsible for the learning?

2.2.4 Why are we teachers?

2.2.5 What is our role?

2.2.6 Why are we here?

2.2.7 What do we want?

2.2.8 Where are we coming from?

2.2.9 Where should we be going?

2.2.10 Where are we now?

Do not turn the page until you have answered all the questions.

(Smart inner game activity – get your students to write your paper for you.)

2.3 New knowledge about learning

80% of our knowledge about how the brain works has been realised in the last 30 years[1].

This quotation is from Alistair Smith the UK's leading trainer in modern learning methods, creator of the Accelerated Learning Model and learning consultant to the English Football Association.

2.4 What is learning?

Here are some examples from our experience teaching English.

- IT IS NOT – conscious effort to remember grammar, rules and vocabulary – this is what the brain does badly.
- IT IS – subconciously picking up a language without being aware that anything has happened, knowledge is stored automatically – this is what the brain does well.

This is based on 30 years of dedicated research by Dr. Stephen Krashen, Emeritus professor of Education at the University of Southern California[2].

2.5 Theory about how we understand

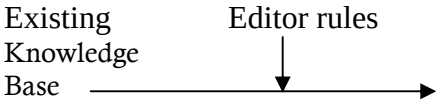
More examples from teaching English[2].

- We get knowledge when we understand meaningful messages from activities that contain the knowledge we need
- Effortless – no work
- Automatic – given activities designed to provide input you must get the new knowledge – you have no choice

2.6 Theory about the conscious brain as editor

Examples from teaching English[2] – why teaching grammar rules and vocabulary does not work.

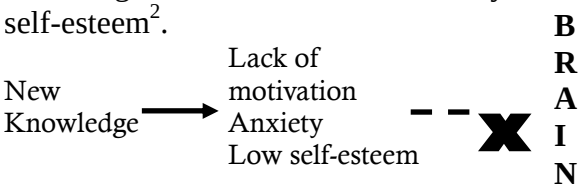
- Consciously learned knowledge is only available in the brain as an editor
- We have to know the rules
- We have to think what is correct
- We have to do it in time
- Weak but not useless



The grammar rules and vocabulary do not help us create language, they only help us to edit it. To create knowledge we need input from meaningful messages in learning activities with the required knowledge.

2.7 Filters to learning

These can affect / stop the brain receiving knowledge: lack of motivation, anxiety, low self-esteem[2].



From this we can deduce the need to create learning activities that motivate students, build self-esteem and reduce anxiety.

2.8 What we need to do?

- Create learning activities that are motivating for students, because they are interesting / enjoyable
- Use continuous project / task based assessment that checks if students can do, not examinations that check if students can remember
- Build students' self-esteem – do not put them down

This is a summary of the conclusions of Alistair Smith the creator of the Accelerated Learning Model[1].

2.9 Who is learning?

Actually, we all never stop learning. Our students are learning new knowledge and we are learning how to help them **discover** that new knowledge for themselves. Discover, because our interesting learning activities create the messages that will automatically be added to and integrated with the students' existing knowledge base.

2.10 Who is responsible for the learning?

Our students are responsible for their learning. We provide the learning resources, guidance and encouragement that enables our students to learn.

2.11 Why are we teachers?

Choose the answer(s) that best suit you for those given below:

- We are expected to encourage learning
- We have to control the learning process
- We need to check learning is taking place
- We enjoy doing it
- We are paid to do it

2.12 What is our role?

Guide our students' learning

or

Give knowledge to students to remember

The first produces first class results and the second produces second class results[2].

John Graystone in the British Educational Research Journal concluded a dynamic model

of the teacher in a resource based learning environment who has the authority to impart socially valued knowledge by involving the students in tasks by managing the learning environment[3]. Students acquire knowledge that is imparted by the teacher by meaningful tasks and relevant resources in a conducive learning environment that support and encourage learning.

2.13 Why are we studying this paper?

- To get new ideas about e-Learning
- Find out what are the new ideas?
- Add the ideas of u-Learning to our current ideas of e-Learning to get a synergetic result from the power of combining them.

The result supercharged e-Learning – that is what you want isn't it?

2.14 What do we want?

- We want to be good teachers
- We want good students
- To achieve both these goals we need -
- Good resources
- Support from above

2.15 Where are we coming from?

The classical model of teaching where students are passive instead of active receivers of knowledge:

- A tradition of:
- Listen, Learn and Remember
- Practice with dull exercises that are easy to mark with an answer key
- Students tested with examinations that check what a student remembers, not their ability to do.

The Elton report reaffirmed by the Bulford project stated that academic work needs to be more winnable[4].

Ability to do should be tested by project / task work

2.16 Where should we be going?

Alistair Smith proposed that motivated learners in the Accelerated Learning Model demonstrate the 5R's of students which are Resilient, Resourceful, Responsible, Reasoning and Reflective[5]. To achieve this we create learning tasks and resources in which:

- Students discover knowledge for themselves by doing project / task activities
- Knowledge is activated with enjoyable activities that encourage learning
- Student assessment is ongoing by students participation and achievements in project / task activities we present to them.

2.17 Where are we now?

Learn new methods to fast track learning.

- Are we happy with our student performance?
- Do we think our students could do better?
- New opportunities
- e-Learning helps us to guide student learning continuously and consistently
- u-Learning helps students to learn automatically without conscious effort.

Read on to find out how to put these exciting learning opportunities together to supercharge our students' learning.

2.18 What is happening on the education horizon around us?

The education horizon presents many new challenges and opportunities to help us enhance the learning of our students. Here are some of the exciting things that are going on around us that you may be able to take advantage of:

- The movement to provide equal opportunities for females and males to learn.
- The use of Information technology to make knowledge resources more accessible.
- The advent of the communication age makes sharing of knowledge more practical and efficient.
- The u-Learning revolution to apply the inner game learning concepts to the classroom.
- The e-Learning revolution to use electronic learning to enable students to revisit their learning anytime.
- The student centred movement which is a development of the inner game learning concept to focus learning on student achievement through activities and project / task work.

- The application of project/task based learning to engage students in projects/tasks in which learning takes place automatically.

In this paper we will look at some of these in more depth to discover how they can help us.

3) FUNDAMENTALS OF E-LEARNING

3.1 What is e-Learning?

Enabling our students to learn when and where they want at their own pace by using Information and Communication Technology to guide their learning

Summarised from the Wikipedia definition of e-Learning[6].

3.2 What happens with e-Learning?

- Teacher is not with student
- Student becomes totally responsible for their learning
- Student can revisit learning as many times as they want until they understand
- Student needs self-motivation or encouragement from the learning media
- Students may collaborate to share their e-Learning experiences

3.3 Why use e-Learning?

- e-Learning appeals to the computer generation (but not necessarily to the older generation)
- e-Learning lets students work at their own pace
- e-Learning lets students learn when and where they want
- e-Learning means students can learn who otherwise would not have any opportunity to learn
- e-Learning compensates for the different speeds at which students learn
- e-Learning makes quality education affordable
- e-Learning has less environmental impact

The last two benefits come from the Wikipedia article on e-Learning[6].

3.4 How we used to teach in the past

- We painstakingly made overhead projector slides which we kept from year to year
- We showed the overhead slides (which often required lights to be dimmed) and lectured
- Sometimes we arranged a tutorial or a lab to help students practice
- Then we set homework to see if the students understood

Did our students learn?, – very slowly and then they forgot after their examinations!

3.5 How we teach now

- We create Powerpoint presentations which we keep from year to year
- We might need a technician to set up all the technology in the classroom
- We give students assignments to do (often in groups) to practice
- We test students to see if they understand

Do our students learn?, – well yes, better than before!

3.6 How we can make things better with e-Learning

- Create e-Learning modules that enable students to learn independently of the teacher
- Create a monitoring system to check students' progress
- Create a feedback system to enable students to ask questions

3.7 The challenges of e-Learning

- To motivate students to learn
- To make the learning material interesting
- To build self esteem
- To enable students to actively use knowledge
- To enable dialogue with students with problems
- To enable students to share learning experiences (as happens now in the classroom)
- To continuously monitor students progress

How can we do all this successfully? Read on to find out the secrets!

4) CONCEPTS OF U-LEARNING

4.1 What is u-Learning?

U-learning involves creating learning activities, tasks, projects and resources that encourage students to discover learning themselves without consciously realising they are learning, so that they learn automatically and independently.

Since there is a lot of confusion among scholars and researchers about what u-Learning is I have created my own definition above which is inspired by:

Ubiquitous – seeming to be in all places
Learning – the activity of obtaining knowledge
From the Cambridge English Dictionary Online[7].

According to Associate Professor Hiroaki Ogata Dr. Eng. at the University of Tokushima, Japan the features of ubiquitous learning are[8]:

- Permanency: Learners can never lose their work unless it is purposefully deleted.
- Accessibility: Learners have access to their documents, data, or videos from any where.
- Immediacy: Wherever learners are, they can get any information immediately
- Interactivity: Learners can interact with e xperts, teachers, or peers in the form of s ynchronous or asynchronous communicati on.
- Situating of instructional activities: The learning could be embedded in our daily life.
- Adaptability: Learners can get the right information at the right place with the right way.

Ubiquitous learning from the Ubiquitous Learning Institute at the University of Illinois.

"Ubiquitous learning is ideas without barriers, inspiration without limits, innovation without boundaries".

"Ubiquitous learning requires no less than a fundamental reinvention of the science of education for our modern society"[9].

Some researchers confuse u-Learning with m-Learning – learning resources for mobile deviced like PDA's. Others confuse u-learning with u-Computing. However, both of these are simply applied subsets of the overall concept of u-learning. Please note that none of the above references restrict u-Learning to m-Learning or u-Computing.

4.2 The scope of u-Learning:

This is an overall term for several practical approaches to learning which are complementary and have the following characteristics:

- Enjoyable, Interesting, Motivating
- Picture, Sound, Action – multiple brain links
- Build students' self-esteem
- Student centred

The result – learners can achieve far more than is currently possible for them

These ideas are a summary of Alistair Smith's work[1].

Other related terms which may be used – accelerated learning, active learning, comprehensible input and, student centred learning.

4.3 How to boost learning and make it far more effective than before

When we combine the following concepts explained in this paper:

- Theory of understanding
- Theory of the conscious brain as editor
- Filters to learning
- Accelerated Learning Model
- Triune Brain *(coming soon)*
- Memory and Sleep *(coming soon)*

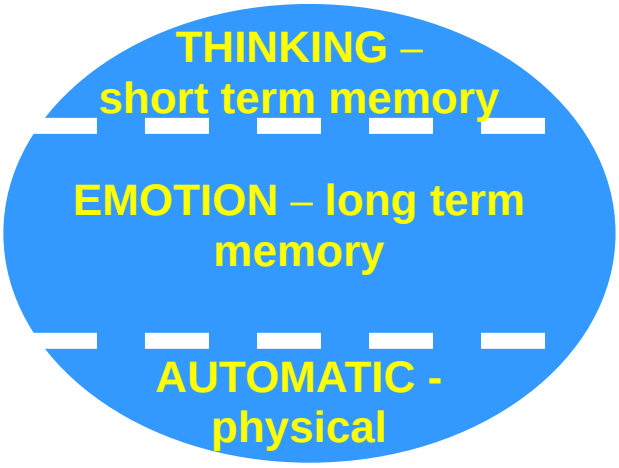
we get the following ways to boost the learning of our students:

- Make it interesting
- Include interaction
- Incorporate doing
- Develop good emotions – build self esteem
- Activate learning
- Recycle learning
- Revisit learning

4.4 Why use u-Learning?

The need for u-Learning came out of the work by Paul McLean Associate Professor of Physiology at the Institute of Physiology in Zurich, Switzerland and Senior Research Scientist Emeritus at the United States Institute of Mental Health on the Triune Brain[10].

Here is a simple model of the Triune Brain



- This is a simple model of the brain.
- The thinking part of the brain does not control long term memory.
- The emotional part of the brain controls long term memory

The outcome of this research is that you cannot consciously order the brain to learn anything. If real learning takes place, it is an unconscious emotional response to how interesting and enjoyable the learning process created by the teacher is. Therefore by creating interesting learning activities which stimulate the emotional part of the brain learning takes place automatically.

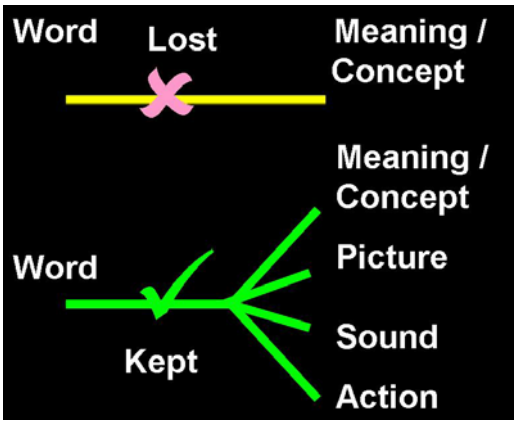
4.4 Learning and memory

- When we learn, we think and put knowledge into short term memory.
- We cannot order knowledge into long term memory.
- When we have a good emotion about our learning knowledge will be put into long term memory
- Our learning activities must build a good emotion in our students

4.5 What happens when we learn?

As we learn connections are made in the brain.

If we do not set up a lot of connections in the brain, when we sleep the brain automatically clears out the weak connections.



These discoveries are the result of modern research using Functional Magnetic Resonance Imaging (fMRI) to non-invasively study how sleep affects learning[11]. Jeffrey Sutton Assistant Professor of Psychiatry at Harvard University found that the brain consolidates information learned during the day. He stated this process could include discarding what the brain considers junk mail, as well as making new connections between brain cells. He called this unsupervised learning[12].

4.6 Creating learning links

Tony Stockwell author of Accelerated Learning in Theory and Practice and The Learning Revolution says, "To learn anything fast and effectively, you have to see it, hear it and feel it[13]."

- As well as our students learning meaning they need to have mental links:
- Picture – help students to visualise, so add pictures to link words visually
- Sound – add sound to learning material *(not just words on a screen)*
- Action – have something for students to do with the learning – puzzle or game

Do your e-Learning modules have all of these?

4.7 What is different about u-Learning?

Modern u-Learning is applying modern methods to the way we used to learn before we formalised teaching. u-Learning has a very long history.

- Our content
- Exciting / Interesting / Funny

- Interaction
- Building self esteem
- Activate learning
- Create multimedia links in brain

4.8 We >>> Them >>> Us – changing the way we create learning for students

Peter Kline in his book 'The Everyday Genius' says, "Learning is most effective when it is fun[14]." To change our content to appeal to students we have to go back and try to think like a student again. In this way we can make our learning activities and resources student centred on what students will achieve – a results orientated approach to teaching which is student based.

- Try changing sides
- Imagine you are a student again
- Imagine you are studying your lesson
- How do you feel?
- Is it exciting? Is it interesting? Is it enjoyable?
- If the answer to any of these is no, maybe we need to make some changes
- Make our learning student centred

4.9 How we view our lesson

- Teacher centred
  - Goal – what we want to teach the students
  - Example – *How to make an appointment*
- Student centred
  - Goal – what we want our students to know by the end of the lesson
  - Example – *Students will be able to make appointments with their friends in English*

Student centred learning is not giving lots of problems or homework[15]!

4.10 What is student centred learning?

Student centred learning focuses on the needs of students rather than those of others involved in the educational process, such as teachers and administrators. For instance, a student-centred course may address the needs of a particular student audience to learn how to solve some student-related problems using some aspects of mathematics. In contrast, a course focused on learning mathematics might choose areas of mathematics to cover and methods of teaching which would be considered irrelevant by the student. Student-centred learning, that is, putting students first, is in contrast to existing teacher-centred lecturing. Student-centred learning is focused on the student's needs, abilities, interests, and learning styles with the teacher as a learning facilitator or coach. This teaching method acknowledges student voice as central to the learning experience for every learner. Teacher-centred learning has the teacher at its centre in an active role and students in a passive, receptive role. Student-centred learning requires students to be active, responsible participants in their own learning[16].

- Provide students with an interesting task that is challenging for them with their existing knowledge
- Provide resources for them to discover new knowledge to help with the task
- Guide the students to discover knowledge for themselves
- Help students to consolidate and integrate the new knowledge

4.11 What are student centred resources – how are they different?

- Students are presented knowledge
- Students are guided to use the knowledge in a controlled and monitored activity with praise and feedback
- (If students get something wrong they need to know what is right)
- Students are challenged by activities to use / produce knowledge in a situation such as a learning puzzle or game

4.12 Are your lessons student centred?

The Royal Melbourne Institute of Technology (RMIT) has a very useful 46 point checklist to use to check if your learning activities and resources are student centred[17]. Here is my own simplified checklist which you can use to get you started creating student centred u-Learning activities and resources.

- Do you start with the desired student ability and work back from this to create activities to acquire the ability?
- Do you activate new knowledge with interesting tasks using the knowledge?

- Do you recycle and revisit knowledge?
- Do you actively build self-esteem?
- Do you create activities that will make learning enjoyable?

4.13 Inner Game Learning

- What is the inner game?
- The inner game is focusing on enjoying an activity, and because it is interesting we unconsciously try hard and achieve.
- How can we apply this?
- Make learning a game.

4.14 Practical application

These ideas have been practically applied by the writer over five years on the Go International with English project of the Continuing Education Centre of Chulalongkorn University. They represent the philosophy of learning followed on this project. The success of these ideas is attested to by the fact that after finishing a course the majority of the students voluntarily reapply for another course.

5) HOW TO BRING U-LEARNING INTO E-LEARNING

5.1 Bringing the experience from u-Learning into e-Learning

Bringing these learning modes together enables us to enrich our e-Learning and increase its effectiveness, as well as building motivation in the student to learn by making the learning process enjoyable and the learning automatically takes place. In order to create e-Learning the writer applied u-Learning principles to the creative design of the e-Learning resources.

This is a combination of the cognitive and emotional approaches to learning as defined by Wikipedia[5].

5.2 What we can do

This is the main part of this paper. It give you practical advice how to merge the concepts of u-Learning with e-Learning to maximise the learning potential for our students. Here is the advice:

- We need to make our e-Learning modules multimedia
- To do this we build into every module:
  - Presentation of new knowledge
  - Links with existing knowledge
  - Pictures to link with words
  - Sound to support context
  - Action – enjoyable activities for students to do something with the new knowledge

This is based on the popular Visual Auditory Kinesthetic (VAK) Learning Styles[18].

5.3 We can reinforce learning in our e-Learning resources

To enhance learning we can recycle and revisit knowledge. Recycling means providing knowledge from several perspectives in a variety of activities and resources. Revisiting means coming back to the knowledge several times to refresh, reinforce and renew it[19].

- We need to recycle knowledge
- Recycling knowledge means we present it several times, each time in a new context.
- The more the brain gets knowledge refreshed in a new context the more it understands and remembers it.
- We need to revisit knowledge
- Revisiting knowledge means we keep coming back to it an using it again and adding to it
- Later modules use knowledge from earlier modules
- This enables the brain to link new knowledge to existing knowledge

5.4 How we can support learning in our e-Learning resources

Nathaniel Branden has done a lot of work on the value of self esteem to inspire students to achieve more[20].

- We need to build self esteem in our students
- Building self esteem creates a good emotion which automates the learning process
- Building self esteem makes students self motivated
- Create student centred e-Learning materials
- Start with what new knowledge the students will be able to use by the end of the learning module
- *(Note use – not know – they are different)*
- Ensure every activity in the e-Learning module works towards achieving this

5.5 How to design our e-Learning resource to build self-esteem

- To build self esteem:
  - Continuously monitor students work as they progress through modules as part of the E-learning module
  - Give praise by sound and pop up boxes regularly to encourage students
  - Keep comments positive – build students up – do not put them down.

6) TOP TEN HOT TIPS FOR E-LEARNING

This is the bet part of the paper.

1) Start with a student centred aim
2) Create learning activities that support achievement of the aim
3) Link new knowledge to old knowledge
4) Make those learning activities multi-media – picture, sound and doing activities
5) Monitor students progress throughout the e-Learning module – *not just at the end*
6) Continuously praise students efforts with words and sound as they progress through an e-Learning module
7) Have a feedback system for students to raise questions, problems and suggestions
8) Recycle knowledge in new contexts
9) Revisit knowledge to refresh it
10) Each module should include activities which present, guided practice and produce knowledge

7) CONCLUSION

The result of following the ten top tips for e-Learning will be Sanook – happiness, and Serendipity – joint success for you, your students and your organisation.

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Other useful resources on Student Centred Learning may be found at: http://www.wmin.ac.uk/pdf/WhatIsSLC.pdf
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E-LEARNING PEDAGOGY IN SOCIAL ADMINISTRATIVE PHARMACY GRADUATE CURRICULUM

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Faculty of Pharmaceutical Sciences, Chulalongkorn University with the support of Thailand Cyber University Project, under Commission on Higher Education Ministry of Education Thailand, opened an online distance education (e-Learning) in Social and Administrative Pharmacy graduate level since 2006. Program's evaluation from the first two batches of student was showed that there are some difficulties in the process. From the literature review and survey of online students and instructors, the programme's committees design three e-Learning pedagogy models. Each model consists of instructional strategies, learning tasks and role of courseware, students, peers and instructors. The new pedagogy model will be implement on academic year 2008 to evaluate for achievement and effectiveness.

Keywords
e-learning pedagogy, Social and Administrative Pharmacy

The Study and Modification of Open Source Game-Based Learning Engines with the Development of Game-Based Learning Prototypes for Higher Education

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1) Introduction

Research findings on future trends of e-Learning by both local and international educational technologists show that content of e-Learning should promote learner participation and provide them with control over their own learning. Game-based learning is one such mode of learning which makes learning fun by employing the concept of edutainment. At present, MMORPG (Massive Multiplayer Online Role-playing Game) games are tremendously popular and the main feature of these games is a virtual world setting in which multiple players can join simultaneously to exchange knowledge and experience. This feature is considered well suited to the construction of games promoting learning. It is anticipated that players (learners) who learn through game-based learning can gain understanding of the contents while simultaneously developing various learning skills, including intercommunication skills (Cuban, 1986; Prensky, 2001).

The Information Technology Service Center, Chiang Mai University has been interested in developing game prototypes and a game engine with a focus on modification of open source engines to make it user-friendly. The study resulted in both a game-based learning/open source system that is appropriate for use by beginning game developers as well as for on-line MMORPG English language learning games for university students. The pilot test found that the contents of the game match the topics stated in the course syllabus. Players (learners) are able to understand the content of the game with ease and find the game interesting and fun making the learning experience both educational and entertaining.

2) Objectives

1) To study and further develop the open source game-based learning engine
2) To develop a game-based learning prototype for university learning
3) To set guidelines for game developers for on-line games creation through the use of open source engines for game developers.

3) Concepts related to game-based Learning

The design of game-based learning was based on the following conceptual frameworks (Malone, 1981; Thanomporn Laohajaratsang, 2000):

- **Major characteristics of game-based learning.** When designing game-based learning, the developers have to take major characteristics of game-based learning into thorough consideration including goals, rules, competition, challenge, fantasy, safety, and entertainment.

- **Theories related to the design of game-based learning.** The designers of game-based learning need to apply the design principles different from those employed when designing other types of e-Learning. One of the most prominent theories related to the design of game-based learning is the Motivational Theory proposed by

Malone which involves challenge, curiosity, fantasy, and control.

4) Research Procedures

4.1.) Study and select popular open source engines used for game-based learning development and compare their strong and weak points, then choose the most appropriate engine for game-based learning.

4.2) Further develop the open source game-based learning engine chosen. The focus is to develop an engine that makes the creation of games easier for game developers by adding a user-friendly library that consists of the following:

- Use of the mouse to control actions in the games
- Control of game characters with control buttons
- Creation of a power bar in the game and the transfer of power
- Text or number display
- Creation of tools for the games such as a menu, scroll bar, check box
- Tools for debugging the program
- Application of visuals and sounds for use in the game

4.3) Design the storyboards involving the themes that will be used as the game scenarios. The themes that have been selected must be present in the dialogues and interactions between the players or characters and NPC (Non Player Character) to get prizes or items that the characters need.

4.4) Design the games that can be used through the Internet.

4.5) Design graphics for the games, namely maps, scenes, player characters and non player characters as well as monsters.

4.6) Write a set of commands and develop a game-based learning prototype to get the story moving, set game rules and conditions according to the storyboards that have been designed.

4.7) Test and make adjustments based on feedback from a sample group of no fewer than 50 subjects to analyze the suitability and the effectiveness of the application of the game as university level English learning media.

5) Results of the Study

1) The study to select an open source system for game based learning and a list of engines to further develop the engine was part of the project to study game-based leaning engines and to develop a game-based learning prototype for university education. From the study, the Irrlicht engine was chosen as the most appropriate for the purpose.The Irrlicht engine is an open source graphics engine that is popular among professional game developers worldwide. It comprises a set of commands that helps manage computer resources in creating 3-D games. A survey showed that 83.78% of programming languages used in developing games is C++, which the Irrlicht engine uses (See Table 1 below). Moreover, among all the surveyed engines, the Irrlicht engine can best support game developers in several ways (See Table 2 below). Therefore, when compared to other open source game engines used at present, the Irrlicht engine is considered most appropriate for developing MMORPG games and 3-D games. It can also be used with other 3-D game engines.

Table 1: Comparison of programming languages used in developing games by the number of usage

Application or programming language for development	Number of usage	Percentage
C#	22	8.49
C / Visual C++	217	83.78
Java	15	5.79
Delphi / Visual Delphi	22	8.49
Pascal	16	6.18
Basic	10	3.86
Visual Basic 6	10	3.86
Visual Basic.NET	13	5.02

Table 2: Comparison of open source game engines by supporting capabilities

Supporting Capabilities	Open Source Game Engines							
	ORGE	**Irrlicht**	**Nevrax LIbrary**	**Revolu-tion 3D**	**HAAF**	**CDX**	**Crytal Space**	**Nebula Device**
Level of developers								
Beginner		*x*		*x*	*x*	*x*		
Intermediate		*x*	*x*	*x*		*x*	*x*	*x*
Professional	*x*		*x*				*x*	*x*
2D Graphic Support								
Building game character support	*x*	*x*	*x*	*x*	*x*	*x*	*x*	
MMORPG support		*x*	*x*			*x*		*x*
Supporting Capabilities	**Open Source Game Engines**							
	ORGE	**Irrlicht**	**Nevrax LIbrary**	**Revolu-tion 3D**	**HAAF**	**CDX**	**Crytal Space**	**Nebula Device**
3D Graphic Support								
Terrain(background graphic) building support	*x*	*x*	*x*		*x*	*x*	*x*	*x*
Terrain building tools	*x*	*x*					*x*	*x*
3D graphic import support		*x*		*x*				*x*
Graphic user interface tools		*x*	*x*	*x*				*x*
Modification Support								
Use of the mouse to control actions in the games	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
Creation of a power bar in the game and the transfer of power	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
Text or number display	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
Creation of tools for the games such as a menu, scroll bar, check box	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
Tools for debugging the program		*x*				*x*	*x*	
Application of visuals and sounds for use in the game	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*

The further development of open source software for game-based learning has resulted in a library of tools (source code) that can be used to develop the game following the set requirements. The trial showed that the set of tools was effective in developing the game-based learning prototype.

3) The content used in the game development is a university level English course. The content chosen (Pre-intermediate & Intermediate Reading) is suited for use in MMORPG games. (See the Appendix 1 for the details of the Content) The game is a combination of academic content and game situations which makes it both entertaining and educational to the learners who had to take the following steps:

- Analyze the situations in the game, answer the Quest questions and destroy the enemies in the game to increase their power level in various areas
- Learn the Reading skills (Pre-intermediate & Intermediate levels) and pass the test in each sub-module.
- pass the test in each sub-module.

Figure 1: The Game-Based Learning Prototype "Eternal Story"

4) The game developed allows concurrent multi-players within the same virtual world on a large scale computer network (here = the Internet). For this reason, the development of this type of game requires the following components:

- Game-Server: receives and compiles requests from Game-Clients such as requests for the information of the characters in the database, and shows the results to the Game-Client.
- Database: stores important information within the game such as character information.

The development of the above system requires the following:

1) A Game-Server system using Microsoft Direct X version 8. The software has basic functions that can be used in developing a MMORPG Game-Server effectively, namely the function that enables concurrent compilation of Game-Client's requests from multiple machines, and the function that enables the sending of compilation results to multiple Game-Clients on different machines at the same time.

2) A Database system using MySQL version 5 that works effectively with C++ language program. There is also MySQL++ software that is especially designed for C++. MySQL is the database system that is widely used on various websites and other programs in use today, making it easy to connect with other game components. For instance, a game membership application website can be created using one of the languages such as PHP, using the same database as that of the Game-Server. In addition, MySQL is capable of handling over 100,000 records which is suitable for the development of MMORPG games. It is also capable to handling a large amount of information coming in at the same time.

3) Graphic Design of maps, scenes, non-player characters and monsters has to be appropriate in terms of file size-that is, the file size must not be too large and the features of each character must not be too detailed as this will affect the information transfer between Server and Client.

4) The job of creating the set of commands and of game development is divided into various parts and different teams are in charge

of the development of different parts as follows:

- The Client part comprises various parts namely:

- The game's main structure that is used in receiving and sending information to and from the Server

  - The control of the characters in the game

  - The visual and audio features of the game

  - The controls in the game such as the menu and control keys

5) The test is conducted by use of questionnaires on 3 groups of subjects namely:

The results can be concluded as follows:

The questionnaire results show that the content contained in the game matches the content requirements specified in the course syllabus while the game storyline is easy to follow. The game itself is interesting, making the learning process entertaining as well as educational.

One additional suggestion is that the game should provide clear instructions for learners who are not game players. Although experienced game-playing students have no difficulty understanding the game system, the students that do not have much exposure have problems in following the story line to a certain extent.

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7) Appendix

Appendix A: Details of Contents

The content used in the game development is a university level English course. The topics of the contents are listed as follows:

1.1) References

1.2) Topic

1.3) Main idea

1.4) Skimming

1.5) Scanning

1.6) Context clues

1.7) Word analysis

1.8) Organization of text

1.9) Supporting details

1.10) Using dictionary

1.11) Making inference

1.12) Identifying fact and opinion

1.13) Transition words

AN ANALYSIS OF THE FACTORS AFFECTING E-LEARNING: A CASE STUDY OF THAILAND CYBER UNIVERSITY PROJECT, COMISSION ON HIGHER EDUCATION

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This research aims at analyzing the factors that affect e-Learning, using a case study of Thailand Cyber University Project, Commission on Higher Education. Samples are 315 students who register in the e-Learning Certificate Program: Creating Technology Web by Word provided by Thailand Cyber University, Commission on Higher Education. The sample group is chosen according to Yamane's concept with deviation value at 0.05 per cent. Research tool used to collect data is a questionnaire and the data is analyzed by using factor analysis method. Variables using in this study include 1) Content 2) Learning Management System 3) Communication 4) Test/Evaluation. The sample consists of 49 per cent of 21-30 years old age group and 65.67 per cent of people who is studying in Bachelor's Degree, amount of 197.

The result can be concluded that there are 5 important factors that affect e-Learning: a case study of Thailand Cyber University Project, Commission on Higher Education, namely 1) Test/Evaluation 2) Content 3) Learning Management System 4) Communication and 5) The use of content, respectively. The last one is a new variable which is revealed from this research. The study of correlation coefficient of 5 variables is valued at 0.005 – 0.196. Regression equation of the factors that affect e-Learning: a case study of Thailand Cyber University Project, Commission on Higher Education is valued at 99.85 per cent and the expected deviation value is 0.057.

Keywords
e-Learning, Factor Analysis, Thailand Cyber University

Blended Learning Models in Workplace Learning

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ABSTRACT

eLearning has its advantages and disadvantages. Various questions have been raised on the effectiveness of instruction delivered online. Blended learning has been suggested, as a solution to address all the pitfalls that eLearning may possess. Blended learning has been in practice for many years now. The basic philosophy of the approach is to derive the best out many learning channels available today. However, with advancement of technology and proliferation of the Internet, learning professionals are posed with a problem of how to mix the various delivery channels that are available. This paper is an attempt to answer some of the key questions that arise while designing a blended learning approach.

TATA consultancy Services (TCS) is Asia's largest IT consulting services company that has operations spread across the globe. The learning and development team of the organization caters to the professional development needs of more than 100, 000 employees. The employees consist of diverse cultures and are from varied educational background. The paper discusses two approaches to blended learning by Josh Bersin, namely the core and spoke approach and the program flow approach. The paper goes on to describe learning situations where the appropriate approach has been applied to derive expected learning outcomes. To ensure that the learning experience is optimal for the leaner, one has to carefully select the learning channels and arrive at proper learning solutions. The learning channels are selected based on the work done by Don Morrison. The paper outlines various case studies of learning programs conducted successfully with in TCS. The paper also discusses various learning channels employed in TCS to effectively provide learning solutions to its employees.

Keywords

Blended Learning, Core and Spoke, eLearning, Program Flow, Learning Delivery Channels.

1) INTRODUCTION

The term "Blended Learning" has been in vogue for many years now. The basic motivation for coining this term stems from the fact that eLearning was not found as effective as the classroom. The basic issue with eLearning in all forms was the fact that social interaction was minimal or none at all. As a natural solution to improve effectiveness of eLearning, practioners thought it prudent to mix the delivery channels [Anderson Cushing (2000)]. For a long time there was confusion in the definition of blended learning. Some learning practioners and academics simply meant blended learning as mixing instruction delivered online and in a classroom in the "right proportion"[Alkesej Heinze & Chris Procter (2004)].

American Society for Training and Development's state of industry survey [ASTD Survey (2006)] described the various delivery channels used in training and the percentages of use of these channels (as shown in Fig1)..

Fig. 1 Percentage of use of Learning Channels

Classroom remained the popular delivery

channel. However there were new channels that were also available

With advent of Web 2.0 technologies, the numbers of online collaborative tools have increased and a recent study conducted by eLearning Guild[eLearning Guild report (2008)] shows that many organizations have adopted web 2.0 methods for training. Web 2.0 technologies like wikis, blogs, podcast etc have become popular learning channels. According to the report adoption of web 2.0 is catching up with many organizations and will remain mainstay of learning technologies for some time to come. Hence a learning professional or a practioner has a plethora of tools that are available to make the learning experience better for the learner.

Larry Bielawski and David Metcalf (2004) in their book "Blended eLearning: Integrating Knowledge, Performance Support, and Online Learning " have defined Blended learning as "*Taking two or more presentation and distribution methods and combining them to enhance the learning content and experience for the learner*".

Now the key question that remains to be answered is "is there a theoretical framework that allows the practioners to choose the right distribution and presentation methods". Josh Bersin in his book titled "Blended Learning Book Best Practices, Proven Methods and Lessons Learnt"[Josh Bersin (2004)] has described two approaches to Blended Learning. We will describe these two approaches in detail in forthcoming sections of this paper. After having selected the approach, it is still a challenge to come up with appropriate mix of delivery channels. Don Morrison in a path-breaking lecture delivered at Strategy and Practice in Blended Learning conference held in London on "Doctrinaire Vs. Strategic Blending" [Don Morrison(2003)]has set the basic guidelines for learning channel selection. We shall describe the entire process of channel selection in a blended learning in the forthcoming sections. At the end we will present four case studies from TCS where we have successfully applied these ideas and have designed learning programs that ensure optimal learning outcomes and good learning experience.

2) BLENDED LEARNING APPROACHES

Josh Bersin in his book has described two approaches to blending namely the core and spoke approach and the program flow approach.

2.1) Core and Spoke

The core and spoke approach is a simple approach to blending. In this approach the learning program is designed with a central core to start with. The learners or participants will necessarily have to go through this core. To help the learners maximize their learning various spokes can be designed around the core. The spokes are normally used as a supplementary material or complementary to the core. It can also be used for reinforcing the learning. It is left to the choice of the learners to use these spokes. These spokes are additional facilities provided to the learners to ensure that they meet the program's learning objective. The following figure represents this approach schematically.

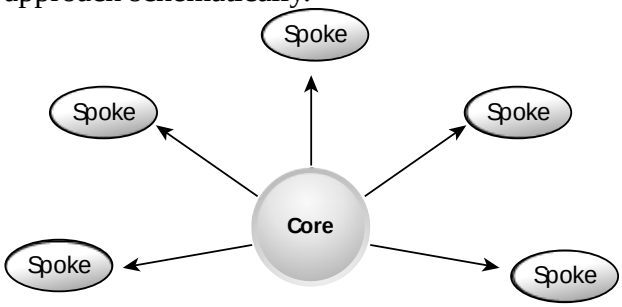

Fig2 Schematic Representation of Core and Spoke

The main advantage of this approach is speed to implement. One can ideally start implementing the program as soon as the core is ready and spokes can be developed as the learners are going through the core and can be periodically released. The biggest benefit of this model is deployment simplicity. When the blended learning elements are optional and involve self- study, you can have hundreds or thousands of people in the program moving at their own pace. You have the benefits of blended learning available to learners, but you do not have to schedule, manage, and track

learners through a series of linear steps. The approach is also highly flexible and learners will be able to customize the learning assets to suit their particular need and style. You could start of with content at the core and change the core at a convenient time in the life cycle of the content. We will discuss this in detail when we discuss our case studies and present Don Morrison's ideas on channel selection.

2.2) Program Flow

The program flow approach is a linear approach that can be carried out iteratively till the desired learning outcome is achieved. This is very popular approach and most of the examples of blending that one comes across in practice follows the program flow approach.

In this model one creates a step-by-step curriculum that integrates several media into a chronological program or syllabus. It is analogous to the process of taking a college or high-school course. Each chapter or step is orchestrated to build on the one before. The program has a strict outline and requires that learners step through material in a linear fashion. At the end, a final step typically includes an exercise or assessment to measure total learning.

To apply blending concepts to the program flow model you replace some of the physical events with self-study or e-learning activities. For example, suppose you have a well-developed week- long class for new hire training. Instead of the introductory lecture, you create a mandatory pre-class assignment on the web and then follow it up with minimal face-to-face interaction. The following figure represents the approach schematically

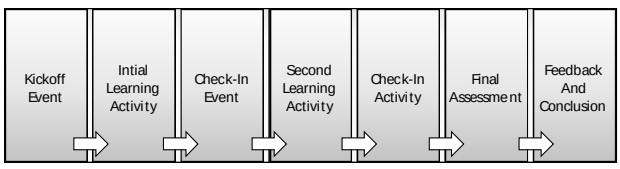

Fig 3 Schematic description of Program Flow

The only disadvantage of this model is that it imposes a rigid sequence of events and is linear. All learners must ensure that they finish the activities on schedule and are ready to take up the next activity at the same time. The model can be repeated iteratively to improve the learning performance of the learners.

3) LEARNING CHANNEL SELECTION

As described earlier, with advent of web 2.0 technologies, the channels available for learning delivery have increased by many folds. This poses a challenge to learning program designers. How do we arrive at the necessary channels? It is widely believed that type of content and learners drives the channel selection. This however is not true. There are various other parameters that needs to be considered before one can arrive at proper channels for learning delivery

Don Morrison has presented a simple set of parameters that one has to look into before deciding on the channels. We have multiple channels for delivering training in our organizations. Synchronous channels like the classrooms. Classrooms are most popular delivery channels. According to the eLearning Guild survey about 71% of the respondents use classroom as learning delivery channel. But now days, organizations that are on aggressive growth, space (classrooms) can be a premium resource. Hence there is a business case to use classrooms judiciously. Many organizations have resorted to use other synchronous channels like videoconference, tele-conference, web cast etc. According to the eLearning Guild's report on Learning Modalities, 35% of the respondent organizations use synchronous eLearning channels.

Most organizations also use asynchronous channels like off-the-shelf courses from companies like Skillsoft, Element K etc. In-fact according to the Guild survey, asynchronous eLearning channels stood third most frequently used delivery channel. Normally organizations will have a subset of these delivery channels. We are often faced with a question of which channels to use and why should we use these channels. Channel selection is key stage in the development of blended learning. What criteria should be applied to strategic channel selection? There

are six inter-related criteria. Figure 4 shows a schematic representation of the six criteria and how they influence the learning delivery channels.

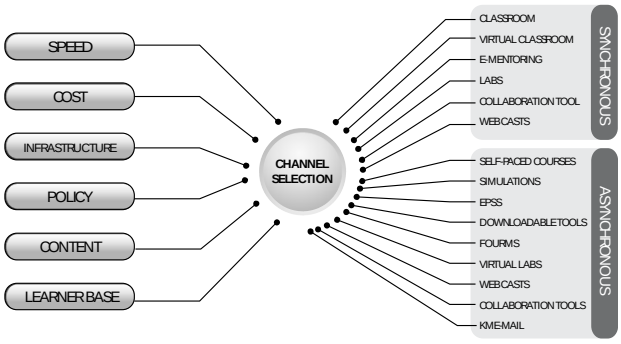

Fig 4 Six Criteria and various Learning Channel

3.1) Speed

While designing a learning program, the designers especially, in corporate environment will have to consider the timing of launch of program. The most important parameter is speed to market. If the learning program is delayed, then the basic business problem or the performance problem it sets out to solve is not achieved. How important is speed to market for the content under consideration? Normally most of us have been confronted with situations where we are expected to quickly organize a program. Normally business leaders come with yesterday's deadline. Where speed is critical, synchronous channels like virtual classrooms and Web casts deliver your message to the most people at the highest speed. However one can't base the channel selection by looking at one parameter in isolation. The importance of this parameter and all other parameters will drive the selection of the learning channel.

3.2) Cost

Cost is an important parameter influencing learning solutions. There are two basic costs one is cost to create content and cost to deliver the training.

According to research conducted by Bryan Chapman (2006) of Chapman Alliance, it takes 36 hours to develop one hour of instructor lead training, whereas it takes 221 hours of development effort to create one hour of eLearning course. If the eLearning is simulation based the development effort can range from 750 hours to 1300 hours.

It is common knowledge that content that is costly to develop is cheaper to deliver and vice versa. Creating self-paced courses is expensive, however it is cheap to deliver and is highly scalable. On the other hand it's much cheaper to develop ILT courseware, but it does cost (travel, availability of faculty, space etc) to deliver this in classroom and is not scalable. So we must select those channels that will give us best impact for an optimal cost. Some time downloadable tools like templates; forms and job aids might do the trick. Combining these with self-paced courses can really deliver the impact at an optimal cost

3.3) Infrastructure

Infrastructure can be a big influence in selection of these delivery channels. Selection of the synchronous channels is primarily depending on classroom infrastructure available in the organizations. Many a times business takes a priority and these channels are unavailable to learning departments. Learning departments have to devise ingenious ways to keep the training going on. Also network infrastructure or IT infrastructure available in the organization can also influence the implementation of asynchronous or synchronous learning channels. Also it should be noted that in the current business environment, infrastructure (IT or physical) comes at a premium and needs to be used optimally. This justifies the strong case for blended learning as well.

3.4) Policy

Policy can also dictate channel selection. For example, an organization might want to move 50% of all its training to the online mode. Needless to say the channel mix will have self-paced courses, virtual classrooms and other collaboration tools. Policy does influence the channel selection in a big way. An organization

3.5) Content

Contrary to the popular belief, content types do

not determine the channel selection. Lifecycle of content will however dictate the channel selection. All strategies, tools, processes start as a notion and develop over time. These are either superseded by newer ideas or fall out of fashion. Hence every piece of content does have a lifecycle of its own. Every stage of content's lifecycle might warrant a different channel selection. Shelf life of content does dictate the learning delivery channel. If content has low shelf life, then it does not make business sense in investing on creating a full-fledged online self-paced course. Also if the content is dynamic and is evolving then we will have to decide on relevant tools to create content that will allow us to make changes to the content quickly. We will discuss this concept in more detail when we discuss the case study on application training.

3.6) Learner Base

Learner base can also influence the channel selection. Particularly size and the geographical spread of the learner base decides the channel selection. If there were large numbers of participants to be trained, then one would consider self-paced eLearning courses or virtual classes.

4) TCS CASE STUDIES

In this section we will present four case studies and will demonstrate the application of ideas presented earlier. The first case study is a program called iLearn. This learning program aims to train TCS staff on various technologies that are used for software development within TCS. Second case study refers to the training provided on integrated quality management system adopted within TCS. The third case study is program designed to reduce the defects in the email communications done with clients by TCS associates. The fourth program is unique program that was designed to train TCS employees on use of an internal system called iCALMS. The program was unique in a sense that it did employ core and spoke approach. When the content matured the core was replaced.

4.1) iLearn Program

Tata Consultancy Services is engaged in providing IT services to its clients. The customers are normally billed for the time spent by TCS employees on the customer projects. The services can also maintenance related, wherein TCS employees troubleshoot and solve several application related issues for the clients. In this scenario, every second an employee is away from his/her workstation will lead to a loss of billing. Hence managers and project leaders were skeptical in sending their staff for the training. The learning and development unit in consultation with business came up with a blended learning solution called iLearn (Innovative Learning). The primary driver for this solution was to ensure that effective training is provided without allowing the employee to leave the workstation. The approach used for this design was the core and spoke. At the core there were self-paced learning courses procured from Skillsoft. The participants were provided with virtual labs, case studies, Books24x7 reference-ware, and mentoring support on instant messaging. The parameters that influenced the channel selection were cost, policy and infrastructure. Since the opportunity cost of an employee being away from work was the primary driver, the entire program was to be delivered on the network. These business leaders could see immediately the value and hence a policy all employees within a business unit need to undertake online learning. To ensure that the program met its objectives, the participants were given case studies that had to be solved and experts graded these.

1722 employees participated in this program till December 2007. 138 participants got over 80% marks in the end course evaluation. Overall participant satisfaction stood at 87.84%. 90^{o} feedback was collected to ascertain the effectiveness of the program and also to ascertain if the program improved the performance on the job. The figure below is snapshot the results.

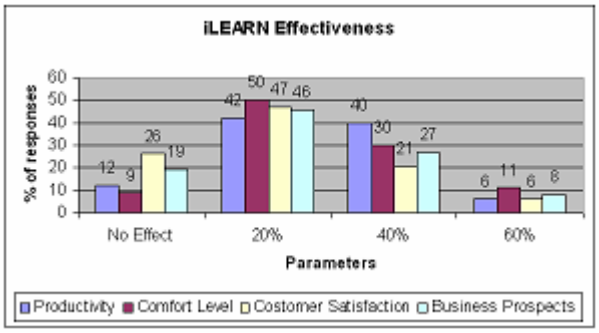

Fig5 Snapshot of the effectiveness of the iLearn program

The entire analysis has shown that the program is as effective as the one delivered in the classroom.

In addition to this close to 115,000 person hours of billing was saved. This has ensured that performance development plans of employees could be met along with the business goals of the organization.

4.2) iQMS Learning Program

TCS follows a integrated quality management system to ensure that all products and services delivered meet a certain quality. As part of this exercise it is mandated that every one of the 116,000 employees undergoes a training on iQMS procedures. Normally these were delivered in the classroom. The Learning and Development team decided to apply a blended learning approach to this and ensure the optimal and effective training delivery. Since the program was mandatory and objective was to ensure that every one is aware of the iQMS procedures and every one effectively applies it on the job, Program Flow approach was adopted.

An internally developed online self-paced course was developed that covered all the aspects of the integrated quality management system. The participants were expected to complete this online course and this was followed by a online quiz. Once the participants cleared the quiz, they were allowed to participate in a classroom event. In the classroom, a case study was solved to ensure that participant comprehend how the quality procedures can be applied to work situations. This was followed by a evaluation and on successful completion the participant were deemed to eligible to work on client engagements.

The parameters that influenced the channel selections were, speed, infrastructure, policy and learner base. The learning and development has to complete these training programs within a specified time and given that the infrastructure available is finite and also needs to be used for the other programs as well, it was obvious that online delivery was the only possible solution. An organizational policy that every associate needs to be trained also played an important role in deciding the channel. The large learner base and distributed learners across 54 countries was another factor to be considered. To ensure a high level-learning objective of application, one-day classroom based workshop was organized. Using this approach Learning and development team could reduce the classroom usage from 3 days to 1 day. The participant satisfaction and learning effectiveness remained the same as the one calculated for participants who attend only classroom session prior to this program.

4.3) Communication Enhancement Program

The Communication Enhancement Program (CEP) is a L&D training model that makes judicious use of Mentoring, Instructor-led training and tech-enabled learning. By blending these three different modes of training the program not only manages to save precious time for the projects but also helps associates show improvement in the way they communicate in the work environment.

CEP consists of choosing mentors from within the project. Each mentor would have 6-8 “mentees” assigned to him/her. Depending on the focus for improvement (e-mailing/writing/speaking etc), the mentor would evaluate samples from the mentees on a weekly basis and provide feedback. The mentor would use an L&D checklist for this purpose. Both mentors and mentees would also undergo various web-based courses during the duration of the initiative and also attend review sessions by the language expert.

We found that this initiative not only helped mentees improve but enhanced competencies of

the mentors as well, led to learning and sharing and a cascading effect within the team. More important: no simulations were needed as live project work was used as content. There was no or minimal need for infrastructure and no direct external costs. Results were quantifiable and dashboards could be presented to Management and the external customers as needed.

The Steps involved:

1) The first step involved is to Identify Language Expert and CEP Coordinator. Once this is done a formal communication is sent to Stakeholders on the launch of CEP Initiative within the Engagement. A Program Schedule is prepared and sent.

2) Once the CEP coordinator identifies the batch, which is to under go the training mentors are selected from within the project with the help of the Language Expert. Each mentor is then assigned 6-8 Mentees. Both the Mentors and the mentees have to be from the same project, this overcomes problems related to information security.

3) A CEP Kick-off Meet is held to explain objectives

4) A workshop on writing skills is conducted and self-study material shared

5) Soon after the workshops, the Mentors begin the review process. Each Mentor reviews 2 messages (email / ticket responses) of each Mentee per week (continuous assessment). This is done regularly over a period of about 8-12 weeks. Each week the mentor helps the mentees improve in select areas. For eg. In week 1 the emphasis is only on Punctuation and Spelling. Week 2 would focus on sentence structure and organization etc.

6) Each week, the mentors and Mentees take specific web-based courses from Skillsoft so that they understand the basics of the topic selected that week.

7) The Language Expert and coordinator review the progress fortnightly and appropriate feedback is given.

8) Finally the performance of the associates is measured through Grade Assessment and Exit Tests

The Benefits:

- Improvement in message quality (emails / ticket updates)
- Structured approach enables short learning curve
- Builds confidence in individuals
- Develops mentors in the account

As is evident from the program design, Program Flow approach was used in this program design. The parameters that influenced the channel selection were Speed, cost, infrastructure, learner base and policy. For any initiative of this kind to succeed it is very important for the senior managers and executives to endorse the initiative. Policy ensured that this endorsement came through and the program was huge success. More than 90% of the participants showed a major improvement in their email writing skills. After a 180^0 perception survey that involved the supervisor, customer, it was found that 90.78% of the participants could write mails that were good and were above acceptable levels.

4.4) Application Training

The last of the case studies presented is a classic example to highlight the life cycle of content and how core can be replaced when the content is in life cycle.

Integrated Competency and Learning Management System popularly known as iCALMS was a new initiative to automate the delivery and tracking of competencies and learning with TCS. The system was ready for deployment in October 2005. As part of the deployment, entire staff in TCS had to be trained on use of this system and all the underlying workflows. A core and spoke approach was employed. At core was the virtual class conducted by iCALMS functional team. Webex was used for this purpose. As the roll out progress, spokes like job aids for various roles, FAQs, and iCALMS advisor on the internal instant messaging system were

added. Every employee was required to attend the synchronous one-hour event on Webex and then could choose to use either one or all of the spokes. The parameter for selection of the channel was speed, infrastructure, and policy, content and cost. The speed of rolling out the training program left with no choice for the L&D but to zero-in on the online delivery. The life cycle of the content dictated the choice of the online delivery channel. Since the content was in early stags of evolution, it was decided to carry out a Webex. Once the system use had become more commonplace, the core of this program was replaced by a full-fledged self-paced online course. This is classic case were core was replaced with more stable online course, once the content matured in its life cycle. Since the learning program had to touch every employee of the organization, classroom infrastructure was not enough and this lead to natural choice of online delivery of the program. In such organization wide roll out, its very important to keep the costs down, online delivery was chosen, so that travel was kept to bare minimum.

The first level feedback was extremely positive and participants were very enthusiastic to use the new system. As a proof of success of the learning program, L&D did a survey to find out the satisfaction levels and awareness about the system. 90% of the respondent showed a high level of awareness of the system. The results were similar to the one obtained in an ILT.

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A Framework for an Online Forum for a Writing Course

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ABSTRACT

The bane of teaching writing is that there is a scarcity of CALL (computer-assisted language learning) courseware that can effectively teach writing. Conventional CALL systems are unable to interact realistically and meaningfully with students and to provide the motivation for students to write. The success of e-Learning 2.0 that creatively applies technologies for social networking to education has pointed out a new direction for CALL. Based on insights from e-Learning 2.0, an online forum was developed and implemented as the CALL component of a writing course for ESL (English as a second language) learners in a university in Malaysia. The online forum project was conceptualised with the specific aim of helping to achieve the objectives of the classroom-based writing course it complements. With proper planning and implementation, the forum technology can be successfully utilised to complement writing instruction. This paper presents the framework that was used to guide the designing of the forum. It describes the five basic components of the framework, that are course objectives, the model adopted for the forum, pedagogical considerations, control, and teacher role.

Keywords
blended learning, CALL for writing, e-Learning 2.0, online forum, writing instruction

1) INTRODUCTION

Teachers of writing know intuitively that the teaching of writing requires the fostering of certain interpersonal dynamics between teacher and student. Writing requires human engagement, and cannot be taught effectively by merely taking the student through a set of algorithm. Thus, it is not surprising that there is a scarcity of CALL (computer-assisted language learning) courseware that can effectively teach writing. Conventional CALL materials are unable to interact realistically and meaningfully with students and to provide the motivation for students to write. Students require human interaction, audience, creative ideas, and conviction to develop as writers. Conventional CALL models are unable to meet these demands.

In recent years, the success of e-Learning 2.0 (Downes, 2005) that creatively applies technologies for social networking to education has pointed out a new direction for CALL. Based on insights from e-Learning 2.0, an experimental online forum project was developed to serve as the CALL component of a writing course in a university in Malaysia.

The online forum was conceptualised with the specific aim of helping to achieve the objectives of the classroom-based writing course it complements. The forum was conducted over two semesters with approximately 1500 students participating each semester. These students had enrolled for a general writing course which was a compulsory course for students with low to average English language proficiency. All the students were required to participate in the forum as part of their coursework.

The project demonstrated how the simple forum or discussion board technology can be applied to achieve language learning objectives,

more specifically, to develop writing skills among ESL (English as a second language) learners.

This paper presents the framework used to guide the design of the online forum. It describes the five basic components of the framework: course objectives, the model adopted for the forum, pedagogical considerations, control, and teacher role. The framework can serve as a guide for writing instructors planning on incorporating the online forum as part of their writing class.

2) WHY AN ONLINE FORUM?

The forum or discussion board networking tool was selected as the basis for the project because of its nature that requires interaction through the mode of the written word. Other more advanced technologies such as podcasting, video sharing etc. may not provide the platform for writing practice that is needed for a writing CALL programme to be effective.

Second, the online forum allows unlimited opportunity for students to write and express their ideas. The writing instructor's ability to give and collect writing assignments cannot match the speed with which students are able write in an online forum. There is a limit to the number of writing assignments the instructor can read and grade. However, this should not be the reason to limit students writing practice. An online forum allows students to write as much as they are motivated to do so.

Third, an online forum allows for active interaction between writer and reader, and encouragement and learning from peers. As the social context has been found to be an important factor that shapes writing (Schultz & Feco, 2000; Vipond, 1993), fostering a supportive e-community and environment is expected to contribute positively to students' writing development.

Many ESL students, especially low proficiency students, see writing as a difficult task. Thus, reducing apprehension towards writing (Daly, 1978; Gungle & Taylor, 1989) and providing motivation for students to write is an important issue in any ESL writing programme. The online forum, being a tool of social networking, is able to spur students to communicate with each other through the medium of writing. Writing is thus made a part of the social networking practice, which makes it less threatening to learners.

The online forum also provides students with a strong sense of audience and a purpose to write which are important motivators. All writers write for an audience, and student writers are no exceptions. By providing a real audience for students' writing in the forum, students no longer write solely for the benefit of the instructor, but has the opportunity to interact with and co-construct their writing with their readers (see Vipond, 1993; Gergen, 1995).

3) THE FRAMEWORK

This section presents and describes the components of the framework used as a guide in the designing and implementation of the online forum in the project. The components, though each conceptually different, are closely linked in a web of interdependent relationships. The framework affirms the importance of sound pedagogical planning, the foundation of all effective educational interventions, whether with or without the use of technology.

3.1) Course objectives and forum objectives

For a CALL programme to be successfully carried out in the blended learning mode, planning must begin with the integration of the CALL component with the classroom-based instruction (see Colbert et al., 2007; Warschauer, 1996; Kannan, 2000). The first component in the framework is the aligning of the objectives of the online forum with the course it is created to complement. The online forum should not merely contribute to students' language learning in a vague way, but should be clearly streamlined with the objectives of its classroom-based offline counterpart. The streamlining of objectives has implications towards on the one hand, students' perception of relevance and therefore acceptance of the

forum activity, and on the other hand, the justification for grants and funding to carry out the project.

Furthermore, the determination of the forum objectives is crucial as it affects the decisions to be made for the other components in the framework. For example, the selection of the forum model to be adopted, type of writing prompts, assessment and control measures relate directly to the objectives of the forum.

3.2) Forum model

The technology of online forums is fairly simple. It comprises applications allowing members of the forum to log in with or without restrictions, and post comments, as well as member/group management features for the leaders of the forum. However, how the forum can be used for educational purposes varies considerably.

A survey of English language learning websites available on the internet yielded several models that academic online forums commonly adopt.

3.2.1. The 'ask-the-expert' forum

This is the type of forum that is most suited for content-based courses as well as grammar, where the instructor, the 'expert', answers questions from the students, clarifies their doubts and gives motivation and advice to students about learning. An example of this is the 'Grammar Clinic' (see Appendix A).

3.2.2. The student community forum

This is by far the most common and prevalent of the models used. The forum 'belongs' to the students, who are expected to provide social support to each other on matters that are important to them. Some forums limit discussion to academic subjects, while some function as free bulletin boards where students may even post personal notices such as 'room for rent'. An example of this type of forum is shown in Appendix B. It is noted that the type of writing usually elicited from members in forums of this type ranges from short communicative messages to longer messages for the sharing of ideas.

3.2.3. The 'serious discussion' forum

The third possible model for online forums is the 'serious discussion' forum, where the leader or instructor leads by posting questions and topics for discussion. Often, discussion will revolve around prescribed readings. It is noted that this forum model is used mainly for 'content' intensive courses, where theories and their application are discussed. The focus of such forums is the content discussed and the goal is to promote, or to demonstrate, deeper understanding of the material. In 'high control' forums, the instructor sets stringent rules and conveys his/her expectations on the quality of discussion required (see Appendix C for an example).

3.2.4. The creative writing forum

This model is the closest to the 'community of practice' (Wenger, 1998) model, where members of the forum post creative writing work and give constructive comments to each other on how to develop their writing. An example of this is the "Writers' Digest" forum (see Appendix D) where a leader posts writing prompts on a regular basis and members write accordingly. The members are mostly creative writers and students of creative writing, learning from each other to develop their skills within their 'practice'. The focus of the forum is on the skill of writing effective stories.

Thus, in designing an online forum activity, decisions have to be made about which forum model is appropriate following the stated objectives of the forum as an instructional tool for language learning. In tailoring a forum activity to the objectives and needs of the learners, hybrid models are encouraged, as creativity in the application of technology to education is the mainstay of e-Learning 2.0.

3.3) Pedagogical considerations

The next component in the framework has to do with pedagogical considerations. Especially

for e-Learning, pedagogical considerations must be held sacred over any hype in the use of technology. As Warschauer has rightly pointed out, effectiveness of CALL does not depend on the technology, but on how the technology is used (1996).

3.3.1. Theoretical paradigms and approaches to writing instruction

The important questions that instructors must ask are what theories of language learning and instruction underpins the approach that will be used in the e-Learning/CALL activity being planned, and how should they be implemented as an online forum activity?

Instructors must be aware of the different views of writing, such as the cognitive view of writing (Flower & Hayes, 1980), the socio-constructivist view (Gergen, 1995; Vygotsky, 1978), as well as the various approaches to writing instruction such as the product-oriented, process-writing, and genre approaches. Awareness of these views about writing and writing instruction will influence the decisions that are made about how the online forum is implemented.

Decisions on what paradigm and approaches to adopt hang upon the objectives of the learning activity being planned. For example, if the objectives of the online forum are to develop students' critical thinking abilities (cognitive view of writing), and to develop ideas collaboratively with their peers (social constructivist paradigm), it is likely that the writing prompts/tasks given in the forum will be of the thought-provoking and high-interest type, or those that require higher-order analytical skills. Moreover, peer feedback and interaction should be highly encouraged, in line with writing instruction approaches informed by the social constructivist view of writing.

Thus, the selection and adoption of theories of teaching and learning will no doubt have implications on the other components of the framework.

3.3.2. Espoused theories versus 'theories-in-use'

The activities in the forum should be designed and be seen to achieve the desired outcome. For this, the type of prompts provided, the topics of discussion selected, the type of feedback given, the method used to encourage interaction, and other aspects of the actual 'operation' of the forum that reflects the "theory-in-use" (Argyris & Shon, 1974: 6), must be clearly spelt out. For example, providing detailed correction of sentence level grammar of a student's attempt to argue a point may be detrimental to the student's confidence and practice of co-constructing meaning with his/her readers (social constructivist view of writing). It would be appropriate, though, for a stated objective of teaching grammatical awareness.

Thus, as important as pedagogical awareness is to the planning process, knowledge of how to apply the pedagogy practically and appropriately in the specific context of the forum activity is just as important, to avoid the unintended inconsistencies between espoused theory and 'theory-in-use'.

3.4) Control

Another important factor to consider in the framework is the issue of control. How much and what type of control should be imposed? This section discusses the areas of control that should be carefully considered.

3.4.1. Assessment

Assessment represents the most effective means of control. Marks can be awarded for participation, quality of writing, asking questions, etc. The criteria for assessment made known to students usually provide a strong control over the type and quality of the writing in the forum. While online forums for ESL learners that do not impose any assessment on the students' work or participation can reduce anxiety of the students towards the activity, many instructors find that no assessment often results in poor participation and poor performance (McCarthy, 1999).

3.4.2. Interactivity

To ensure a sufficient level of interactivity in the forum, the instructor may have to lay down rules for interaction. This is important especially for models that utilise peer feedback and collaborative work as an important part of the learning process. An example of such a rule is the specification of the number of times per week a student must post a comment on or a response to a fellow forum member's post.

3.4.3. Feedback

Control may be exercised in the area of feedback. What kind of feedback can or cannot be given, and by whom? In order for peer feedback to be effective, training students on how to give constructive feedback will be helpful.

3.4.4. Access

A decision has to be made about the openness of the forum. Should it be completely open in the World Wide Web, or should access be restricted only to registered students? Do we want students to experience exchange of ideas with people of other nations/cultures, or do we want them to interact only with members of their own class?

There are pros and cons for different levels of openness the forum adopts. Basically, the more open the access, the more 'threatening' but challenging the environment. The more closed the access, the 'safer' the environment. The instructor will have to evaluate whether the students are ready and for which level of access.

3.5) Teacher role

The role of the teacher in the online forum must be clarified and made known to the students. This is to prevent a mismatch of expectations that could undermine the success of the forum and the students' satisfaction level.

What role will the teacher be playing in the online forum? Will he/she be an ordinary member of the forum community, the 'expert' who answers questions, the facilitator/ motivator who provides topics and questions to guide discussion, or is the teacher purely an administrator who has no role in the discussion?

From the project that was carried out by the researchers, it was found (through informal sampling of students' feedback posted in the forum) (see Appendix E) that a contentious issue among the ESL students is the expectation that the teacher's role is to correct the grammatical errors in their writing. In the feedback they gave after the project, a small number of them mentioned that they wanted the teacher to point out errors in grammar and sentence structure in their forum posts.

Also, some of them wanted more online interaction with the teacher, indicating they preferred a stronger presence of the teacher. This may be because the students, and possibly most Asian students who are used to teacher-centred instruction, may not be sufficiently exposed to the practice of CALL where independent learning without the security of the presence of a teacher is the norm. The results obtained from another CALL project that was carried out in the same university with a different group of students pointed to the same conclusion (Liew et al., forthcoming). The students had agreed that they were not very comfortable learning in the CALL environment without the presence of a teacher.

4.0) CONCLUSION

The online forum, a web-based social networking platform, can be modified as an e-Learning tool for the teaching and learning of writing. Properly designed, it is a promising alternative to conventional CALL coursewares for developing writing skills in ESL students.

Informal sampling of students' feedback on the forum project showed that even the students with low proficiency in English felt that they had improved in their writing skills and had an overall positive learning experience (see Appendix F for an example).

The components of the framework described in this paper can serve as a guide for instructors of

writing to design and tailor the use and implementation of the forum platform to the specific needs of their students. In an age where networking is said to spur social learning, educators should and can successfully harness the advantages offered by e-Learning 2.0 to achieve down-to-earth learning objectives.

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5) APPENDICES

Appendix A: Example of an Ask-the-Expert Forum: Lydbury English Centre's Question and Answer Grammar Clinic

Source: http://www.lydbury.co.uk/forum/viewtopic.php?f=10&t=397

Appendix B: Example of a Student Community Forum: Cengage Education's Student-to-Student Forum

Source: http://forums.cengage.edu.au/viewtopic.php?f=42&t=5853

Appendix C: Example of instructions for a 'Serious Discussion' Forum for a University Course

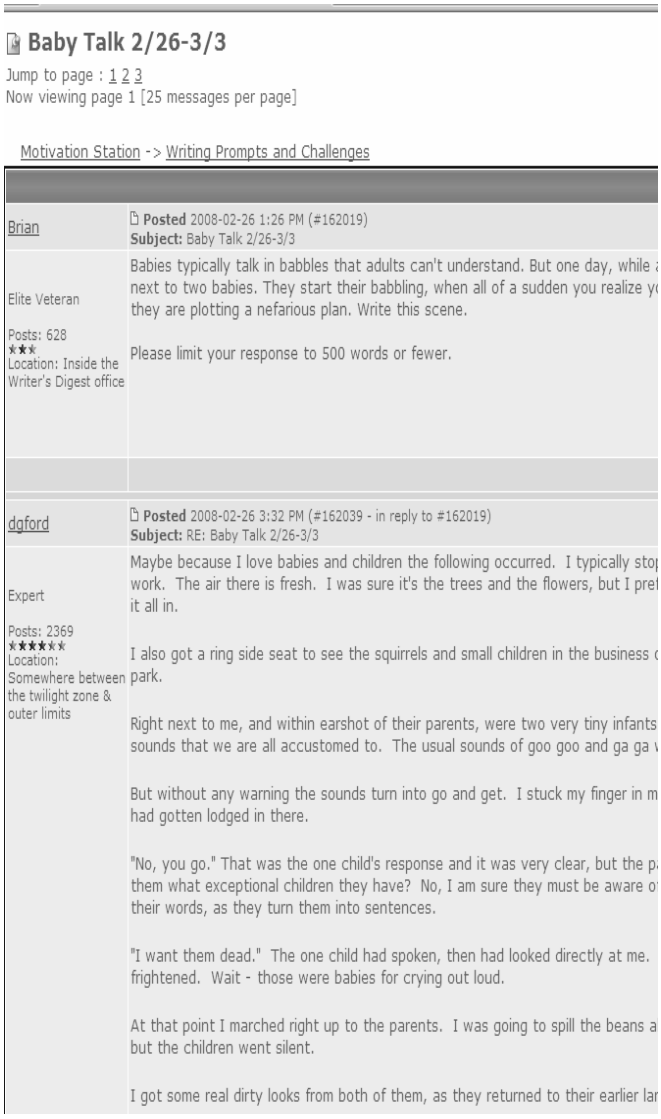
Blackboard Postings: Specific requirements for Blackboard posting will be listed with each dialogue period. In general, each student is expected to post at least once with original thought(s) and twice in response to classmate postings. **Online Dialogue** response to **instructors' posted questions and peer postings** offers an opportunity forstudents to demonstrate some mastery of the concepts, as well as apply learned knowledge immediately. The focus of the dialogue will be on the student's critical thinking skills as evidenced by substantive commentary. This means that student postings should be thoughtful and cogently responsive to the question or peer/instructor material that is posted. The dialogue format simulates a degree of normal classroom **discussion** and interaction. Where relevant and indicated in instructor postings, students will be expected to cite authors thought(s) and idea(s) relative to the question at hand along with the students understanding, knowledge, opinion and experience. Students should check [*omitted material*]

All students will be expected to participate fully in the online aspects of the course, and successfully fulfill all assignments. Class members are expected to show-up with ***honest and grace-filled interactions that extend human dignity and worth to all members of the community while being willing to challenge one another's thoughts.***

Source: https://www.bioethics.emu.edu/graduatecounseling/syllabi/coun607.pdf.

Appendix D: Example of a Creative Writing

Forum: Writer's Digest Forum **forum project**



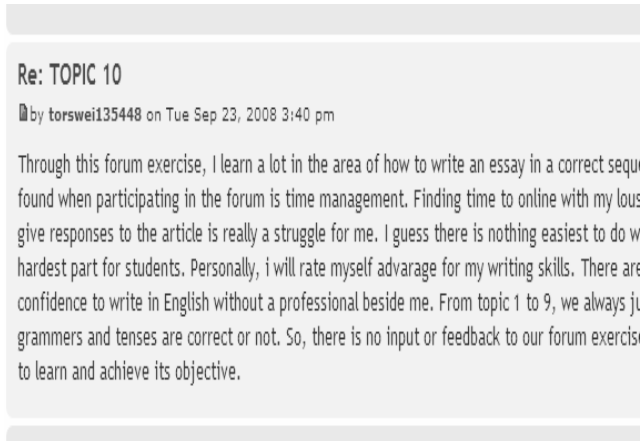
Baby Talk 2/26-3/3

Jump to page : 1 2 3
Now viewing page 1 [25 messages per page]

Motivation Station -> Writing Prompts and Challenges

Brian	**Posted** 2008-02-26 1:26 PM (#162019) **Subject:** Baby Talk 2/26-3/3
Elite Veteran Posts: 628 ★★★ Location: Inside the Writer's Digest office	Babies typically talk in babbles that adults can't understand. But one day, while next to two babies. They start their babbling, when all of a sudden you realize y they are plotting a nefarious plan. Write this scene. Please limit your response to 500 words or fewer.
dgford	**Posted** 2008-02-26 3:32 PM (#162039 - in reply to #162019) **Subject:** RE: Baby Talk 2/26-3/3
Expert Posts: 2369 ★★★★★★ Location: Somewhere between the twilight zone & outer limits	Maybe because I love babies and children the following occurred. I typically sto work. The air there is fresh. I was sure it's the trees and the flowers, but I pre it all in. I also got a ring side seat to see the squirrels and small children in the business park. Right next to me, and within earshot of their parents, were two very tiny infants sounds that we are all accustomed to. The usual sounds of goo goo and ga ga But without any warning the sounds turn into go and get. I stuck my finger in m had gotten lodged in there. "No, you go." That was the one child's response and it was very clear, but the p them what exceptional children they have? No, I am sure they must be aware o their words, as they turn them into sentences. "I want them dead." The one child had spoken, then had looked directly at me. frightened. Wait - those were babies for crying out loud. At that point I marched right up to the parents. I was going to spill the beans a but the children went silent. I got some real dirty looks from both of them, as they returned to their earlier la

Source: http://forum.writersdigest.com/forums/thread-view.asp?tid=16388&posts=54&start=1



Re: TOPIC 10

by **torswei135448** on Tue Sep 23, 2008 3:40 pm

Through this forum exercise, I learn a lot in the area of how to write an essay in a correct sequ
found when participating in the forum is time management. Finding time to online with my lous
give responses to the article is really a struggle for me. I guess there is nothing easiest to do w
hardest part for students. Personally, i will rate myself advarage for my writing skills. There are
confidence to write in English without a professional beside me. From topic 1 to 9, we always ju
grammers and tenses are correct or not. So, there is no input or feedback to our forum exercis
to learn and achieve its objective.

Appendix F: A student's feedback on the forum project

Topic 10

EDIT QUOTE

by **NURUL142566** on Mon Oct 06, 2008 11:06 am

First time I know that I must give my opinions and comments in this forum, I feel like I want to die. Actually, I don't like to write an essay because I don't know how to describe my point. After a few week, I started love to write in this forum although my English language is broken. The important thing that I learnt from this forum is how to express my opinions and give comments in simple paragraph. Although I take one week to finish a simple paragraph, I satisfied with my effort. Now, I only take about half an hour to finish my paragraph. From this forum, I also can give feedback to my friends according their opinion. Beside that, my friends and I can change and share more information about one topic. For conclusion, this forum must go on for next student especially for student who don't like write an essay like me.

NURUL142566

Posts: 16
Joined: Tue Jul 15, 2008 12:33 pm

PM

0

Appendix E: A student's feedback on the

Towards Self-Access CALL: What Students Say

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ABSTRACT

The success of CALL (computer-assisted language learning) self-access centres depend largely on students' receptivity towards the use of CALL in their learning, as well as their motivation to use the facilities offered. Lack of exposure to self-access learning and computer skills required for CALL also contribute to under-utilisation of CALL self-access facilities. In UPM, in line with the direction the university is taking to encourage more student-centred learning to complement classroom teaching, a pilot CALL programme involving the participation of 1800 students was implemented as a platform to provide initial exposure to the CALL self-access mode of learning. At the end of the programme, a survey was carried out to evaluate the extent of students' receptivity to the CALL self-access mode of learning, their acceptance of the courseware used, their preference for the types of activities, and feedback on the implementation aspects of the programme. This paper presents the survey results obtained from the project that represent feedback on the programme from the students. Students' perception of the programme provides valuable information on how well the programme is received and how ready the students are to the practice of self-access CALL. The results of this survey will inform the university's effort towards the implementation of full-fledged self-access CALL programmes.

Keywords

CALL courseware, English language learning, receptivity, self-access, student's perception

1) INTRODUCTION

The use of CALL (computer-assisted language learning) systems in language learning programmes represents a shift of pedagogical methods from a traditional teacher-centred approach to a method that is more versatile and student-centred (Gonzalez, 2003). There are benefits that can be gained from including a CALL component in most classroom-based instruction. Warschauer and Healey (1998) noted several benefits of using CALL such as multimodal practice with feedback, individualisation in a large class, the fun factor, variety in the resources available and the learning styles used, exploratory learning with large amounts of language data, and real-life skill-building in computer use. In addition, the use of CALL adds variety, speed and interest in the student learning process (Bayliss, 1995).

However, having technology and courseware does not automatically translate to effective learning. Educational researchers (Boyle et al., 1994; Peterson, 1999; Robinson, 1991) have emphasised the importance of getting learner feedback on CALL programmes. Factors such as students' perception of the relevance of courseware content, the effectiveness of the activities, their satisfaction with the overall learning experience with the courseware and exposure to self-access learning and computer skills required for CALL can affect their motivation and participation in the programme.

Kannan and Macknish (2000) found that the CALL programme implemented in a tertiary institution in Singapore ran into a number of

challenges, among which were assessment difficulties, perception of feedback, problems in encouraging self-directedness in students, and technology issues. Thus, it appears that how students perceive the CALL content, as well as their readiness for the self-access mode of learning plays an important role in ensuring the success for any self-access CALL programme.

To ensure better participation of students in CALL self-access centres, students should be familiarised with the use of CALL courseware as well as to be sufficiently exposed to the concept and practice of self-access learning.

One way of doing this is to have a CALL component as part of a language proficiency course, whereby students are required to complete the CALL activities for credit. A programme such as this can provide invaluable information as to the receptivity of students towards the self-access concept, and the suitability of the courseware used. At the same time students can be exposed to the practice of self-access learning before it is implemented on a larger scale.

A pilot project was carried out in UPM as a platform to initiate students to the self-access learning environment. A total of 1800 students were required to complete CALL activities as part of a basic English speaking course for credit. At the end of the programme, a survey was carried out to evaluate the extent of students' receptivity to the CALL self-access mode of learning, their acceptance of the courseware used, their preference for the types of activities, and feedback on the implementation aspects of the programme. This paper presents the survey results obtained from the project that represent feedback on the programme from the students.

2) MATERIALS AND METHODS

2.1) The courseware

The courseware used in the programme was *ELLIS Academic* developed by English Language Learning and Instruction Systems Incorporated. This courseware was chosen because it had a range of topics relevant to the objectives of the course. The activities in this courseware provide learners with the opportunity to play an active role in the learning process. Each lesson consists of a short contextual video of realistic everyday situations such as meeting people and making small talk which allow students to practise listening, pronunciation and speaking skills through the use of role play, as well as practise skills in vocabulary and grammar. In addition, students could select from a range of activities including games, quizzes and tests in a non-linear mode according to their interests.

2.2) Research procedures

A total of 1800 undergraduate students participated in the CALL programme, which was offered as part of their basic English speaking course. Participation in the CALL programme contributed credit towards the total assessment for the course.

Students were instructed to use the *ELLIS* courseware for one hour a week for a period of 7 weeks, in two language laboratories. Each student was given a password and username in order to access the courseware. Each week, the students had to access one unit of activities prescribed for the week from the *Senior Mastery* package of the courseware. Within each unit, they were free to select any of the learning activities (labeled as video, role-play, practice, summary, game, and quiz, test, and recording activities) targeting any of the specified language skills (listening, vocabulary, grammar, pronunciation, and communication).

The students were encouraged to complete as many activities as possible within the one-hour slot. After the completion of all the seven units of learning content in the courseware, a questionnaire was administered to all the students through their respective class instructors. As the class instructors administered and collected the questionnaires, the response rate was about 86% (1550 respondents). Students who were absent and students who did not return the questionnaires accounted for the non response.

2.3) Sample

The respondents in the study were first year undergraduate students who had registered for a basic English speaking course at the university. Out of the total who completed the questionnaire, 862 were taken as sample for the study. The selection of the sample group of students was made based on selection of classes and not individual students. Out of the 59 classes that comprised the 1800 students, 30 classes were selected. To get a balanced representation of students from the science and social science streams, 15 classes (totaling 434 students) were selected from the science faculties, while 15 classes (totaling 428) were selected from the faculties of social sciences and humanities.

The sample of 862 students consisted of 251 male and 611 female students. The majority of the students had sat for the Malaysian University English Test (MUET) and obtained Band 2 or Band 3, indicating low to average proficiency in the English language.

2.4) Instrument

The questionnaire used in the study consisted of five sections. The first section of the questionnaire covered background information of the students. In the second section, students were asked to rate their preference for each type of language activities and skills practice in the *ELLIS* courseware. In the third section, the students were required to rate the courseware in terms of the following criteria: appeal, difficulty, relevance, interactivity, clarity and ease of use, and effectiveness. The fourth section aimed to find out the students' overall acceptance of self-access learning and the programme. In the last section, they were asked to give feedback on any problems they faced.

For sections two to four, a five-point Likert-type scale was used while for the first and last sections, closed and open-ended questions were used to elicit the students' personal particulars and their feedback on the implementation aspects of the courseware.

2.5) Data analysis

Data obtained from the five-point scales were analysed quantitatively using the Statistical Package for the Social Sciences (SPSS) Version 15.0. The data were analysed descriptively to obtain means and standard deviations.

As the scores range from 1 to 5 (1 = least preferred/strong disagreement, 5=most preferred/strong agreement), mean scores ranging from 1 to 3 were interpreted as negative (not preferred/disagreement), scores between 3 and 3.75 were taken as a weak positive (weak preference/weak agreement) or ambivalence, while scores above 3.75 were interpreted as strong positive (strong preference/strong agreement).

For data obtained from open-ended questions on problems faced by students, the responses were informally consulted for further insight into the nature of the problems.

Out of the 862 questionnaires that were returned, two were incomplete and were therefore not analysed.

3) FINDINGS AND DISCUSSION

This section of the paper presents the findings and discussion of the survey which focus on students' preferred activities and skills practice, students' evaluation of the ELLIS courseware, students' acceptance of self-access learning and their overall perception of the programme, as well as issues in the implementation of the CALL programme.

3.1) Students' preferences

The *ELLIS* courseware provides a menu page listing the learning activities related to the skills being studied. The activities are named video, role-play, practice, summary, game, quiz, test and recording activities, while the skills specified include listening, vocabulary, grammar, pronunciation and communication.

Students were asked to indicate on a five-point scale their degree of preference for each activity and skill listed, with 1 indicating least

preferred and 5 indicating most preferred.

3.1.1. Students' preferred skills practice

The results show students' strong preference for all the skills practice listed ($M > 3.75$, Table 1). In particular, they liked the pronunciation practices which allowed them to practise discriminating between minimal pairs ($M = 4.24$).

Table 1: Preferred skills practice

	N	*M*	*SD*
Listening	860	4.03	.89
Vocabulary	860	4.07	1.26
Grammar	860	3.99	.84
Pronunciation	860	4.24	.76
Communication	860	4.06	.84

3.1.2. Students' preferred learning activities

In terms of the learning activities provided by the courseware, students showed a weak preference for three activities, which are the role-play activity that accompanied the video, the summary activity, and recording ($M < 3.75$, Table 2).

On the other hand, video, practice, game, quiz and test all received high scores, indicating students' strong preference for these activities ($M > 3.75$).

Table 2: Preferred activities

	N	*M*	*SD*
Role-play	860	3.59	.95
Video	860	3.86	.89
Practice	860	4.10	.78
Summary	860	3.73	.83
Game	860	3.75	1.06
Quiz	860	4.11	.79
Test	860	4.07	.83
Recording	860	3.43	1.06

Thus, in terms of students' preference for the learning activities and the skills practice offered by the courseware, the results were mainly positive.

3.2) Students' evaluation of the courseware

Students were asked to state their agreement or disagreement with evaluative statements on the courseware used, on a five-point scale. The courseware was evaluated on the criteria of appeal, difficulty, relevance, interactivity, clarity and ease of use, and effectiveness.

3.2.1. Appeal

Three questions were asked to determine how appealing the courseware was to students. The students strongly agreed that the activities in the courseware were interesting ($M > 3.75$, Table 3), but were more moderate in assessing the activities as fun ($M = 3.66$).

Table 3: Appeal

	N	*M*	*SD*
The activities are interesting.	860	3.79	.83
The activities are fun.	860	3.66	.89
The visuals are attractive and relevant to the ideas presented.	860	3.96	.83

Thus, it appears that the learning materials of the *ELLIS* courseware used in the study have to a certain extent succeeded in maintaining the interest of the students.

3.2.2. Difficulty

The students found the difficulty level of the courseware appropriate for their level of ability ($M > 3.75$, Table 4).

Table 4: Difficulty

	N	*M*	*SD*
The difficulty level of the materials is appropriate for my level.	860	3.79	.81
The materials are easy to understand.	860	3.98	.75

Although the courseware had activities set at different levels of difficulty that students could navigate to, most of the students were able to complete the activities they were interested in.

3.2.3. Relevance

When asked to evaluate the relevance of the courseware to their language needs and to the course objectives, the students gave mostly strong positive responses ($M > 3.75$, Table 5).

Table 5: Relevance

	N	*M*	*SD*
The materials are relevant to the learning of oral interactions.	860	3.99	.78
The courseware fulfils my language learning needs.	860	3.89	.77

Students' perception of relevance of the courseware to their needs and the course objectives is an important factor related to acceptance of the courseware.

3.2.4. Interactivity

In terms of the interactivity of the courseware, the students were very satisfied with the interactive features of the courseware, indicating, too, that they were satisfied with the feedback the courseware was able to provide them ($M > 3.75$, Table 6).

Table 6: Interactivity/Feedback

	N	*M*	*SD*
The degree of interactivity of the courseware is good.	860	3.83	.82
The courseware provides useful feedback about my ability.	860	3.86	.76

3.2.5. Clarity and ease of use

Of particular concern to the researchers was the accent of the speakers in the video and audio activities, as the speakers were mainly people with North American accent. However, the results show that the students did not have a problem in that area. The students found the courseware generally easy to understand and easy to use ($M > 3.75$, Table 7).

Table 7: Clarity and ease of use

	N	*M*	*SD*
The materials are easy to understand.	860	3.98	.75
The courseware is easy to use.	860	4.04	.79
The sound quality of the courseware is good.	860	3.95	.83
The instructions are clear.	860	3.91	.88
The accent of the speakers in the video/audio is easy to understand	860	3.92	.78

Particularly, the item with the highest score ($M = 4.04$) indicating strong agreement among the students was the proposition that the courseware was easy to use. This result has important implications on students' readiness for self-access learning with the courseware.

3.2.6 Effectiveness

The students' perception of the effectiveness of the courseware in helping them improve their oral interactions skills was very encouraging ($M > 3.75$, Table 8).

Table 8: Perceived effectiveness

	N	*M*	*SD*
After using the courseware, I feel that I have improved in my oral interaction skills.	860	3.78	.85
The activities help me to improve my oral interaction skills.	860	4.08	.81

The results indicate that the students felt they were able to learn using the self-access approach.

The positive evaluation of the courseware by the students on the six criteria (appeal, difficulty, relevance, interactivity, clarity/ease of use, and effectiveness) points to the students' positive attitude towards the CALL programme. This shows that the students were confident about using the courseware in the self-access mode, and to a certain extent indicates the success of the programme in exposing the students to the experience of self-access learning.

3.3) Students' acceptance of self-access learning and of the programme

Despite the positive feedback on the courseware and their confidence in using the courseware, the students were not as certain when asked about their acceptance of the features of the self-access mode of learning, particularly, their comfort level with learning without the presence of an instructor.

The results show a moderate level of acceptance among the students of the features characteristic of self-access learning.

Table 9: Acceptance of self-access learning

	N	*M*	*SD*
I am comfortable doing this activity without the presence of a teacher.	860	3.63	1.06
I feel more comfortable using the courseware compared to attending classes.	860	3.52	1.07
The courseware promotes independent learning.	860	4.02	.72

At best, students are ambivalent about the prospect of having to learn without the presence of a teacher ($M = 3.63$, Table 9). Their acceptance of learning in the self-access mode

compared with classroom-based learning is also lukewarm (*M* = 3.52). It appears that the students will require more time to ease into the self-access learning culture, as this is their first exposure to such a mode of learning.

However, despite their ambivalence about leaving their comfort zone of learning where the teacher is always expected to be present, the students recognise the value of the programme in fostering independent learning (*M* = 4.02).

Furthermore, the students indicated a strong acceptance of the programme when asked whether the programme should be made a permanent feature of the basic English speaking course (*M* = 3.86, Table 10). However, to the question whether they thought the time allocated for the lab activity should be increased, they were not very receptive (*M* = 3.28). These results indicate that the students were positive about participating in the programme, and that they were comfortable with the current one-hour learning time allocated for each student per week.

Table 10: Acceptance of the programme

	N	*M*	*SD*
The lab activity should be made compulsory for the course.	860	3.86	.94
The lab activity should be more than one hour per week.	860	3.28	1.35

It is thus concluded that although the students do see the value of self-access learning, and are generally comfortable with the use of the CALL courseware, they have expressed a lack of confidence in having to learn without the physical presence of a teacher. Even though traditional classroom-based classes may not be as exciting and interest-generating compared to the CALL systems that utilise multimodal approaches and individualised learning plans, it appears that the students' dependence on a teacher may yet hinder their full acceptance of self-access CALL.

Thus, researchers must deal with this factor of students' sense of insecurity before a full-scale self-access CALL programme can be implemented successfully.

4) IMPLEMENTATION ISSUES

The CALL programme catered to a large number of students and hence, problems in implementation were expected. These problems had to be identified and resolved as they could affect students' satisfaction with their self-access experience, and hence their motivation and interest (Kannan & Macknish, 2000; Huang & Liu, 2000).

This section describes the problems faced by the students when participating in the programme. The questions asked in the questionnaire on problems faced by the students were closed-ended questions (yes/no answers required) followed by open-ended ones. The closed-ended responses were tabulated, and a small number of the open-ended responses were informally consulted to shed light on the nature of the problems.

4.1) Registration

The programme required the students to register for their lab hours at the beginning of the semester. The majority of the students (88.6%, Table 11) stated that they did not face any problems in the registration process.

Table 11: Registration problems

	Freq	%
Yes	96	11.4
No	764	88.6

For the few who had problems, the most common reason given was that they were not able to register for the time slots they preferred, as they were late in registering, and had to settle for less convenient slots.

4.2) Log-in problems

When the students were asked to state whether they had problems logging into the courseware, the majority of the students (87.6%, Table 12) did not encounter any problems. Only 12.4% encountered problems, and the reasons given were incorrect passwords, and unclear instructions.

Table 12: Log-in problems

	Freq	%
Yes	105	12.4
No	755	87.6

The results suggest that more detailed instructions should be given as some students may not be proficient in the use of IT.

4.3) Technical problems

In terms of technical problems, most of the students (77.1%, Table 13) stated that they had no problems using the computer to access the courseware while 22.9% of them faced some technical problems, such as the computer stalling or server problems.

Table 13: Technical problems

	Freq	%
Yes	195	22.9
No	665	77.1

For the students who were unable to complete their hour of learning with the courseware due to technical problems, they had to re-schedule their lab hour for the week. The fact that more than 20% of the students faced this problem indicates that technical hardware and its maintenance are factors to be attentive to.

4.4) Assistance from laboratory technicians

Table 14 presents the students' opinion on how helpful the laboratory technicians were. More than half of the students (67.7%) reported that they did not get assistance from the technicians when they needed it. When the students encountered problems accessing the courseware or starting the computers, the technicians either did not provide full assistance or they were not around to assist.

Table 14: Assistance from technicians

	Freq	%
No	582	67.7
Yes	278	32.3

This indicates that lack of technical support is an important factor that can reduce students' satisfaction with a self-access programme. Students expect a facilitator to be present in order to overcome their frustrations resulting from technical problems and unfamiliarity with the use of the courseware.

4.5) Availability of computers/seats

Although the labs had a sufficient number of computers to cater to all the students, a significant number of students (28%, Table 15) said they faced problems in getting a seat in the computer lab.

The reasons for this were computer breakdowns (thus reducing the number of available computers) and students occupying the seats of other students 'illegally'. This happened when a student who had missed his/her lab session attended a session not at his/her designated time and took up a seat in the lab meant for another student. This problem could not be detected easily as the lab used a free-seating system.

Table 15: Availability of computers/seats

	Freq	%
No	239	28
Yes	621	72

4.6) Suggestions

The last question in the questionnaire gave the students a chance to give suggestions on how to improve the CALL programme. The result shows that many of the students were eager to give suggestions (44%, Table 16).

The most common suggestions given were that a) the lab assistants should have a better attitude towards students and provide better technical support, b) more labs should be provided for the programme (most likely so that they can have more choices of time slots to select for themselves), and c) more computers should be provided in the labs.

Table 16: Students who gave suggestions

	Freq	%
Yes	377	44
No	483	56

Overall, the findings indicate that there were some problems in the implementation of the programme. These problems, however, did not adversely affect the students' overall satisfaction with and acceptance of the CALL

programme, as indicated in the results discussed in earlier sections.

5) CONCLUSION

One of the major findings of this study reveals students' strong acceptance of self-access learning and of the CALL programme. The majority of the students enjoyed the learning activities offered by the CALL courseware. They found the activities interesting and appealing and the courseware relevant to their needs and met the objectives of their oral interactions course.

For a CALL programme to be successfully incorporated into language learning courses, proper implementation is needed. It is found that selection and efficient management of courseware, sufficient and technical support, students' computer literacy, and well-equipped and maintained lab facilities play an important role in the success of the self-access CALL programmes. As the main problem reported in this study was due to the laboratory technicians, all the technical staff should be trained to provide assistance to students.

A real concern that could potentially affect the success of any plan to implement self-access is the students' attitude towards learning independently, in particular, learning without the physical presence of a teacher. This attitude could be due to their being more accustomed to a teacher-directed approach to learning.

In closing, the positive results of this study seem to indicate that self-access CALL could be successfully incorporated into language courses which involve a large number of students as evidenced in this study. This can be the first step towards exposing students and familiarising them with the culture of self-access and the physical resources available in the institution. With such exposure given to students, it is expected that the success rate of self-access programmes and self-access centres in terms of student acceptance and utilisation will be more assured.

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Management Games: e-Learning Tools for Application of Management Techniques

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ABSTRACT

This paper reviews two Management Games (Business Strategy Game coordinated by Prof. Arthur A. Thompson Jr., University of Alabama, USA and Management Game coordinated by Prof. David Lamont, Carnegie Mellon University, USA) that simulate a multi-national company with manufacturing plants and markets in different countries. Students form the management of a simulated company and compete against multiple competitors in a global setting. They are required to take decisions regarding finance, operations and marketing. They make strategic choices and the results are based on real world financial indicators of the health of the company against other competitors. This paper illustrates how management games that simulate competition between companies can make the learning of the application and integration of management techniques a fun experience. The different management techniques that the students apply are listed which illustrates how effective these tools can be to form a capstone course in any management program.

Keywords
Business Strategy Game, Management Game

1) REVIEW: BUSINESS STRATEGY GAME

The Business Strategy Game (BSG) developed at University of Alabama, USA is structured as follows:

Student Teams
Class is divided into teams of 4 – 5 students in each team. Each team is given a simulated company. They compete against 4 - 10 teams in an industry.

Company
The company is a global athletic footwear company.

Markets
There are four geographic regions in which the factories and markets are located - Europe-Africa, North America, Asia-Pacific, and Latin America.

Products
Companies sell branded and private-label athletic footwear. Branded footwear is sold through retail and online channels and private label footwear is sold through bids.

Starting Position: Operations
There are initially two factories located in two regions. Students have an option to build factories at other locations later in the Game. A factory reflects the available labor and material costs typical of the region in which it is located.

Starting Position: Marketing
All companies begin the exercise with equal sales volume, global market share, revenues, profits, costs, product quality and performance, brand recognition, and so on. The company is considered to be in the market for the last 10 years.

Decisions
Students have 4 to 10 regular decision rounds; each decision round represents a year of

company operations. After the decision round time expires the algorithms award sales and market shares to the competing companies, region by region.

There are 47 types of decisions each decision round, spread across the functional spectrum as follows:

- Production operations (up to 10 decisions for each plant, with a maximum of 4 plants)
- Plant capacity additions/sales/upgrades (up to 6 decisions per plant)
- Worker compensation and training (3 decisions per plant)
- Shipping (up to 8 decisions each plant)
- Pricing and marketing (up to 10 decisions in each of 4 geographic regions)
- Bids to sign celebrities (2 decision entries per bid)

Factors Responsible for Sales

The factors that are responsible for the company sales are:

- how its price compares against the prices of rival brands
- how its footwear styling and quality compares against rival footwear brands
- how the breadth of its product line compares
- how its advertising effort compares
- what are the number of channels, retailer support and distribution lead time

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Reports Generated

The results are presented in the form of three sets of reports:

- The **Footwear Industry Report** (FIR) which contains (1) a three page company performance scoreboard, (2) a one page statistical overview of the athletic footwear market showing total footwear production, materials prices, inventory levels, total pairs sold, demand forecasts for each of the next four years, and plant capacity statistics, (3) a one page of comparative financial statistics for all companies, (4) one page of data that benchmarks your costs against those of rival companies, and (5) a final page that reports the results of celebrity bidding and graphs industry pricing and S/Q trends.
- A **Competitive Intelligence Report** consisting of (a) a four page "market snapshot" showing the competitive efforts (prices, Style / Quality ratings, advertising, number of models, delivery times, rebates, etc.) of all companies in each of the four geographic regions and (b) a "company analysis" page showing the competitive efforts of any rival company of interest for all years to date.
- A five page set of **Company Reports** that includes a plant operations report, a distribution and warehouse operations report, a marketing and admin report, a private-label sales report, a branded sales report, an income statement, a balance sheet, and a cash flow statement.

Final Performance Measures

In running their footwear companies, the challenge for each management team is to craft and execute a competitive strategy that results in a respected brand image, keeps their company in contention for global market leadership, and produces good financial performance as measured by earnings per share, return on equity investment, stock price appreciation, and credit rating.

2) REVIEW: MANAGEMENT GAME

The Management Game (MG) developed at Tepper School of Management, Carnegie Mellon University, USA is structured as follows:

Student Teams

Class is divided into teams of 4 – 5 students in each team. Each team is given a simulated company. They compete against 4 - 6 teams in a world.

Company

The company is a global watch making company.

Markets

There are six possible countries in which factories and markets are located: Japan, China, Mexico, United Kingdom, Germany, and the United States.

Products
There are two products – Product 1 and Product 2. Products are initially positioned in the market as described below. Teams can change it as the Game progresses:

- Product 1 is at the more price-sensitive end of the market; customers of this product show less product loyalty and will quickly buy from the companies competitors should the company "stock out."
- Product 2 is a more premium product; Product 2 customers show both brand loyalty and more sensitivity to quality.

Starting Position: Operations
Factory locations are initially selected for the teams, but once the Game starts students can relocate the manufacturing facilities to any six locations. A factory reflects the available labor and material costs typical of the country in which it is located.

Starting Position: Marketing
All companies begin the exercise with equal sales volume, global market share, revenues, profits, costs, product quality and so on. The company is considered to be in the market for the last 5 years.

Decisions
Students have 4 – 12 decision rounds. Each round represent a quarter. Teams operate their companies by controlling close to 70 decision variables, called inputs. Inputs are actually entries students make in the web interface that represent the teams decisions. The Input decisions are divided into five categories:

- Prices
- Shipping
- Marketing
- Operations
- Finance

Factors Responsible for Sales
The factors that are responsible are:

- The quality of the product (both absolute and relative to competitors)
- The price of the product
- The marketing brand image of the product
- The environmental sensitivity of the product (green value)

Reports Generated
The results are presented in the form of the following reports:

- **The Market Report** provides summary information about the company's place and performance within the world market and explains how the company's pricing compares to other companies in that world.
- **The Production Report** describes the activity of a company's two factories, including the unit price and capacity at which the factory is operating.
- **The Finance Report** supplies information about what company's competitors are doing, including the size of their facilities, the amounts of their loans, and their retained earnings for the period.
- **The Cash Flow Report** is a simple, single-period cash flow statement that helps each team manage its cash flow.
- **The Competitors Report** is a set of graphical and tabular data that shows comparative data across the 5 teams in the world.

Final Performance Measures
The final performance of the company is measured by after tax profit and Economic Value Add.

3) MANAGEMENT TECHNIQUES THAT GET APPLIED WHILE PLAYING ANY OF THE ABOVE GAMES

Students of these games get to practically apply principles in the following areas:

- Strategy
- Finance
- Operations
- Marketing
- Soft Skills

Strategy Techniques
Students learn about competitive strategy options regarding product positioning — low-cost leadership, differentiation, best-cost provider, focused low-cost, and focused differentiation. Each strategy requires different decisions to be made regarding Marketing, Operations and Finance. While deciding on a strategic option, students need to go through

strategy tools like – five forces model, SWOT analysis, competitive strategies of rival companies by using strategic group maps and decide what should be the position of their own company for a sustained competitive advantage. The application of all these tools is tested by having students prepare a Strategic Plan.

Finance Techniques

The management games take into consideration current exchange rates. Since the expenses are in dollars and revenues are in local currencies, students get to understand how exchange rate fluctuations can affect their profit and loss statement. Student have an option to hedge currencies.

In these Games, every company has interest rates at which they can borrow money. This interest rate is dependent on the credit rating of the company. The credit rating is in turn dependent on ratios like Debt Equity ratio; Debt Assets Ratio; Interest Coverage Ratio and Default Risk Ratio. Students get to apply and understand these ratios and how various aspects of finance are interrelated.

Students need to take decisions regarding increase or decrease of debt or equity and how much dividend should be given to the shareholders. They become familiar with understanding the balance sheet, Cash Flow Statement and Profit and Loss Statement. They also increase their ability to read reports and analyze large amounts of data and understand what is important.

While the wining team is generally the one that has made the highest net profits over the period of time, other aspects like earnings per share, return on equity and their performance in the Board meeting plays an important role. Students are expected to be presenting their results to an external Board that checks their understanding on the various functional areas and the logic of the students decision making process.

Operations Techniques

Students learn how operations are very important aspects of cost control and quality. They need to decide if they need to build extra plants or sell plant capacity based on their current production capacity. The games make them appreciate fixed and variable costs and how unit costs increases when they do not produce at full capacity. This might sometime be necessary when current inventory levels are high or forecasted sales are low but there is a trade off in increased unit costs. Students get to understand that keeping an optimal inventory is very important to reduce costs.

Business Strategy Game has other options for cost reduction techniques like defect reduction, set-up time reduction, quality improvement or worker training. Just like in a real life scenario where everything cannot be achieved at the same time, students have to choose between these options every cycle. Students who do a good cost benefit analysis and chose options that are in line with their product positioning, show a greater understanding and benefit more in terms of cost reduction.

Worker compensation and incentives is also an important part of cost. Management Game allows instructors to conduct worker compensation negotiations by bring in real workers. The results of wage negotiations become part of the input cost for wages. This allows students to experience real world negotiations.

As the Game progresses, students have to decide if they have to shift their location of production to lower costs countries. They need to incorporate tradeoffs like possible increased distribution expenses and increased quality expenses. The production reports that contain certain information about other competitors prove a very useful tool for students to understand the benefits of benchmarking.

Marketing Techniques

Within the area of Marketing, students understand various aspects of pricing and how pricing affects demand. While lower prices increases demand, students start understanding how pricing should be in line with the overall positioning of the product line and the company for the company to do well. They get to appreciate that if they keep prices low, their overall cost of operations have to be low to

retain margins and if their prices are higher than competitors, they need to provide greater value to the customers through other attributes of the product or have to spend higher on marketing. Students also need to make choices regarding differentiation pricing for different types of products and differentiation pricing for different geographical locations. Since pricing plays an important role in product positioning and overall performance of the company, students learn when their results are sub-optimal because of pricing errors.

Students understand that Marketing has various aspects like advertising through various mediums, rebates and celebrity endorsements. Students have to take decisions of product line breadth, quality, retail outlets and customer support. Online sales is also a medium that student can use. They need to decide on pricing and other facilities like free shipping. After taking into consideration all the initiatives of Marketing, forecasting sales becomes very important as an input for production and inventory control. Wrong forecasts can lead to out of stock situations or bloated inventories.

The Management Game has facility for auctions with two options – close bid and open bid auctions. This is a good learning to for students to understand when to bid and what should be the lowest bid price for them to make the bid beneficial for them. Many teams find that competitive behavior leads to irrational decisions during the bidding process.

Students are asked to prepare Marketing Plans, which becomes a very good learning tool to integrate all aspects of Marketing. Typically wining teams ensure that all aspects of their Marketing is in line with product positioning and is consistent over a period of time.

Soft Skills

Theses games also refine number of soft skills that are required to be successful as a manager. Since these games requires analyzing a lot of data that is interrelated in a very short period of time, it becomes very important that teams work very well together. It has been observed that more than individual competence, the wining teams are one that communicate very well and take decisions that fit into the overall strategy of the firm.

Students also understand how to take quick decisions under pressure. The ability to read reports and extract relevant information and make decisions is enhanced. Management Skills like time management, online teamwork and leadership become important. Written communication is enhanced since students have to submit formal strategic, operating and marketing plans.

Presentation and communication skills in the board meeting are also very important for the final grading.

In conclusion, these management games are excellent online e-Learning tools for a capstone course in management.

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Designing criterion-based assessment in a way that emphasizes the development of professional judgment and can be incorporated in a criterion-based e-Learning tool

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ABSTRACT

This paper discusses a systematic approach for assessing some of the skills which students develop while undertaking and reflecting on internships. The approach provides a simple yet effective way to develop relevant assessment tasks, so that the assessment itself plays a constructive role in the learning process. It also provides a practical method for developing assessment criteria that are (a) consistent with the objectives of a program, and (b) suitable for inclusion as part of an e-Learning tool. The approach has been piloted with a beta version of the "*ReView*" e-Learning tool which is currently being developed at UTS. The e-Learning tool helps to achieve three main goals. First, the tool helps the course-developer to connect assessment criteria with the desired graduate attributes. Second, it is used in a way that encourages students to consider their reports' strengths and weakness. Third, it provides a convenient means for markers to mark the students' reports and provide timely and constructive feedback to the students.

Keywords
criterion-based assessment, e-Learning, graduate attributes

1) INTRODUCTION

This paper discusses an approach for assessing some of the generic skills (e.g. critical thinking skills) which students develop while undertaking and reflecting on internships. The approach attempts to take into account considerations of how various learning outcomes can be encouraged and enabled in students of internship programs. The approach is intended to foster beneficial reflection in the context of professional practice, drawing from ideas of Boud (2001; 2006) and Moulton (2007; 2008).

When attempting to develop skills in judgment and decision-making, teachers and learners can tend to employ oversimplified decision-making scenarios. Internships, however, typically place students in real-life situations of greater complexity. While classroom-based activities generally address comparatively narrowly defined exercises or exam questions, students in the workplace are typically required to exercise judgment in a much broader sense.

The generic skills that internships enable might be characterised as relatively difficult to assess. Traditional assessment and examination methods may work well in the context of classroom-based higher education, but it is possible that such methods are less successful in the context of professional practice. It is comparatively straightforward to grade students according to readily-assessable technical skills and readily-assessable chunks of knowledge. Assessing generic capabilities such as professionalism and reflective practice is a different matter entirely.

The majority of University of Technology Sydney Bachelor of Engineering students

undertake two 6-month internships as a part of a 5-year course. For example, a full time UTS engineering student typically progresses as follows: 18 months of classes; 6-month internship, 18 months of classes, 6-month internship, 12 months of classes/thesis. This case study specifically relates to the period between the two internships during which students undertake the subject *Engineering Practice Review 1*. The subject attempts to encourage thoughtful reflective practice and enable students to identify and document workplace learning.[1]

2) METHOD

The approach for developing assessment criteria suitable for inclusion in an e-Learning tool is briefly summarised in the following five steps:

1. Consider the educational philosophy, and arrange principles as a set of questions.
2. Consider the intended graduate attributes.
3. Construct list of Example Indicators.
4. From this list, choose a balanced range of indicators and adapt to produce a small number (less than 12) of "assessment criteria".
5. Review each indicator taking into account considerations of the educational principles and intended graduate attributes.

These steps are illustrated in the following sections

2.1) The educational philosophy and principles were arranged as a set of questions

UTS's educational philosophy is set out in the *Coursework Assessment Policy and Procedures Manual*, (UTS, 2007) – amongst other things, it states:

> Assessment in UTS is based on the general principle of criterion-based assessment that means students' work is assessed against stated criteria that reflect the objectives of the subject. Grades are based on a student's level of performance in achieving stated objectives (criterion-referenced assessment), not on the number of other students who achieve a particular grade

Two of the principles stated in the assessment policy are:

> a) Assessment should be an aid to successful learning and encourage students to apply their knowledge and skills in an analytical and critical manner.
>
> b) Students should receive feedback on their work in a timely manner that assists them to understand the learning objectives achieved and how they can improve the quality

In the case-study described here, examples of questions that arose during this stage of the process are:

- *How can the assessment criteria be formed to reflect the objectives of the subject? (What are the objectives of the subject?)*
- *How can the assessment be done in a way that assists learning, and at a level that is appropriate to the stage in the course?*
- *How can professional judgment skills be encouraged?*
- *How can feedback be given so that students' understanding is improved?*

2.2) The intended graduate attributes were considered

The National Generic Competency Standards put forward by Engineers Australia stipulates that graduates of engineering courses should have

- a knowledge base;
- engineering ability;
- professional attributes.

(Engineers Australia, 2005)[2]

The University, on the other hand, specifies that graduates of the university should have a "graduate profile framework" with the following three broad attribute domains:

[1] Approximately 300 students per year complete their first six-month work-placement internship, and submit a report which is assessed using the criteria and e-Learning system described in the following pages.

[2] These criteria are very similar to those of the Accreditation Board for Engineering and Technology in the USA (ABET, 2002).

- personal (e.g. managing own work)
- professional (e.g disciplinary knowledge)
- intellectual (e.g. critical and independent thinking)

After considering these and other principles, including those of Bowden et al (2000), and Ramsden (1992), five categories were arrived at.

The five categories are provided in Table 1.

Table 1: Categories of Intended Graduate Attributes

	Category
1	Critical thinking, analysis, modelling and research capabilites
2	Communication and cross disciplinary skills
3	Attitudes and values
4	Planning and design capabilities
5	Specialist professional skills

Table 2: Results of Step 3—Engineering Graduate Attribute Categories and Example Indicators

Category	*Example indicators*
Critical thinking, analysis, modelling and research	Locates and reviews relevant information Understands and applies logic and mathematics Analyses and synthesises data and information Handles complexity (e.g. does not oversimplify) Demonstrates creative and flexible processes and solutions
Communication and cross disciplinary skills	Communicates effectively with others (written/oral) Writes according to the reader's level of technical expertise Integrates engineering with other disciplines Considers diverse interpretations and implications Engages in multidisciplinary and inter-cultural activities Writes and maintains appropriate documentation
Attitudes and values	Recognises and values cultural diversity Seeks input from internal and external sources Reviews own strengths and determines areas for ongoing development Considers community, environmental, political, economic and cultural issues Reflects on long-term issues associated with engineering activities Considers own and others' rights and responsibilities
Planning and design	Documents and analyses requirements and specifications Develops and analyses viable design concepts Employs appropriate methods when planning and designing Reviews solutions in light of specifications and requirements Considers and manages constraints, hazards, risks and sustainability Considers standards/design specifications when writing functional specifications
Specialist professional skills	Identifies and proposes options to achieve engineering solutions Plans and manages the development of solutions Proposes appropriate methods for testing, measuring and evaluating solutions Solves problems by applying specialist engineering methods Demonstrates understanding of engineering methods

2.3) A list of Example Indicators was created

Taking the competency criteria into consideration, example indicators for each of the above five categories were formulated. An attempt was made to express each indicator in simple language and as a distinct and universally comprehensible skill, ability, attribute or descriptor. The Example Indicators are provided in Table 2.

2.4) A balanced range of indicators was selected and adapted to produce assessment criteria

Several example indicators were selected from each category and adapted to become assessment criteria. The final set of assessment criteria was balanced in a way that emphasised

Category 1 (critical thinking) and Category 3 (attitudes and values). This is because a major aim of the internship report writing task is to facilitate improved decision-making capacity and attributes relating to professional attitudes and values, while bearing in mind methods intended to foster beneficial reflection in the context of professional practice.

The attempt to stimulate lifelong development of judgment and decision-making capabilities was informed by work such as that of Boud & Falchikov, (2005; 2007), and Moulton (2008) – a key feature is that decision-making judgment is enabled by way of real-word experience and examples. In addition, learning activities which require students to make judgments about their own learning may be beneficial in developing lifelong learning.

3) HOW THE RESULTING CRITERIA ARE USED IN AN E-LEARNING TOOL

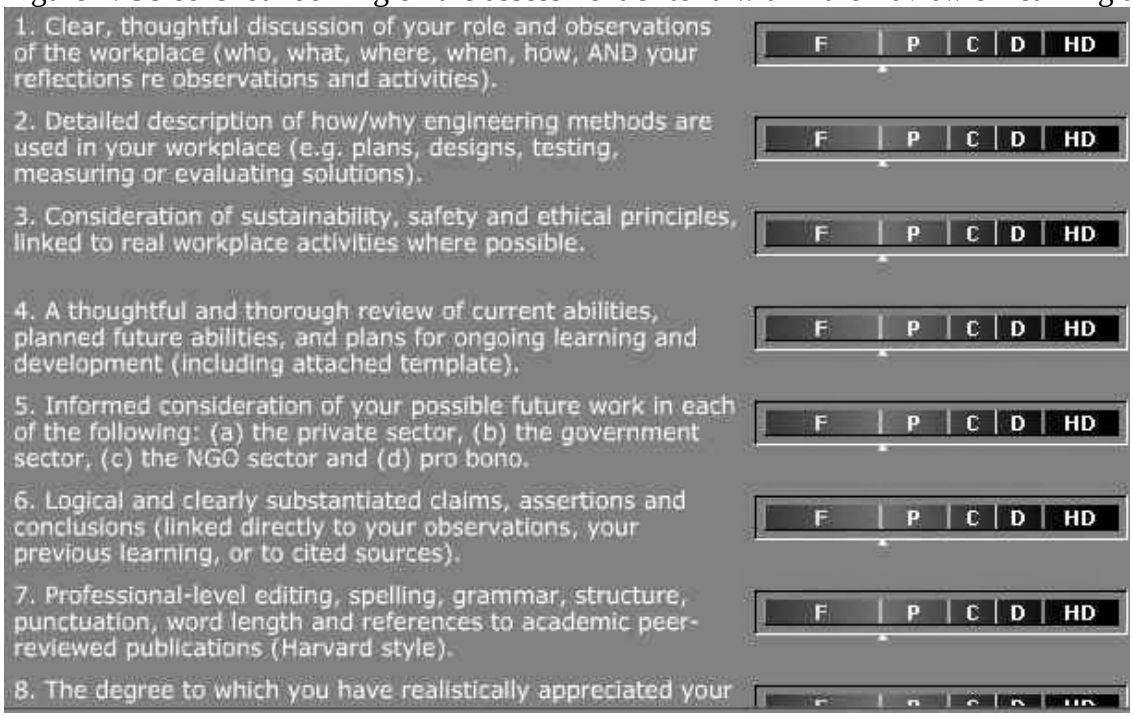
The assessment criteria were loaded into an e-Learning tool named *ReView* that is being developed at UTS. The tool is designed in a way that makes it particularly suitable for the development of criterion-based assessment tasks

Students are able to access this tool from the pre-existing *Blackboard* learning environment, which is shown in Figure 1.

Figure 1: Screenshot showing the *Blackboard* and *ReView* e-Learning tools

The resulting assessment task and criteria are shown in Figure 2.

Figure 2: Screenshot zooming on the assessment criteria within the *ReView* e-Learning tool



When the students submit their reports, they also login to ReView to provide a self-assessment of their reports strengths and

weakness, relative to each of the marking criteria shown in Figure 2.

The markers later perform their own assessments of the students work. After the markers do their assessments, they can then see the students' own judgments concerning their reports, and the markers then provide an additional assessment of the degree to which the student has realistically self-assessed her report's strengths and weaknesses.

4) FINAL OBSERVATIONS

One of the challenges is enabling learning that connects to the diversity of student workplace experiences. Students not only have different disciplinary majors, but have been engaged in a wide range workplace cultures. When students return from their internships to the university, it seems that they experience a transition period. Given their wide range of disciplinary majors and workplace cultures, it also seems that the characteristics of each student's transition can vary greatly from one student to another. Some of the challenges appear to be similar to those faced by programs that seek to enhance the first year experience (FYE), particularly the challenges associated with the transition (from various settings such as school, TAFE, work or unemployment) to the first year of university.

The criteria were cast in a way that addresses both the broad aims of the program and the specific aims of the subject. The assessment task is thus intended to assist students to identify, reflect upon and document what has been learnt, to develop a portfolio to meet professional affiliation requirements, to extend 'non-individual' technical expertise, to reflect on social and ethical responsibility, to consider personal, organisational, and societal attitudes and values, to identify areas that the student wants to focus on during future internships, to form a plan to achieve further learning, and to develop strategies for collaborative and life-long learning.

An important aspect of the criterion-based assessment approach described here is that it allowed the assessment to play a role in contributing to the learning process. It is *constructively aligned*, meaning that the assessment plays a constructive role in the learning process (Biggs and Tang, 2007). However, as noted by Boud and Falchikov (2005), when designing assessments for constructive alignment, it is useful to consider that assessment should not only be aligned to immediate learning outcomes, but also with what is expected for long-term, "longer lasting" learning.

In conclusion, the e-Learning tools provide a convenient means for markers to mark the students reports and provide timely and constructive feedback to the students. The real benefits, however, are achieved through efforts directed at developing well-aligned assessment criteria. Such efforts go a long way to ensuring that an assessment is effective in enabling the skills and attributes associated with long lasting and ongoing learning.

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Innovation in e-Learning through Sponsored Project Based Learning

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ABSTRACT

Enriching learning and its effectiveness by providing enhanced learning experience for students have remained a common concern for any e-Learning initiative. With the web 2.0 Internet technologies interesting possibilities are emerging. However, implementing the latest technologies alone may not guarantee success. In this regard a sound learning model is evolving in a logical progression. Library and information support, collaboration and faculty support, interactive design, creating communities of practices and computer supported distributed collaboration are the logical evolution of the model. Extending the collaboration to provide field experience and on-the-job application through 'sponsored project based learning' (SPBL) is another innovative approach that can be adopted for the purpose of adding the component of authentic learning experience for the students. In this paper we will first briefly discuss the e-Learning approaches and its advantages. Thereafter we will explore the learning opportunities that could be offered, for example, in the JIU's learning model design. We will present the innovative SPBL model to service learning from the practitioners' perspective in a fully online learning environment. This approach allowed the students pursuing education through fully online mode to connect with people in their communities and linked theory to practice enriching learning greatly.

Keywords

E-Learning design, pedagogy, Cognitive apprenticeship, Community of practice, Sponsored Project Based Learning (SPBL).

1) INTRODUCTION

Thomas Edition predicted that "the motion picture is destined to revolutionize" the educational system and will largely supplement the textbooks. Later, radio was hailed with the promise to "bring the world to the classroom". Similarly, the educational television was hyped as a way to create "continental classroom" (Cuban, 1986). How much of these have been met till today? These are the examples from the past indicating the rush to implement cutting edge technologies.

With the advent of Internet and now web 2.0 technologies interesting possibilities are emerging. However, implementing these latest technologies alone may not guarantee success of any e-Learning initiative. This paper will describe an innovative approach called "sponsored project based learning" (SPBL) adopted at Jones International University (JIU). JIU is the first accredited fully online University, named one of the Top ten Online Universities in the World (DiUlus, 2008). Before elaborating SPBL, the basics of e-Learning design are presented briefly.

2) E-LEARNING AND ITS ADVANTAGES

With the advent of technologies for learning and teaching, several terminologies emerged. Starting from CBT (computer based training) to e-Learning and now to m-learning represents a continuum of the search for a better model to describe what we want to do – to promote and support **learning** utilizing technology. Initially technology was stand alone computers (for CBT), then networked computers (for e-Learning), and now what is suggested is always connected portable computer facility (for m-learning). However, all these are mainly for providing universal access to learning,

any-time any-where. Therefore, we will use to the term e-Learning for the lack of better accepted alternative because computers are evolving into mobile, always-connected, portable ubiquitous devices in any way.

There are several factors that contribute to a success of e-Learning and considered as viable options for engaging learners in the academics and also in the workplace. These are:

- **Just-in-time access** - An e-Learning approach with just-in-time access to knowledge and training can provide competitive edge to a learner or a company.
- **Efficient** - An e-Learning solution can provide training to employees more rapidly, more effectively, and more efficiently - especially when the goal is to reach an international audience. Similarly, e-Learning is effective for adult learners who are keen to pursue learning while engaged in a profession. For academic institutions, e-Learning seem to be the best viable option to extend the reach of teaching expertise, meeting the problem of faculty shortages.
- **Time and place independent**- Learning/Training can occur at any place and any time, which provides flexibility and convenience for the learner.
- **Cost savings** - Over time, e-Learning can provide substantial travel and time cost savings as well as cost of enrollment to obtain a degree or certification.
- **Standardization** – This is one of the major advantages of e-Learning. Learning opportunity for the students can be made to remain essentially similar across courses while supporting creativity.

E-Learning is technology facilitated delivery of instruction, knowledge and learning facility that can be accessed by anybody, any-time, any-where. In our view, the prefix ‘e’ is only in the connotation of the delivery model because learning a subject is an independent function of the mode through which it is learned. However, effective e-Learning strategy must be more than the technology itself or the content it carries (Rosenberg, 2001). Rosenberg discussed these in great detail in his book.

The current trend in rapid adoption of e-Learning in academics and in industry is attributed to innovations in learning design. In this regard a sound learning model is evolving in a logical progression. Library and information support, collaboration and faculty support, and extending the collaboration to provide field experience and on-the-job application through ‘project based learning’ are the logical evolution of the model. In a traditional University all the support components are available within the campus. Most Online Universities are also offering all these facilities through electronic means. These have been proved and tested over the years in the JIU’s model of learning design which provides all the learning support components including something more and value added. For example, access to digital library and access to an international body of faculties and students. In the subsequent sections of this paper we will describe the innovations in e-Learning design using JIU’s design as a case example.

3) JIU’s E-LEARNING MODEL

Knowledge accumulated by an expert in a particular subject domain gets distilled and documented in the form of textbooks. Monographs and edited books document the latest techniques or experiences. Scholarly journals disseminate the current practices and research trends. Thus all the knowledge in the world is documented in printed form. Technology now provides another method of making this knowledge easily accessible at lesser cost. Thus there are some tendencies to create an online system through which the knowledge and information are made available in digital form and call it e-Learning. Another closely related approach is making available the video recordings of lectures. However, it will be appreciated that as a knowledge resource the digital productions available through the Internet and a library have similar attributes. It is particularly wrong to assume that putting all the information on the Internet

will make learning to happen. Internet is useful, but it does not guarantee learning any more than a good library ensures creating knowledgeable persons. Thus, digitally available library and information resources are important support components for e-Learning but these are not the end in itself.

For creating effective learning experience, a holistic model of e-Learning is required. JIU's learning model provides this through four interlinked components as shown in Figure 1. Interactivity and collaboration is the key to the model. This allows the learners to become directly involved with the information material, make active choices, navigating their own path and participate in **active learning** understanding the building blocks of their studies.

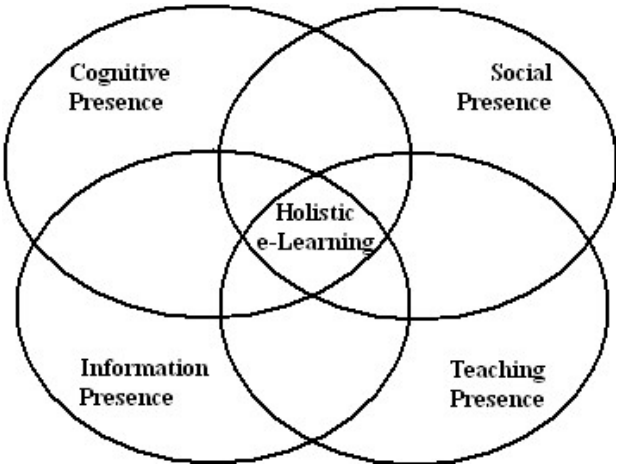

Figure 1: Holistic e-Learning infrastructure

Collaboration is the key to the model shown in Figure 1. It encourages the social aspect of learning by creating online communities through the course forum where the students (and faculty) share information and participate in discourse, complete collaborative work and projects. The social presence thus created for each course, permeates across courses through cohorts.

Teaching presence is created through two-tier approach. The courses are first authored by experts contacted from various institutions. The world class curriculum thus created is taught by other contracted teaching faculties who are specially trained to facilitate students' learning in a totally online learning environment. This is a new kind of skill that has been mastered by the JIU team. JIU Professors are assigned courses in their specialty and students have easy access to professors and peers' contact to promote learning community aiding completion of the project.

Cognitive presence enables the learners to construct and confirm meaning through sustained reflection and discussions in an environment of critical community of learning. This is supported by forum discussions and though targeted assignments. The course instructional designs are structured to facilitate the process for the learners as per their individual need.

E-learning design also includes effective integration of administration, content, delivery and media. This is provided by the JESS®, Jones e-education Software Standard®. It has been our experience that for the purpose learning, pedagogical methods determine the educational success. Here, technology only compliments the design.

4) PROJECT BASED LEARNING

Assessment of student learning outcomes is a natural requirement. For this purpose JIU continues to utilize and expand a variety of comprehensive approaches to measuring student learning success. It is guided by best practices in student learning assessment principles and strategies and designed to meet the expectations of external agencies and professional organizations. Comprehensive and ongoing assessment of student learning includes measures that evaluate professional knowledge and performance, demonstrate candidates' ability to apply competencies and skills in an educational setting, and generate information and data used to inform curriculum design and program improvement.

In order to implement this evaluation approach it was realized that conventional tests will not serve the required purpose. Further, the traditional exam-based evaluations tend to promote rote learning. Therefore, project-based curriculum guided by professional competencies has been adopted. Foundation for

this approach is based on the principle of situated learning. Knowledge is situated, being in part a product of the activity, context, and culture in which it is developed and used (Brown and Duguid, 1989). Students are required to develop professional synthesizing projects in every course. These are designed to demonstrate student learning of program and course learning objectives, as evaluated by faculty using assessment instruments built to determine the level of a student's acquisition of professional knowledge and skills.

The project-based learning model is extended further to create sponsored project-based learning (SPBL). This promotes Cognitive apprenticeship where the students are engaged into authentic practices through activity and social interaction. This supports learning in a domain by enabling students to acquire, develop, and use cognitive tools in authentic domain activity.

The goal of sponsored learning is to be of service to the sponsor. The students provide a service to the sponsor. At the beginning of a course, the student's sponsor is asked to review the course learning outcomes, as well as the student's proposal. Toward the end of the course, the sponsor reviews the completed professional project. Students complete professional synthesizing projects under the guidance of supervising professors and field-based sponsors in learning communities around the globe. Sponsors are the thought leaders in the field and act as bridge to academic environment. They provide guidance for the student's professional synthesizing project and ensure that the project has a real-world application while the project is firmly based on the topic of the course. The broad picture of JIU's innovative e-Learning model is shown in Figure 2.

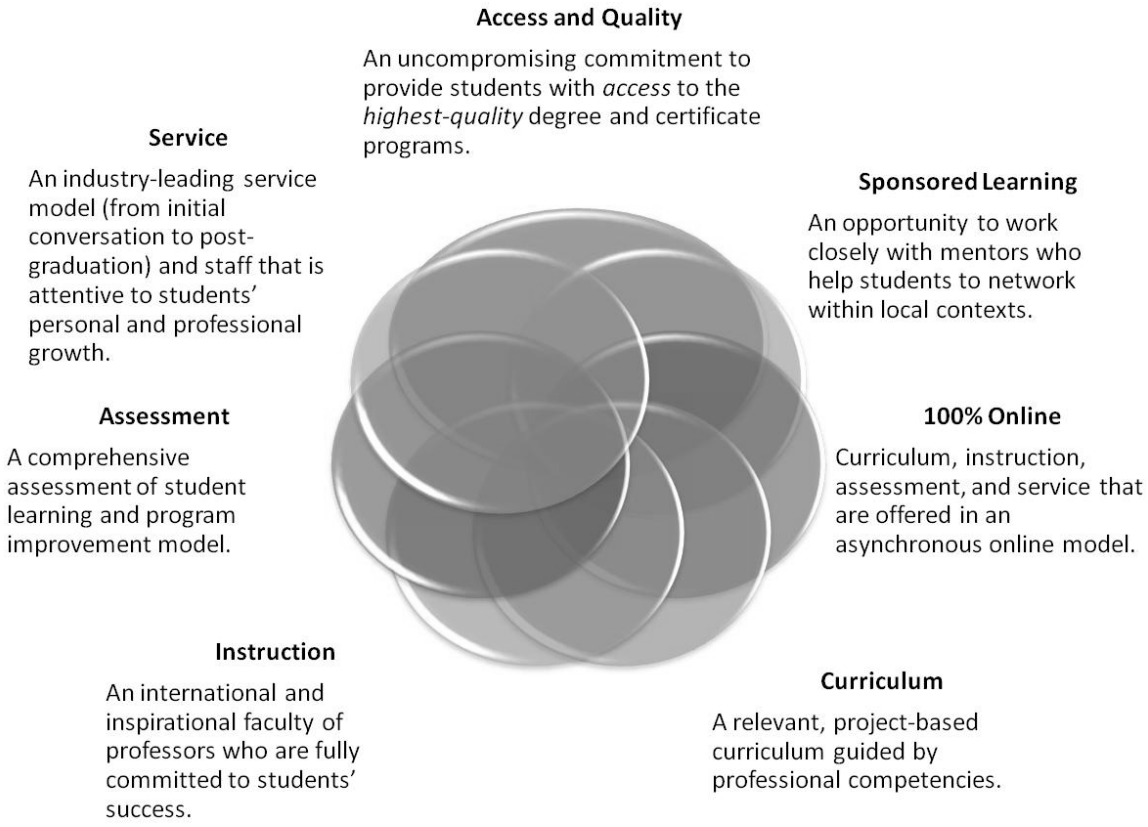

Figure 2: E-Learning innovation at JIU (Fulton, et.al. 2008).

5) BENEFITS

In completing the sponsored project the student act as project manager, managing his/her own project for success. The objective of SPBL model is to empower learning in ways that are personally and professionally meaningful to the student while they explore theory and its application to the solutions of important education challenges. Each course requires students to work closely with a sponsor to complete a project that addresses a relevant, authentic problem. Thus *Student Learning Outcomes* are:

- High quality professional synthesizing projects,
- Students connect to leaders in their fields,
- Professionally meaningful work that changes their worlds for the better,
- Students open avenues for their personal career development and become professionals, and
- Enhance the Social Networking Competence of the students.

The SPBL model allowed the university learning to be grounded in authentic practice, enlarging the *cognitive presence* and *social presence* beyond e-Learning environment provided by the University (Figure 1). Students are prepared to be active members of networks of practicing professionals. Influential professional must know how to build relationships with others, political leaders, business leaders and other professional practitioners. This skill is inculcated through the sponsored learning practices.

Through multiple measures, the program has documented student achievement of course and program learning objectives, including:

- Student satisfaction ratings with their learning,
- In-course and course-to-course retention,
- Graduation rates,
- Placement into the workforce,
- Employer appraisal of graduates' performance.

6) CONCLUSION

From a technocratic perspective, there is a tendency to assume that installing computers and networks will solve every conceivable problem. However, the value and benefits of technology will come only through leveraging it for dynamic and strategic purposes that place the focus first on the learning and performing and second on the technology (Banerji, & Scales 2005).

The key lessons from the past indicate that attempts to create information and learning systems using a technology-centered approach generally failed. It is important to consider technological solutions principally to support teaching and learning. For this purpose we need to consider the benefits of a user-centered approach from the standpoint of design. A well designed holistic approach towards learning and training development is needed to support the e-Learning needs of the current generation and for this purpose Figure 1 provides the broad framework.

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ELECTRONIC LESSON

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ABSTRACT

Beginning from 2006-2008, USAID/ Ethiopia through Academy for Educational Development launched a new strategy to infuse Educational Technology into Teacher Training Institutes (TEIs) of Ethiopia.

This is a demonstration on a success story and on-going project of using interactive multi-media program (electronic lesson) for 22 governmental TEIs. The primarily focus of the Project is to promote active learning by: generating and stimulating teacher trainers' and students' interest to use Educational Technology, producing E-lessons for students of teacher education institutes, and training ICT personnel of the TEIs on how they can produce their own customized lessons.

Electronic lesson is a self-instructor tutorial developed using Macromedia Authorware software and other supportive softwares. These E-lessons integrate text, graphics, digitalized sound, animation and live video to simplify, explain, generate interest and create interaction with the user. They address physical science subject matters (in mathematics, physics, biology and chemistry) that most students find difficult to learn and in the areas where students got low marks. The lessons have been tested on teachers and students, and evaluation questionnaires were collected showing high interest on continuous production of these lessons.

The E-lesson can address e-Learning curriculum development issues and more other applications that demonstrate given topic supporting it with real-life situation and containing examples that make remarkable memory in our mind.

1) Introduction

Globally, ICTs include interactive radio instruction, multi-media including television, as well as computers and electronic devices and gadgets used in information communication. The technology of teaching and learning is a combination of ICTs' media and devices, and human learning theories and management science. According to the report of the 1998 UNESCO World Education Report, **Teachers and Teaching in a Changing World**, "Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICTs) to teach students the knowledge and skills they need in the 21st century. The report describes the radical implications ICTs have for conventional teaching and learning. It predicts the transformation of the teaching-learning process and the way teachers and learners gain access to knowledge and information." Obviously, ICTs bring learning efficiency through improved presentation methods refined over time. Many students are eager to present their work using a simply technology as PowerPoint. Many teachers can build a library

of reading resources for their students from free resources found in the Internet.

In Ethiopia, radio and television broadcast programs support courses in primary, secondary and distance education programs. Teacher Education Institutions (TEIs) offer courses for pre-service students on how to use audio-visual devices in teaching such as overhead projection, video projections, audio cassette recorders/players, videotape recorders/players, television, video projection equipment, slide and opaque projectors. In teaching and learning most of the above devices can be termed as passive technology because their interactivity depends upon the manipulative ability of users, thus, the need to shift to Information Communication Technology (ICT).

The use of ICTs in teaching and learning began in 1997. The United States Agency for International Development (USAID), through a contract with Academy for Educational Development (AED) started a program to use ICT in supporting teacher training courses. The process involves systematic stages as presented below.

Stage 1: Setting up facilities –workstations, Internet access, intra-networking

Stage 2: Training –basic word-processing skills, intermediate skills in data processing and presentations; advanced skills in data-processing, and use of multi-media softwares.

Stage 3: Setting up database sharing (portals) and exchanges

Stage 4: Software applications in teaching and learning.

This is a demonstration on a success story and on-going project of using interactive multi-media program (electronic lesson) for 22 governmental TEIs. The primarily focus of the Project is to promote active learning by: generating and stimulating teacher trainers' and students' interest to use Educational Technology, producing E-lessons for students of teacher education institutes, and training ICT personnel of the TEIs on how they can produce their own customized lessons.

2) About the Authorware Lessons

The Authorware lessons are designed to address a particular aspect of a course in such a way that difficult concepts are illustrated with examples supported by

A. Simulation and gaming exercises
B. Graphical illustrations
C. Still photographs
D. Motion pictures or movies
E. Laboratory experiments
F. Dramatization
G. Etc

3) Learning support uses

Each lesson runs for about 10-30 minutes and have the following learning advantages:

- Provide students the opportunity to learn at their own pace. Each lesson has "Next" and "Back" loops to study each frame over and over;

- Provide students the opportunity to have access to additional information that enriches the lesson topic by using
  - **Links**- these are references to further explanation, definition, examples, additional information and other websites that contain the same or similar information.
  - **Visual Aids**- these are graphical animations, photographs, motion pictures of classroom teaching, laboratory demonstrations, dramatization etc. that help the students to develop better mental images that explain the concept.

4) Features of the Authorware

- Authorware is an authoring system intended for use by non-programmers who wish to create interactive multimedia presentation.

- The package supports text, graphics, digitized sound, animation and full-motion video within presentations.
- Authorware runs in a graphical environment, that is, rather than defining the structure of a presentation using text-based commands, pictorial representations are used wherever possible to show the sequence of events graphically.
- The ability to work in a graphical environment increases the quality of the end result including graphics and animation, and generally controlled with a mouse which can also result in more attractive and accessible tutorial for students.

5) Performance summary

Macromedia Authorware lessons are developed as a part of the infusion of Education Technology into the teaching curriculum. The TEIs were involved in the training on how to use the Authorware software.

- At first, on April 2007, a 3 week workshop was conducted for 19 instructors on how to use the Software
- Each college developed 2 lessons upon returning from various institutions. These lessons were presented in a national workshop attended by USAID, senior officials from basic service program and the mission director, the state minister of education, department head of MOE and regional education biro heads.
- Participants were provided feedback to make the lessons more interactive as well as to add new ones.
- 11 lessons were further refined as sample lessons and distributed to the colleges.
- A pilot test was conducted on students at Kotebe College of Teachers Education.
- A Pilot test was conducted on teachers at Adawa TEI.
- On August 2008, a 5 days follow-up workshop was conducted to refresh the ICT personnel of the 19 TEIs. Each college were assigned to developed 3 lessons(1 new, 1 revision from the existing lessons and 1 evaluation exercise containing 40-60 question or 1 revision for the existing) upon return to their institutes.
- Currently, we are collecting the lessons produced by the colleges and evaluation is under-going before the distribution starts.

5.1) Students assessments of lessons produced by Macromedia Authorware

27, December 2007
Kotebe College of Teachers Education

Sample Lesson Topic: Projectile motion (Physics)

Speed of presentation	Just right	Too fast	Too slow	Total
	16	2	2	20
Lesson sequence (Correct and relevant)	Very good	good	bad	Total
	24	6	0	30
Clarity of voice	Very clear	Just clear	Not clear	Total
	26	4	0	30
Graphic enhancements	Very helpful	helpful	Not relevant	Total
	23	7	0	30
Examples	Very clear	Just clear	Not clear	Total
	20	8	0	28
Exercises and feedback	Very helpful	helpful	Not relevant	Total
	21	6	3	30
How does this lesson compare with the live teacher	Better	Equal	Worse	Total
	21	3	4	28
How does this lesson compare with reading your manual	Better	Equal	Worse	Total
	26	4	0	30
Do you recommend us to continue producing these types of lessons?	YES I like them very much	YES I like them somehow	NO I do not like them at all	Total
	24	6	0	30

Figure 1: The following table shows the result of assessment on 30 students.

5.2) Teachers assessments of lessons produced by Macromedia Authorware

29, July 2008
Adawa College of Teachers Education

Sample Lesson Topic: Mitotic cell division (Biology)

Relevance to the TEIs curriculum	Not relevant	Helpful	Very helpful	Total
	0	2	14	16
Helpful to simplify complex concept	Not relevant	Helpful	Very helpful	Total
	0	3	13	16
Clarity of voice	Not clear	Just clear	Very clear	Total
	0	5	11	16
Graphic enhancements	Not helpful	helpful	Very relevant	Total
	0	3	13	16
Exercise and feedback	Not helpful	helpful	Very helpful	Total
	0	3	13	16
Do you want to produce your own customized lessons and demand us to facilitate training for you?	Not at all	Just recommended	Very recommended	Total
	0	3	13	16
How does this lesson compare with the class room teaching technique?	Worse	Equal	Better	Total
	0	2	14	16
Will you recommend students to these lessons for further study?	Not at all	Just recommended	Very recommended	Total
	0	1	15	16
Do you recommend for continues production of lessons like this?	Not at all	Just recommended	Very recommended	Total
	0	2	14	16

Figure 2: The following table shows the result of assessment on 16 teachers.

5.3) Education Technology lessons series

Education Technology lessons series using
Multimedia Software (Macromedia Authorware)

Biology	**Chemistry**	**Mathematics**	**Physics**
Mitotic Cell Division Robe College of Teachers Education	**Balancing Chemical Equations** Kotebe College of Teachers Education	**Trigonometric Functions** Adwa College of Teachers Education	**Projectile Motion** G/Belese College of Teachers Education
Protein Synthesis Adwa College of teachers Education	**Resonance Structure** Adwa College of Teachers Education	**Polynomial Functions** Dessie College of Teachers Education	**Collusion** Kotebe College of Teachers Education
Formation and Replication of DNA Adama College of Teachers Education	**Molecular geometry** Assela College of Teachers Education	-	**Kerchief's Rules** Awassa College of Teachers Education
-	**Close Packing** Robe College of Teachers Education	**Application of derivatives for sketching** Gondar College of Teachers Education	**Conservation of Mechanical Energy** Gambele College of Teachers Education
-	**Ozone layer Depletion** Assela College of Teachers Education	**Geometric Construction** Kotebe College of Teachers Education	**Electromagnetism** Hossana College of Teachers Education

Biology	Chemistry	Mathematics	Physics
-	**Periodic table** Awassa College of Teachers Education	**Volume of Solid of Revolution** A/Minch College of Teachers Education	**Impulse and Momentum** Mettu College of Teachers Education
-	**Hybridization** Adama College of Teachers Education	**Limit and Continuity** Bonga College of Teachers Education	**Magnetic Field** Abbiy Addi College of Teachers Education
-	**Balancing Chemical Equations** D/brihan College of Teachers Education	**Tangent Line** Bonga College of Teachers Education	**Uniform Circular Motion** Dessie College of Teachers Education
-	**Hybridization** Jimma College of Teachers Education	**Introduction to Derivatives** Bonga College of Teachers Education	**Mutual Induction** Awassa College of Teachers Education
-		**Conic Sections** Nekemet College of Teachers Education	**Lorenz Transformation** A/Minch College of Teachers Education

Figure 3: Education Technology lessons Series produced using Multimedia Software (Macromedia Authorware)

SMILE! Students Meeting for Intercultural Learning and Exchange

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ABSTRACT

The following paper considers the viability of cyber exchanges between students in two Asian nations, Malaysia and Japan. In keeping with the theme of the conference, the paper will present the ideology and rationale for such an initiative, some applicable research, preliminary results, as well as a discussion of this emerging format's potential.

Keywords
Classroom applications for emerging technology, Innovation for education

1) INTRODUCTION

In November 2007, the 10 member states of ASEAN signed the Charter of Southeast Asian Nations. Article 35 of the charter states that "ASEAN shall promote its common ASEAN identity and a sense of belonging among its peoples in order to achieve its shared destiny, goals and values." In order to accomplish this, Article 34 provides that the official working language of ASEAN shall be English (ASEAN, 2007). The following paper acknowledges that there are many issues regarding the use of English as a global language. I share the concern that English is regrettably serving a gatekeeper function in all too many contexts, with a resultant overemphasis within educational environments on testing. Language is better used for communication and for the promotion of understanding and respect amongst the peoples of the world. It is also an implicit assumption of this paper that English should be adopted for communication in international contexts with full respect for its local varieties, furthermore that English should not be a vehicle for the spread of cultural values that may conflict with the first language (L1) or first culture (C1) of the context in which it is used. It is therefore with the strongest possible conviction that I affirm the value of diversity and respect for linguistic, cultural and religious differences on a global basis. With this in mind, the following paper has little to say about historical aspects of how English came to play such a prominent role in global interaction, nor does it consider the ideology of higher language policy. Rather, as Al-Salman (2006) has noted, it accepts the fact that English can provide students with wider access to opportunities such as (a) economic, political and material resources; (b) a role in the decision-making process at the international level; (c) the ability to introduce and cope with global technical developments, including the Internet and Information Communication Technology (ICT).

A key objective of this study is to create a situation where students of English are able to interact and realize the potential of English as a *língua franca*. An unfortunate aspect of many teachers' approach to the English language is that they convey an impression which designates certain aspects of English as the preserve of native speakers. This can result in a situation where learners do not take full ownership of their learning experience, and it perpetuates a certain attitude toward the use of English which is counter-productive for language acquisition. As Tsuda (2008) has noted, English language instruction is all too often associated with the West exclusively, and is too closely associated with power issues. This is a situation which obscures English's full potential to be used as a *língua franca*. The Students Meeting for Intercultural Learning and Exchange (SMILE) initiative seeks to alleviate this situation by allowing students the opportunity to interact in an international forum with other Asian members of their generational

peer group, to exercise their developing language skills and to test and explore emerging technologies. Implicit in this process are efforts to develop international understanding between two Asian nations and attempts to make effective use of ICT in educational settings that could be described as typical, and even those which are somewhat ICT-challenged. This paper will therefore summarize some recent studies, outline the rationale for the SMILE initiative, as well as note progress to date.

2) TECHNICAL RATIONALE

A parallel goal underlying the SMILE project is to allow students to experience language and explore emerging technologies at the same time. It is with some urgency that language teachers and materials developers should consider the use of technology where language teaching is concerned. Extensive opportunities are being made possible by emerging technology. Furthermore, an increasing number of students today are moving close to becoming what Prensky (2001) has referred to as "digital natives." Higher education language teaching must at times make efforts to accommodate this reality, and make efforts to incorporate relevant aspects of emerging technologies in instruction and also to afford students the opportunity to use the target language in situations that will hopefully help them to mitigate demands that the 'real world' will place upon them once they have graduated. David Wiley's 2006 report to the American Secretary of Education's Commission on the Future of Higher Education summarizes this imperative nicely by noting that:

> We must recognize that not only is "the world" changing, but our students are changing along with it. Normal life experience for today's undergraduates involves assumptions about instant, on-demand access to multiple sources of information and multiple people via myriad technologies…With significant changes occurring in its societal context and participant base, higher education must innovate in teaching and learning, as well as other areas, to hope to remain relevant.

With the above in mind, I decided to try to implement a project where students could speak to other students in remote locations via the Internet, together with Abdulah Adnan Mohamed of Universiti Malaysia Pahang. Voice over Internet Protocol (VoIP) allows users to speak over the Internet. One of the most popular VoIP programs available is Skype. Skype functions closely along the lines of traditional telephone service, albeit in a web environment. It is user friendly, once it is installed and configured. The initial set up of the web camera and the audio can be somewhat complicated, but thereafter the operating system is largely intuitive. Skype is available for PC, Mac, and Linux operating systems. It enables users to talk with other Skype users throughout the world. Furthermore, the service is free when used between two computer-connected lines. Skype provides conference calling for as many as 10 simultaneous users. Endeavours to date which have used Skype include The CultureQuest Project and The eTandem Network. The CultureQuest Project involves students and teachers in inquiry-based classroom projects that explore other peoples and cultures. The project has used Skype to enable American students to engage in mini cyber-exchanges with students from numerous countries. The eTandem Network allows language learners to work together with a language learning partner from another country by Skype, telephone, e-mail or other media.

3) STUDIES TO DATE

Mackey, Oliver and Leeman (2003) noted that an important aspect of interaction is that learners receive various types of feedback on their non target-like output. Their study investigated the provision of feedback by native speaker (NS) and non-native speaker (NNS) interlocutors in task-based interaction to assess if there was any difference in (a) the amount of feedback, (b) opportunities for modified output, (c) immediate incorporations of feedback. Such differences would have important implications for assessing the value of learner-learner pair work and inform the design of instructional programs. Analyses revealed significant differences for amount,

nature, and response to feedback according to dyad type. Results showed that feedback is less common among adult NNSs, however, even they provided it in response to 32% of their interlocutors' non-target like forms, which suggests that such interaction can be a valuable source of target language information for learners.

Where technical versus non-technical interaction is concerned, MacLean and Elwood (2008) have found that students show no preference between face-to-face versus Internet chatting, while An and Frick (2006) have found that students prefer face-to-face discussion for most tasks, however computer mediated communication (CMC) was preferred for simple learning tasks. Abrams (2003) compared the performance of three groups of learners (a control group, a synchronous CMC group, and an asynchronous CMC group) on three oral discussions tasks, and found that there was an increase in the quantity of language produced by students in the synchronous CMC group as compared to the other two groups, albeit no significant difference was shown in terms of the quality of language indicated among the three groups either lexically or syntactically. Kotter (2003) has suggested that online voice exchanges can contribute to successful second language acquisition (SLA) and the development of learners' metalinguistic abilities. The author compared the discourse between 29 language students from classes at a German and a North American university, and found that there was a marked difference between conversational repair in spoken interactions and in the CMC-based exchanges. Repair is defined as a reaction to some trouble spot in speech or nonverbal behavior that attempts to right the trouble spot. The trouble spot can be an error, but is not necessarily so; it is sometimes found where no detectable error occurs, such as word searches characterized by silence (MacLean, 1998). Jepson (2005) compared the patterns of repair moves in synchronous non-native speaker text chat rooms to voice chat rooms on the Internet and found a higher number of total repair moves made in voice chats and a significant difference between them and those made during text chats. This suggests that voice chats offer an environment that is more conducive to the negotiation of meaning and therefore of value for second language development.

4) PARTICIPATING SCHOOLS

Universiti Malaysia Pahang (UMP) is a competency-based technical university that specializes in the fields of engineering and technology. It is located in the East Coast Industrial Belt of Peninsular Malaysia, which hosts a large number of multinational corporations in the chemical, petrochemical, manufacturing, automotive and biotechnology industries. Participants in the SMILE initiative are first year students who are enrolled in the university's compulsory first year English Communication courses. The gender composition of classes is almost equal and most students are between the ages of 18-23. They are from different engineering majors such as Software Engineering, Manufacturing Engineering and Occupational Safety and Health.

Tsukuba University is a four year national university, located approximately 80 kilometers from Tokyo. It is one of the more competitive Japanese universities to enter. Students come from throughout the Japanese archipelago, and they thus represent a geographic cross-section of highly-motivated Japanese university students. Participants in the SMILE initiative are first year freshmen who are enrolled in the university’s compulsory English Communications course. Gender composition is mixed, with an average age of 18. They are from different majors, including Humanities, Civil Engineering, Biology and one advanced-English class.

Japan is mostly a monolingual country with a large degree of cultural homogeneity. Understandably then, the majority of students have had limited opportunity for discourse in English, and their knowledge of the world beyond Japan is limited and academic. A survey of 250 student-participants found that their knowledge of the Muslim world was particularly limited. Using an eInstruction Interwrite Personal Response System (PRS),

students were asked to rate their knowledge in increments of 10 between 0 and 100 (see Figure 1). Results revealed that students largely perceived that they had very little knowledge of the topic, with an average answer of 20. This suggested that an exchange endeavour, such as SMILE, would be a worthwhile undertaking if it could promote further understanding in this one area alone. Additional motivation to undertake the project was that learners do not receive enough feedback or opportunity to interact in large classes and that they do not use the target language enough during interaction-inspired activities. Discussion between the researchers found other common obstacles to language learning, such as those described by Kassim and Mohd Radzuan (2008)

> Conversing in a second language particularly in English can be demanding for second language learners; they [students] are often reluctant and embarrassed to communicate due to the fact that they are afraid they will commit grammatical inaccuracy. Concerns over accuracy often hinder students' ability to speak fluently.

It was therefore decided to give students the opportunity to converse with peers from another country, and to observe if this resulted in more use of the target language. It was also hoped that such experiences would improve students' fluency as well as give them an opportunity to use their English in an intercultural communications setting.

5) RESULTS TO DATE

Results of the SMILE initiative thus far are limited due to the short time since the project was conceived. It will take yet some time before the program is able to harmonize its objectives with existing curricular demands and develop tasks accordingly. Still, contact has been established between instructors at both locations, using Skype. An initial session between student representatives in Malaysia and the instructor in Japan has also been accomplished. Students were shown a PowerPoint presentation about places that the instructor went during his summer vacation as well as his activities. There were approximately 7.33 million users online when the exchanges were undertaken. Initial exchanges were attempted using audio and visual communication. Seven attempts were undertaken, with connection times ranging from 0.28 to 3.30 minutes. Particular difficulty was encountered establishing video communication, and sound quality varied. The eighth attempt resulted in a 5.13 minute connection, and a conversation with a student who spoke very well resulted; however technical difficulties thereafter required a switch to Skype's text messaging. Questions ensued regarding the instructor's houses Canada and Japan. Conversations typically featured self introductions, procedural discussion and questions regarding the PowerPoint presentation.

6) LIMITATIONS

Several limitations have been revealed thus far in the SMILE project, which present challenges to overcome before the full potential of this endeavour is realized. The most obvious shortcoming regards technical obstacles to effective VoIP communication. Notably, a lack of sufficient bandwidth prevented effective use of Skype audio and visual features, as mentioned above. Additional difficulties occur regarding differences in the school year and the scheduling of various holidays. To date, it has been challenging to find an extended period when both countries are in school, so as to properly introduce the format to students. The timing of each school's class schedule and the length of classes also vary. Tsukuba University classes are 75 minutes whereas Universiti Malaysia Pahang classes are 90 minutes. Finally, the student ratio is unbalanced in some classes. Tsukuba University classes typically have 40-48 students, whereas the number of students in Universiti Malaysia Pahang classes is in the low thirties. Thus, there are a number of issues to be resolved before further progress can be accomplished; however, both instructors are optimistic that accommodations will ensure that further exchanges are carried out.

7) CONCLUSION

The above account describes how students

from different cultures are currently or will soon be able to meet & learn about each other using VoIP technology such as Skype. It suggests that the incorporation of such experiences into the language learning curriculum will expose students to 'real world' skills and better prepare them for their futures. It also contends that such experiences will help them to better perceive the usefulness of English as a *lingua franca* and to develop fluency. Results of the SMILE initiative are admittedly limited to date, and several obstacles have been identified. However, essential progress has been achieved and further accomplishments in the near future are anticipated.

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Mobile-Learning in Thai Universities: Potential Technological Impacts

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ABSTRACT

Higher education appears to be changing in Thailand, as students, especially young students whose networking concerns match their obsession with mobile technology, may not accept past staid patterns of teaching practices and opt for more contemporary approaches such as mobile-learning.
This research used a qualitative approach and conducted a focus group of students exploring their recent experiences of m-Learning at a university in Bangkok.
The major results yield a mixed response in terms of student readiness for m-Learning technology demands. The analysis would appear to suggest that there are crucial technological constraints that have to be overcome relating to mobile devices, the media used and the effects of the delivery mechanism; and that these technological constraints have a considerable impact on student's pedagogic engagement.
Future research implications and issues surrounding the development of mobile-Learning in Thai higher education is also discussed.

Keywords
m-Learning, Higher Education, e-Learning, Thailand.

1) INTRODUCTION

Higher education appears to be changing in Thailand. Students, especially young students (Wilson and Velayutham, 2008) - whose networking concerns match their obsession with mobile technology - may not accept past staid patterns of teaching practices and opt for more 'sexy' contemporary approaches such as mobile-learning (Weller, 2008). These students can be characterised essentially as *digital natives* (Prensky, 2001a). Although Robinson's (2008) notion of contemporary students learning behaviour as *collaborative, problem solving and task based*, may not reflect a universal student phenomenon and is perhaps somewhat imprecise when applied to Asian settings. This may be considered in terms of the disconnected discourse (Lippincott, 2005) between what higher education offers students and what they demand in terms of learning attributes and the technological provision that encompasses their pedagogic needs. However, Bates (2001) claimed that many universities in developing countries may not move towards e-Learning and this may thus offset and reduce the pattern of university engagement in m-learning.
Consequently, student demands could add pressures to Thai higher education to make their educational provision more personalised, interactive, responsive and facilitative – using technologies in the same way as expected through students' normal social-networking behaviours. However, engaging higher education processes to consistently meet students requirements comes at a cost. Besides the usual costs of media development, universities in Thailand will also have bear the costs of on-going staff training; upgrades to hardware and software; and of course the cost of understanding what students want. Whilst these are upfront costs, which burden the higher education purse, there is also the opportunity-cost associated with not engaging with such contemporary technologies as the competition seizes such opportunities to gain student recruitment increases. This also puts pressures on higher education internal changes such as quality assurance mechanisms and how these are changed to facilitate assessments. Thus, changing one part of the technological

equation creates fundamental and on-going issues that underpin exactly what higher education needs to do in order to match student demands. Web 2.0 and any corresponding use of mobile devices are seen as technological tools in linking the university to meet these current student demands. The power of Web 2.0 underpins e-Learning 2.0 and helps create and communicate towards a more effective distributed learning environment.

What are mobile devices?

Petsas et al. (2001) suggests that mobile devices are often technologies such as personal digital assistants (PDAs); mobile phones; iPods; and also includes such things as web-based systems that support both internet and mobile access. This is seen by some an innovative (Nyiri, 2002), reflecting newer and broadening learning channels that seemingly offers organisational flexibility. Ally (2004) defined m-learning as the delivery of electronic learning materials to mobile devices. Unfortunately, targeting remains one of the ubiquitous problems of electronic media personalisation developments (Perugini and Ramakrishnan, 2003) through which to deliver appropriate adjustments in learning content provision as flexibility is required as a consequence of heterogeneous mobile technologies relating to student device software capabilities and hardware limitations. Coupled with the technology limitations are the issues surrounding delivery band-width (Jones et al., 2006) which has an impact on the effectiveness of the whole m-learning experience – irrespective of the mobile-device capability or the content design.

Numerous researchers have discussed digital system developments (Petsas et al., 2001; Cheng et al., 2000; Tsai et al., 2000) and have shown how user data can be used to provide appropriate content/information streams that match targeted user learning needs. More appropriate to this paper, Zhang and Shijagurumayum (2003) used the concept of *user metadata* as a profile underpinning the delivery of targeted and customized content to mobile-phone users. This has not been lost in pedagogic developments, as research has focused on how students may be assisted in receiving individualised and personalised knowledge content (Dahn and Schwabe, 2002) whether as assisted learning in the classroom (Carchiolo et al., 2003) or through distance-learning programmes (Qu and Shen, 2002; Dadarlat et al., 2002). Consequently, it has become an operational imperative for universities to deliver appropriate learning requirements to interested stakeholders/students (Freeman and Thomas, 2005; Lancaster and Reynolds, 2002) directly through contemporary technologies such as mobile devices (Tapp et al., 2004)..

2) METHODOLOGY

To consider more closely the technological issues involved in the application of m-learning in Thai universities, this empirical paper employed an interpretive approach using a semi-structured questionnaire providing an appropriate element of context and flexibility (Cassell and Symon, 2004). Given the lack of purposeful research in this area, this methodology is seen as appropriate to generating contextual data for the purpose of underpinning an enriched theory development (Cayla and Eckhardt, 2007).

The population for this study were international students in a private university in Bangkok (based on Carman, 1990; Glaser’s (2004)) and the resultant sample frame was based on convenience sampling (after Harrel & Fors, 1992). The criteria of theoretical purpose and relevance (Glaser and Strauss, 1967) were applied to the identified population. The focus group was conducted in English and audio recorded for future analysis. The interview took approximately one and a half hours and were later transcribed verbatim. The conduct of the interviews follows a similar process as used by Gray & Wilcox (1995), where the group was asked a small set of prepared questions modified through ancillary questioning (probes and follow-ups) in the same way as Balshem (1991).

The focus group outcome was manually coded initially using Copernic desktop according to sub-themes that 'surfaced' from the interview dialogue using a form of open coding which is derived from Glaser (1992a) and Straus & Corbin (1990). This treatment was also reinforced and extended through the use of thematic analysis conducted using the NVivo

qualitative software package (Walsh et al., 2008). In this way, no portion of any interview dialogue was left uncoded and the outcome represented the shared respondents views and perspectives. Various themes were detected from the use of this package, as well as from the manual coding. This dual form of interrogation was an attempt to increase the validity of the choice of both key themes and sub-themes through a triangulation process. NVivo was further used to explore these sub-themes by helping to pull together each of these sub-themes from all the interviews (Harwood & Garry, 2003). It was thus possible to capture the respondent's comments on each supported sub-theme and place them together for further consideration and analysis.

3) OUTCOMES

The major outcomes of this m-learning inquiry suggest that there are many and varied issues that need to be assessed in order for m-learning to become more common-place in Thai higher education. Three major questions were asked in the focus group interview. The student responses are discussed below:

What is that students want from m-learning?

Students appeared to require media that they could use to collaborate with other students (Moriarty, 2008; Clarke and Hermens, 2001) and thus require that the media is flexible pedagogically in terms of learning outcomes and social integration (Duin, 1996). This would seem to be a crucial factor which could use the inherent capabilities of mobile devices through social discourse mechanisms (Mathews, 2004), as well as reducing the element of *perceived* distance (Zhao etal., 2002).

Many students did not seem to want m-learning (Mason, 1998) which differs from Chan (2001) in terms of learner autonomy. This was an interesting outcome. This was intimated through expressions of not wanting to lose *classroom time*. It would seem that face-to-face engagement (Schifter, 1999) was required more than their use of a mobile-device. This may reflect social aspects that goes beyond just technological possession and its consequent use (Bitner & Bitner, 2002) and it may also expose learning concerns (Rakes and Casey, 2002) relating to technology adoption within the learning sphere.

Students appeared to want more say in what was actually presented, as some “programmes” used copied material that was used in a normal face-to-face teaching session without any *apparent changes* (Rovai, 2000). This has a number of implications: firstly, students appear to understand that m-learning should be different in terms of delivery and media content (Moriarty, 2008); secondly, students demand that if they use their technology then the “system” must understand (1) and deliver a more robust and personalised learning outcome (Chard, 2000) in terms of student learning portfolios (Chen, et al., 2000); thirdly, programme design and delivery issues are raised that students recognise, and these need to be mitigated through appropriate e-Learning developments (Clayton, 1997) in order to shape the learning outcomes (Andrews and Haythornthwaite, 2007) more effectively. As such, some students felt “left out” with the level of university m-learning engagement where technology was perceived as only a *delivery mechanism* (HEFCE, 2005), rather than an integrated and shared pedagogic/learning support process. This suggests that universities may need to undertake and deliver more appropriate media, through more effective channels to satisfy student needs (Waller & Wilson, 2001) whom *expect* to engage with the power of mobile-learning , not just through copy-learning but also in terms of how the technology could be used (Rahm and Reed 1997).

What are the technological constraints and opportunities affecting students engagement of m-learning in Thai higher education?

Students didn’t appear too concerned about what they could use their devices for, but there were practical concerns about the speed of connection (Cunningham et al., 2000); access issues (Magnussen, 2008) and any subsequent costs associated with downloads (Sekikawa et al., 2001; Dames and Handscomb, 2002). Students using WIFI capable/enabled mobile-devices whilst the use was essentially ‘free of charge’ were thus not be seen by many students as a constraint – but the cost associations of mobile-devices capable of only connecting through GPRS or Edge raised some

student cost issues. For example, students paid the same course fees – whether the course was traditional or distributed. It was perceived by some students that they subsidised the "system" whenever they engaged with on-line courses.

Mobile viewing of media content was initially accepted by students, but many thought that this went away from the need to be in class (Rovai, 2000) supporting Chan et al. (2003); as was the negative impact of the large size of the presentations (Magnussen, 2008); and often, the presentation's lack of interaction (Ponzurick et al., 2000) – seemingly ignoring the need for student media/interaction (Wong, 2007; Chan et al., 2003). Technological constraints were therefore related to how student's perceived that they could use the m-Learning material (Rovai, 2000), as well as related to design issues surrounding the media's development and delivery.

Further, students continued to advise that there appears to be a disparity between most students' ownership (Rishi, 2007), the use of mobile-device technologies (Clark, 2001), and the implications for these in terms of university operations. This is seen as a major stumbling block to m-learning developments. An assessment of the students own personal technology demonstrated that few mobile devices were presently 3G capable and that suggested that it is the diversity of technology that student's own that is a major barrier to m-learning developments in Thailand.

Student's suggested that they are willing to engage as long as the m-Learning platform was configured in a way that made the learning experience seamless (Chan et al., 2003). Although this is perhaps an opportunity, there are considerable technological issues to consider and mitigate as students struggle to engage in the provision of contemporary higher education m-Learning practices.

What technological issues surrounding m-learning practices would help students learn more effectively?

Some students perceived that they favoured face-to-face over mobile-device technology (Rovai, 2000); but others recognised that more interactiveness (Lau and Bates, 2004) may help students learn in a more personal way (Armstrong and Hagel 1996). However, mobile broadband (Wong, 2007) which is a very fast, ubiquitous, and an *always on* technology will affect how universities connect to students. This will possibly create a new digital divide (Andrews and Haythornthwaite, 2007; Carnaby and Rao, 2003), but more importantly, as a consequence will bring about substantial changes to university pedagogic provision (Conole, 2004).

Coverage issues were raised by many students, as the programme content and accuracy was brought into question (Corbeil and Valdes-Corbeil, 2007). These issues were perceived as important as the lack of face-to-face capability left students on their own, but not isolated.

Students seemed to prefer interactive media (Wong, 2007) and learning from some students experiences of game-play suggested that prior technology experience may have a positive effect on student perceptions of, and engagement with, m-Learning needs, requirements and capabilities.

4) FUTURE RESEARCH

Future research implications and issues surrounding the development of mobile-Learning in Thai higher education could focus on mobile-broadband developments; seeking wider student opinion; assessing lecturer needs and engagement; and evaluating the impact of support requirements and how these could enhance student learning experiences within and outside the classroom.

5) CONCLUSION

It was obvious from the response that many students thought that they would not like m-learning to become a mirror of PCs. A different and more personalised learning model was asked for by students and this signals that there would also be likely that the university applied learning-provision model will need to change as m-Learning capable mobile-devices become more popular; and the potential opportunities to enhance the mobile learning experience by connecting directly to students increases through the development of mobile-broadband.

However, this will require changes in overall university strategy (Inglis et al., 2002) and possibly result in the future development of a

new paradigm in pedagogic operations in Thailand. It will take the Thai university beyond technology change per se, to a more enlightened techno-cultural ethic based on advanced technology development. This will change the structure and orientation of universities as Web 2.0 facilitates a more interactive experience, and as such this will put pressure on the development of more open and flexible organisational characteristics (Bates 2001).

However, developing learning media that is pedagogically innovative, fresh and unobtrusive in terms of technological constraints will remain a major obstacle for Thai higher education for the foreseeable future.

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A Development of Instructional Model using Collaborative Learning on Computer Network Based Learning for Undergraduate Student Based on Constructivist Theory

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ABSTRACT

The objectives of this research were 1) to develop the efficient collaborative instructional model on computer network based on Constructivism (CIM-CNC) for undergraduate students, and 2) to study the experts' opinion on the developed model. There were 3 steps of implementation as follows: First step was to study the problem situation and instructional activities in undergraduate level based on Rajabhat University's curriculum. Second step was to design instructional model. And third step was to develop the instructional model using data collected from document and 10 experts, by Focus Group Discussion method. The results shown that the CIM-CNC consisted of 5 activities: 1) The Orientation, 2) The Thinking Encouragement and Cognitive Structure Adjustment, 3) The Studying through media and sharing knowledge, and 4) Thinking Conclusions and knowledge construction. 5) Learning Performance Evaluation. The expertise's opinion of the instructional model was at the highest level ($\overline{X}$ = 4.68, S.D. = 0.56)

Keywords
Collaborative Learning, Computer Network Based Learning, Constructivist Theory Instructional Model.

1) INTRODUCTION

1.1) Background and Significance of the Problem

Education was a major factor of learning for competition in globalization society. As a result, people studied in higher level of education, especially in higher education offering Undergraduate Study Level both by government and private sectors, which was more likely to extend the instructional management in various fields. In addition, the government provided support by allowing loan for education. Consequently, it facilitated opportunity for people who wanted to learn for being more able to study. For the production of Bachelor's Degree Graduates of different educational institutes, we found that there were problems in learning and teaching which would affect characteristics of future graduates. It was based on instructional model to be relevant to the needs of students and curriculum of

educational institutes in order to produce quality graduates as major power for developing country in future. According to the survey of problem situation of instruction in Rajabhat Universities, we found that most of them didn't focus on guideline of student centered. But, teacher centered was still focused on. The students participated in learning process (Teerawut, 2004), so they didn't have their persistence in studying. Besides, according to the survey of Mahasarakam Rajabhat University, the students would have learning style as sensory and feeling rather than theoretical learning. They liked group working which could learn best from direct experience with sharing their feeling and experience with the others (Poosit, 2005) According to the above problems, they affected students in Mahasarakam Rajabhat University had low learning achievement comparing to the other universities. According to research studies, we found that the instructional management focusing on collaborative learning activities on Computer Network and Constructivist Theory, would help students could have higher learning achievement. So, the approach in applying collaborative learning activities on Computer Network and Constructivism together by experts in order to develop the appropriate learning model (Wittaya, 2006),(Supang, 2004),(Woranuch, 2001),(Ann, 1995),(Beth, 2006),(Donna, 2008). Collaborative Learning was an approach of learning with the focus on student centered and learning environment management. The students learned together in small group. Each group consisted of members with different competencies. Each person participated in studying and success of group. As a result, the social skill and good working skill were developed by adjusting their opinion from accepting with each other (Yi Jia, 2005) Studying through Computer Network Based Learning by using technology for implementing efficient learning activities through Web, it was necessary to be based on instructional technique and appropriate activities to obtain efficient learning and help instruction to be efficient because the knowledge transfer through multimedia could make students learn better than studying through only text media or lecture by instructors. The systematically designed and produced media would help students in studying better than. But, studying through Web still had some limitations that the students and instructors couldn't be able to sense the real feeling and reaction of students and instructors that how did they feel. The students had to have their habit of searching for knowledge and being responsible for themselves in order to be successful. Moreover, there should be the instructional media which were available for using. Constructivist Theory was an application of learning theories or principles as foundation of design and development of instructional model or studying based on computer information and technology as media for presenting. It was indispensable such as Jean Piaget's Cognitive Developmental Theory stated that the human's cognitive development including adaptation with 2 major processes: assimilation or absorption, when human beings had an interaction with environment, new experience would be absorbed in cognitive structure by interpreting or receiving information from the environment. For the second thing, the cognitive structure would be adjusted which was to adjust former thought with new environment (Sumalee, 2004). The cognitive structure occurred by adjusting oneself with the environment. The students learned by doing and thinking, The knowledge were classified into physical, Mathematical Logic, and social developmental process (Pichai, 2004) According to all of above reasons from documentary study, research, interview, and collecting from various kinds of media, found that the collaborative instructional model development on Computer Network Based Learning for Undergraduate Students based on Constructivist Theory by applying characteristics of studying on Web, could overcome limitation of time, place, individual differences as well as it was media presenting in multimedia by associating various knowledge resources available to conveniently communicate. Therefore, the application of rationale in creating media and collaborative instructional activities which would train skill and team work for improving learning achievement as well as providing opportunity for students to study with enthusiasm.

1.2) Objectives

There were 2 objectives: 1) To develop collaborative instructional model on Computer Network Based Learning (CNBL) for Undergraduate Student based on efficient Constructivist Theory. 2) To study opinion of experts on collaborative instructional model on CNBL for Undergraduate Students based on Constructivist Theory.

2) Related Literature

According to the related research literature, it could be concluded as follows: the study of Ann D. Yakimovicz and Karen L. Murphy(1995), Beth Perry (2006) in "The Development of Body of Knowledge and Collaboration in the Internet", found that the students had higher confidence in communicating for creating new body of knowledge through CNBL. Donna Ashcraft (2008) conducted research for developing the students' learning by using collaborative learning on Web based on Social Constructivist Theory, found that the students improved their learning achievement Besides, the study of Yi Jia (2005) found that the lesson development through Web by managing the collaborative learning environment could help the students in being more enthusiastic for learning. The research study of Wittaya Areeras (2006) in The Instructional Model Development by using Genius Computer Assisted Instruction and Participation through CNBL and, the study of Supang Thaisomboonsuk (2006) in The Development of Group Collaborative Learning Model titled The Project Administration in Virtual Classroom for Bachelor's Degree Students, Faculty of Education, Chulalongkorn University and the study of Woranuch Netpisanwanich (2001) in The Development of Training Model through Computer Network by Collaborative Learning: A Case Study for Developing Critical Thinking of Professional Nurse.

3) Research Methodology

3.1) Research Stage

For this study, the researcher designed the study for 3 stages including following stages: 1)The study of situation of problems and instructional activity management. 2)The design of instruction. 3) The design of instructional development.

3.2) Population and Sample

The population and samples of this study were the experts in collaborative instructional model on CNBL for Undergraduate Students based on Constructivist Theory The researcher used Purposive Sampling from 10 instructors and expertise in collaborative instructional model management from higher educational institutes,They are 4 expertise in Curriculum development .and Instruction, 4 expertise in educational Technology and Computer educational, and 2 expertise in educational Evaluation.

4) The Findings

4.1 The study of situation of problems and instructional activity management.

According to documentary and research study, found that the situation of instructional problems for Undergraduate Students under Rajabhat University, most of them didn't focus on student centered. The students participated in learning process very little. As a result, they didn't persist in studying re was lack of persistence in studying (Teerawut, 2004). Besides, according to the survey the learning style of Mahasarakam University, most of students had their learning style as sensation and feeling rather than theoretical learning. They preferred group working which learning would be best from direct experience, sharing feeling and experience with others (Poosit, 2005)

4.2) The instructional design

The researcher collected related literature for designing instruction to be relevant to guidelines of problem solving obtaining from stages in studying problem situations and instructional management, found that Collaborative Learning was congruent with characteristics of students who preferred collaborative group working and application of

Constructivist Theory focusing on students' self access learning and systematic intellectual development by using Computer Network Based Learning in order to manage learning environment facilitating students to be able to appropriately learn and interact with instructional media as well as a guideline in communicating with member group and outsiders conveniently for increasing instructional efficiency by focusing on higher level of learning achievement theories and congruence with instructional management based on objective.

4.3) The instructional development

The researcher used 10 experts in the focus group discussion. There are 3 topics in discussion; 1) The relevance of concepts and thoeries about problems in instruction 2) Analyzs instructional factors.3). Analyze instructional activities.for sharing their opinions on instructional model development in order to obtain instructional model combining with collaborative learning environmental management based on Constructivist Theory on CNBL using for instruction in Bachelor's Degree including 3 aspects as follows:

4.3.1 The related theoretical approach aspect.
To develop instructional model, we collected information from documents, related literature, and from Focus Group Discussion. The components and descriptions of the instructional model were as follows: 1) The instructional activity management on CNBL referred to the presentation of developed information and technology based on computer technology and internet in determining instructional activity as well as system for tracking the students' behavior in order to advise, support, and evaluate their learning performance as the specified objective. The collaborative learning referred to learning activity management divided students into small group so that they could be able to learn and work together, plan, assign task, have direct interaction with the same goal as group success. The Constructivist Theory Approach referred to the application of rationale and Constructivist Theory in managing the learning environment for encouraging the students with Active Learning and social interaction, with support foundation for students to be able to adjust their cognitive structure by absorbing former knowledge with new knowledge by focusing on group process as a major point.

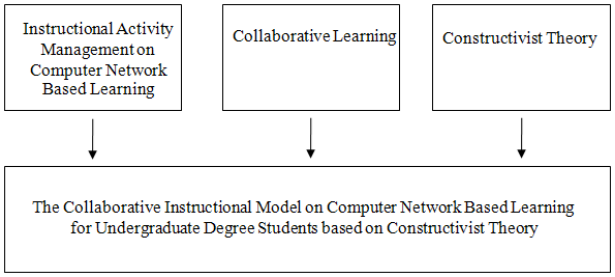

Figure 1: The First Component: Related Theoretical Approach.

4.3.2. The principle aspect included the following principles:
There were instructional model focusing on collaborative learning process among student groups and instructors or related persons. The instructional management implemented activities by using CNBL, the students were able to learn from media or resources in learning, and have appropriate interaction with media. The students were able to learn by themselves and construct knowledge by interacting with the group members and designed learning environment. The instructors had their role in counseling, advising, providing opportunity for students to apply their knowledge and competencies based on their competency levels, and encouraging students to be eager and curious to know as guidelines in searching for solutions in order to create appropriate body of knowledge. The instructional system on CNBL should provide facilities for students, system of following the students' behavior, Coaching system for interacting with students automatically or as they needed as well as the Expert System for providing counseling and supporting the students' decision making.

4.3.3. The instructional activity aspect based on the following principles and Learning *Performance Evaluation:*

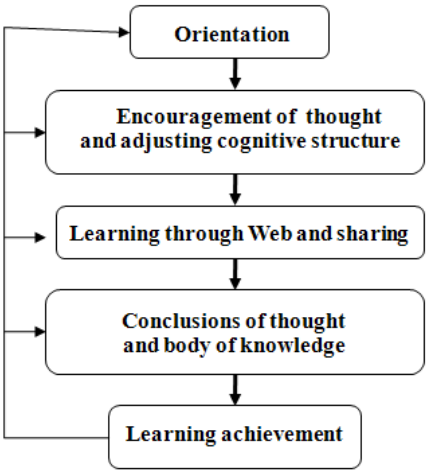

Figure 2: The collaborative instructional stages on Web for Undergraduate Students based on Constructivist Theory.

Step 1: Orientation, the instructor oriented course by informing the details as well as regulation for implementing activities, encouraging students to be interested in learning, providing basic knowledge in using computer and internet for education, pre-testing and dividing student into groups, 4 students each group as heterogeneous group based on their learning achievement level. *Step 2: Encouragement of thought and adjusting cognitive structure* referred to the students would be reviewed for former knowledge and experience related to content in the lesson, and presented new information technology or knowledge so that the students could adjust their cognitive structure for encouraging them to collaborate in learning and searching for solution. *Step 3: Learning through Web and sharing* referred to the students implemented learning activities through Web by collaborative learning in groups. The members were provided opportunity in sharing their opinion and experience in groups as well as social interaction. The outsiders were provided opportunity to participate in expressing their opinion and suggestions with instructors to encourage and take care so that the learning activities would implement as follows : the interactive learning media referred to the

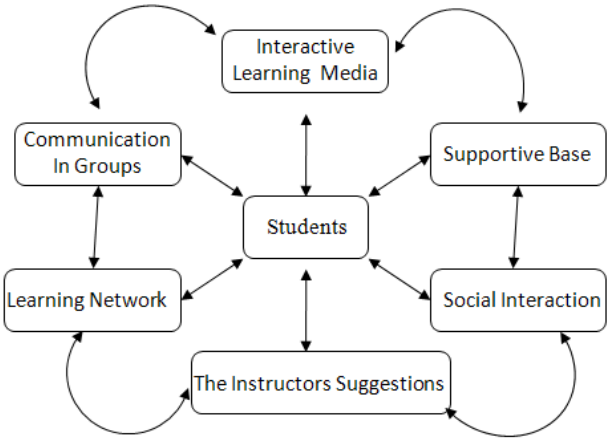

Figure 3: The chart of learning model through Web and sharing.

collection of products and presentation of media in various styles relating to learning by specified objective on Computer Network which could be accessed by students throughout the time such as data base, statement, picture, sound, video tape, lesson document that they could communicate with each other as well as be responded from media such as the exercise. Supportive Base or Scaffolding referred to the encouragement and support for students in learning by applying the approach of environmental management as a guideline of learning which was the guidance in learning and helping students to achieve objective (Sumalee, 2004) The system would enter information relating to learning or additional content to support them in achieving objective when they couldn't be able to conclude the ideas or answer the question. Social Interaction referred to the provision of opportunity for students to communicate with persons or experts in related fields through CNBL such as Web-board, E-mail, Chat Room, in order to consult or listen to opinion for improving and helping them in finding solutions quicker. Coaching referred to the changing of instructors' role from teachers to knowledge informer, the persons who advised or explained more the things students wondered, and monitored and followed their students' behavior. The students would communicate with their instructors in 2 ways: Synchronous, the students could contact their instructors like face to face or through CNBL such as Chat Room, Teleconference, and Asynchronous, the students could contact their instructors during different durations. They could have direct

communication with the instructors through Web-board, E-mail, and Expert System constructed on Computer Network Based Learning by the instructors. Learning Network referred to the students could be able to have an additional search from other knowledge resources on internet network by the instructors' determination or the students' search by themselves. Communication in group referred to the students could be able to plan together, contact for cooperation in their own group, and collaborative work on Web both Synchronous and Asynchronous.

Step 4: Conclusions of thought and body of knowledge referred to the students could be able to share by collaborative learning based on Constructivist Theory by the specified model. The students were provided opportunity in expressing knowledge by themselves from real practice, searching, discovering knowledge as well. They would apply their prior knowledge in adjusting thought from learning activities for synthesizing and concluding as new body of knowledge as well as presenting as performance or document by using brainstorming in group through Web. *Step 5: Learning achievement* was evaluated by evaluating the correctness of content and completeness of performances. The students' behaviors were evaluated by observation, interview, both in theoretical and practice forms. For the practice form, the work practice could be performed outside the Web system. To find out the opinions of 10 experts on the developed instructional model, we used questionnaire with 5 level rating scale and 25 items based on appropriateness in related literature and approach, rational components, instructional activities, and evaluation.

Table 1: The experts' opinion level on the collaborative instructional model on Web for Undergraduate Students based on Constructivist Theory.

Component	$\overline{X}$	*S.D.*	*Opinion Level*
Appropriateness of Related Theories	4.50	0.68	High
Appropriateness of Principle Component	4.81	0.47	Highest
Appropriateness of Instructional Activity Component	4.81	0.44	Highest
Appropriateness of Evaluation Component	4.68	0.56	Highest

The results showed that 1) the opinions on appropriateness of related theories were at High level ($\overline{X}$ = 4.50, S.D. = 0.68). 2) the opinions on rational component were at Highest level ($\overline{X}$ = 4.81, S.D. = 0.47). The opinions on instructional activity component were at Highest level ($\overline{X}$ = 4.81, S.D. = 0.44). And the opinions on evaluation component were at "Highest" level ($\overline{X}$ = 4.62, S.D. = 0.67). The average value of the experts' opinions on the developed instructional model were at "high" level ($\overline{X}$ = 4.68, S.D. = 0.56). The level of the test reliability coefficient was .94.

5) Conclusions

To develop instructional model, we used both the collaborative learning principles on CNBL and Constructivist Theory. We aimed after using the developed model, the students must improve their learning efficiency and their learning style. The research titled "A Development of Instructional Model using Collaborative Learning on Computer Network Based Learning for Undergraduate Student Based on Constructivist Theory" consisted of 2 objectives as follows: 1) To develop efficient Collaborative Learning Model on Computer Network for undergraduate students based on Constructivist Theory. 2) To study the experts' opinion on development of Collaborative Learning Model on Computer Network Based Learning for undergraduate students based on Constructivist Theory. By 3 research stages as follows: Stage 1. The study of problem situation and instructional management.Stage 2. The instructional design.Stage 3. The instructional model development. Stage 1 and Stage 2, the study of document and related literature was administered. Stage 3, Focus Group Discussion was administered by 10 experts. The questionnaire was used for studying the experts' opinion. The research findings found that: The developed instructional model consisted of 3 aspects as follows:1) The components of related approach and theories.2) The component of rational. 3) The component of instructional activities and

learning achievement evaluation. The CIM-CNC consisted of 5 activities: 1) The Orientation, 2) The Thinking Encouragement and Cognitive Structure Adjustment, 3) The Studying through media and sharing knowledge, 4) Thinking Conclusions and knowledge construction.and 5) Learning Performance Evaluation. The experts showed their opinion on the appropriateness of instructional model in High level. For the next stage of implementation, the experiment of collaborative instructional model development on Computer Network Based Learning for Undergraduate Students based on Constructivist Theory by the developed instructional model by trying out in the course Innovation and Information Technology for Education according to curriculum of Rajabhat University 2006 and stages in evaluating the developed instructional model development for concluding the research findings of this study.

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The Activity Model and Components to Support Collaborative Learning Using JIGSAW Technique on Computer Online System

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ABSTRACT

This research aims to study the activity model and components that support collaborative learning by mainly using the JIGSAW technique. This technique could be used in the knowledge matching method as well as the self-studying method. In the first phase, the Delphi technique is examined to be the research instrument. Data collection was gathered 3 times from 28 specialists in 17 universities where educational curriculums are available. The data were gathered and synthesized in order to design the model components. The result revealed that the following components were vital to support JIGSAW based on learning activities; (1) home group: using round table technique, (2) expert group: using structure problem solving, and (3) evaluation process: using teams games tournament technique.

Keywords
Collaborative Learning, JIGSAW, Round Table, Structure Problem Solving, Teams Games Tournament

1) INTRODUCTION

1.1) Background and Significance of the Problem

Learning significantly composes of both learners and learning. A number of various techniques, such as learning using different levels of learners or between friends and friends, self-learning and learning along with technology supports, are applied in order to support learning (Yun and Somchai, 2003). It is obvious that learning should be arranged in well-planed stages in order to assist learners to gain knowledge of provided lessons. It can be claimed that everyone has potential in self-learning (Thisana et al., 2002). A class management is usually limited to teaching and class schedule; in addition, teachers are the center of classrooms. Moreover, teachers also absolutely empower the class management and usually emphasize a memorization method in teaching. This leads to restrict students from analytical skills, opinion sharing and self-learning (The National Education Commission , 2000). Problems in class management that discourage students to think, practice and solve problems cause students lack confidence, struggle with joining class and then hinder knowledge sharing from groups (boonfirm, 2003). Self-learning may cause learning obstacles leading to the feeling of isolation, the lack of joining activities and the deficiency of reinforcement in group working (haawke, Schwemmer, Haake, 2006). Class management focusing on memorization rather than critical thinking and practical learning necessarily needs adjustments that assist students to enhance their learning efficiency. Team learning and group processes may develop students' communication skills and problem solving skills in interpersonal relationship building and self-learning. Therefore, team learning may be an appropriate choice of learning (Waraporn, 2000).

Team learning shares the common characteristics with the collaborative learning in

the sense that learners are divided into groups or small teams then working in collaboration for achieving ultimate goals (Slavin 1987; Ref to Waraporn, 2002). The degree of learning success depends on not only learners but also collaborative learning skills which improve students' behavior and attitudes toward study achievement (McManus, 1997). Activities encouraging students in classroom participation aim at improving the critical thinking skills, self-knowledge-building skills and teamwork skills of students (Thitiporn, 2004).

Teachers play an important role in forming preferable graduates. This forces the teachers to change their role from knowledge providers to be learning supports in order to assist students in maximize their potentials. (Chalerm, n.d.). Although a number of collaborative learning methods is applied in classroom teaching, a well-known and highly accepted technique is an activity management that includes jigsaw concepts into group activities (Narin, 1999). Jigsaw technique, developed by Elliot Aronson, affects students to have an attraction for learning contents and enhancing perception skills (Turk, Brineand, Kanev, 2006). Moreover, jigsaw technique, which is a greatly efficient teaching method, consists of challenging problems, participating student, and sharing their own opinions and ideas (Maritland, Latourelle, Valenti and Bookman, 2001). Jigsaw technique immensely emphasizing fundamental interactions among students provides advantages of student independence, group learning and multiple levels of learning (Kanokporn, 1997). In addition, the jigsaw technique encourages students to efficiently work in collaboration, to improve teamwork skills in problem solving. Furthermore, it also promotes students' self-responsibility and group responsibility leading to knowledge sharing among students with different level of learning abilities. Using the jigsaw technique, all students have a chance to take turns to be a leader along with learning social skills (Suwit and Orathai, 2002).

An objective of higher education is to build student intelligence. After processes of knowledge exploration, thoroughly understanding in theory and practical knowledge including working attitudes, students will be formed themselves to be wisdom concentration (Paitoon, n.d.). At the present, called the information age, tremendous data and information are readily available for student to investigate and explore. It can be seen that education currently is not restricted into a classroom and also teachers are not only main information providers. Consequently, students play the most important role in learning processes (Anan, n.d.). The use of information technology becomes an essential component in operating a number of systems as so to the educational systems which have taken information technologies to improve processes (Yun and Somchai, 2003).

For example, the Internet which is a supremely efficient worldwide computer networks has been extensively applied in learning and teaching methods (Waraporn, 2002). The Internet also gives opportunities to students to interact with teachers and fellows for the purpose of learning at any time and any places. Appointment arrangements, discussions via distant conferencing and video conferencing are excellent examples of the Internet used in educational systems. Students are able to learn contents and participate at their own available time through email, bulletin board systems and Listserv which support interactions between a student and a student, between a student and a group and between a group and a group (Woranut, 2001). Computer Supported Collaborative Learning (CSCL) is a use of technologies for supporting several students to simultaneously learn along with facilitating students in group communication, information exchange, collaborative working via computer networks (Hsiao 1996: 1 ref to Wittaya, 2006). Accordingly, it can be claimed that online collaborative learning is the most popular learning method (Kao, Feng, Kuo: 2006).

As mentioned above, the researchers are interested in studying and congregating experts' opinions in relation to the learning management that supports collaborative learning mainly using Jigsaw technique via online computer networks. The Delphi technique is examined to be a research instrument for aggregating data from 28 educational experts working in 17

universities in order to extract experts' points of view. The result of this research may yield the framework for developing appropriate learning activities.

1.2) Objectives of the Research

The followings are objectives of the research

1.2.1 In order to analyze a model of learning activities that support collaborative learning by mainly using Jigsaw technique through an online computer system along with Delphi technique with educational experts.

1.2.2 In order to synthesize a model of learning activities that support collaborative learning by mainly using Jigsaw technique through an online computer system.

1.3) Scope of the Research

The scope of this research will be described below:

1.3.1) This research applies Delphi Technique to collect points of view from 28 educational experts among 17 participating universities in order to study an activity model supporting collaborative learning by using Jigsaw technique via an online computer system.

1.3.2) The main point of this research focuses on activities supporting Jigsaw technique in the Home Group and the Expert Group in conjunction with the team tournament technique.

2) RESEARCH METHODS

2.1) Population and Sample

Research population is a group of educational experts who have experience not less than five years in government universities where Education and Educational Science degrees are available. The population can be classified into three groups which are 1) experts in activities supporting collaborative learning, 2) experts in Jigsaw technique and 3) experts in online teaching systems. The population containing 28 educational experts is specifically selected from 17 public universities.

2.2) Methods and Materials of the Research

Methods and materials used in this research are

2.2.1) five informal interviews for collecting ideas regarding Jigsaw technique

2.2.2) a design of learning activity by creating questionnaires to aggregate the points of view from 28 educational experts working in 17 public universities. With the use of Delphi technique, the data collection was arranged in three phases.

Firstly, open-ended questionnaires were sent to the population to encourage experts to extremely express their own opinions with regard to Jigsaw technique and collaborative learning supporting the effective Jigsaw technique. At this phase, the experts suggested totally 28 collaborative learning techniques and five competitive techniques.

Secondly, the synthesized data from the first phase demonstrated that Jigsaw technique can be categorized into two groups which are the home group and the expert group. Additionally, the selected research instrument is the questionnaire estimation ratio with Likert five-level data collection. As a result, data obtained from the first phase were synthesized to form the questionnaire for experts to pinpoint each issue (shown in Figure 1).

Use of collaborative learning integrated with Jigsaw	Home Group					Expert Group				
	5	4	3	2	1	5	4	3	2	1
1. Round Robin										
2. Round Table										
3. Send A Problem										
…										
28. Brainstorm										

Figure 1: Questionnaire Estimation Ratio

Thirdly, the questionnaire was similar to the one used in the previous phase. However, median, interquartile range (IR) and answers from each expert were included. Then, the newly created questionnaire sent back to each expert in order

to obtain confirmations and validations (shown in Figure 2).

Collaborative learning using Jigsaw technique including median range	Home Group					Median (Mdn)	Interquartile Range (IR)
	5 Highly Agree	4 Much Agree	3 Agree	2 Disagree	1 Highly Disagree		
1. Round Robin						4.03	0.87
2. Round Table						4.07	0.96
3. Send A Problem						3.78	1.62
….	…	…	…	…	…	…	…

Figure 2: Questionnaire sent to the experts for validation.

2.2.3) synthesizing and summarizing the teaching model are the process of gathering all experts' opinions to analyze the inclusion and then calculate the median and the interquartile range in order to form the learning activity model

3) RESEARCH RESULT

3.1) Results from collaborative learning activities principally using Jigsaw technique

3.1.1) General concept of Collaborative Learning using Jigsaw Technique.

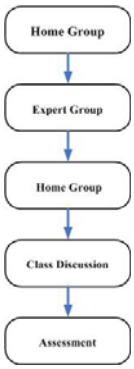

Figure 3: Jigsaw Technique Model

1) Home Group: Teachers separated students into groups consisting of four to six members. Each member was assigned to different contents for self-learning.
2) Expert Group: Members who are assigned to the same topics from every group gathered to study together.
3) Home Group: Members returned to their group to discuss and clarify contents they were assigned.
4) Class discussion: All members discussed the contents in order to summarize the effect of learning.
5) 5) Assessment: Teacher evaluated the learning result of each person.

3.1.2) An activity supporting Jigsaw technique for Home group from ideas of the experts is the Round Table technique that members share their own opinions by recording discussed issues.

3.1.3) An activity supporting Jigsaw technique for Expert Group from ideas of the experts is the Structure Problem Solving technique which teachers emphasize the critical thinking method and encourage the problem solving method step by step.

3.1.4) An activity supporting group competition from ideas of the experts is the Team Games Tournament technique which separates students into groups depending on their own abilities.

3.2) Activities supporting collaborative learning mainly using Jigsaw technique

According to the experts' opinion relating to activities supporting collaborative learning principally using the Jigsaw technique, the researchers analyzed and then synthesized a model from data collection from experts using the Delphi technique to develop components for significant activities (as mentioned in 3.1). The researcher also synthesized obtained ideas and opinions to create a collaborative learning model using the Jigsaw technique (as shown in Figure 4).

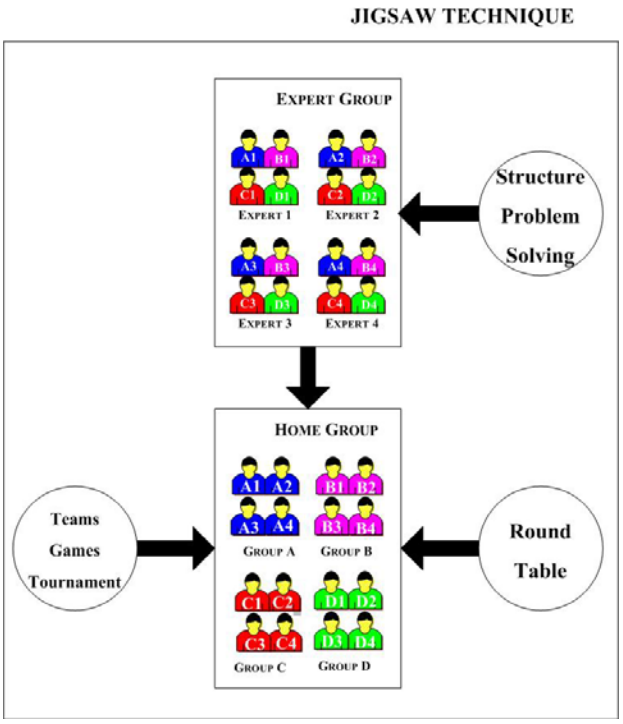

Figure 4: A model supporting collaborative learning by using Jigsaw

3.2.1) Activity in Expert Group

This procedure concerns with the process of Structured Problem Solving. Members from all groups, who are assigned to the same study topic, work in collaboration for understanding documents and exploring additional information related to their own area. After that, each member cooperatively summarizes the assigned topic to ensure that every member shares the knowledge and understanding in the contents. Then, each member returns to their own home group in order to explain and discuss the summarized contents with other members in their home group.

3.2.2) Activity in Home Group

This activity continues from the activity in 3.2.1. After all members return to their home group, they describe and clarify the knowledge they obtained to other members of the group by using the round table technique.

3.2.3) Activity in Team Games Tournament

This activity also continues from the activity in 3.2.2. After group discussion, evaluation of each member is arranged by applying the team game tournament technique which categorizes students into groups depending on their learning ability such as excellent, average and below average in order to take a test. The test scores from all members in each group will be accumulated to be the group score afterward.
According to the synthesizing experts' opinions acquired from the questionnaire, the model shown in Figure 4 was created.

4) SUMMARY

This research aims at investigating activities supporting collaborative learning using the Jigsaw technique via an online computer system in conjunction with the Delphi technique. The result revealed that an activity supporting Jigsaw technique for the home group is the round table technique. Moreover, the structure problem solving technique seemed appropriate for the expert group whereas the teams games tournament is more suitable for the group competition activity.

An interesting study in the future will be an investigation of activity conformable with contents in order to develop a learning activity model then evaluate with the actual teaching through e-Learning system. The study may apply in order to compare a learning efficiency between a typical teaching class and a model-developed class. Then the satisfaction of both students and teachers will be subsequently assessed.

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Second Life : New dimension of Online Learning Resource

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ABSTRACT

Second Life(SL) is a 3D virtual world which was opened to the public in 2003 and has grown explosively to more than 13 millions of users from around the world. Shops, parks, galleries, brothels, schools, embassies, restaurants, universities and libraries all appear in SL. They have every kind of activity. There is likely virtual representation of environment that one finds in the real world. For education, SL provides a platform for interactive experiences that bring a new dimension to learning, an active education community. More than 300 universities and colleges around the world have set up virtual campuses where students can meet, attend classes and create content together. The platform of learning resources in SL is interesting. With the 3D environment, students can create their avatar, explore the learning resources, search online databases, and gain experiences with fun.

The researcher was interested in studying the opinion of the students toward Second Life as the dimention of online learning resources using the pilot project. The objective of this study was to investigate students perception of Second Life as an online learning resource. The pilot study involved 5 undergraduate library and information science students. The researcher taught students how to integrate themselves into SL. The student were given a series of educationally related tasks which involved searching for information within SL, viewing and downloading information and communicating with other students and other residents. Then they were given tasks without assistance which involved going to university libraries and museums, using reference service, searching the special databases and exploring the events in SL. Data collected from the focus group and from the indepth interviews. The research result shown that students think SL is a good learning resource and is fun to use. Students can communicate with an electronic barrier. Students think if they had more interesting things to do on computer which related to study, they would spend more time and focus more on it.

Keywords
Second Life, e-Learning, Online Information

Resource

1) INTRODUCTION

Second Life (SL) is a 3D virtual world that was opened to the public in 2003. It was developed by Linden Research, Inc., at ww.secondlife.com. It caters to users aged over 18. Users (referred to as “residents” in SL) create their own “avatar” that appears to be human. “Residents” can modify their avatar to represent themselves in any way that they choose. Second Life allows residents to explore, meet other residents, socialize, join interest groups, build a house, create and trade items. The internal currency used in SL is called the ‘Linden Dollar’ (Linden Research Inc., 2008). Everything in SL is created by its residents. In 2008, Linden Research, Inc. launched a direct Second Life URL. This is an improved tool that enables visitors to arrive directly at a specified location within the Second Life virtual world simply by clicking on the URL (Official Second Life Blog, 2008).

Second Life has grown exponentially to attract more than 13 million users from around the world. Shops, parks, galleries, brothels, schools, embassies, restaurants, universities and libraries all appear in SL. They offer every kind of activity. It provides virtual representation of the social environment that one finds in the real world.

"Figure 1 Participating with others in SL"

"Figure 2 Meeting others in SL"

"Figure 3 Siam Commercial Bank opened a "branch" in SL"

"Figure 4 The University of South Carolina Library in SL provides a reference service database for searching for tutorials"

In the field of education, Second Life provides a platform for interactive experiences that bring new dimensions to learning, thus creating an active education community. More than 300 universities and colleges from around the world have joined the community, including Harvard, Princeton, New York and Stanford Universities. ABAC University in Thailand has also set up avirtual campus where students can meet, attend classes and create content. The platform of learning resources in SL is of particular interest. In the three dimensional environment, students create their avatar, go to libraries, explore learning resources, search online databases, and gain experience with a sense of enjoyment. There is a wide variety of information offered in SL by residents including objects, animations and software. The Second Life Terms of Service ensure that users retain copyright to any content that they create. The server and client provide simple 'Digital Right Management' functions. Content may be given away or sold (Cate Cohen, 2008).

The field of library and information sciences is well represented in Second Life. They work together in a consortium called 'alliance virtual library.' They also have an official website at www.infoisland.org. They purchased virtual "land" in SL, where many universities have helped create the buildings and objects, including the establishment of an online open access collection. "Infoisland" functions as a center for information and events from around the island, offering links to libraries and other

places of interest. Every library has a reference librarian on duty to answer questions in case users have problems with library materials.

The information explosion and growth of the virtual community in Second Life is very significant for those in the library and information science field to teach students to discover information resources.

2) RESEARCH INSTRUCTIONS

The researcher was interested in studying students' opinions towards Second Life as a new dimension of online learning resources using this pilot project.

2.1) Objective

The objective of this study was to investigate students' perceptions of Second Life as an online learning resource.

2.2) Research Process

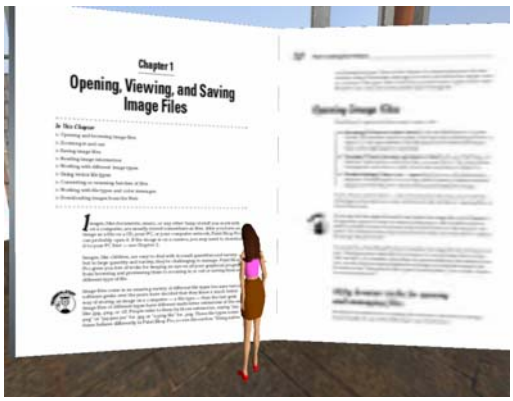
The researcher taught students how to integrate themselves into SL. The students were given a series of educationally related tasks that involved searching for information within SL; viewing and downloading information; and communicating with other students and residents. They were then given individual tasks that involved going to university libraries and museums, using reference services, searching special databases and exploring events in SL.

"Figure 5 A pilot study group, in front of Second Life Resource Center"

"Figure 6 Virtual class at San Jose State University in SL"

"Figure 7 A reference librarian on duty at infoisland in SL"

"Figure 8 Current event in SL"



"Figure 9 Current event in SL"

"Figure 10 Round table meeting on technology education in SL"

"Figure 11 Medical library in SL offers "PubMed" database search"

2.3) Data Collection

Data collected from the focus group and from in-depth interviews.

2.4) Research Results

Research results show that students consider SL to be a good learning resource and fun to use. Students can communicate without eclectronic barrier. Students expressed the opinion that if they had more interesting tasks to do on computers that were related to their fields of study, they would spend more time and focus more intently on it.

Below are some insightful quotes from interviews with the students who participated in the research project.

"There are many university libraries, I can get whatever information I want."

Charinrat Jingjit

"I visited libraries and museums, the objects are like in real, I like it"

Petchwalee Komrondetch

"I met a reference librarian there; she guided me to various places and how to search, just like in real life."

Nattha Gerdmanee

"I tried searching the library catalog; it pops up to library websites."

Sirinapha Supromin

"It is easy to use and interesting."

Suriyo Wadeesirisak

"The objects are just like in real life, and a note card that contains useful information is sent to me when I click on it."

Petchwalee Komrondetch

"People don't talk at all when they're together in real life, but I didn't feel like that when I was in SL."

Suriyo Wadeesirisak

"What I find most exciting about SL is the chance to interact with others without the space gaps"

Charinrat Jingjit

"When I talked with the reference librarian, I didn't feel shy about my English."

Natha Gerdmanee

"It's like a game; I don't feel like I'm studying, but I gain a lot of experience from many information sources. I love it so much"

Sirinapha Supromin

2.5) Conclusion

Based on this study, the conclusion can be made that Second Life is a valuable online learning resource that can link social life and school life together, with the added bonus that students have fun using it. This is good way for students to learn and gain experience from exploring SL materials and to be familiar with information. Further, it gives users an opportunity to develop their research skills. SL is a large virtual community; information literacy skills are needed to evaluate the quality of information and activities.

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The self-studied achievement by using "Moral and Life" e-Learning in undergraduate curriculum of the institute of Physical Education Year 2005

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ABSTRACT

The purpose of this research was to study the self-studied achievement by using "Moral and Life" e-Learning in undergraduate curriculum of the Institute of Physical Education year 2005.

The research samples comprised 57 first-year undergraduate students enrolled in the Physical Education, Udon Thani Campus. They were selected by the use of the purposive sampling technique.

The research instruments consisted of (1) the moral and life e-Learning lesson (2) a learning achievement test and (3) the learning achievement reports. Statistical procedures for data analysis were the percentage, mean, standard deviation and t-test.

Results of the research were summarized as follows: (1) the students show learning achievement increased from before learning at the .01 level of significance and (2) the self-studied achievement of students scored of 95%.

Keywords
e-Learning, e-Learning instruction, moral and life, self-study, self-studied achievement

1) INTRODUCTION

Regards to the developments in technology and information literacy, the 8-9th national economic and social development plan were designed by the government of Thailand. The objectives of these plans are:

- The human being is the most important goal for Thailand development.
- The potential development is the characteristic of Thais.

Because of these objectives, the educational enactment of Thailand year 1999 was created. Learners-centered and new educational technologies are used for the framework of this enactment.

With respect to the higher education, the Institute of Physical Education is one of institutes concerning in the important of ICT. Most students in this institute are athletes and sport committee. They don't have mach times to attend to the class and they can't finish some tasks or teacher's assignments on time. Moreover, they don't have the concentration and can't follow Trisikkha-Buddha Teaching. Therefore, they always get the lower achievement.

According to the problem of students, the researcher is interested in conducting the Moral and life e-Learning. This e-Learning is useful because the students can go to study it in anytime anywhere. They can study by themselves; finish all assignments; learn the new knowledge by using the internet. Moreover, the researcher is interested in studying the self-studied achievement of the student by using "Moral and Life" e-Learning.

"Moral and Life" e-Learning was conducted in 2005. There are two units. The first samples are 30 first-year undergraduate students enrolled in the Physical Education, Udon Thani Campus. They were selected by the use of the cluster sampling technique. The first group has students who learned with e-Learning. The second group has students who learned with the Trisikkha usual instruction. The researcher study and compare learning achievement, the

learning satisfaction and the retention in both instruction. After that, the researcher develops and complete e-Learning. The five units of this e-Learning were used to tryout by 30 first-year undergraduate students enrolled in the Physical Education, Udon Thani Campus year 2006. The purpose of this research was to study only the achievement and satisfaction in e-Learning. In this step, the researcher didn't compare with the usual instruction.

The researcher improves and develops this e-Learning in twice. Then, studying the self-studied by using "Moral and Life" e-Learning in 57 first-year undergraduate students enrolled in the Physical Education, Udon Thani Campus year 2007. They were selected by the use of the purposive sampling technique.

2) RESEARCH FRAMEWORK

To follow the computer-based instruction of Raungsuwan, C. (2003:161-166), the researcher conducted the research framework with the following steps.

2.1) Analyze
2.2) Design
2.3) Develop
2.4) Implement/Tryout
2.5) Evaluate and Revise

3) RESEARCH PURPOSE

To study the self-studied achievement by using "Moral and Life" e-Learning in undergraduate curriculum of the Institute of Physical Education year 2005.

4) RESEARCH HYPOTHESIS

4.1) Students get higher post-test achievement than pre-test achievement.

4.2) 80% of students have the self-studied achievement in the high level.

5) RESEARCH IMPORTANCY

5.1) The Institute of Physical Education has "Moral and Life" e-Learning. It is the efficiency and effective instruction.

5.2) This e-Learning is the guide line for other teacher to conduct e-Learning in many fields.

5.3) The research can support or motivate the teachers to create e-Leaning by using instant web site.

5.4) The research is agreed with the educational development at the age of technology and information literacy.

6) RESERCH METHODOLOGY

6.1) Participants

The participants for this research were 57 first-year undergraduate students enrolled in the Physical Education, Udon Thani Campus year 2007. They were selected by the use of the purposive sampling technique.

6.2) Research Instruments

Data elected instruments in this research were:

6.1.1 e-Learning lesson

"Moral and Life" e-Learning lesson is in undergraduate curriculum of the Institute of Physical Education year 2005. It consists of five units for learning activities in 15 weeks. There are pre-test and posttest in each unit.

6.1.2 Learning achievement test

Learning achievement test consists of pretests and posttests (objective, short answer, completion test) and 20 criteria based tests.

6.1.3 Learning achievement reports

They are reports of students' achievement in each unit. The activities in each unit were conducted for conceiving students' learning. Moreover, the activities also show the learning responsibility of students.

6.1.4 Research stage

This research was conducted by using quasi-experimental research design. It was adapted from Nonrandomized Control Group

Pretest Posttest Design (Taweerath. 1997: 65-66) see in table 1.

Table 1: Experimental Design

Pretest	Experiment	Posttest
T_1	X	T_2

Note: T_1 stands for Pretest
X stands for the experiment by using e-Learning lesson
T_2 stands for Posttest

The stages of research were:

1) Students were evaluated by first completing a pre-learning achievement test.

2) This research is in a usual classroom. It occurred in the computer lab. e-Learning lesson were used as the standing material.

3) In 15 weeks, students studied each lesson and complete e-Learning activities in class, with the support of a teacher. Those who couldn't attend could study in any location with internet access.

4) Students completed the post learning achievement test at the end of semester. The test results also took for studying learning achievement by using e-Learning lesson.

5) Learning achievement reports were used for finding the efficiency and effective of e-Learning lesson and the percentage of students' learning responsibilities.

7) RESEARCH RESULTS

7.1) The students show learning achievement increased from before learning at the .01 level of significance and

7.2) The self-studied achievement of students scored of 95%.

8) DESCRIPTIVE OF RESEARCH RESULTS

8.1) The efficiency of e-Learning lesson is 93/81. This shows that e-Learning lesson appears to be effective. As a result of this research, it can be described that e-Learning lesson has 80/80 efficiency and it is an effective learning material.

8.2) The index efficiency of "Moral and Life" e-Learning lesson is 0.5994. This increased achievement of 59.94% after learning supports the research results of Krokkratoke (2003: 150-159) that also noted an increase when students experienced web-based instruction or e-Learning lesson. Further details revealed that:

8.2.1 Web-based instruction or e-Learning has a specific characteristic in itself.

8.2.2 In terms of characteristic of web-based instruction or e-Learning, students can learn and study in anytime anywhere. Furthermore, students can review, complete assignments and contact the teacher every time.

8.3) The students showed that their learning achievement increased at the .01 level of significance and were highly satisfied with e-Learning. This is in agreement with the results of Mulchart (2003: 126-130), who found that students have higher learning achievements after using web-based instruction or e-Learning. This is because:

8.3.1 As noted with the constructivism approach of Dewey (1938), students can learn and study in anytime anywhere. Therefore, students will construct their knowledge by themselves.

8.3.2 It agrees with the research results of Griffiths and other (2004) that web-based instruction or e-Learning can change inappropriate behavior of the students. Moreover, Chikul (2004) studied and developed his web-based instruction or e-Learning. He found that web-based instruction or e-Learning can improve learning achievements. Therefore, knowledge occurred while students study by using eyes and meditation. As a result of an effective "Moral and Life" e-Learning, students are happy and feel relaxed when they learn.

8.4) At the end of semester, the students who learn by using "Moral and Life" e-Learning have more responsibility. They also have the achievement in high level. In this term, it can assume that students who have much responsibility can be success in studying

and learning. It supports the research result of Panyotee (2006) that the effective web-based instruction or e-Learning can help the students have a responsibilities and discipline in a high level.

9) RECOMMENDATIONS

9.1)Currently, there are many e-Learning web sites. They are very easy to create and maintain.

9.2) Although, there is much benefit in e-Learning, it is only a study tool. Therefore, teachers must continue to their role as the advisor for students. He/she should help them to study and motivate them to reach the goals of study. Moreover, teacher should add ethics to their course and assign some cooperative activities to students too.

9.3) It is very useful to use the e-Learning in other subjects because it has proven to be highly motivating for students.

9.4) The Institute of Physical Education should support teachers to create e-Learning, with professional guidance.

10) FURTHER RECOMMENDATIONS

10.1) To examine problems and effects of e-Learning

10.2) To focus students' morals and ethics for further research.

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A CREATION OF VIRTUAL CLASSROOM FOR TEACHING AND LEARNING MANAGEMENT WITH e-Learning

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ABSTRACT

The purposes of this research are 1. to create virtual classroom for teaching and learning management with e-Learning for radio graphic testing inspection subject, 2. finding the quality of the created virtual classroom from e-Learning lesson and 3. making an experiment for finding learning effectiveness from one who study in this virtual classroom. The ideas of this research are 1. using computer graphics to create the model, 2. create a virtual classroom, 3. analyze and design this virtual classroom to be an information system of education which consistency and suitably for the process of knowledge management. For the creation process, first the virtual classroom was created by using virtual reality technique. Next create e-Learning lessons and compose together. Last it was tested with samplers which are the fourth year students of King Mongkut's university of Technology Thonburi, faculty of engineering, department of production engineer. The hypotheses of this research is the e-Learning from this virtual classroom for radio graphic testing subject has a quality and suitable for the new idea of knowledge management process and the achievement is better than 60 % and save learning time not less than 30 %.

Keywords
Virtual Classroom, Radio graphic testing, Learning management, e-Learning

1) INTRODUCTION

At present, internet and computer has more roles in everybody's life and way of living. All educational institutes are interested in information technology. Application of technology in education, therefore, is important. Current instruction has changed quite dramatically. Students and instructors use network in their classroom. Information technology is the cause of the age of information in which there are a lot of contents to learn without end. Connecting information through the largest network can be done on the internet. People can broaden their learning and knowledge at all levels because internet collects all bodies of knowledge in the form of hypertext documents, normally it is called WWW or World Wide Web. This can be considered as virtual library of the world. Moreover, internet is a tool to communicate easily to every person from all parts of the world. As a result, internet is used in instruction and learning to supplement classroom and it can be used as a tool for online teaching/learning. This is a form of distance learning for a whole course or a whole curriculum. Trends in internet technology are also progressing rapidly. That is to say, learning via electronic media or e-Learning is becoming

more and more important. Students have a role to search for and share knowledge. They will learn to communicate in a fast manner, learn to choose the content to enhance their understanding, and learn according to their demands because they can access to all information in the world. It is widely known that web is an important service on the internet which drives e-Learning and makes it gain more attention from the general public. Web has an important role in education and learning in an open system and decentralization. This makes a new dimension of learning with no limit in time and place. Learning can be made both in classroom and external world. In developed countries, e-Learning has spread inside conventional education, human development in organizations and individual learning. However, in Thailand, learning via electronic media is very new and it has not gained much application. In the course of this changing world, the impact of globalization, free trade in economics along with development in science and technology will push Thailand to make sure that the population is ready for the changes in the future. Therefore, e-Learning is an alternative which is suitable for the development of human resource in order to compete in the modern world.

e-Learning is a kind of distance learning which applies electronic media through World Wide Web where learners and instructors can communicate. Learners can access many resources of information without boundaries. Learners can participate in activities and trainings online by facilities in WWW. Online learning, therefore, is widely popular at present because there is no limit in distance, time and place. Moreover, it supports the potentials and the capabilities of learners.

e-Learning instruction is a kind of Technology-Based Learning which covers various forms of learning like Computer-Based Learning, Web-Based Learning, Virtual Classrooms, and Digital Collaboration, for example. Learners can learn via all kinds of electronic media such as internet, intranet, extranet, satellite broadcast, audio/video tape, interactive TV and CD-ROM.

e-Learning instruction via Virtual Classrooms is a kind of instruction through network which uses the efficiency of technology in communication and internet. Instruction needs to connect learners' computer to the instruction network computer. Learners use computers to surf on the website of virtual classrooms and participate in the activities designed by the instructors. This kind of virtual classroom is called real virtual classroom. Access to this virtual classroom on the first page which is called 'homepage' will describe the title of the course, the name of the instructor and short texts concerning the main topics in the course. This homepage is beautifully designed along with photos, graphics, fonts and colors to gain attention from the learners. The short texts in the homepage will link to webpage where subtopics and details can be found. The contents in each part are arranged in the order of importance. Learners can click mouse to select the topics according to their interests, for example, announcement webpage, comprehension webpage, content webpage, opinion webpage, conclusion webpage, answer webpage, learning resource webpage, evaluation webpage and other designed webpage.

The course 'Radiographic Testing' is a course in the curriculum of Industrial Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi. Radiographic testing is a specialized field and it is normally open to private organizations in the industry. The contents contain both theories and practice. In order to participate in practice, the learners must pass the standard criteria of the theories first. If the learners do not have enough knowledge, practice might hurt the learners. To illustrate, dangers from radiation can cause damages and wounds. Such course is not only for students in King Mongkut's University of Technology Thonburi but also for industries. At present, the course 'Radiographic Testing' is done through e-Learning which complies with the National Education Act of B.E. 2542. This is in accord with the current information technology in that:

1. Learners can learn according to their preference
2. This is a development of e-Learning media
3. This is distance learning e-Learning

lessons of such course mainly contain theories and the contents essential before practice. The

learners must pass the standard measurement and evaluation first in order to be able to get inside the workshop of the Department of Industrial Engineering.

According to the above-mentioned principles, theories, and reasons, the researchers developed virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’. The virtual classrooms are divided into 3 rooms as follows:

1. Theories Room contains the video clips of the instructors along with slides to accompany the lecture in theories and practice.

2. Library connects the network system to the e-Learning lessons on radiographic testing by current existing radiation.

3. Workshop is intended for practice which simulates virtual practice before real practice. These rooms were created using the principles in virtual computer graphic technology.

2) Research Objectives

This research has the following objectives:

1. To develop virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’

2. To evaluate the quality of virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’

3. To find out the learning achievements of the learners who used the virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’

4. To find out the opinions of the learners towards the virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’

3) EXPECTED OUTCOME

In this research, it was expected that the developed virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’ would have quality and be appropriate for the new learning management procedure. The learning achievement should be over 60% and it takes 30% less time to learn.

4) ASSUMPTIONS

This research has the following assumptions:

1. The quality of the third virtual classroom for e-Learning instruction about practice in Radiographic Testing was examined.

2. The learning achievement of the learners from the third virtual classroom about practice in Radiographic Testing was measured.

5) RESEARCH METHODOLOGY

The researchers set the following methodology:

Tools used in this research

1. Virtual classrooms for e-Learning instruction

2. e-Learning lessons on radiographic testing

3. Quality evaluation form for virtual classrooms

4. Learning achievement test for the learners of virtual classrooms for e-Learning instructors

5. Questionnaire concerning the learners’ opinion towards virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’

The steps in developing virtual classrooms fore-Learning instruction

1. Virtual classrooms were analyzed and designed to become a system for educational information which was suitable for knowledge management according to e-Learning instruction.

2. Computer graphic technology was used to create 3 dimensional simulations for the practical virtual classroom so that the instruction on the course ‘Radiographic Testing’ in the form of e-Learning was similar to real practice in simulation.

3. Virtual classrooms were developed using virtual image technology.

4. The quality of virtual classrooms for e-Learning instruction on the course ‘Radiographic Testing’ was examined.

5. The learning achievement of learners towards the e-Learning lesson on radiographic testing was measured through virtual classrooms.

The steps in developing learning Achievement test

1. The test was developed according to the behavioral objectives by analyzing the numbers of the real questions by experts. The

method by Rovinelli and Hambleton was used. 120 items with the average score over or equal to 0.5 which was accurate in the contents were chosen out of 180 ones. They were tested with the sampling group.

2. The test was analyzed by specifying the weight of sub-behaviors from the behavioral objectives in order to make questions. The behaviors used in the measurement were about cognitive domain in 6 aspects as follows: memory, understanding, application, analysis, synthesis and evaluation.

3. Testing Management System or TMS was designed. The tests in this research consisted of pre-test, tests at the end of each learning unit, and post-test.

4. The quality of the test was measured by using the test with the sampling group or the students at the Department of Industrial Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi. The results from the test were analyzed to find out the quality of the test which contained power score (difficulty), discrimination and reliability of the test.

5. The test was used in the experiment to find out the efficiency of virtual classrooms and the learning achievement.

The steps in developing quality evaluation form for virtual classrooms for e-Learning instruction

The quality evaluation form for virtual classrooms was a questionnaire with Likert's rating scale. The criteria for the questionnaire in terms of multimedia quality consisted of 5 levels: Level 5 means the best quality; Level 4 means good quality; Level 3 means moderate quality; Level 2 means unsatisfactory quality and Level 1 means 'it needs revision'.

The steps in developing the questionnaire about the learners' opinion towards the e-Learning instruction was done by setting the questionnaire with 5 Likert's rating scales: Level 5 means 'agree the most'; Level 4 means 'highly agree'; Level 3 means 'uncertain'; Level 2 means 'disagree' and Level 1 means 'disagree the most'.

6) CONCLUSIONS

After the experiment in the practice of the course 'Radiographic Testing' in the third classroom by practice with e-Learning instruction, it was found that:

1. The overall quality of the virtual classrooms with virtual image technology was at the best level. The efficiency of instruction was higher than the criteria set at 80/80.

2. The learning achievement of the learners for the course 'Radiographic Testing' in terms of practice after e-Learning instruction with virtual classrooms showed that the learners passed the standard set at 65%, as expected and the learning time took 35% less, higher than expected.

3. The learners showed the overall opinion towards the virtual classrooms that it was suitable for e-Learning instruction at high level.

Table 1 summarizes the quality evaluation results of virtual classrooms for e-Learning instruction on the course 'Radiographic Testing' by experts

Evaluated Items	Mean	Quality Level
1. Virtual classrooms through internet network are more interesting than instruction in classrooms.	4.67	the best quality
2. Virtual classrooms through internet network help learners understand the contents better than in classrooms.	4.67	the best quality
3. Academic contents about radiographic testing in virtual classrooms are presented in an interesting way.	4.00	good quality
4. Learners need not study additional contents from instructors after virtual classrooms.	4.33	good quality
5. Images and texts are in a suitable and neat layout.	4.67	the best quality
6. The lessons have suitable and neat	4.00	good quality

images and texts.		
7. Colors used in virtual classrooms are suitable.	4.44	good quality
8. The size of texts and images is suitable.	4.27	good quality
9. Virtual classrooms through internet network can link to other appropriate learning resources.	4.64	the best quality
10. Learners can learn in virtual classrooms by themselves.	4.85	the best quality
11. Learners can practice in virtual classrooms by themselves.	4.62	the best quality
12. Learners can learn radiographic testing by themselves.	4.47	good quality
13. Virtual classrooms are interesting; Learners are more enthusiastic because 3 dimension images attract their attention.	4.65	the best quality
14. Virtual classrooms have simulated images, 3 dimensional simulation, and simulated situations.	4.76	the best quality
Average score	4.50	the best quality

Table 2 summarizes the opinions of the learners towards e-Learning instruction on the course ‘Radiographic Testing’.

Evaluated Items	Mean	Opinion Level
1. Virtual classrooms through internet network are more interesting than instruction in classrooms.	4.42	Highly agree
2. Virtual classrooms through internet network help learners understand the	4.33	Highly agree
3. Academic contents about radiographic testing in virtual classrooms are presented in an interesting way.	4.19	Highly agree
4. Learners need not study additional contents from instructors after virtual classrooms.	4.17	Highly agree
5. Images and texts are in a suitable and neat layout.	4.00	Highly agree
6. The lessons have suitable and neat images and texts.	4.14	Highly agree
7. Colors used in virtual classrooms are suitable.	4.42	Highly agree
8. The size of texts and images is suitable.	4.33	Highly agree
9. Virtual classrooms through internet network can link to other appropriate learning resources.	4.27	Highly agree
10. Learners can learn in virtual classrooms by themselves.	4.59	Agree the most
11. Learners can practice in virtual classrooms by themselves.	4.17	Highly agree
12. Learners can learn radiographic testing by themselves.	4.73	Agree the most
13. Virtual classrooms are interesting; Learners are more enthusiastic because 3 dimension images attract their attention.	4.36	Highly agree
14. Virtual classrooms have simulated images, 3 dimensional simulation, and simulated situations.	4.60	Agree the most
Average score	4.33	Highly agree

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THE TEACHING MODEL TO CREATE SYSTEMS THINKING BY USING WEBQUEST INSTRUCTIONAL PROCESS FOR MASTER'S DEGREE IN EDUCATION

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The purposes of this study were to develop the teaching model to create systems thinking by using webquest instructional process in master education and to examine the impact of the model on student's development of system thinking skills, and computer skills.

The target was the master degree students in educational administration of Faculty of education Srinakharinwirot University who work in the year 2006

The study tools employed at different stage were as follows: The questionnaire to survey current status and need for the development of thinking skills, The instruction of computer subject; at action research stage, there were 2 tools 1) computer test 2) teacher observation

The findings of the study revealed the model of teaching that provides details in the arrangement of learning environment of develop students' systems thinking skills and computer skills

Development of a Knowledge Sharing Process using CSCL based on PAL Approach to Enhance Knowledge Creation Behaviors of Graduate Students

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ABSTRACT

The purposes of this research were to develop a knowledge sharing process using Computer-Supported Collaborative Learning (CSCL) based on Peer-Assisted Learning (PAL) approach to enhance knowledge creation behaviors of graduate students. The Research and Development (R&D) methods were divided into four phase: Phase 1 Study from analyzing and synthesizing related documents, investigate the experts' opinion about a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students. Phase 2 Develop a prototype of knowledge sharing process using CSCL based on PAL approach. Phase 3 Evaluate knowledge sharing process using CSCL based on PAL approach in higher education institutions. Phase 4 Revise and Propose a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.

The subjects of the first phase were seven experts in the field of Educational Technology and Knowledge Management (KM). Individual Interview was used to investigate the experts' opinion. The participations of the third phase were twenty-five graduate students. This phase was administered during the first semester of the academic year 2008 in the field of Curriculum Instruction and Educational Technology at the faculty of Education Chulalongkorn University, Thailand. The Knowledge Creation Behaviors of the subjects were assessed before and after the experiment. A dependent t-test was used to compare pretest and posttest results.

The research findings indicated that: 1. The five components were: 1) People 2) Content 3) Computer-Support Collaborative Tools (CSCT) 4) Transition and Behavior Management 5) Evaluation. 2. The six step were: 1) Orientation and Group Socialization 2) Definition of Objective Knowledge 3) Peer Meeting and Knowledge Sharing 4) Acquisition of New Knowledge 5) Creation and Revision of the Knowledge 6) Evaluation and Integration of Thoughts. 3. There were significant differences between Knowledge Creation Behaviors pretest and posttest scores at the .05 level. 4. The products developed by the learners were in a good level which was considered appropriate.

Keywords

Knowledge sharing, Computer-Supported Collaborative Learning, peer-assisted learning, Knowledge Creation Behaviors

1) INTRODUCTION

In the recent years, educators from many countries have applied the concept of KM in theory and practice to education and found it successful (Kidwell et al., 2001; Milam, 2001; Thorn, 2001). Also, it is universally accepted that KM has become a necessity to improve the use of information system and to create participation in data transferring.

This research has tried to apply the concept of KM, which consists of basic processes: Creation, Storage/Retrieval, Transfer and Application (Alavi and Leidner, 2001), in the modeling and development of knowledge sharing process for graduate learners, in combination with Peer-Assisted Learning (Learning before Doing through others' experience (Chris and Geoff, 2001)). Knowledge management projects are attempts to do something useful with knowledge to accomplish organizational objectives through the structuring of people, technology, and content. (Davenport et al., 1998). The study tries to have the knowledgeable, skilled and experienced people interact among themselves to share knowledge, skills, and experiences in a specific area. The role of the instructor is to give suggestions and facilitate the learning process.

CSCL is one of the most important KM practices, Knowledge sharing is done with the help of computers (Jy Wana, 1997; Lipponen et al., 2004)) following to the Knowledge Spiral or The SECI model (Nonaka and Takeuchi, 1995), which proposed that organizational knowledge is created through the continuous social interaction of tacit and explicit knowledge involving four sequential modes of knowledge conversion: socialization, externalization, combination and internalization. A Knowledge Conversion Program was developed according to the Assistant Computer theory to support joint learning. A CSCL application program for a Knowledge sharing process based on PAL approach to enhance knowledge creation behaviors is in the form of simple Templates or Wizards allowing learners to corporately think, question, find, convert, and record knowledge by choosing tools which are suitable to each individual. The learners can thus communicate as much as they like, with no limitation.

Moreover, it will motivate learners to seek more knowledge. They can share and expand their knowledge in group conversion in order to produce insightful knowledge outcome. Educational innovations will be created, which is in line with the national education reform plan and the learning goals for higher education learners. (Commission on Higher Education, 2005)

From the above; this study was conducted to develop a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.

2) PURPOSE OF THE RESEARCH

To develop a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.
To be more specific, the focus would be;
2.1) To investigate the experts' opinion about a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.
2.2) To develop a prototype of knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.
2.3) To study effectiveness of a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.
2.4) Revise and Propose a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.

3) CONCEPTUAL FRAMEWORK

The conceptual framework of this research was showed in figure 1. Five components were used for developing knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.

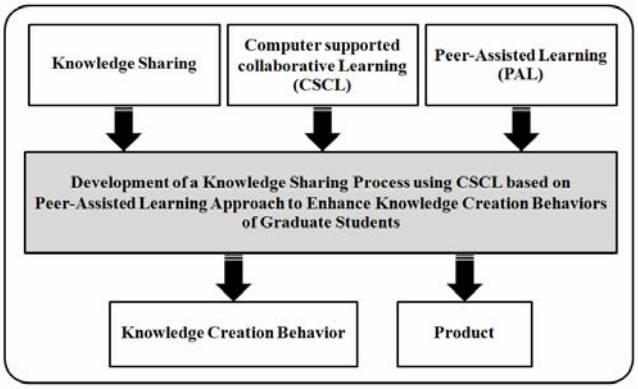

Figure 1: Conceptual framework of the research

The details of each component were described as followed:

3.1) Knowledge Sharing is the exchange of experience, knowledge, thought between people and groups of people via communication, instructions, seminars, meetings and debates on points of mutual interest, and transfer them in writing in different kinds of printed matter or in virtual reality through the computer network and e-Learning. Knowledge sharing can be either formal or informal. It reduces redundancy and time for finding new knowledge. In addition, if the Best Practice for knowledge conversion, reliable data, efficient data storing system, and easily accessible data banks are available, knowledge can be quickly retrieved for problem solving.

3.2) Computer supported collaborative Tools (CSCT) is an emerging paradigm (Koschmann, 1996) for research in educational technology that focuses on the use of information and communications technology (ICT) as a meditational tool within collaborative methods (e.g. peer learning and tutoring, project- or problem-based learning, etc.) of learning. CSCL interest lies on how collaborative learning supported by technology can enhance peer interaction and work in groups, and how collaboration and technology facilitate sharing and distributing of knowledge and expertise among community members (TELL, 2006). CSCL supports learner on changing of Tacit Knowledge to Explicit Knowledge by building learning environment that enhances learners to have an interaction, knowledge sharing, opinions and data sharing. Moreover, CSCL aids to data keeping and searching by relying on Computer-mediated communication that may increase the quality of knowledge creation by enabling a forum for constructing and sharing beliefs, for confirming consensual interpretation, and for allowing expression of new ideas (Henderson and Sussman 1997).

3.3) Peer-Assisted Learning is the technique of bringing people together to learn by sharing experiences, insights and knowledge on specific problems, projects or tasks. Learning is achieved through others' experiences, assistance, thoughts, ideas and mistakes (Shealagh et al., 2005). Peer assists are part of a process of what BP calls 'learning before doing', in other words gathering knowledge before embarking on a project or piece of work, or when facing a specific problem or challenge within a piece of work. (Chris and Geoff, 2001). The benefits of peer assists are therefore quickly realised: learning is directly focused on a specific task or problem, and so it can be applied immediately.

3.4) Knowledge Creation Behavior is a transform behavior which explains the creation of knowledge through conversions between tacit and explicit knowledge. Nonaka (1994) proposes that there are four different modes of knowledge conversion according to the Spiral of Knowledge or SECI's Model; 1) Socialization: Sharing experiences to create tacit knowledge, such as shared mental models and technical skills. 2) Externalization: The quintessential process of articulating tacit knowledge into explicit concepts through metaphors, analogies, concepts, hypothesis, or models. Note that when we conceptualize an image, we express its essence mostly in language, 3) Combination: A process of systemizing concepts into a knowledge system. Individuals exchange and combine knowledge through media, such as documents, meetings, and conversations. Information is reconfigured by such means as sorting, combining, and categorizing. and 4) Internalization: Embodying explicit knowledge into tacit knowledge. Closely related to "learning by doing." Normally, knowledge is verbalized or diagrammed into documents or oral stories.

3.5) Product is the new creation, process, thought and the ability to use knowledge or creative thinking. It may involve the use of a different method or the adaptation of existing conditions to create a new idea that is useful for oneself and the community. The key concept of product is creation, research and development and technology, which leads to technological innovation. A product needs not be new knowledge. It can be existing one, but which involves new thoughts, applications or management methods. Most importantly, it must be useful in a specific area. Products may be made by combining existing things to create a new and better ones. In this study, when activities are carried out through the process, a product is obtained.

4) RESEARCH METHODOLOGY

The research methodology used a Research and Development (R&D) approach to develop a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students. The research process consisted of four phase;

Phase 1 Study from analyzing and synthesizing related literatures and documents, investigate the experts' opinion about a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students. The experts were selected by using purposive random sampling method. The instrument used an interview questionnaire to capture experts' opinion with Individual Interview.

Phase 2 Develop a prototype of knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students. Based on information gained from the first Phase researcher will create the prototype composed of five components and the process consists of six steps. The five components were: 1) People, 2) Content, 3) CSCT, 4) Transition, and 5) Behavior Management and Evaluation and, the six steps were: 1) Orientation and Group Socialization, 2) Definition of Objective Knowledge, 3) Peer Meeting and Knowledge Sharing, 4) Acquisition of New Knowledge, 5) Creation and Revision of Innovation, and 6) Evaluation and Integration of Thoughts. Then, it was approved by a research advisor and validated by seven experts in the field of KM and Educational Communications and Technology using questionnaire with Index of consistency (IOC) to make The Activities Control plan consists of Process name, Objective, Activity Process, Tools and Evaluation.

Phase 3 The validated the prototype developed in the second phase was implemented for sixteen weeks in one subject find out the efficiency of the process and CSCL application program. Participations were selected by a purposive random sampling method, were twenty-five graduate students was administered during the first semester of the academic year 2008 in the field of Curriculum Instruction and Educational Technology at the faculty of Education Chulalongkorn University, Thailand.

The instrument consists of 1) A CSCL application program for a Knowledge sharing process based on PAL approach to enhance knowledge creation behaviors, 2) A knowledge creation behaviors check list designed to assess and compare student Knowledge Creation Behaviors before and after the experiments and 3) A product evaluation form to assess criteria in three parts i.e. Product Development Process part, Quality and Possibility of Implementation part and Innovation part of the products developed by the learner.

Phase 4 Revise and Propose a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students. The revised will specify every components and process using flowchart and descriptive narration. Then, to attain a consensus from five experts in the field of KM and Educational Communications and Technology, edited and revised again based on the experts' opinion. Finally, the researcher proposed a development a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students.

5) RESEARCH FINDINGS

The results of a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students could be revealed in figure 2.

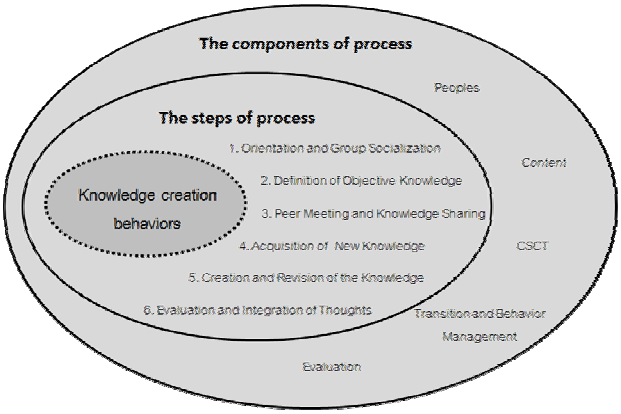

Figure 2: The components and process of a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students (version 1)

5.1) The five components of a knowledge sharing process using CSCL based on PAL approach to enhance graduate students knowledge creation behaviors could be described as follows:

5.1.1 People play an important role in creating, storing and sharing knowledge efficiently. They can be classified into Course Manager, Coordinator/ Teacher Assistant, Peer-Assisted Group Expert and Peer-Assisted Group Learner. Each of these roles has different desirable qualifications and functions as follows:

- The Course Manager is the Learning Facilitator or Knowledge Navigator who manages activities and likewise encourages, supports and creates learning environment in order for knowledge sharing to take place among learners through participation under individual's need and interest. The Course Manager also encourages, motivates, compliments and regularly monitors progress of learners.
- The Coordinator or Teacher Assistant is the person who coordinates participation in activities with the Course Manager. The Coordinator/ Teacher Assistant is the linking point between people in the network, procures supplement data sources and technology, provides advices and suggestions, and solves arising problems.
- The Peer-Assisted Group Expert is the person who participates in the sharing of knowledge, skills, expertise, experiences, and opinions and willingly suggests good practices on issues needed or requested by learners in the group. He or she also gives guidance, compliments, and motivation to co-learners regularly.
- The Peer-Assisted Group Learner is the group members who participate in the activities in the process. His functions are to share, find, store, and compile knowledge into sections and system, including analyze and make a summary, and present the knowledge obtained to the group. Moreover, the Peer-Assisted Group Learner uses knowledge gained to develop a product, asking for help, suggestions or advices from Peer-Assisted Group Expert.

5.1.2 Content is skill, experience, wisdom, information or news which is relevant to the topic in question. It can be obtained from people, documents, theories and handbooks. It may be something people gained from knowledge sharing, analysis, synthesis, and extraction of data. Content must be related to course syllabus and can be used to develop a product (body of knowledge).

5.1.3 Computer-Support Collaborative Tools are learning support tools used in knowledge sharing. There are two types of CSCT, Synchronous and Asynchronous, used to support different activities, peer interaction, facilitate sharing and distributing of knowledge, storage and delivery of Content to those who need it and help members in an online learning community deal with problems more effectively. Examples of CSCT are: Weblog - for sharing texts, pictures and diagrams, Wikipedia - for editing projects and sharing idea in groups work, Web Board – for posting news, information or issues, Chat/ MSN – for discussing with increased level of interactivity in online communication, and E-Mail.

5.1.4 Transition and Behavior Management involves preparation and behavior adaptation

for people joining knowledge sharing process in order to motivate target behavior and willingness to achieve success in activities. Besides, Transition and Behavior Management are used for solving problems and obstacles along the knowledge sharing. Support and Learning Environment are required from relevant people to enable interaction which will lead to knowledge sharing. These factors have to be borne in mind: Motivation, Trust, and Enabling Learning Environment.

5.1.5 Evaluation is the assessment of the products developed by the Peer-Assisted Group Learners. Then, the Course Manager and the Peer-Assisted Group Expert jointly evaluate the product, by discussing pros and cons and giving suggestions or advices that help the Peer-Assisted Group Learner to correct the imperfections and improve the product. Generally, the Peer-Assisted Group Learner will create the assessment form for his/ her own product assessment.

Moreover, to study learner's behavior which shows transition of Tacit Knowledge and Explicit Knowledge according to the concept of SECI's Model (Nonaka and Takeuchi, 1995), the Peer-Assisted Group Learner will make self- assessment before and after joining the knowledge sharing process. This is an important step to monitor effects and efficiency of the process and is useful for the Course Manager to manage or adjust process to be more efficient.

5.2) The process was defined by six steps (See figure 4) and each step has specific activities as follows:

5.2.1 The first step was Orientation and Group Socialization. It is an activity to introduce activity guideline and create participation among Peer-Assisted Group Learners.

- Course Manager explains the process and the roles of each individual to the Peer-Assisted Group Learners.
- Peer-Assisted Group Learner does the knowledge creation behavior assessment before following the process.
- The Peer-Assisted Group Learners register in the program and creates weblog (memorandum) to introduce themselves, their interests and expectations.
- The Peer-Assisted Group Learner visits Peer-Assisted Group Expert's weblog and other Peer-Assisted Group Learners' weblog to create acquaintance by giving comments.

5.2.2 The second step was Definition of Objective Knowledge. It is an activity to specify or set needed knowledge and analyze targets.

- The Peer-Assisted Group Learners propose topics for developing his/her own product and specify needed knowledge or help from the Peer-Assisted Group Expert.
- The Peer-Assisted Group Expert studies the topics proposed by the Peer-Assisted Group Learners through the weblog and gives comments on knowledge needed.
- The Peer-Assisted Group Learners and the Peer-Assisted Group Expert corporately set Contents and provide relevant information sources through the web board.
- The Peer-Assisted Group Learners analyze targets and needs in product development to seek new Contents and record them in the weblog.

5.2.3 The third step was Peer Meeting and Knowledge Sharing. It is an activity to convert knowledge in co-learning. There are two types: face to face and online.

- The Peer-Assisted Group Learner makes familiarity and good relationship with the Peer-Assisted Group Expert through an interaction.
- The Peer-Assisted Group Learners are divided into meeting groups with the Peer-Assisted Group Expert to share experiences, skills, practices which will be useful for product development.
- The Peer-Assisted Group Expert monitors and checks the weblogs and gives support and help, as well as regular feedbacks through CSCT.
- The Peer-Assisted Group Learners and the Peer-Assisted Group Expert manage time for debate, giving opinions, supporting advices through CSCT.

5.2.4 The fourth step was Acquisition of New Knowledge. It is an activity to search for

knowledge and keep it, creating motivating environment to encourage learners in knowledge sharing.

- The Peer-Assisted Group Learners seek out relevant knowledge for product development and keep it in the relevant section of the weblog and share it for knowledge searching.
- The Peer-Assisted Group Learners reflect weekly their thoughts after joining the knowledge sharing through the weblog.
- The Peer-Assisted Group Expert gives comments, advices and suggestions through CSCT.
- The Course Manager and the Coordinator/ Teacher Assistant monitor and follow Peer-Assisted Group Learner's knowledge sharing behavior and reward creative work or learners with excellent practice in the knowledge sharing.

5.2.5 The fifth step was Creation and Revision of the Knowledge. It is an activity to develop the product and propose ideas for improvement.

- The Peer-Assisted Group Learners who have similar target products are divided into groups to corporately analyze and gather contents, thoughts, theories, and also design Story Board with the help of Wikipedia.
- The Peer-Assisted Group Learners pick some knowledge gained from sharing to apply in his/her own product development plan by writing as a project and keep it in weblog.
- The Peer-Assisted Group Learners develop their product step by step and periodically report progress through the weblog.
- The Course Manager and the Peer-Assisted Group Expert together give help, suggestions and feedbacks through the CSCT.

5.2.6 The sixth step was Evaluation and Integration of Thoughts. It is an activity to jointly assess and propose ideas to improve developed product.

- The Peer-Assisted Group Learners present their developed products to the Course Manager and Peer-Assisted Group Expert for their comments, suggestions or advices and assessment of the products. The Peer-Assisted Group Learners are the persons who create the assessment form of their products.
- The Peer-Assisted Group Learners keep the assessment results, comments, suggestions for use as a guideline to improve quality of the product through the weblog.
- The Peer-Assisted Group Learners fill in the knowledge creation behavior assessment form after following the process.

5.3) After using this process, knowledge creation behaviors were analyzed by using a dependent t-test. Knowledge creation behavior scores of the posttest (Mean = 2.39) were significantly higher than those of the pretest (Mean = 2.11) at the level of 0.05. There were 26 behaviors (from a total 40 behaviors) with the mean of the knowledge creation behavior scores that showed significant difference ($P<0.05$) when examined by item, and the mean of the knowledge creation behavior scores of all 4 parts also showed significant difference ($P<0.05$). (See Table 1)

Table 1: Means, standard deviations and t-test result of the difference between the pretest and posttest Knowledge Creation Behaviors scores.

Knowledge Creation Behaviors	Mean	S.D.	t-test
Pretest	2.11	0.59	*13.93
Posttest	2.39	0.54	

* Significant at the .05 level

5.4) The products which were developed by the learner were assessed by three experts in the field of educational technology. The overall outcome were in a good level (Mean = 2.39 from a possible total score = 3, S.D. = 0.51). When determined by each criterion, the Product Development Process part (Mean = 2.48, S.D. = 0.51) and the Quality and Possibility of Implementation part (Mean = 2.43, S.D. = 0.50) were in a good level, while the Innovation part (Mean = 1.88, S.D. = 0.49) was in a moderate level. (See table 2)

Table 2: Means and standard deviations result of the product evaluate scores

Product Criterion	Mean	S.D.	Level
Product Development Process	2.48	0.51	Good
Quality and Possibility of Implementation	2.43	0.50	Good
Innovation	1.88	0.49	Moderate
Total	**2.39**	**0.51**	**Good**

CONCLUSIONS

The complete process of this research consists of four phases but only the first three phases have been completed. While the last phase is under process this paper presents the results of the work accomplished to date.

In the first phase, the related literatures and documents were analyzed together with opinions from experts. Data synthesis led to a conclusion that a knowledge sharing process using CSCL based on PAL approach to enhance knowledge creation behaviors of graduate students should be composed of five components and the process consists of six steps. The five components were: 1) People, 2) Content, 3) CSCT, 4) Transition, and 5) Behavior Management and Evaluation and, the six steps were: 1) Orientation and Group Socialization, 2) Definition of Objective Knowledge, 3) Peer Meeting and Knowledge Sharing, 4) Acquisition of New Knowledge, 5) Creation and Revision of Innovation, and 6) Evaluation and Integration of Thoughts.

The second phase involved the development of the prototype according to the components found in the first phase. The third phase was designed to validate the prototype developed in the second phase. The experiments showed that there were significant differences between Knowledge Creation Behaviors pretest and posttest scores at the .05 level. The improvement of posttest scores was due to the implementation of CSCL based on PAL approach which encouraged learners to show knowledge conversion behaviors according to the Spiral of Knowledge or SECI's Model.
The products developed by the learners were in a good level which was considered appropriate. The researchers concluded that it was due to the knowledge sharing process which facilitated exchange of experience, knowledge and thoughts between people. Peer assistance and supports done through the CSCT allowed the graduate students to create effective products.

In conclusion, the success of knowledge creation depends on many components (People, Content, CSCT, Transition and Behavior Management and Evaluation) and the six-step processes identified in this research have helped graduate students to create products effectively and systematically. Regarding the flow of the processes, the first two steps should be performed sequentially but the steps three through five can be performed in any order or even simultaneously before proceeding to the last step (Evaluation and Integration of Thought). However, the whole process does not necessarily stop at the last step where learners summarize the comments, suggestions or advices from Course Manager and Peer-Assisted Group Expert to find ways to improve the products, but the learners can bring those issues back to step two to define a new objective knowledge and start a new cycle of product creation as the continuing cycle of knowledge creation is crucial for ongoing growth of a knowledge-based society.

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Benefits and Barriers Through e-Learning Among Nursing Students in The Introduction to Nursing Profession Course

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ABSTRACT

E-Learning is a learning method that utilizes computer networks and electronic media in the learning process. The purpose of this descriptive study was to examine the benefits and barriers of e-Learning among baccalaureate nursing students in the Faculty of Nursing, Chiang Mai University (CMU). Study population consisted of 74 first year nursing students enrolled in the first semester Introduction to the Nursing Profession course at CMU in 2008. Data were collected using the Benefits and Barriers of attending an e-Learning course developed by the researchers. Content validity of the questionnaire was established by a panel of three experts prior to use. Internal consistency reliability of the questionnaire using Cronbach's alpha was 0.91. Data were analyzed by the SPSS/FW program and included frequency, means and standard deviation.

Findings were organized into the two categories of benefits and barriers of attending an e-Learning course. Benefits of e-Learning were rated as high (μ=90.57, σ=7.17) by participants. Themes identified as benefits of e-Learning include: 1) interactive learning; 2) innovative teaching; 3) promoting self-directed learning; 4) convenience; 5) safe time and place for learning; 6) enable to enhance data-search by hyperlinks; 7) self-paced learning; 8) availability of help when needed; 9) promote internet use; and 10) building responsibility and self-confidence. Three ranks of benefit items were identified: 1) ability to repeat content until understood (50%); 2) ability to study anywhere and anytime that computers and internet are available (36.5%); 3) eliminates need to travel to physical classroom (36.5%).

Barriers to e-Learning were rated as low (μ=29.86, σ= 15.39). Themes identified as barriers include: 1) readiness and capability of systems and equipment; 2) readiness of student for e-Learning; and 3) adequacy of budget to support e-Learning. Three ranks of barrier items are: 1) insufficient computer resources (48.6%); 2) Lack of personal computers (31.1%); and 3) low-speed internet access (28.4%).

Results of this study suggest that while e-Learning is highly valued by undergraduate nursing students, institutions must provide the equipment and network support required for this learning modality.

Keywords
Benefits, Barriers, e-Learning, Nursing Students, The Introduction to Nursing Profession Course

1. BACKGROUND

The educational Development, which intends the graduates have the multi-knowledgement (multidisciplinary), has the learning-teaching by using students as center (student-centered). It emphasizes the creation of learning process, idea, data information and technology exchanging together between teacher and students. There is Information Technology identification to be used as equipment to make new knowledgement from basic knowledgement to make Thai Society to be knowledge-based society. Including to emphasize the course's learning-teaching substances to intend to the graduates to have the innovative capability and knowledgement to adapt themselves in using it to make a living, educational management should have an idea that all students are important and should use an appropriate learning-teaching process to support them can develop their skill naturally and full capability (National Education Committee Administration B.E, 2542) ,which learning-teaching as e-learning is a selective way to promote the self-study, the learning as student-centered type, which has each types of information content transmission

through the internet network by learning-teaching process using technological equipment to make flexibility in learning Nursing Management Department, Nursing Faculty, Chiang Mai University has opened the subject 558112 The Introduction to the Nursing Profession Course for first year students; Nursing Graduate Course by having subject content consists of; Health service system, History and evolution of nursing career both in Thailand and abroad, The idea of nursing conceptual theory, the role and job responsibility of professional Nurse, including to morality principle. Each morality in career, which is theory subject, which has contents with highly abstract and is the first subject to bring nursing students understand the career.

To arrange learning-teaching as e-Learning will be able to help students enter to study the content details, which are benefit to their learning and students can arrange time to study or review the contents according to their need by themselves because each student has different ability and capability in learning. Including to the students has their opportunity to consult teacher in the studied content easier via electronic email or web board of e-Learning (T. Laohajarassaeng ,2545). But on the other hand, Learning-teaching as e-Learning may not success completely if there is some part as barriers to study such as the institution lack of internet network system availability in sending through data too slowly speed especially photos and moving pictures and lack of the equipment availability. Especially, the quantity of good quality computer is not enough for student quantity or students are not ready i.e. lacking of computer and internet network using skill. Using time in studying through internet network outside the class has limitation because having many subjects. It makes the loss of motivation to study outside the class to additional study again, etc. (Assavinee Namagunkham and group B.E. 2550)

So, teacher team has arranged the learning-teaching as e-Learning; media type to support students in this course. By the educational year 2551, there is the course in first semester, total narrative hour is 30 hrs per semester (2 credits) and has the method of learning-teaching both in classroom by lecturing, discussion and dividing group to analyze case study about main topic, interesting topic i.e. role, duty and responsibilities of professional Nurse. Creating good attitude to the career, Moral problem, etc. together with making a study trip an interview patients in their dormitory, Including to the media presentation as power point, video and other from internet network. Answer questions by teacher via email and to let students have participated in suggestion from case study analysis or question topic through the web board of A-Tutor's the administrative management system. For the subject evaluation, it has the mid-term and final exam evaluation. To Make analysis report of making a study trip with patient interview at their dormitory compare with concept in nursing and making report of interesting case study.

The Researching Group has interested in evaluate the learning-teaching with e-Learning as additional media type. After finishing learning-teaching already, it will be evaluated in utility, problems ,barriers in learning through e-Learning of Nursing students to bring the case study result to be developed the learning-teaching as e-Learning in this subject, Including to be the basic data to Nursing Administrative person to use the educational administration, which support the learning-teaching as e-Learning more appropriately in the next time.

2.OBJECTIVES

1. To study the benefits in learning through e-Learning of Nursing students in The Introduction Profession Nursing Course
2. To study the barriers in learning through e-Learning of Nursing students in The Introduction Profession Nursing Course

3.METHOD

This research is the descriptive research (descriptive research). The population in this case study is first year nursing students, who register to learn the subject 558112 The Introduction to Profession Nursing; Semester 1 Part1 quantity 74 persons

The Research Equipment are divided as 3 parts as personal data questionnaire,

Benefits from learning through E-learning questionnaire, and Barriers of learning through E-Learning Questionnaires in The Introduction Profession Nursing Course by classifying as ideal frame as 2 groups as benefits and barriers. Benefits compose of 10 sub items are: Interactive learning, New learning-teaching format, promoting self learning, convenience, save time and place, Enable to enhance data-search by Hyperlinks, ability to choose as his capability, knowing how to use support equipment, promoting to use internet, building self responsibility and self-confident quantity 23 items. Barriers are divided as 3 sub items are: Readiness of system and equipment, Readiness of learners and budget quantity 23 items by both 2 groups are selective answer with estimate scale as 5 levels, which create from literature review and related job.

Finding the correct messages as content by passing the inspection from 5 high qualified persons to have corrected index according to the content of questionnaire as 0.76

To find Self-confident by bringing questionnaire to study with 30 nursing students, who are similar as population. Then, find out the self-confident value by using Cronbach's alpha coefficient. It gets the questionnaire confident by including to total issue as 0.91 and when separate into 2 sections, benefits of learning through e-learning section is 0.88 and Barriers of learning through e-learning is 0.93. The researchers collect data by him in total population. He has the completely questionnaire feed back totally 74 issues as 100% and data analysis by using program SPSS/PC to find frequency, percentage, average, standard variation.

4. RESULTS

Most population are female (91.9%) average age 19.14 year. Now use computer, which is the university asset (77.1%) and by wireless (47.1%) PC+LANS (43.9%), using program web browser to log in web site 3-5 times per week (31.1%) Use internet average7.8 hours/ week. By using activities in travel to entertainment website (77.1%) Study as e-learning (46.4%) and investigate data information to make report (33.8%) used to study in e-learning in other subject before (51.4%) which population has studied passing the lesson in The Introduction Profession Nursing Course through e-learning as A-tutor some weeks (82.7%) About 0-2 times per week (52.7%) by learning about1.35 hours per week.

Benefits in learning through e-learning of Nursing students by total is in high level (μ = 90.57, σ = 7.17) when let the student rank the benefits as 3 items ; found that the first item is the learner can repeat studying lessons until their well understanding (50%) second item is the learner feel convenient to learn anytime and anywhere if they have computer and internet network (36.5%) third item is the learning is no need to travel to enter the classroom in some identified online hour(36.5%)

Barriers in learning through e-learning of Nursing students by total is in small levell (μ = 29.86, σ = 15.39) when we let students classify barriers to be 3 items, found that first 3 levels are no enough computer quantity for learner quantity (48.7%) Item no.2 Have no own computer (31.1%) third item: Internet Network system send data slowly (28.4%)

When separate benefit and barriers as by item, it gets the results as below:

Table 1 Average, Standard variation and score level of benefits in learning through e-learning of nursing students in The Introduction to the Nursing Profession Course by total and by item

Benefits	range	μ	σ	Benefit Level
By item				
1. Have Interactive in learning	0-15	12.23	1.41	high
2. Innovative teaching	0-30	23.45	2.49	high
3. Promoting self-directed learning	0-15	12.59	1.19	high
4. convenience	0-5	4.16	0.70	high
5. save time and place	0-5	4.59	0.64	high
6. Enable to enhance data-search by Hyperlinks	0-5	4.15	0.63	high
7. Can choose against himself capability	0-15	12.50	1.36	high
8. Knowing how to use support equipment	0-5	4.18	0.65	high
9. Promote to use internet	0-10	8.54	1.09	high
10. Building self-responsibility and self-confidence	0-10	8.34	1.22	high
Total	0-110	**90.57**	**7.17**	**high**

Table 2 Quantity and percentage of barriers in learning through E-learning of nursing students of The Introduction to the Nursing Profession Course

Description		Be Barriers		No Barriers	
		Qty	%	Qty	%
1.Availability of system and equipment					
item	1.Computer quantity is not enough for learner quantity	64	86.5	10	13.5
item	3.Most used computer has poor working efficiency	36	42.4	38	48.6
item	4.Computer service center set up limitation in time using the internet from home	24	32.4	50	67.6
item	5.network system error often in using it at home	37	50.0	37	50.0
item	6.unable to log into A-tutor system from home when study lessons for helping the teaching on internet whenever need often	19	25.7	55	74.3
item	7.Internet network system in educational institution often error	47	63.5	27	36.5
item	8. computer service centre limit the using internet time in educational institution	48	64.9	26	35.1
item	9. Unable to log in to system A-tutor during staying in the institution. When study supportive lesson onto internet at the needed time often	19	25.7	55	74.3
item	10.Internet network system send data slowly	52	70.3	22	29.7
item	11.No receive the support from educational institution in personnel, who will help advising how to use internet	18	24.3	56	75.7
item	12.No receive the support from educational institution in personnel, who advice to use A-tutor system	16	21.6	58	78.4
item	13.lesson content in helping to teach onto internet is complicate	26	35.1	48	64.9
item	14.content in helping to teach onto internet is hard to understand	28	37.8	46	62.2
item	15.Teacher designs and promotes the interactive between learning with content in lesson too small qty	17	23.0	57	77.0
item	16.no answer from suggestion onto web board	30	40.5	44	59.5
2.Learner's Readiness					
item	2.Having no own computer	55	74.3	19	25.7
item	17.Having many learning subjects cause the learning from e-learning time as small	52	70.3	22	29.7
item	18.Have university activities, which have to join a lot ,effect to have less time to study from e-learning	47	63.5	27	36.5

Table 2(continued) Quantity and percentage of barriers in learning through E-learning of nursing students of The Introduction to the Nursing Profession Course

Description		Be barriers		No barriers	
		Qty	%	Qty	%
Item	19.Have additional course activities of faculty, which must join a lot to effect the learning time to study from e-learning has a few time	27	36.5	47	63.5
Item	20.No convenient in reading main topic of lessons via computer monitor	46	62.2	28	37.8
Item	21.No familiar with self-direct learning method through e-learning as additional media	31	41.9	43	58.1
3.Budget					
item	22. Learner must pay the expense for printing the related teaching document data request.	45	60.8	29	39.2
By Total		51	68.9	23	31.1

Table3 Average, standard variation and score level of barriers in learning through e-learning of nursing students in the Introduction to the Nursing Profession course

Barriers	range	μ	σ	Barriers Level
Per Item				
1. Availability of system and equipment	0-75	16.92	9.72	low
2. Readiness of learner	0-30	9.53	5.84	low
3. Budget	0-5	1.43	1.49	low
By Total	0-110	29.86	15.39	low

5.DISCUSSION

1. The benefits in learning through e-Learning of nursing students in The Introduction to the Nursing Profession Course

Study result found that the average, benefits in learning through e-learning of Nursing students by totally is in high level (μ = 90.57, σ = 7.17). When consider it, I found that every sides are in good level (Table1). It shows that there is relation with Asvinee Namagunkham B.E. 2550, which found that nursing students has positive ideas to learning-teaching arrangement as e-learning, which can self-direct learning anytime, and has freedom in learning, to practice investigation by them to let them learn how to be self-responsible. It is modern learning and creative method. Moreover, it makes more active and feel that is new learning-teaching to make them no sleepy.

And when we let the population classify benefit to be 3 ranks, we found that first rank is the learner can repeat studying the content until they understand (50%). Second Rank is the learner feel comfortable to learn anytime, anywhere if they have computer and internet network(36.5%). Third rank is the learner does not have to travel to enter the classroom in

some identified hour to learn online type (36.5%)

It shows that nursing students have the developed learning path as Adult learning. The average age as 19.14 year with responsibility, love freedom, who can self directed learning, try to study the content repeatedly until they understand it from having teaching document and other teaching medias, which are in e-learning system, if it has computer and internet network system, including to having interested in learning through new communication as chatting online in some hours, which identify to study as online, which the learner has no waste the time to travel to come to the class because most of the first year nursing students has learning calendar in morning period in Teak Garden and have to travel by bus to study at Suan Dok (The university geographic condition is divided the area to be 2 sides as 1. Teak Garden means the area close to Huaykaew Street. It is located for Scientific and Technology major, Humanities and Social Science Faculty, Male and Female Dormitory, Combining learning Building, Dean Office and Central Service Department 2. Suan Dok means the location of Health Science in every faculties, Health Science Student Dormitory, Hospital and Clinic. Even there is public service bus to deliver , students have to spend the time to wait for the bus and that delivery takes time at least 15-20minuts and sometimes there are a lot of passengers so that they have to wait the next bus come, which match with S.Sukhaninthara and K.Wongphanit .(2545) they presented that the learning as e-learning is interesting thing to make many fields of benefits to students and relate both good and weak point of learning through e-learning at University of North Carolina (1998), which had compared about this benefits as to emphasize the learning-teaching new method, make convenient, save times and places, can finding more data through internet network immediately, an select to study as his capability by repeating learning to make more understanding. This learning-teaching will have flexibility, availability. The students can learn as they want and the learner will be controller the learning-teaching by themselves.

2. Barriers in learning through e-learning of nursing students in The Introduction to Nursing Profession Course

Study result is founded that the Barrier average in learning through e-learning of the nursing students by total will be in low level (μ = 29.86, σ = 15.39). When consider it, found that every sides are in low level (Table 3), but when consider in barrier details by side , it found that 50% up of students identified some items, which were their barriers to learn through e-learning in each side(Table2) as below: **Readiness in system and equipment** has 5 items are:1) computer quantity is not enough with student quantity (86.5%) 2)Internet Network system error often in using at home (50.0%) 3) Internet network system at educational institution error often (63.5%) 4) Computer Service Centre limit the using time in the institution (64.9%) 5) Internet network system data delivery is slow (70.3%), has related to the research of Asvinee Namagunkham.(2550), which found that nursing students have negative ideas to learning-teaching as e-Learning with slow internet network system, including to having no enough good working computer quantity. **Readiness of learner** has 4 items are:1)No having own computer (74.3%),which may involve with system and equipment of university no enough so that students try to find supportive things to study by themselves, but having no enough money to have own personal computer, then they evaluate this item is barrier 2) having many subjects to study so that it causes them to have less time to learn from e-learning(70.3%) and 3) having many university activities to join so that it cause them to have less time to study from e-learning, this additional media.(63.5%) which in these 2 items are shown that to promote students to self-direct learning through this media-e-learning, the teacher must arrange more suitable time to support students to study 4) Inconvenience in reading lesson through computer monitor (62.2%)shows the teacher or teamwork produce computer media must consider in some technique to increase

learner's capability in reading together e-learning design (Thanormporn Laohajarassaeng B.E.2545) **Budget** 1)Learner must pay the expense of teaching involved printing documents(60.8%) which may cause from inconvenience in reading lesson through computer monitor basically so that they print teaching involved printing document to read and waste the expense.

When we let the population to classify the barrier ranking as 3 levels ,we found that first level is having no enough computer quantity with learner quantity (48.7%) second level is having no own personal computer (31.1%), Third level is internet network system delivery is slow (28.4%) show that basic infrastructure facilities are important to support learning through e-learning. The Result Study of Theera Tungwicharn and group B.E.(2545) has surveyed the production problem and using teaching assisting lesson onto internet in learning-teaching at university level shows that problem of technology basic system has no solution or have slow development because there is problem since year B.E. 2545 to present, which composes of :slow network, computer quantity is not enough, internet system limitation and error sometimes. So, if we want to develop system, e-learning must consider this matter and develop better i.e. promoting students to have own computer in special price for students to reduce using the central computer or develop media in type of Live Online during teacher is teaching, also can live online teaching through e-learning network or expand the network as Intranet to cover all area to be more convenient for students especially participating with many departments to push the hi-speed internet network i.e. 3G ,etc.

Benefits from Research

1. Be data for teacher in developing type of learning-teaching arrangement of The Introduction to Nursing Profession Course by using e-Learning later.
2. Be fundamental data to Nursing Faculty Administrator manage for adding supportive factors or manage to reduce matters, barriers, which effect to learning-teaching as e-Learning of nursing students in Nursing Faculty or present to university level to provide computer equipment, which has quality and hi-speed internet network system to cover usage sufficiently and appropriately later.

Suggestion in bringing Research result to be used

1. The faculty and university should prepare the readiness in internet network system by solving the delayed internet network transmission, signal error when use both in the institution and from home. Together with increasing point of wireless internet network for group of people, who have own personal computer, too.
2. Faculty and University should provide the readiness of equipment to be useful in learning by providing efficient computer to learn as e-Learning to be enough quantity for student quantity in many areas of university such as student dormitory, library, computer service centre, etc.
3. Faculty and university should arrange the system of using central computer of faculty or university in case of having limit time to use internet service to expand more time to use
4. In case of arranging the learning as e-Learning as additional media, which qualify with first year student already, but the faculty and university should set up additional course activities both in faculty level, university level to have no much quantity. So, to support time management to students to be able to manage their learning time
5. The teacher may select learning arrangement as e-Learning to be main media : Learnning through internet network without coming to attend the class for some lessons in subject 558112 so that it should develop computer media in teaching appropriate to have high quality,too.

Suggestion for next time research

1. Teaching Computer Media Development for e-Learning
2. Readiness Study, Achievement and satisfaction of nursing students in learning through e-Learning as main media.

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“The Study of Guideline to Enhance Ethics of e-Learning among University Students”

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ABSTRACT

The purposes of this research entitled “The Study of Guideline to Enhance Ethics of E-Learning among University Students” were (1) to investigate the major facilitating factors for developing ethics of e-Learning, and (2) to propose the guidelines for developing ethics of e-Learning. The samples of this research were 15 university professors and scholars who had worked in universities which had long-term e-Learning experience. Those were selected by purposive sampling method. The study also employed 40 academic publications of which 20 were related to ethical development and another 20 were about e-Learning. Unstructured interviews and documentary analysis were used for data collection. Those data collected was scrutinized by frequency analysis and content analysis and later by comparing with the criteria developed by the researcher. It was found that university students should develop the triple ethical issues: responsibility, discipline, and honesty. Moreover, in terms of e-Learning, university students should develop their four roles and ethical skills i.e., studiousness, honorable respect to the right of others, responsibility, and class attendance. The guidelines for developing university students were self-regulation and value clarification. In addition, the appropriateness of ethical evaluation way in e-Learning was behavioral observation. Eventually, e-Learning elements were content, components of multimedia, the Internet tool, resources, Learning Management System (LMS), program and evaluation.

Keywords
Ethics, Moral, e-Learning.

1) Research rationale

The 9th National Economic and Social Development Plan (2002 – 2006) had focused on “human-centered.” Emphasis on integral development was the strategy for human development. Its main issue was the quality of society in which there were balance and accurateness that could build every people to be good, intelligent, virtuous, ethical, disciplined, responsible, and aware of public. In other words, it should be the intellectual and conformity society (The 9th National Economic and Social Development Plan Board, 2006; National Education Plan 2002 – 2006). Nowadays, the 10th National Economic and Social Development Plan (2007- 2011) mentions that Thailand is encountering value crisis resulting from the stream of the Western cultures through mass media and the Information Technology. And, there is the shortage of screening for and exposing to magnificent cultures leading to lessen Thai people’s virtues and ethics. As a consequence of changing in Thai lifestyles, the roles of instructing, giving knowledge, and qualitative and ethical cultivating that are played by family and education institutions decrease. Materialism and consumerism, in turn, emerge. For strategic development, the quality of Thai humans and society is being developed into intellectual and learning society so that Thai people have virtues and knowledge to protect themselves. Their physical and psychological strengths are also enhanced. Furthermore, Thais’ happy living is enforced (Abstract, the 10th National Economic and Social Development Plan, 2008). Khaemanee (2003: 1) also stated that even though today’s Thai situations and conditions primarily target to economic advance, no stability is presented because such matter are not cooperatively developed with psychological, virtuous, ethical, and value components. It cause to social

problems that can latter affect on many Thai people's quality of lives.

In today's society, it is found that the university graduate has mostly faced with their emotion and ethics, but no knowledge relevance. For example, self-temper cannot be controlled by those university pundits. This problem leads them to unable to adapt themselves to work with others. Thus, they have to frequently shift their jobs (Education Service, Kasetsart University, in Chumsai na Ayudhaya, 2005: 3). Moreover, Higher Education Standards Institute (2000: 5) referred to virtues and ethics for the graduate for the purpose of content living. Humans in society have to be guided to obtain virtues and ethics so that the favorable relationship between humans, environment, and the nature can happen. The purpose of education plan is to transmit and manipulate the youth to understand and accept virtues and ethics at a certain level. Those virtues and ethics are composed of goodness, accurateness, and appropriateness.

In the age of the Information Technology, there are rapid advances and changes leading to contain more comfortable and effective communication than the past. With regard to the significance of computer, the Education Ministry has commanded to adjoin computer sciences in every academic level's curriculums since computer's benefits enable students to catch up with ever-changing technology and effectively live in the Information Technology society (Na Takuatung *et al.*, 1998). There are some changes in learning and teaching format when having the use of the Internet. It facilitates people to access knowledge sources and expands instructional system to respond to learners' needs. It can be called learn anywhere and anytime (Pusuwan & Numprasert, 2003). Some subjects are communicated via the Internet only, without virtual class attendance. However, this depends on learners' capability to consume the Internet. The National Electronics and Computer Technology Center (2001) surveyed the quantity of Internet users in Thailand. It was revealed that about 81 per cent of the Internet users was the students who were the undergraduate. According to the government's strategic development, the use of the necessary Technology Information to develop e-education is proposed so that its advantages can be applied to learners in studying a variety of sources and approaches. The government, thus, has developed curriculums that support the application of the Information Technology in order to manage instructional system, enlarge the efficiency of distance learning, establish the Courseware Center, create e-Learning, set up e-Library, and stimulate lifelong learning. These can finally cause to the virtuous and intellectual and learning society (Nilsook, 1999). Thammetar (1997) also said about teaching and learning activity through computer that computer teaching and learning activity is the process of which both an instructor provides his/her experiences about the use of computer to learners in order to change those learners' behaviors to respond to the instructor's established expectations. It can be concluded from the ICT curriculum management addressed by Pelgrum and Law (2003) that learning process should be composed of learners who are active and responsible for self-management and self-learning. Thus, self-control is preferable. At the same time, persistent learning is required to lead to eternal learning.

Moreover, the following ethical characteristics i.e., responsibility, class participation, team working, class attendance, honesty, and intellectual property are required among e-Learning learners (Gunnel, 1997; Khan, 2005; Porter, 2004). Ethics among learners can be developed by behavior change. That is to say, such ethics have to be acted as concrete behaviors and there should be the organization of activities to continual use those ethical behaviors. As a result of this, excellent ethics can competently be turned out because ethics cannot be taught only. Activity is the heart of ethical development, at last (Iamsupasith, 1983: 15; Kalish, 1981; Vishavudh, 1983: 28, in Chanpen, 2001: 8). Teeraputh (2003: 7) claimed that e-Learning learners whose educational level is undergraduate lack intention, motivation and self-conduct, and learning activeness.

Nonetheless, self-conduct and self-control, activeness, self-discipline, and time management are the criteria enforcing e-Learning learners to potentially better in learning. Ethical development among university learners who are regarded as the mature should be done by cultivating them to understand and change their own behaviors. Self-control helps learners to have knowledge and be able to manage their behaviors themselves. In addition, value-built process is the vital technique for expanding students' learning ethics due to that fact that those students will hold obvious values and freely choose those values. This is the proper approach for ethical development among learners (Chanpen, 2002; Chumsai na Ayudhaya, 2005; Permpol, 2002).

From the troubles mentioned above, the large amount of freedom provided to learners in e-Learning system can influence on ethics that is presented in the form of learners' learning behaviors such as no discipline and no class participation. Ethics in learning should be cultivated among learners. To be appropriate, there should be the combination between universities' education management and ethical development so that learners will be fulfilled with knowledge and ethics. As a result, the researcher aims at studying guideline for developing ethics in e-Learning for the purpose of university learning in the future.

2) Research objectives

2.1) To examine elements of ethical development in e-Learning

2.2) To present guideline of ethical development in e-Learning

3) Research framework

The framework of this research was as follows:

3.1) The study and analysis of e-Learning system was done to build ethics among university students. In this case, information from a wide range of resources including books, research, journals, e-journals, web sites, seminar and meeting documents, and so forth were employed.

3.2) Guideline of ethical development in e-Learning was received by unstructured interviews with academic professionals.

3.3) Guideline of ethical development in e-Learning was presented by the findings revealed in 3.2 and 3.3.

Population

The research employed the following sources:

1. Documents relating to ethical development and e-Learning
2. University professors and scholars

Samples

Underneath were the research's samples:

1. Documentary sample, for instance, documents, books, and research. Those were purposively selected. Twenty publications that were relevant to ethical development were chosen. And, another 20 academic documents relating to e-Learning were picked.
2. Personal sample, for example, 15 university instructors and scholars who had experienced in e-Learning no less than five years were purposively selected.

4) Research methods

4.1) Unstructured interviews were conducted with ethical development experts. The dual major questions were ethical framework and ethical development in e-Learning, and format/elements about ethical framework and ethical development in e-Learning.

4.2) Documentary analysis was assessed by frequent evaluation form created by the researcher. The issues on the form were about guideline of ethical development in e-Learning.

5) Research methodologies

5.1) Relevant documents, books, and research were examined to establish guideline of ethical development in

e-Learning among university students.

5.1.1) The selection of documents

5.1.1.1) Domestic and international books, articles, journals, research findings, seminar/meeting documents, theses, and other documents relating to ethical characteristics for university students, learners' attributes in e-Learning system, and e-Learning model

5.1.1.2) Statements or indicators of ethical characteristics for e-Learning's learners

5.2) The selected documents were analyzed in order to find out the ethics that should be developed for teaching and learning in e-Learning system. Its frequency was scrutinized and ranked. If 50 per cent of any data was repeated, such information was considered. But, if less than 50 per cent, the data would be cut.

5.3) The results of those documents about ethical development in e-Learning were employed to create the framework on guideline of e-Learning. It was followed by unstructured interviews for the purpose of conclusion.

5.4) Main issues were concluded from the information obtained from the interviews and documentary analysis so that guideline of ethical development in e-Learning among university students was set up.

6) Research findings

From the documentary analysis and interviews, it was found that:

6.1) University students should develop their first triple ethics: responsibility, discipline, and honesty.

6.2) The roles and ethics of e-Learning that university students should behave were studiousness, honorable respect to the right of others, responsibility, and class attendance.

6.3) The guideline of ethical development among university students was self-control based upon the social cognitive theory. Its components were self-observation, judgment process, self-reaction, and value clarification.

6.4) The suitable approaches of ethical evaluation in e-Learning were content, elements of multimedia, the Internet tool, resources, Learning Management System (LMS), learning activities, and assessment.

7) Suggestions

7.1) e-Learning should be developed to latter increase ethics among university students.

7.2) Roles of public and private sectors should be researched to elucidate their participation in supporting e-Learning.

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Experimental an E2.0 Model: To Sustain Business Process in Quality Assurance Problem Solving of Electronic Manufacturing Companies

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ABSTRACT

This paper presented an experimental with Enterprise 2.0 (E2.0), web application software model to sustain business process in quality assurance problem solving of electronic manufacturing companies. The construction based on the knowledge-sharing systems which can cooperate in social network among users of production, purchase and quality assurance (QA). The E2.0 model sustained business process performance of quality view. The presentation based on the complex enterprise of quality problem solving in electronic manufacturing companies systems. E2.0 model applied a new technology and with contemporary project of web application. Based on this experimental prototype model was created and implemented in two electronic manufacturing companies. The result measurements proved by financial reports with increasing the business process efficiency. The root cause of quality problem will clearly and find out the best solution for operational management team. The recovery of intangible assets in quality loss amount can be benefited in financial. In the future, this model can have further implement into the other industry that not electronic manufacturing.

Keywords

Enterprise 2.0, Absorptive Capacity, Knowledge Sharing, Business Process Performance, Social Network

1) INTRODUCTION

The current trend of business have higher competitive. To achieve customer satisfaction needs should have the value added by the sustained from new information technology system. (Neil A. Morton, Qing Hu, 2008) Enterprise Resource Planning (ERP) System is designed to integrate business processes with complex and lack of comprehensive in application software. (DeLone, W.H and E.R McLean, 1992, Kallinkikos, J.,2004, KKransner, 2000). ERP system has provided a lot of compatible useless reports and customization cost (Markus, 2000, Nahar N.,2000, Sammon D.,2003). The evolution of Web Service and new concept of technology in Service Oriented Architecture (SOA), Software as a Service (SaaS), and E2.0 have changed the software development system. These new technology service can support the different organize systems. Most of manufacturing process will have a lot of problems in loss amount over standard. To apply Absorptive Capacity framework into Business Process can transfer potential capacity to be realized capacity. (Zahra, George, 2002, T. Srivadhana, S.D. Pawlowski, 2007) This paper will present an approach of E2.0 model can sustain the business process performance at quality assurance problem solving view. The relationship between an ERP system and the knowledge capabilities of the organization can sustain the business process performance. The Absorptive Capacity frame work concept can reduce the gap between the potential and

realized capabilities. An E2.0 model will enable to solve the quality assurance problem solving.

2) OBJECTIVES AND CONTRIBUTIONS

2.1) Objectives

This paper considered the following objective points; the first is to approach an E2.0 model can analyze the root cause of quality problems. Technical of "Why-Why" analysis will emphasize in deep detail of root cause. And finally problem can be solved and sustain business process performance. The second is to provide the efficient quality assurance knowledge sharing source in the social network users. This will have sorting by category of problems grouping, solving pattern with action plan, and case reference. And the third is to provide a tool to enable the presentation case of the concept in absorb capability of electronic manufacturing organization from potential to be realized enable business process performance of quality solving. This social network will absorb "Tacit", knowing-how knowledge and "Explicit", knowing-that knowledge from organization into knowledge pool and activate to realize capability in business process performance.

2.2) Contributions

Base on electronic manufacturing company in Thailand scope of this paper will present the benefit following outcomes. In development IT Enterprise for supporting business process need to have concept of Service Oriented Architecture (SOA), Software as a Service (SaaS) and E2.0 model as the part. The first is to have an E2.0 model in the social network to sustain business performance in quality problem solving. The second is to value added of Intangible Assets in quality loss analyze and sustain business performance improvement. Since knowledge in the organization even thought tacit or explicit knowledge is Human Capital. Each problem solving will keep for study or reference. The third is to prove the concept of absorb capability of organization from potential to be realize. As a model can prove E2.0 do sustain business performance improvement.

3) CONCEPTUAL AND PROPOSE PROTOTYPE MODEL

3.1) Main Conceptual

In high competitive situation now depend on how to increase revenue or equity and/or how to reduce cost. Reducing cost is the most way that enterprise will do within organize. To sustained business process performance can do by improving quality problem solving. This paper will focus on a main concept of quality problem solving model with base on framework of Business Process Absorptive Capacity.

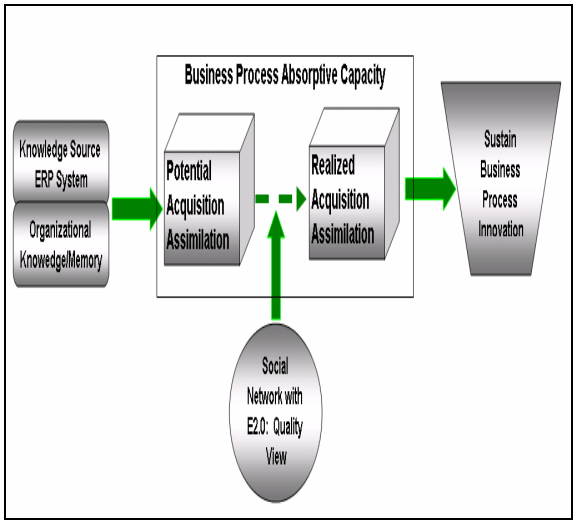

Figure 1: A Proposed Framework of E2.0 in Quality Problem Solving

In figure 1 is to explain this main concept which composes of three parts, input, process and output part. As Input part is sources of knowledge, Enterprise Resource Planning (ERP) and Organization knowledge. In the large organization structure, especially electronic manufacturing companies need Information Technology System. ERP system has composed of three main modules; Financial Module, Account Payable (AP), Account Receivable (AR), General Ledger accounting (GL), Fixed Asset, Distribution Module, Purchasing, Sales and Inventory systems, and

Manufacturing Module, Production Shop-floor, Material Resource Planning, Bill of Material (BOM). Business has not only ERP application system but also Human Resource Management System (HRMS). ERP knowledge is the input part because of in Shop Floor System that records the data of Defect Loss with Reason Code. These data will be analyzed the problem of quality issues. Another source is organization knowledge of tacit and explicit that has experience in quality problem solving.

Process part will apply Social Network with E2.0 to absorb the Potential Capacity of knowing loss code data to be Realized Capacity in solving action. The new technology of SOA, SaaS and E2.0 can activate to sustain business process. Base on knowledge from ERP system and Organization itself. It will be the knowledge source as potential that can absorb to be realized and then to sustain the business process, production efficiency of quality.

The output part will be measured the successful result of outcome the in Financial Report and quality problem can reduce.

3.2) Social Network with E2.0 Model

In business activities can increase production efficiency. There are many activities implemented. Some called “Small Group Activities” (SGA) which composed of many activities spot. This paper has focused on electronic manufacturing company.

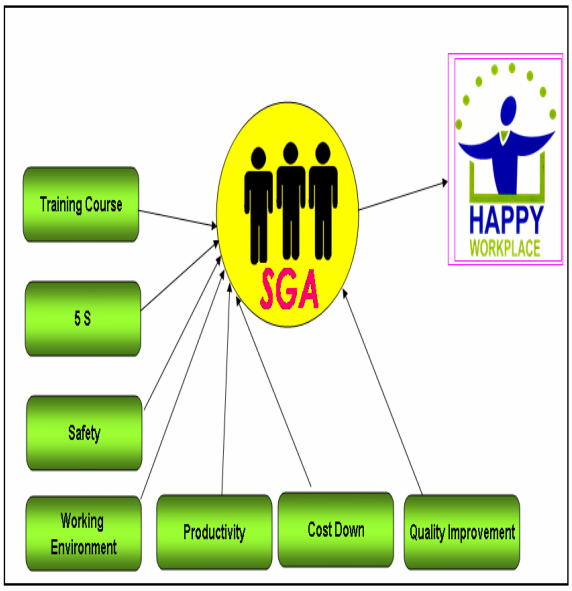

Figure 2: Small Group Activities (GSA)

In figure 2 presented the social network of SGA in the manufacturing. E2.0 in application system can apply these activities as a window of knowledge sharing within the organization. Users can receive information of all activities easily as web service that they can place in their desktop. E2.0 Application of Quality Problem Solving Program will continue instead by E2.0 QPSP. In E2.0 QPSP will be a proposed prototype application system model. In figure 3 is concept of E2.0 QPSP. The first step is starting by registering a new problem case into E2.0 QPSP. All internal users in any area, production or non-production, sales staffs or marketing or purchase staffs can issue the problem case. And also external users, customers can enter the case as channel of application provided. There are three selections for users, the register new problem to entry new problem case, modify existing case to update case that already registered, reports for viewing problem case that already done. How to identify the new problem case, users need to enter these main detail information, problem case name, find problem, clarify problem of when/where/what/extent, stair up (Why-Why analysis), recognize true cause (what is an object?, what is a problem?, deviation statement, true cause, base of reason to show that we know the true cause). E2.0 QPSP can issue problem case.

There is a function of upload defect image or reference documents case for clearly view into system. Attached files for clarify problem will be ease to Quality Engineers (QE). They will classify the problem case and group it together. The second step is filter and analyze problems by category which done by two parties. QE analyze the problem into group and two managers in charged consideration as E2.0 QPSP committee. Approval routing have to do in twice for confirm that are the available case.

The third step, the approved problem case will be pressed in the problem progress report. This report will have the format of problem case solving, described in clarify step by step with image documents attached. There are two mains knowledge sharing, one is to follow up the problem progress and another one is to be knowledge pool for reference base.

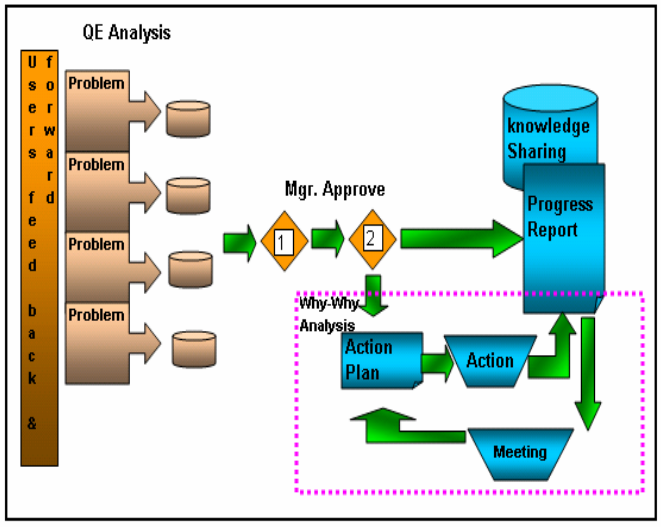

Figure 3: Show an E2.0 QPSP Conceptual Flow

The last step, perform as action plan, E2.0 QPSP committee will invite the extra member in the special case and need to have. Normally QPSP committee members will have semi-monthly meeting. The standard agenda will compose of the problem case listing that separated the new and follow up cases, report of action plan, and discussion the new case of action plan. The problem case will be solved by these perform as looping.

3.3) Measurement in Production Efficiency in Quality

To collect the data of "Loss Amount" that gave the reason code of loss. Therefore the root with "Reason Code" based on 4M, Man, Machine, Material, and Method. A sample is shown in figure 4. When management knew where and what are the root causes in quality problem. Management will take solving action to turn back of defect to be production yield. And this will sustain business performance direction and lead to be the improvement in business or make a chance of profit (T.Srivadhana, S.D. Pawlowski, 2007, Zahra, S.A., George, G., 2002). And with questionnaire by survey with top management and with Financial Reports in the statistical will be output part shown the result quality problem solving.

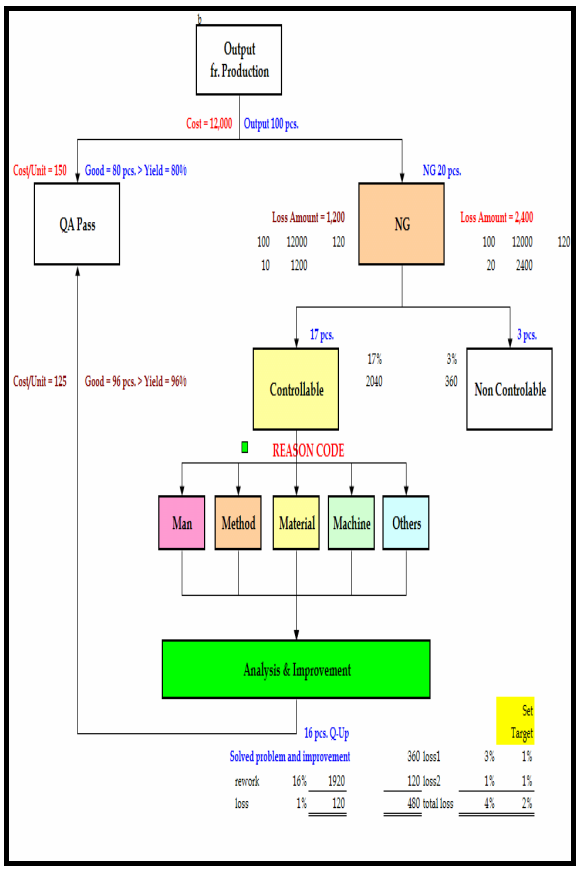

Figure 4: To Show Loss Amount Conceptual

There are three types of analyze reports, Trend Report, Pareto Report, and Variance Report. A sample report is shown in figure 5. These analysis reports will give the view to management in the quality problem solving. This paper will compare the before and after using E2.0 model result. And proving the E2.0 model can absorb the potential capacity in organization to be realized.

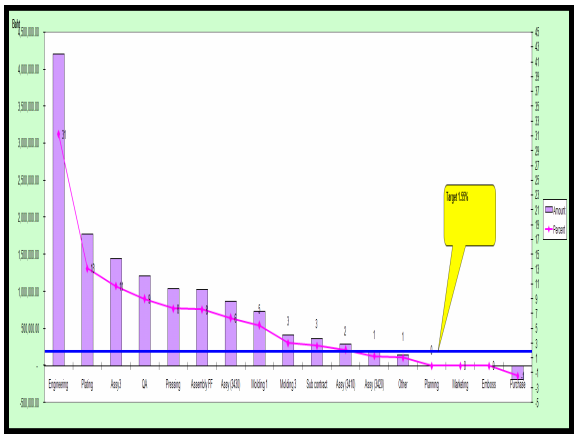

Figure 5: A sample of Management Report (Pareto)

4) FUTURE WORK

Base on Absorb Potential Capacity to be Realized in this paper proposed an E2.0 model tool with quality problem solving in Social Network platform is not only one model. But also other views in production efficiency that can sustain business process performance.

5) CONCLUSION

Base on framework of Absorb Potential Capacity to be Realized, this paper approached an E2.0 model tool with quality problem solving in the electronic manufacturing companies. In the high competitive status, to reduce cost is the most way that businesses do. This paper provides an experimental case of E2.0 web application tool for managing to analyze the quality problem solving. With this intangible business costs affected the business quality assurance. The more found out the root cause and solved, the more reduced expense will achieve. The finally operating profit will increase after solved the quality problems. Input part is knowledge sources that are based on ERP System and Organization Tacit and Explicit knowledge. By Information Technology with an E2.0 model is in contemporary project. The result of implemented in two electronic manufacturing can prove the quality assurance have reduced and been a cause of business financial became gain profit. And For the further in the future work should implement in the other industries.

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Design of Intelligent Tutoring System for Collaborative Problem Based Learning

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ABSTRACT

Intelligent Tutoring System (ITS) for collaborative learning is a tutoring system that focuses on the ability of learners in collaborative problem solving, which based on learners' knowledge and expert's guidelines. Problem-based solving technique is used to stimulate learners to effectively analyze and use their accumulated knowledge and experiences in solving a given problem. Brain storming is required for each step of problem-solving process and proposed solutions, resulted from collaborative work, are automatically verified to ensure correct direction or solution. This paper presents a design of an ITS for collaborative problem-based learning that used Torrance's six-step problem-solving processes and ONION ontology mapping to verify proposed outcomes from brain storming processes.

Keywords

Intelligent Tutoring System, Collaborative Problem Solving, Ontology Mapping, Compare Discussion, ONION.

1) INTRODUCTION

Intelligent Tutoring System is an evolution of Computer Aided Instruction (CAI), which applied an artificial intelligence technique, such as expert system, to a learning system. An ITS is a learning system that is capable to analyze learners knowledge from their performances on exercises or tests so that the system can provide appropriate learning contents to individual learner (Wittaya, 2007).

An ITS as proposed by (Chitaya,et,al 2007) comprises of six components Student Module, Domain Module, Expert Module, Pedagogical Agent, Mentor Agent and User Interface. The Student Module is the component that stores all data about a learner to be used in analyzing and monitoring each individual performance and knowledge. In this module there is also a sub-component, Diagnostic Module, to perform analyzing and comparing proposed outcomes, resulted from collaborative work, with expert's solution guideline to ensure correctness. If the proposed outcomes cannot be compromised with the expert solution guideline then another round of brain storming or further study would be required, otherwise proceed to the next step of problem-solving process. The Domain Module is the component that stores all learning contents in form of learning objects along with metadata. The Expert Module is the component that stores problem-solving rules for both teachers and learners. The Pedagogical Agent is a software agent that automatically acquires information from the student module and expert module in order to present appropriate format or style to each individual learner. The Mentor Agent acts as the coordinator for the ITS system. It is a software agent that automatically sends and stores data for related components, e.g. detecting and sending learners' proposed outcomes, resulted from collaborative work, to the Diagnostic Module for verification. The Interface Module is the component that controls communication among learners, teachers, and the system, including recording learners' behaviors and sending them to the Student Module.

2) COLLABORATIVE PROBLEM SOLVING

Collaborative Problem Solving is an effective stimulator that helps learners in analyzing and using their cumulative knowledge in problem-based learning. Most problems are ill-structure problems, which have many flexible solutions. Learners need to regularly improve their skills in order to cope with this type of problems.

An approach for collaborative problem solving, as proposed by Paul E. Torrance (Torrance, 1974) is depicted in figure 1. There are six steps of problem solving processes:

Step 1 is the process of problem identification. Learners brain storm to investigate and identify clear causes and effects or events of a given problem.

Step 2 is the process of identifying the underline problem to select only one important problem from the brain storming activity in step 1.

Step 3 is the process of brain storming to propose potential solutions for the selected problem (in step 2), which should be at least 10 alternatives.

Step 4 is the process of developing criteria for evaluating proposed solutions, which consists of at least five criteria for selecting the best suitable potential from 10 alternatives defined in step 3.

Step 5 is the process of evaluation of all solution to determine the best one y applying rules and criteria defined in step 4.

Step 6 is the final step which is the process of elaborating the best solution (the highest scored solution) and developing an action plan. The presentation includes the details of what, where, when, and how to address the given problem.

The process of problem identification (step 1) and the process of evaluation of all solution (step 5) require an appropriate verification technique. ONION (Mitra, P.et,al, 2007) is an ontology mapping that may be a sound approach for systematic verification

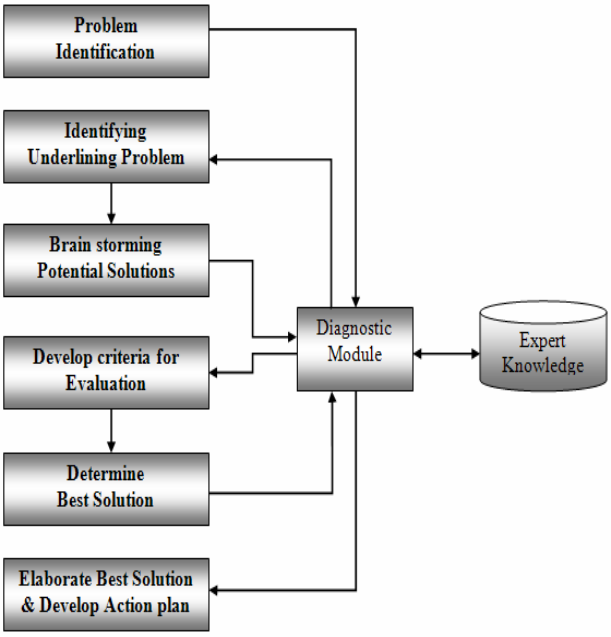

Figure 1: Approach for Problem Solve Process

3) ONTOLOGY MAPPING

Ontologies are knowledge bodies that provide a formal representation of a shared conceptualization of a particular domain. They are widely used in the semantic web. Recently ontologies have become increasingly common on World Wide Web where they provide semantics of annotation in web pages. The distributed nature of ontology development has led to a large number of different ontologies covering the same or overlapping domains. Therefore in order for two parties to understand each other, they should use the same formal representation of the shared conceptualization, i.e. the same ontology.

Ontology mapping is the process whereby two ontologies are semantically related at conceptual level, and the source ontology instance is transformed into the target ontology entities according to those semantic relations. With successful mapping, both ontologies are conceptually considered having the same semantic. One word then has the same somatic as other words, for example the word “HotelBooking” has the same semantic as “BookingRoom” and “ReserveRoom” (Teerayuth and Somjit, 2005).

ONION (Onion compositION) is an ontology mapping technique that can be appropriately used for verification of learners' proposed solution (Fig. 2). This technique considers a pair of concepts whether they similar or dissimilar in semantic. The similarity values are computed for both concepts. The pair of concepts are dissimilar if the computed value is zero, otherwise the pairs is some degree of similarity. The process of verification is considered by comparing the semantic of learners' solution and those of the expert's solutions. If they are similar the word has value 1, otherwise the word has value 0. The probability of being the right solution (P) is also investigated. If P is less that 0.5 then the proposed solution was rejected. If P is greater than or equal to 0.75 then the solution in that process is accepted and advance to the next problem solving process. If P is between 0.5 and 0.75 then there options whether to retry on proposing a new solution or suspended for further study or quit this problem and work on the easier one.

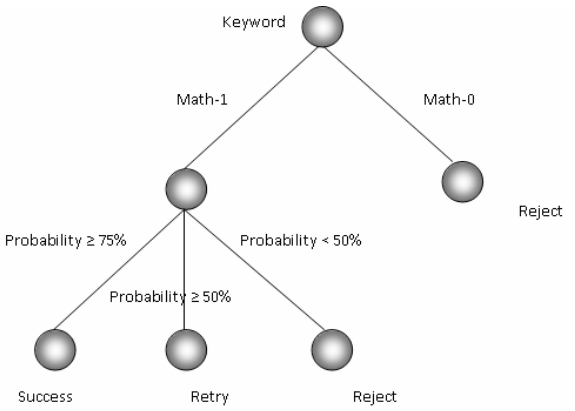

Figure 2: Ontology mapping for solution comparison.

A problem for non-English language is the difficulty in identifying a word in the solution. Thai language, for example, does not use a space to separate words and does not use a period to indicate the end of a sentence. There for it is rather difficult to identify a word in Thai language. However, there is a tool, developed by Thai research, called KU Wordcut as depicted in Fig. 3 that can identify words from a document (Asanee et. al. 2007). By using this tool, verification according to ONION technique is possible for working with Thai language.

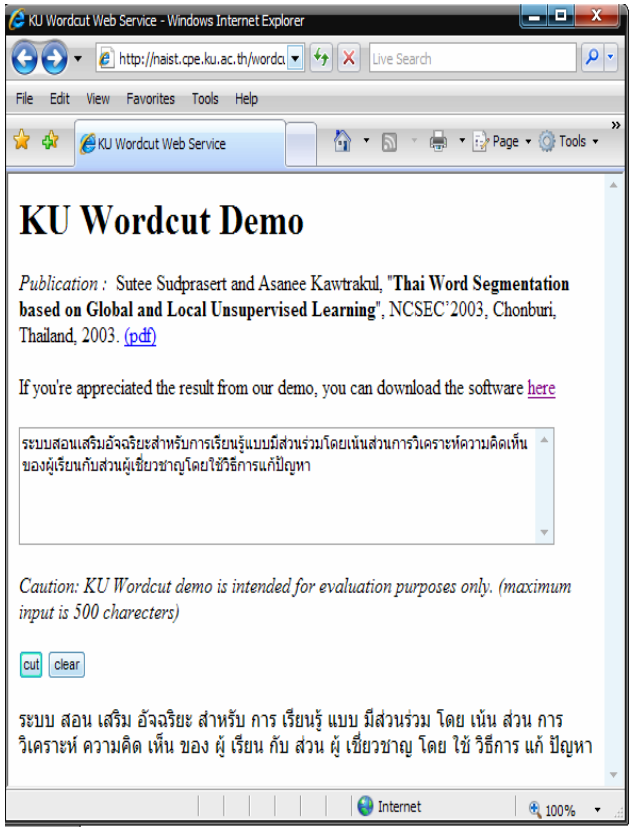

Figure 3: KU Wordcut that is used for extracting word from Thai document

A problem for non-English language is the difficulty in identifying a word in the solution. Thai language, for example, does not use a space to separate words and does not use a period to indicate the end of a sentence. There for it is rather difficult to identify a word in Thai language. However, there is a tool, developed by Thai research, called KU Wordcut as depicted in Fig. 3 that can identify words from a document (Asanee et. al. 2007). By using this tool, verification according to ONION technique is possible for working with Thai language.

4) MODEL ONION AND ALGORITHM

According to the ONION process, the proposed solution from learners' brain storming will be input of the verification process. The system then compare and evaluate words from the proposed solution with those of the expert' solution for concept similarity. The output indicates whether the proposed solution is correct or at least acceptable toward the right direction.

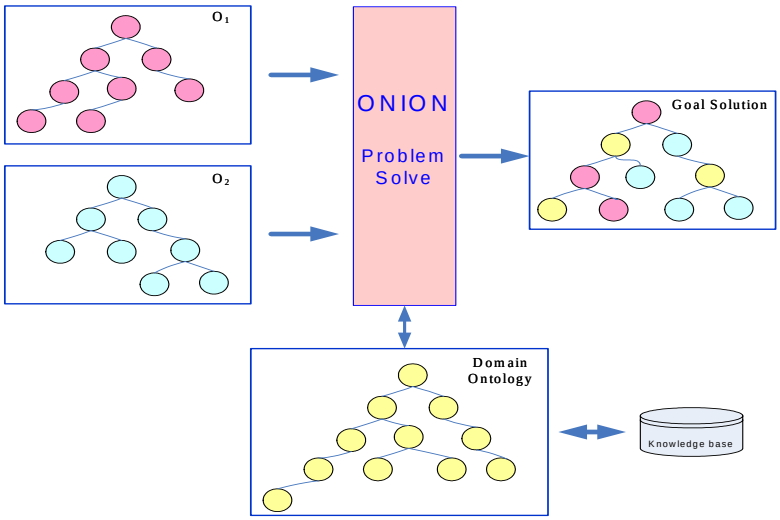

Figure 4: ONION concept for collaborative problem solving

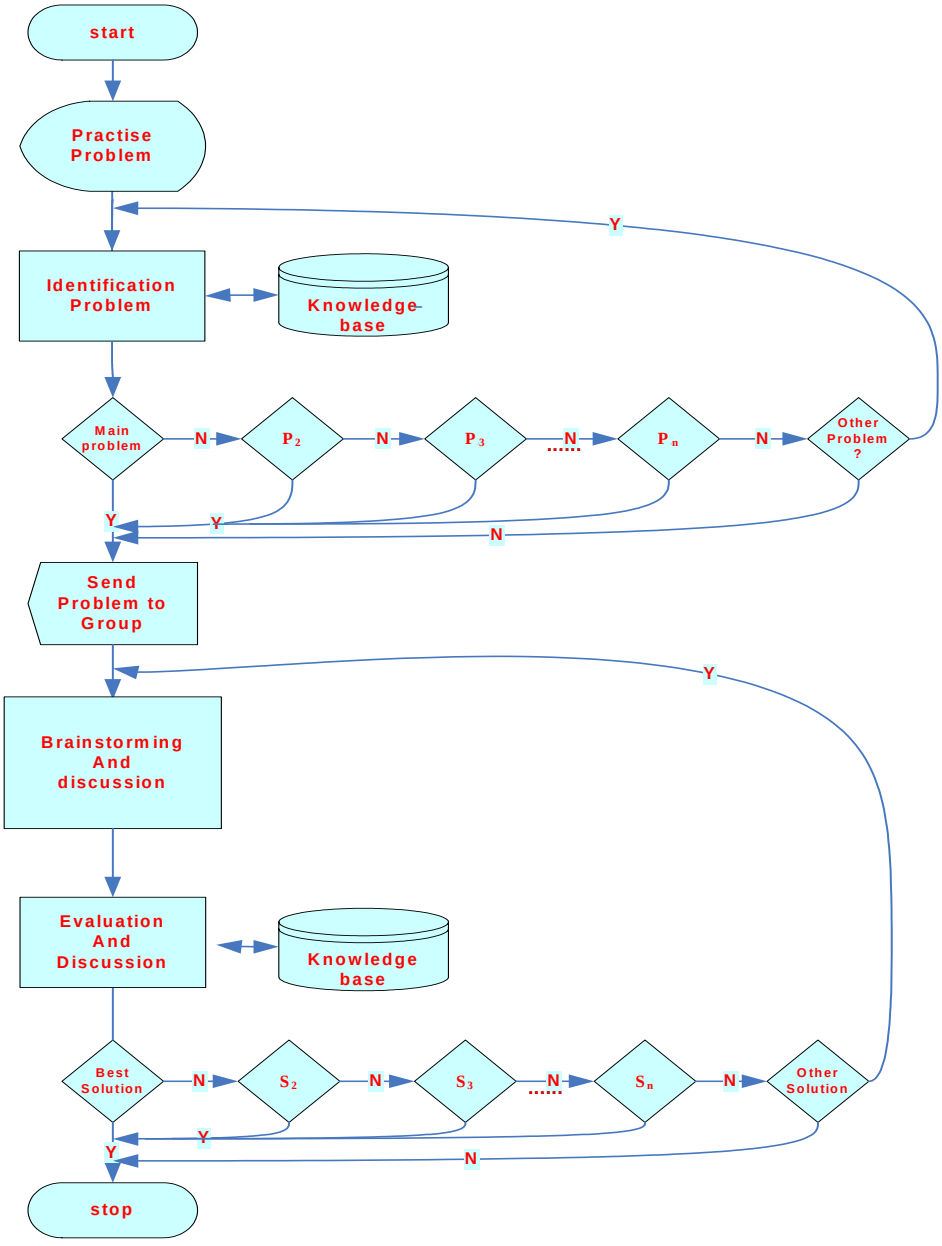

Figure 5: Algorithm for a collaborative problem solving based on Terrance's theory and ONION concept

Figure 5 illustrates an algorithm for a collaborative problem solving, which shows Torrance's six steps of problem solving and interaction of some steps with the database to verify the brain-storming outcomes based on ONION verification concept.

5) Conclusions

This learning model uses problem-based as a technique to stimulate learners' interests in working together to solve a given problem. The outcomes in each step, along the learning process, are used to test the ability of learners whether they can analyze and address a given problem properly and in the right direction. The future work is to investigate a program, Protégé, and test how efficient it is to managing ontology in the database. In addition to that, a proof of concept will be illustrated for the process of problem identification (step1) and the process of evaluating all solutions to determine the best one (step 5).

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The Development of e-Learning on Satellite Orbit Design

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ABSTRACT

The purpose of this research is to develop the e-Learning on satellite orbit design in satellite communication subject. Satellite orbit design learning is an interesting and important part of study in satellite communication subject. It is the subject content that teaches students to know how to design, to create, to modify, and to control the satellite's orbit. The e-Learning on satellite orbit design is divided into three parts which are the concept design, orbit calculation, and simulation. The sample group of this research was seven master's degree students who studied in electrical communications engineering program, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang. Students were taught, learned, and used on the development of the e-Learning on satellite orbit design. The result of this research is indicated that the achievement score of students on score on the e-Learning is higher than the before achievement score of students at less than 0.01 in significant statistical level.

Keywords
e-Learning on Satellite Orbit Design, Satellite Orbit Design, Satellite Tool Kit

1) INTRODUCTION

In the satellite communication subject, students are required to learn about the satellite orbit. Satellites can operate in several types of orbits. The most common orbits for environmental satellites are geostationary and polar, but some satellites also fly in inclined orbits. Other types of orbits are possible, such as the Molniya orbits commonly used for spacecraft. Students who study in electrical communications engineering program need to understand the all types of satellite orbit design especially in broadcasting satellites that send and receive television signals to television program which can be seen all over the world.

The e-Learning on satellite orbit design on this research is developed according to Kemp (1990) who stated that in the core knowledge on satellite orbit design, the learners must understand five classical orbit parameters in orbital plane including semi-major axis, eccentricity, inclination, right ascension of the ascending node, and argument of perigee.

2) RESEARCH OBJECTIVE

In this research, the research objective is to develop the e-Learning on satellite orbit design in satellite communication subject for students who study in master's degree majoring in electrical communications engineering.

The e-Learning on satellite orbit design is accomplished in four primary goals:

1. Give students increasingly interest on satellite orbit design.
2. Help students understand on satellite orbit design.

3. Help student achievement on satellite orbit design.
4. Give teachers and students a tool for learning on satellite orbit design.

In this research, the researchers used and listed the types of satellite orbit design that were taught for master's degree students in telecommunications engineering program, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang. There are five types on satellite orbit design following as:

1. Geostationary orbit design
2. Circular orbit design
3. Repeating ground trace orbit design
4. Molniya orbit design
5. Sun synchronous orbit design

3) DEVELOPED CONTENT

According to the five types of satellite orbit design, the researchers developed the content into three parts which are the concept design, orbit calculation, and simulation along with each satellite orbits.

3.1) Concept Design

3.1.1. Geostationary Orbit

- A geostationary orbit (GEO) is a geosynchronous orbit directly above the Earth's equator (0° latitude), with a period equal to the Earth's rotational period and an orbital eccentricity of approximately zero. From locations on the surface of the Earth, geostationary objects appear motionless in the sky, making the GEO an orbit of great interest to operators of communications and weather satellites.
- Geostationary orbits are useful because they cause a satellite to appear stationary with respect to a fixed point on the rotating Earth. As a result, an antenna can point in a fixed direction and maintain a link with the satellite. The satellite orbits in the direction of the Earth's rotation, at an altitude of 35,786 km above ground. This altitude is significant because it produces an orbital period equal to the Earth's period of rotation, known as the sidereal day.

3.1.2. Circular Orbit

- A circular orbit (CIO) is a satellite orbit directly above the Earth, with an orbital eccentricity of approximately zero. From circular objects in the sky, the CIO is an orbit of great interest to operators of navigation and remote sensing satellites.
- The satellite orbits in the direction of the Earth's rotation, at different altitudes of orbits above ground. The vary altitude is useful because it produces an orbital period equal to/less than/more than the Earth's period of rotation.

3.1.3. Repeating Ground Trace Orbit

- A repeating ground trace orbit (RGTO) is a circular orbit with a period equal to/less than/more than the Earth's rotational period and an orbital eccentricity of approximately zero. The RGTO is an orbit to operators of Earth observation and imagery satellites.
- The satellite orbits in the direction of the Earth's rotation, at different altitudes and orbital period produce the repeating position to the ground station.

3.1.4. Molniya Orbit

- Molniya orbit (MOO) is an ellipse orbit with a period less than or more than the Earth's rotational period and an orbital eccentricity of approximately one. The MOO is an orbit to operators of spy and spacecraft satellites.
- The satellite altitudes are two differences between apogee and perigee that make significant on security purpose.

3.1.5. Sun Synchronous Orbit

- A Sun synchronous orbit (SSO) is a circular orbit with ninety-seven degrees inclination to the Earth's equator, with a period equal to the Earth's rotational period and an orbital eccentricity of approximately zero..
- Sun synchronous orbits are useful because they can directly receive the solar energy from the Sun to storage and to produce the electricity on solar cell. The SSO is an orbit to operators of Earth observation, navigation, communication, and remote sensing satellites.

3.2) Orbit Calculation

According to Salem, Zaki, & Wahdan (2005), all types of satellite orbit calculation are similarly starting with following,

3.2.1. Semi-major Axis (a)

$$a = \frac{r_a + r_p}{2} \quad (1)$$

3.2.2. Apogee Radius (r_a)

$$r_a = a(1+e) \quad (2)$$

3.2.3. Perigee Radius (r_p)

$$r_p = a(1-e) \quad (3)$$

3.2.4. Apogee Altitude (A_a)

$$A_a = a(1+e) - R_E \quad (4)$$

3.2.5. Perigee Altitude (A_p)

$$A_p = a(1-e) - r_E \quad (5)$$

3.2.6. Orbital Period (T)

$$T = 2\pi\sqrt{\frac{a^3}{\mu}} \quad (6)$$

3.2.7. Mean Motion (n)

$$n = \frac{2\pi}{T} = \sqrt{\frac{\mu}{a^3}} \quad (7)$$

3.2.8. Eccentricity (e)

$$e = \frac{r_a - r_p}{r_a + r_p} = \frac{r_a - a}{a} = \frac{a - r_p}{a} \quad (8)$$

From equation on (1),(2),(3),(4),(5),(6),(7), and (8), Adams & Rider (1987) stated that we can calculate all eight parameters where we defined satellite's gravity according to Earth's mass $\mu = GM = 3.986500 \times 10^5 \quad km^3/s^2$ and the Earth's radius $r_E = 6,378 \quad km$.

3.2.9. Orbital Calculated Result Example

Table 1 is an example of circular orbit calculation. The results on all eight parameters are semi-major axis, apogee and perigee radius, apogee and perigee altitude, orbital period, mean motion, and eccentricity shown as below.

.

Table 1: Orbit Calculation of CIO

Parameters	Results
a	26562 km
r_a	26562 km
r_p	26562 km
A_a	20184 km
A_p	20184 km
T	43082.05 s
n	0.0001458
e	0

Note: The circular orbit is that the semi-major axis, apogee radius, and perigee radius are the same values. The apogee and perigee altitudes are equal distance from the Earth's ground.

3.3) Orbit Simulation

The orbit simulation was programmed to show the motion of satellite orbit in two dimensions. Figure 1 illustrates an example of two dimensions on orbit simulation.

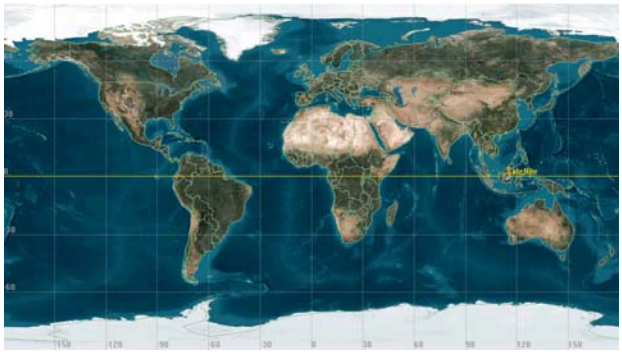

Figure 1: An example of two dimensions on orbit simulation

The two dimensions are not enough to meet the research objectives according to the limitation of students' understanding based on Chouraqui, S. & Benyettou, M. (2005).

So, the researchers modified and created the orbit simulation into the three dimensions as shown in Figure 2.

Figure 2 illustrates an example of three dimensions on orbit simulation.

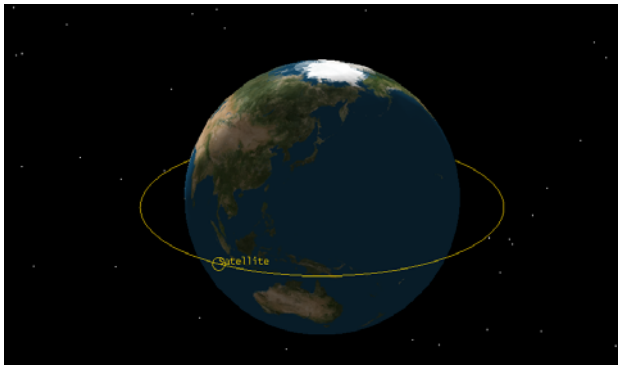

Figure 2: An example of three dimensions on orbit simulation

The three dimensions on orbit simulation was created and used in the class. The students seemed to be excited and interested how the orbital moving around the globe.

4) STUDENTS' ACHIEVEMENT

Students are taught and studied with the e-Learning on satellite orbit. At the beginning of class, the researchers gave the pretest to students. At the ending of class, the researchers gave the posttest to students. A statistic analysis was conducted to compare learning outcomes measured by pretest and posttest across the students' achievement. The result of student's achievement is shown on Table 2.

.

Table 2: Students' Achievement

Test	N	$\overline{x}$	SD	t	Sig.
Pretest	7	4.5714	0.97590	-4.655	0.001
Posttest	7	7.7143	1.49603		

Note: The result of this research is the achievement score of students at less than 0.01 in significant statistical level.

The result of using the e-Learning on satellite orbit design in the class teaching indicated that the achievement score of students on score on the e-Learning is higher than the before achievement score of students at less than 0.01 in significant statistical level.

5) CONCLUSIONS

The development of e-Learning on satellite orbit design is the subject content that gives and helps students to learn how to design, to create, to modify, and to control the satellite's orbit. The development of e-Learning on satellite orbit design is divided into three parts which are the concept design, orbit calculation, and simulation. The result of this research indicated that the achievement of master's degree students who studied in electrical communications engineering program, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang is improved according to learning with the development of e-Learning on satellite orbit design.

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Knowledge and Comprehension of online courses among CMU nursing students

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Backgrounds

From the university system development policy in the main concept in education evolution according to the National Society and Economic Developmental plan issue no.9 about Educational Development, which intend to let graduates have knowledge in multidisciplinary, have learning-teaching management, which use learners as student center, emphasize the learning knowledge process, exchange ideas, data, information and technology together between teacher and students. There is information technology identification to be used as equipment to make new knowledge from knowledge base to make Thai society to be knowledge base society, including to emphasize the content of learning-teaching course to make graduates have knowledge and can innovate and adapt the knowledge in making further living.

Chiang Mai University is the big educational institution. It has arrangement to response to governmental policy in that educational evolution in many types and has idea in using new learning-teaching system in the type of learning-teaching through e-Learning or online course in the characteristic, which emphasize to self-direct study of learner, too. Which now it bring electronic learning system to be used with normal students, who walk to study in some subjects (http // www.cmu.ac.th /CMU online learning). Moreover, there is university policy in promoting each faculties join together to make online courses, too.

Nursing Faculty, Chiang Mai University, which has organizational vision that in year B.E.2550 will be the leader and Academic Nursing centre in country level and international level by emphasizing the research, produces quality graduates and self-responsibility one. It has the related policy with each policies of university, too. By arranging the activity, which leads to each educational development items are:

Educational service, educational management and educational improvement, etc. As seeing from making public hearing of Nursing

Degree course(Improvement B.E. 2546 Academic Seminar Arrangement in any courses meeting agenda of Faculty administrator, who looks at the problem of current learning-teaching arrangement in the case study, which is the educational system as mostly learning-teaching in classroom and has major learning-teaching media in printing type, has divided group of students as one teacher per a lot of students. The faculty has seen the benefits of online course will be media and channel to additional support the student's learning,including to the faculty also pay attention to online course continuously by promoting management team, personnel take a training course of online course both local and outside the faculty periodically and the main thing is to identify quality KPI(Quality Key Performance Index) to assurance the faculty's educational quality, which relates to the course of learning-teaching through computer network system by showing in Measurement Template of KPI No. 18 .It is percentage of the course, which has learning-teaching through computer network system(Quality Assurance Department of Educational Service Job B.E. 2546:75)

From fundamental data survey about online course arrangement in each department of Nursing Faculty, Chiang Mail University during February- March B.E. 2546 has founded that there was arrangement to make online course in various type, but from surveying via online system in http // www.cmu.ac.th /cmu online learning has founded that there is still no have Nursing Faculty, Chiang Mai University's learning-teaching course through computer network system completely. The researcher has interested strongly about implementation of online course development of the Nursing Faculty, Chiang Mai University. From the experience and observation, the researcher found that one measuremet in production of product, which means online course, should pay attention to group of using service, which is the target group of students in the research. The researcher interested in knowledge and comprehension about nursing students' online course, Nursing Faculty, Chiang Mai University to get the information to develop nursing students to have more knowledge and comprehension in the online course and be fundamental data for concerned administrators, personnel in course online production to match with the students' requirement.

Objective

To study the knowledge and comprehension level of nursing

students, Nursing Faculty, Chiang Mai University in Bachelor Degree in general knowledge about online course.

The Research Scope

This study uses the educational theory about knowledge and comprehension level and general knowledge about meaning, composition and benefits to students of e-learning by Thanormporn Laohajarassaeng B.E., 2545 to be an idea to study, knowledge ,comprehension about online course of nursing students, Nursing Faculty, Chiang Mai University by collecting from August 22-31, B.E. 2548

Definitions

nursing student means Bachelor degree student in nursing graduates course for all 4 year-students, which register to study in semester B.E. 2548

Knowledge and comprehension about online course means Intellectual capability in memory part, bringing knowledge, memory to make comprehension in online course**.** It is measured by knowledge and comprehension test of meaning, composition and benefits of online course, which the researcher creates it by himself. This online course means the learning-teaching type in the course, which Nursing Faculty, Chiang Mai University or other department, organization's created knowledge lessons as system and has demonstrated it through electronic network, which maybe either intranet or internet network by using the media composition and promoting equipment in any type of learning i.e. web board or chatting on the network, photo and video voice. Learning through computer is similar as learning in classroom, electronic library, digital information technological service and chat room, etc.

Method

This research is Descriptive research. Used population in this research is nursing students in graduates Nursing course, normal course, 1^{st}- 4^{th} year student in semester B.E. 2548 quantity 509 persons. Identify group sample by sampling as stratified random sampling from total nursing students quantity 224 persons separated in each year as:

Using equipment in data collecting in this research as questionnaire with 2 parts is:

Part1.Personal Data Questionnaire i.e. Sex, Age, study year , computer using type, learning online course experience and self-evaluation about knowledge , meaning of online course comprehension. Questionnaire characteristics are selective choices 7

items and fill in blank for item 6.1-6.7

Part2. Online course knowledge, comprehension Questionnaire. The researcher creates it by himself according to the idea of Thanormporn Laohajarassaeng B.E. 2545 and related literature review. Type of questionnaire is yes No question. In each item has score as 1 and 0 total qty is 32 items, composes with 3 subjects are:

Subject 1 Meaning of Online Course 2 items

Subject 2 Major compositions of Online Course 20 items

Subject 3 Benefits of Online Course 10 items

By having meaning translation of score in each subject as below:

1. The student has knowledge, comprehension in meaning of online course in low level means the score between 0-0.66; medium level means the score between 0.67-1.33; and high level is the score between 1.34 – 2.00.

2. The student has comprehension in main composition of online course in low level means the score between 0 -6.60, Medium level means the score between 6.70-13.33; high level is the score between 13.40–20.00.

3. The student has knowledge; comprehension in benefits of online course in low level means the score between 0 -3.33, medium level means the score between 3.34-6.66; high level means the score between 6.67–10.00.

4. The student has knowledge and comprehension in online course totally as low level means the score between 0 -10.66; medium level means the score between 10.67-21.33; high level means the score between 21.34–32.00

Inspection the equipment quality in this research use the content validity inspection (content validity: CVI) by 5 qualified persons, has result as 0.83. The researcher has adjusted the questionnaire according to their suggestion, and then brings to meet the reliability of questionnaire by using Kuder Richardson formula. The questionnaire has reliability value as 0.67.

Collecting data from sampling group in this research by distributing questionnaires to nursing students, graduates in nursing course, normal course, which register to study in semester B.E.2548 ; quantity 224 persons had sent completely questionnaire qty 220 as 98.21%.

Data analysis by using ready to use software: SPSS/PC+ (Statistical package for the social science/personal computer)as below:

1. Personal Data is analyzed by using frequency distribution and percentage

2. Knowledge and comprehension data in online course is analyzed by finding average vale and standard variation.

Results

1. Sampling group in this study has total 220 persons as major94.5% are female, average age is 21.08 years old(S.D.3.45)study in first year as 30.5 % has characteristics in using computer of Faculty reaching to 71.8%, have knowledge/skill in using internet explorer program as 96.8%, have learning experience in online course system as 51.4% and has self-direct evaluation as having knowledge and comprehension in online course as medium level as 70.0%

2. Sample group by total and by separating as year student as 1st, 2nd,3rd, 4th year student has knowledge and comprehension about online course both total content and by subject in high level.

Table 1 Average and Standard Variation of knowledge and comprehension about online course by total and classify by subject of total nursing students and separating per studying year

Study Year	Knowledge and Comprehension about online course											
	By total			Meaning			composition			benefits		
	$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	Level	$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
1	28.51	2.61	high	2.00	0	High	17.46	2.10	high	9.04	1.41	high
2	28.28	3.36	high	1.92	0.27	High	17.73	2.81	high	8.62	1.82	high
3	26.94	3.16	high	1.91	0.28	High	16.00	3.09	high	9.02	1.17	high
4	27.17	3.12	high	1.90	0.29	High	17.66	1.48	high	7.41	2.46	high
total	27.70	2.94	high	1.94	0.24	High	17.17	2.23	high	8.59	1.88	high

Discussion

Sample group both by total and by separating as student year 1st, 2nd,3rd, and 4th has knowledge and comprehension about online course both total content and by subject in high level. It shows that nursing students has development from observation, skill and experience practice in learning any academic subjects through online course learning-teaching has level of knowledge and comprehension in online course according to knowledge idea (Cognitive Domain)of Bloom,1956 referred in Pornphan Anankul and group B.E.,2546 which said that the ability born from using brain process to get knowledge, comprehension in data information or any experiences , which get from both direct and indirect observation, including to

using idea to manage knowledge system to have meaning readily to bring it to use later. It has characteristics as procedure (Taxonomy) as basic ability will be fundamental of higher level ability. In this case, from sampling group has knowledge/ skill in using internet explorer as 96.8% , has learning experience in online course system as 51.4% (as research result conclusion item1) before , then effect to knowledge and comprehension of online course level in next level by starting from special memory of knowledge level especially knowledge of Terminology such as meaning, definitions of anything, in this case means online course and in second level is Comprehension, which means type of understanding or measurement of comprehension , which each one know that they should show what meaning and use which content or idea to show their meaning. It may no need to use relationship with other content or subject by personal behaviour, which reflects to the comprehension level, has divided as 3 sub items are: Translation, Interpreting and Extrapolation. In this case, nursing student has knowledge, comprehension in major composition of online course with translation, interpreting and extrapolation in benefits of online course, too. So, when we measure the knowledge, comprehension about online course level of nursing student in Nursing Faculty, Chiang Mai University, then we found that they are in high level, so that it shows that students has readiness to study academic subjects in nursing course as online course. By the way, the readiness of student is one of major composition of learning-teaching arrangement as online course or e-Learning Supachai Sukhanin B.E.2545, which is more important.

Suggestion in bringing this research to be used

From the research result, the researcher suggests to bring it to be used as below:

1. Administration field; The Educational Institution Administrator can bring this research result to be the guideline in:

1.1 Identify research polity, which has time flexibility and budget for teachers to use the learning-teaching with online course to develop the quality both course administration, product the quality media, develop each knowledge in each subject, which demonstrates through online course to be suitable for online course knowledge, and comprehension level of students, which already have high level.

1.2 Identify Personnel Development policy, which will have trained, increased knowledge and comprehension about online course, produce quality media to have ability to promote online course administration and produce quality media, including to push it to be job responsibility or special job performance to support each interested in personnel or who has special skill in this field to work as teamwork with teacher to make highest benefits to students, which reflects to the quality and standard of learning-teaching as online course arrangement in the future.

1.3 Develop in organizational environmental structure supporting learning-teaching through online course i.e. having more points to reach internet system in Nursing Faculty area., to have the high efficient and enough quantity of computer, can log in to use 24 hours, to have the investigation via hi-speed internet or intranet network in Nursing Faculty with efficiency, etc.

2. Adaptation in arranging learning-teaching as online course. The Nursing teachers can bring this research result to be guideline to:

2.1 Arranging learning-teaching, produce new Academic media instead of using old fashioned teaching documents to be in new interesting form and suitable, related to knowledge and comprehension level of nursing students in learning by this mentioned method.

2.2 Arrange researching team or high quality media producer by requesting supportive budget or time from Nursing Faculty Administrator, other related departments or organizations to promote the research scholarship about online course or high quality media production to make online course learning-teaching has more effectiveness and efficiency.

Suggestion for next time research

1. Should have educational research about readiness of students, who learn through online course as sample group i.e. master degree students, who attend in special Nursing courses, general people, who register to study online course for whole life continuously study, etc.

2. Should have the educational research about learning efficiency, self-direct learning capability level of students, who learn full type of nursing online course and have evaluation package by subject to follow up the students' readiness and effectiveness.

3.Should have educational research about satisfaction of

students to media or full option of learning-teaching as online course to follow up its effectiveness and evaluate the online course quality, which is produced and to apply it to be use.

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The Design of Online Learning Community Using Web 2.0

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ABSTRACT
Information and communication technology has been increasingly applied in education and driven educational institutes to improve their teaching and learning strategies in order to fit the new learning style of students. Constructivist learning theory, as one of the attempts to improve student learning outcomes, focuses on learning environment and learning activity. Constructivist learning theory emphasizes that students need to be active and gain experiences from meaningful learning environment. Recently, the emerging of Web 2.0 eras has shown that the online user behavior has changed. Now, the online users are likely to share their knowledge and gain acknowledgement. This paper, therefore, studied the key characteristics of Web 2.0 and constructivist learning theory. The number of 329 websites was examined. The results showed that Web 2.0 learning community consists of three main components which are Content Sharing, Communication, and Socialization.

Keywords
Constructivist Learning, Education 2.0, Learning Community, Web 2.0

1) INTRODUCTION

The rise of the use of the information and communication technology in education has driven educational institutes to improve the teaching and learning method, resulting in many kinds of new learning strategies such as e-learning, m-learning, and blended learning.

Recently, the emerging of Web 2.0 eras shows that the online user behavior including student learning style has changed. In Web 2.0 society, online users are more freedom, independent, and self-direct learning.

The development of Web 2.0 sites, such as Facebook, Myspace, Wiki, and other social networking sites (SNS), rapidly increase the number of virtual communities, in which online users may use to communicate, participate, and share content (Fu, Liu, & Wang, 2008). Web 2.0 makes a revolution in the way that users are not only read the content from the web pages, but also interact with the websites and other users. The web usage has been changed from viewing content to sharing content, from reading web to reading/writing web.

The revolution of Web 2.0 has also made the impact on education. It is found that Web 2.0 plays an important role in any academic or pedagogical activity (Tijerino, et al., 2006). However, the study of how to apply Web 2.0 concept to the education is needed (Ullrich, et al., 2008).

This paper, therefore, studied Web 2.0 characteristics and learning theories, and then proposed the Web 2.0 learning community framework. The result of the study may be used to apply for the future development of online educational framework in order to fit to the new student learning behavior and encourage lifelong learning.

2) CONSTRUCTIVIST LEARNING THEORY

Recently, the educational learning paradigm has shifted from behaviorist learning theory to constructivist learning theory. The constructivist learning theory is a combination of many ideas (Tynjala, 1999) that focus on activities and environment. It is believed that

the learning environment, that gives students meaningful experiences and makes students active, can help students develop new knowledge. As a result, in constructivist learning, the design of the learning environment is more important than the sequence of instructions (Jonassen, 1994; Wangpipatwong, 2007). Students are the center of learning and the teachers change their role from teaching students to facilitating students to learn. Practically, students compare and share their ideas with others, collaborate and participate in learning environment in order to develop new knowledge (Wangpipatwong, 2007). Many studies reported that students in constructivist learning environment have better learning outcomes than students in traditional learning environment (Moreno, et al., 2006; Parker & Becker, 2003; Zhang, et al., 2004; Zhang, et al., 2005).

3) WEB 2.0

The term of "Web 2.0" was first introduced in 2004 by O'Reilly and MediaLive International (O'Reilly, 2005). Recently, Web 2.0 has become the mechanism for the next generation of Web (Gibson, 2007) and led to the development and evolution of online communities.

Web 2.0 does not suggest any update to technical specifications of how to develop web application. Instead, it is described as a set of principles and practices that considers web as a platform for the online community, and harnesses collective intelligence (O'Reilly, 2005). In addition, Web 2.0 provides the information of web development styles, method of interaction, and sources of content (Lewis, 2006). In Web 2.0 environment, contents may be user-generated contents (Singh, et al., 2008) or may be gathered from other websites in real time and assembled in a single web page (Lewis, 2006).

4) WEB 2.0 CHARACTERISTICS

O'Reilly (2005) describes many key characteristics of Web 2.0 such as the web should be considered as platform. The web platform considers other webs as source of services which are integrated into a single website. That is, Web 2.0 may be a business platform for corporate people or may be a communication platform for marketing team. Another key characteristic of Web 2.0 is the information. O'Reilly (2005) pointed out that Web 2.0 is an information-driven application. Source of information is the key to success or failure of Web 2.0. In addition, user-generated content is the most important information in Web 2.0. The more contribution of the user, the more success of Web 2.0 will be. Moreover, Web 2.0 application is no longer a software artifact controlled by the developer but a service community that is gradually changed by the users.

According to Mason & Rennie (2007), Web 2.0 is considered as social networking sites consisting of three main characteristics. Firstly, Web 2.0 should contain user profiles such as person's name, information about person, and photograph. Besides, most profiles have unique URLs that users can directly access. Secondly, Web 2.0 should be traversable. That is, users in the community have the ability to explore their friend's profiles. Finally, users can leave public comments for others.

Stephens & Collins (2007) explained that Web 2.0 should support user conversation and participation. They believed that conversation and participation can create the sense of community and belonging. Information and ideas should be created by users and be shared freely. In addition, rewarding or acknowledgement should be given to users who provide meaningful knowledge.

Ullrich, et al. (2008) suggested that Web 2.0 should enable and facilitate the active users. The value of Web 2.0 increases when more people are using it. Information in Web 2.0 is normally provided by the users. Web 2.0 is considered as a service that can be assembled to a single platform. Finally, Web 2.0 is no longer a version-based software packages, but are constantly refined and improved by users. The changes of services occur gradually by the community.

Singh, et al. (2008) concluded that Web 2.0 changed the way of services to user-centric model. The focus of Web 2.0 developer should be on the users. Web 2.0 fosters user participation by building the community and collecting knowledge and intelligence.

5) THE WEB 2.0 LEARNING COMMUNITY FRAMEWORK

Since the behavior of users in cyberspace has changed, most successful online communities are based on the data and information generated by users. The more users participate in the community, the more success the community will be. Therefore, the definition of online education should be expanded and developed to fit the new generation of users. In other words, the design concept of education should be reconsidered and come up with more relevant ideas. Students now have a freedom mind and like to be free. They want to be different and like to gain acknowledgment. Education is no longer about learning in classroom but about the real-life activities. Moreover, education needs something new and capable of attracting interest from students. As a result, Web 2.0 concept is really suitable for new generation of students.

Because learning environment is an essential component in constructivist learning theory, building Web 2.0 learning community, that creates such a learning environment, is an important issue. The Web 2.0 learning community framework establishes the foundation on which learning facilities are designed. A well designed learning community has a benefit of sharing knowledge. Based on the behavior of online users in Web 2.0 and the concept of constructivist learning theory, the Web 2.0 learning community should encourage students to learn with pleasure, eager to participate, and gain experiences. In addition, the learning activities and elements of interest should be provided in order to attract student interest and urge to share knowledge (Jang, Kye, & Kang, 2006). The conceptual design of Web 2.0 learning community framework is illustrated in Figure 1. There are three components consisted of content sharing, communication, and socialization.

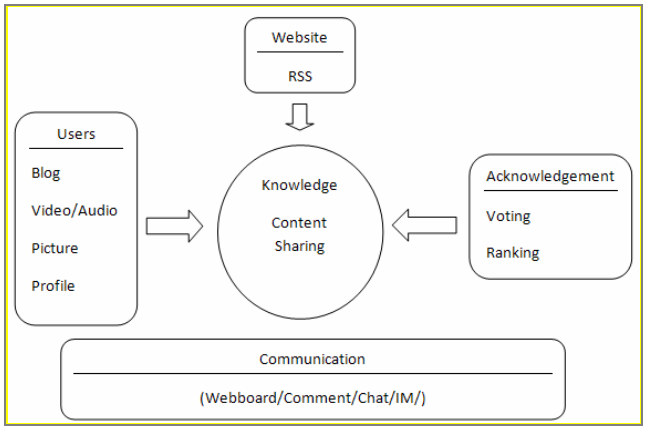

Figure 1: The Conceptual Model

With this conceptual model, Web 2.0 learning community is an educational platform for students and teachers. It contains services that support the learning process (O'Reilly, 2005; Ullrich, et al., 2008). The model focuses on students and tries to collect information from them (Singh, et al., 2008).

The Web 2.0 learning community is driven by information and data generated from users (O'Reilly, 2005). Knowledge is not only from teachers but come from many sources including student generated content and other websites as depicted in Figure 2.

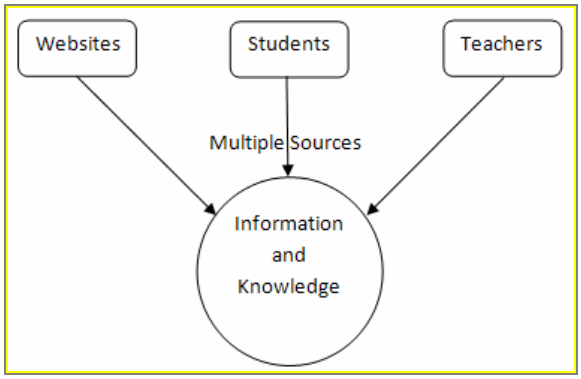

Figure 2: Multiple Sources of Content

In order to make students active, students are required to have their own profile and content (Mason & Rennie, 2007). Conversation and participation is encouraged through chat room and webboard (Stephens & Collins, 2007). Students can exchange their profile and information among their friends or their teachers (Ullrich, et al., 2008). In addition, they can make a comment for other information as well (Mason & Rennie, 2007).

The key factor to make web 2.0 successful is that users should be regularly attracted to the website in order to contribute and share knowledge (Mason & Rennie, 2007). Therefore, incentive and rewarding should be considered. The Web 2.0 learning community provides incentive and rewarding for students by giving them an acknowledgement (Stephens & Collins, 2007). The most read content or the most voted content will be displayed in the list along with the writer's profile in order to give writer the credit

6) WEB 2.0 SURVEY

To confirm the conceptual model and have better understanding of Web 2.0, Web 2.0 sites were explored in this study. The websites were gathered by using the top four Web 2.0 directories searched by Google and 329 websites were analyzed. The name and location of Web 2.0 directories is listed in Table 1.

Table 1: Web 2.0 Directories

Name	Location
GO2WEB20.NET	http://www.go2web20.net/
FeedMyApp	http://www.feedmyapp.com/
Ziipa	http://www.ziipa.com/
LISTIO	http://www.listio.com/

According to the survey, the result shows that the most popular content sharing tools is Blog and Wiki which users can use to share their information and knowledge. The percentage of Blog and Wiki is 68.4. Furthermore, other sharing contents are user profile, multimedia files and news from RSS which are 25.2, 24.9, and 23.7 percent, respectively. Additionally, search engine tool is also provided in the content sharing section for users to search for the needed information. The percentage of websites which provide search engine tool is 59.9.

In communication section, we found that asynchronous communication is more popular than synchronous communication. The percentage of asynchronous communication is 59.9 whereas the percentage of synchronous communication is only 6.1. Comment tool for the sharing content is also provided in most Web 2.0 sites. The percentage of comment tool is 65.7.

For socialization section, the result shows that vote and ranking for content is the most popular tool which is 39.2 percent. Event and contest is the second most popular which is only 14 percent. The detail of Web 2.0 features is listed in Table 2.

Table 2: The Number and Percentage for Web 2.0 features

Category details	No.	%
1. Content Sharing		
Sharing Information (Blog, Wiki)	225	68.4
Search engine	197	59.9
Sharing Profile	83	25.2
Sharing Multimedia File	82	24.9
RSS	78	23.7
Others (Slides, News, etc.)	61	18.5
2. Communication		
Comments	216	65.7
Webboard	197	59.9
Chat Room/ IM	20	6.1
3. Socialization		
Voting and Ranking	129	39.2
Event and Contest	46	14.0
Others (Acknowledgement, Poll, etc.)	24	7.3

7) DISCUSSION

In traditional education, teachers give students too many information and they are exhausted. In Web 2.0 education, it is believed that students are more active and likely to exchange ideas with satisfaction. Since Web 2.0 changes the way information are created, shared, and used, the Web 2.0 learning community is intended to be a learning source that gives students real-life experiences. The Web 2.0 learning community is the rich network connecting students together and intends to gather information that are contributed by students. With this strategy, students are more active in the learning environment which results to the improvement of knowledge development. However, the key success of Web 2.0 learning community is the motivation. Although Web 2.0 learning community is driven by the information from students, teachers still have an important role to motivate students. In addition, teachers play a facilitator role to encourage students to join and share information in the community and support them to develop knowledge. Finally, some learning activities may be added to the

community to activate the movement in the community.

In this study, the Web 2.0 learning community has three important components which are content sharing, communication, and socialization. Content sharing section is the part that integrated information and knowledge from many sources mainly by students. Another possible source is other websites using RSS technology. It is interesting that the most popular content is the information found in Blog or Wiki instead of multimedia content. This result may imply that the online users are more interested in useful information than other kinds of content such as multimedia files. Therefore, this finding confirms that Web 2.0 concept should be used in the design of the online learning community.

Another interesting finding is that the comment is the most popular activity in the communication section which means users tend to participate and comment for other user contents. This result may conclude that users enjoy sharing their experiences with other. In addition, the result shows that users like to communicate with others asynchronously. This finding may imply that users communicate and learn at their convenient time. This behavior explains why traditional face-to-face learning is no longer enough for new generation of students. Additional learning strategies, such as online learning community, should be added to the traditional learning method in order to improve student learning outcomes.

Finally, the results show that the most popular tool used in socialization section is voting and ranking. Because the key to success of the community is the information generated from users. The more contents users generate, the more success of the community will be. Therefore, voting and ranking gives online users a credit and makes them acknowledge by other users.

8) CONCLUSION

The behavior of students has now changed and the education needs to come up with new learning strategies. Constructivist learning theory, as an endeavor to improve student learning outcome, is found to be similar to Web 2.0 characteristics. Constructivist learning theory focuses on learning environment and making students active by encouraging students to collaborate and share information. Similarly, Web 2.0 shows that online users currently like to share information and participate in socialized community. Therefore, this paper studied the web 2.0 characteristics and proposed the online learning community based on Web 2.0. The online learning community consists of three components which are content sharing, communication and socialization. Finally, this paper examined the number of Web 2.0 sites and pointed out the key important issues in order to confirm the design of online learning community.

The results of this study showed that the most popular sharing content is information and knowledge in Blog or Wiki. Users like to communicate with others asynchronously. Voting and ranking the user content is the tool that may be used to encourage users to share knowledge.

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How ready are distance education learners at Chulalongkorn University? – an experience of Learning at the Work Place Program at the College of Public Health Sciences

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ABSTRACT

With an application of Michael Moore theory (1983) on "intent and planning" on the distance learner's part, and "structure and dialogue" on the educational institution's part, together with an application of Guglielmino (1977) questionnaire on Self-directed Learning Readiness Scale (or SDLRS), adult education in the program "Learning at the Workplace" by the College of Public Health Sciences for Master's degree international curriculum, Chulalongkorn University, Thailand, was analyzed. Focuses were in twofold: First were elements of learning program by the learners ranging from agenda-setting, learning strategy, implementation, and evaluation. Second were the three categories of learners: those with self-directed skills, those with pursuit of degree-seeking behaviors, and those with emotional need for dependence. The results of this twofold were made explicit.

Keywords

Chulalongkorn University, College of Public Health Sciences, distance education learners, Learning at the Work Place Program**,** readiness, Thailand

1) INTRODUCTION

Stated by Moore and Kearsley (2005), in the context of distance education / transactional education[1], there are two sets of variables which are determined by the educational institutes - dialogue and course structure.[2] The extent of dialogue and the

[1] Transactional education is the gap of understanding and communication between the teachers and learners caused by geographic distance that must be bridged through distinctive procedures in instructional design and facilitation of interaction (Moore and Kearsley, 2005:223).

[2] A dialogue is purposeful, constructive and valued by learners and teachers. Its direction in an educational relationship is toward the improved understanding of the learners. On the other hand, a course structure means elements of course design, for instance, learning objectives, content themes, information presentations, case studies, pictorial and

degree of structure varies from course to course. In a course with little transactional distance (more dialogue and less structure), the learners can use instructional materials that allow modifications to suite their needs, learning style, and pace. Learners will have some guidance if there is less dialogue but more structure. Finally, if there is neither dialogue nor structure, the learners must be entirely independent and make their own decisions about their study strategies or their personal learning plan. This plan includes the issues of how to study, what to study, when, where, in what ways, and to what extent. In general, learners have different capacities for making decisions regarding their own learning or "learner autonomy". The extent to which these learner behaviors exist can be seen as an important dimension for the classification of distance education programs (Moore and Kearsley, 2005: 227-228).

This paper was thus interested in finding out the level of such "learner autonomy" with two main objectives. First was to study the elements of learning program by the learners ranging from agenda-setting, learning strategy, implementation, and evaluation, by employing the Focus Group Discussion as the research method. Second was to categorize the learners into the followings: those with self-directed skills, those with pursuit of degree-seeking behaviors, and those with emotional need for dependence, by applying Guglielmino (1977) questionnaire on Self-directed Learning Readiness Scale (SDLRS) basic 58 items and adding-on other 17 items by the authors. To achieve these two objectives, the Master's degree learners in the "Learning at the Workplace Program" (or LWP Program) international curriculum organized by the College of Public Health Sciences, Chulalongkorn University, Thailand, year batch 2008 were analyzed. The article is divided into six parts, starting first with (1) the planned-learning approach in distance education (2) Self-directed Learning Readiness Scale (SDLRS) and the Focus Group Discussion approach - the research methodology (3) The SDLRS questionnaire and Focus Group Discussion in the study samples (4) main points of the discussion (5) discussion and (6) recommendations.

It is expected that skills in self-directed learning and planned learning will keep the learner's retention and satisfaction rate on a high level, the two factors which are considered as the major outputs of distance education program management. Expected benefit from this study is aimed at providing an insight for the program executives to adjust the program where needed.

2) LITERATURE REVIEW

2.1) The planned-learning approach in distance education

Moore and Kearsley (2005) defined distance education as:

> … planned learning that normally occurs in a different place from teaching, requiring special course design and instruction techniques, communication through various technologies, and special organizational and administrative arrangements (Moore and Kearsley, 2005: 2).

From this definition, it is clear that distance education involves firstly, learning and teaching (thus is an education), secondly, planned learning (when the learner sets out deliberately what to learn and is assisted by the teacher who deliberately designs ways of helping that person to learn), thirdly, learning context (that is normally in a different place from teaching since technology is the sole or principal means of communication in distance education context), and finally, communication through various technologies (Moore and Kearsley, 2005: 3).

The emphasis of planned learning is switched from the teacher-controlled base to the learner-controlled system. Learners are capable of finding resources for study in their own work/community environment and are able to decide for themselves when their progress is satisfactory. The concept of planned learning aims at promoting self-directed learning for learners' life-long learning skills.

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other illustrations, exercises, projects, and tests (Moore and Kearley, 2005: 224/ 226)

2.2) Self-directed Learning Readiness Scale (SDLRS) and the Focus Group Discussion approach - the research methodology

2.2.1 Self-directed Learning Readiness Scale (SDLRS)

In order to find out the level of "learner autonomy", the authors first applied the Self-directed Learning Readiness Scale (SDLRS) questionnaire which was originally developed by Guglielmino (1977). This self-administered questionnaire was in 5 Likert scales from "totally agree to totally disagree". An emphasis was on the expressed behaviors of the learner that reflected the learner's interest, enthusiasm, and responsibility toward his/her study. Guglielmino first conducted a study in 14 subjects via Delphi Technique and developed the questionnaire which was later on translated into many other languages for the use worldwide. In this study, the Thai version of Guglielmino's questionnaire made by Narin Boonchu (1989) (with a reliability value of 0.84) was employed.[3] The eight domains of self-directed learning skills indicated were: (1) Openness to Learning Opportunities (2) Self-concept as an Effective Learner (3) Initiative and Independence in Learning (4) Informed Acceptance of Responsibility for One's Own Learning (5) Love of Learning (6) Creativity (7) Positive Orientation to the Future, and (8) Ability to Use Basic Study Skills and Problem-solving Skills. The questionnaire consisted of the original 58 items plus an extra 17 items added-on by the authors, thus a sum of 75 items. The extra items were intended to reflect first the learners with pursuit of degree-seeking behaviors (4 items), second the learners with emotional need for dependence (6 items), and last to reflect the learners encountering difficulty with basic online computer skills (for instance, internet information search, online discussion forum) and difficulty with English language capability (for example, doing the search offline and online, English verbal presentation, and English report write-up) (7 items). This last reflection was the two new dimensions particularly suited the characteristics of LWP distance learners in an international curriculum. Besides these 17 extra items, demographic data (such as gender, age, years of work experiences, grade point average before enrolling the study, and learner's enrollment year) was also requested.

2.2.2 Focus Group Discussion approach

The authors next employed the Focus Group Discussion approach to find out the elements of learning program set out by the learners. This learning program elaborated the agenda-setting, learning strategy, implementation, and evaluation, by the learners themselves.

Focus Group Discussion (FGD) is one of the qualitative research methods which emphasizes on finding out the body of knowledge under the unstructured yet natural circumstances (Dreachslin, 1999: 224-232). Being a tool for an exploratory study (Fagerheim and Weingart, 2005: 524-530), FGD is defined as

> …a group of individuals selected and assembled by researcher to discuss and comment upon, from personal experience, the topic that is the subject of the research (Gibbs, 1997:1)

In order to ensure that all participants have an opportunity to engage in the discussion, it is recommended that the FGD groups consist of 6-8 persons with the duration time of 60-120 minutes per group (Stokes and Bergin, 2006: 26-37). The importance of FGD technique is the balance of the homogeneity and the heterogeneity of the group members. While homogeneity is aimed at building up a rapport and a candid and non-threatening atmosphere, the heterogeneity is aimed at widely-shared discussion among participants (Kitzinger, 1995: 299-302).

The role of group moderator/facilitator is a key success factor for FGD, especially the competency to develop an

[3] Narin Boonchu. Self-directed Learning Skills by Ramkhamhaeng University. Master's degree Thesis in Adult Education and Continuing Study. Graduate School. Silapakorn University, 1989, cited in Srisukan Binthaprasitthi. Effects on Using Learning Contracts on Learning Achievement and Self-directed Learning Readiness of Nursing Students. Master's degree Thesis in Nursing Education, Graduate School, Chulalongkorn University, 1997: abstract/ 147-150. .

interview guide for the topic under discussion which aims at knowledge elicitation (Khan and Manderson, 1992: 56-66). When proceed in FGD, group moderator/facilitator should start from something general, in order to prompt the discussion and to help the participants feel at ease with the group format, before moving onto something specific, in order to encourage the discussion and to allow for flexibility based on the direction the discussions taken during the session (Morgan, 1995: 516-523).

This interview guide should be pre-tested with the subjects who are not the actual study subjects in order to ascertain that the questions are appropriate for the discussion, that the way they are prioritized are well organized, that the language in use is clearly understood, etc. In addition, remaining objective and being attentive to what the group members have to say, as well as ensuring that there is no dominating figure exists in the group, are some of the qualifications a skillful group moderator/facilitator should possess.

3) THE SDLRS QUESTIONNAIRE AND FOCUS GROUP DISCUSSION IN THE STUDY SAMPLES

3.1 The SDLRS questionnaire in the study samples

As this study used a consensus sampling (N = n) with the target population of 23 year batch 2008 LWP learners, and as there was a limit to find the similar learners to serve as a pilot study (with parallel technology as to what LWP program provided), this research had no pre-test conducted. However, the reliability value by Boonchu's SDLRS questionnaire, as previously stated, was 0.84. In this study, the questionnaire had 5 ranges - from "totally agree to totally disagree". Upon data collection during the months of June - August, 2008, twenty-three LWP learners year batch 2008 were requested to fill-in the SDLRS questionnaire. They received the questionnaire via postage mail and the return rate was 100.00 %. In order to comply with the standard research ethics, the authors had stated in the introduction letter that the data was strictly for research purpose with no impact on their study. The data would be kept confidential and the subjects had the right to end this voluntary participation at any time.

In terms of statistical analysis, descriptive statistics were used for frequency, percentage, minimum, maximum, mean, and standard deviation; and inferential statistics in use were Pearson's Correlation Co-efficient for correlation between continuous variables and Unpaired t-test to compare the two different means. For score interpretation, it is shown in table 1.

Table 1: Score interpretation

Average score between	*Level*
4.21-5.00	highest
3.41-4.20	high
2.61-3.40	moderate
1.81-2.60	low
1.00-1.80	lowest

The study result on this quantitative part is reported in table 2 under the session of main points of discussion.

3.2 Focus Group Discussion in the study samples

LWP learners were invited to attend Focus Group Discussion (FGD) before end of August 2008 which took about 45 minutes per group. The subjects were informed that this FGD was to learn about their intent and planning for their study in LWP distance education program. The group facilitator confirmed that there would be no impact on their study as a result of this FGD.

During the FGDs, only a tape cassette was requested to be used. The group moderator/facilitator started first with an introduction of the research project and the research objectives. Pure academic use and data confidentiality were made explicit to the subjects. The interview guide which was pre-tested at Bangkok Metropolitan Administration Distance Education Program among 4 Thai students with satisfactory result, both in the content and in the prioritized items, was used in the exact same series. They were (1) current program from learner's perception (from general to specific) (2) study program as

learner's agenda (3) learning strategy including time management, lesson determination, access to lessons required, learner's present life cycle, empowerment with guidance from the instructors, desired package of courses, learner's access to minimal technology required (4) implementation of learner's action plan, and (5) learner's own evaluation on the set goals. After each FGD, the group moderator/facilitator would request for any additional notes the note-taker had and tried to improve where necessary to gain more efficiency in the next FGDs. Regarding content analysis, the group moderator/facilitator did the verbatim report approach and the authors analyzed the data in accordance with the FGD discipline with the results shown in the main points of discussion section in table 3.

4) MAIN POINTS OF THE DISCUSSION

This study found the main results of quantitative part as shown in table 2 below.

Table 2: Results from SDLRS questionnaire

A. Demographic data

Gender	*Number*	*Percentage*
Male	7	30.43
Female	16	69.57
Total	23	100.00
Age (years)	*Number*	*Percentage*
21- 30	2	8.70
31- 40	4	17.39
41- 50	17	73.91
Total	23	100.00
Work experiences (years)	*Number*	*Percentage*
1- 5	4	17.39
6 - 10	5	21.74
11- 15	3	13.04
16- 20	4	17.39
> 21	7	30.43
Total	23	100.00
Work position	*Number*	*Percentage*
Physicians	1	4.35
Professional nurse	7	30.43
Public health technical officers	8	34.78
Public health administrator	3	13.04
Public health worker	1	4.35
Dentist	2	8.70
Radiologist	1	4.35
Total	23	100.00
Grade point average	*GPA*	
N	20	-
Mean	2.78	-
Min	2.14	-
Max	3.34	-

B. Domains of SDLRS

Domain	*N*	*Mean*	*Min*	*Max*
1	23	4.17	3.46	4.85
2	23	3.82	2.75	4.58
3	23	3.39	2.33	4.50
4	23	4.28	3.50	5.00
5	23	4.26	3.56	4.89
6	23	3.74	2.80	4.80
7	23	4.22	3.00	5.00
8	23	3.97	3.00	4.71
All 58 items	23	3.91	3.32	4.61

Domain 1 - Openness to Learning Opportunities Domain 2 - Self-concept as an Effective Learner Domain 3 - Initiative and Independence in Learning
Domain 4- Informed Acceptance of Responsibility for One's Own Learning
Domain 5 - Love of Learning
Domain 6 – Creativity
Domain 7 - Positive Orientation to the Future
Domain 8 - Ability to Use Basic Study Skills and Problem-solving Skills

C. Factors affecting SDLRS domains 1-8 (Gender only)

Domain	*Male*	*Female*	*P-value*
1*	3.90	4.29	0.03
2	3.67	3.88	NS
3*	3.12	3.50	0.046
4*	3.96	4.42	0.031
5	4.14	4.31	NS
6	3.54	3.83	NS
7	3.93	4.34	NS
8	3.71	4.08	NS
All 58 items*****	3.66	4.02	0.03

NS = non-significant

D. Difficulty encountered in online computer skills and English capability

Demographic factors	*N*	*Mean*	*Min*	*Max*
All samples	23	3.61	2.29	4.57

E. Learners with emotional need for dependence

Demographic factors	*N*	*Mean*	*Min*	*Max*
All samples	23	3.99	3.00	5.00

F. Learners with the pursuit of degree-seeking behaviors				
Demographic factors	*N*	*Mean*	*Min*	*Max*
All samples	23	3.35	1.00	4.75

A. From table 2, LWP learners year batch 2008 were mostly female (69.57%) between 41-50 years old (73.91%), with more than 21 years of work experiences (30.43%). A majority of them were public health technical officers (34.78%) and professional nurse (30.43%). Their grade point average before enrolling the LWP Program was 2.78 (minimum 2.14 and maximum 3.34). They all enrolled in year 2008 (100%) from the same province in Thailand.

B. The mean score for overall eight domains of SDLRS was 3.91 (high level). For each domain, the mean was prioritized from the highest to the lowest values as follows: Informed Acceptance of Responsibility for One's Own Learning (4.28); Love of Learning (4.26); Positive Orientation to the Future (4.22); Openness to Learning Opportunities (4.17); Ability to Use Basic Study Skills and Problem-solving Skills (3.97); Self-concept as an Effective Learner (3.82); Creativity (3.74); and Initiative and Independence in Learning (3.39).

C. The demographic factors affecting the eight domains of SDLRS was only gender. Male students rated their SDLRS lower than female students in all domains with statistical significant value in the domains of Openness to Learning Opportunities (p-value 0.03); Initiative and Independence in Learning (p-value 0.046); Informed Acceptance of Responsibility for One's Own Learning (p-value 0.031) , and overall picture (p-value 0.03).

D. The difficulty encountered in online computer skills and English capability had the mean score of 3.61 (high level). None of the demographic factors had the significant relationship to this issue.

E. Learners with emotional need for dependence had the mean score of 3.99 (high level). None of the demographic factors had the significant relationship to this issue.

F. Learners with the pursuit of degree-seeking behaviors had the mean score of 3.35 (moderate level). None of the demographic factors had the significant relationship to this issue.

G. Among learners with SDLRS, with pursuit of degree-seeking behaviors, with emotional need for dependence, and with difficulty encountered in online computer skills and English capability, the correlation is shown as follows:

G.1 Learners with SDLRS had the positive correlation among one another on a moderate to high level (r=0.436 to r=0.892), except for the domain of "Informed Acceptance of Responsibility for One's Own Learning" & "Creativity", where no statistical significance was found.

G.2 Difficulty encountered in online computer skills and English capability had a negative relationship on a moderate level (r=-0.431) with "Ability to Use Basic Study Skills and Problem-solving Skills".

G.3 Pursuit of degree-seeking behaviors had no correlation to other factors.

G4 Emotional need for dependence had a positive relation on a moderate level (r=0.508 to r=0.577) with "Openness to Learning Opportunities", "Self-concept as an Effective Learner", "Creativity", and "Ability to Use Basic Study Skills and Problem-solving Skills". (Table 2- G shown in appendix A).

This study found the main points of the discussion from FGD as shown in table 3.

Table 3 Main points from Focus Group Discussion

Questions:	*Response:*
1. What comes to your mind when you talk about "distance education"?	1.1 Open University in Thailand, such as Sukhothaithammatirat University
2. What comes to your mind when you talk about "Learning at the Workplace Distance Education Program"?	2.1 work and study with no study leave and still be employed with financial liquidation 2.2 one more status as higher education university student
3. What comes to your mind when you talk about "Learning at the Workplace Distance Education Program" conducted by the College of Public Health Sciences, Chulalongkorn University?	3.1 Being a part of prestige university in Thailand - an honorary study program indeed 3.2 Gaining in-depth knowledge by highly experienced instructors in public health field at the College

4. For your study plan in “Learning at the Workplace Distance Education Program” at the College of Public Health Sciences, how do you plan for the followings:	
4.1 Agenda-setting: why do you plan for this study?	4.1.1 Their chief gave them full support for their potentiality development aiming for three key goals (1) to upgrade local work system (2) to develop staff competency and career development, and (3) to make better health services available to the people in the area under responsibility
	4.1.2 They wanted to conduct correct academic research
	4.1.3 Their local preceptor was of great help to them
	4.1.4 It was a chance to brush up their English
	4.1.5 “Near Home Near Heart” study program (easy access to study program)
	4.1.6 Fully equipped with basic technological support by the Ministry of Public Health of Thailand (ASDL, CDNA, and GSM Solomon)
4.2 Learning strategy	
4.2.1 How do you manage your study time?	4.2.1.1 Group learning over weekends at the Main Office Meeting Room 4.2.1.2 Non-campus study can save time and traveling expenses.
4.2.2 How do you determine your required lessons?	4.2.2.1 Lessons that would pertain to their local felt needs
4.2.3 How do you get an access to the sources of information for your study in regards to issues in your community environment?	4.2.3.1 Provincial library, instructor’s suggestions, self-searching via Internet, hands-on field experiences
4.2.4 How is your life cycle at present?	4.2.4.1 Free from family commitment, hassle -free from financing issues, having more time, and getting good cooperation from colleagues or subordinates which could facilitate their study role
4.2.5 What do you think about “empowerment with guidance for your study” from the College’s instructors?	4.2.5.1 Tend to buy-in the ideas as this could well be responsive to the problems in their work context
4.2.6 What do you think about “package of courses” which should be studied in order to respond to your true study needs and requirements?	4.2.6.1 Tailor-made courses were desirable, for instance, quality assurance in healthcare service; leadership in health care system; community participation; project implementation; and project evaluation
4.2.7 How do you describe your access to minimal technology required for this study program?	4.2.7.1 Fully equipped with ASDL, CDNA, and GSM Solomon provided by the Ministry of Public Health of Thailand
4.3. Regarding the action plan, how would you implement your set plan above?	4.3.1 Self-study, suggestions from local preceptor, advice from the College’s instructors, group-learning, prompt feedback from the instructors, and prioritized course content for their adjustment
4.4 In terms of self-evaluation, how do you measure your achievement for the set goals?	4.4.1 Similar with their office work evaluation, contingency plan needed to be established, pre- and post study result measurement should be made, early-bird thesis preparation should be done 4.4.2 Learners were, in addition, willing to take part in extra-curriculum activities and social responsibility projects, for example, Green projects, culture-arts, and culture - nurturing project, etc.

5) DISCUSSION

From SDLRS questionnaire, LWP learners had the mean score for overall eight domains at 3.91 which is considered a high level according to the identified score interpretation. The fact that there were almost 70% female learners in this homogeneous group (all from one same province) might have an impact on this. These female learners, rating

themselves higher in all domains comparing to male ones, were in their late 40s with long-time career life (more than 21 years) as public health technical officers and professional nurses. Overall, the subjects had the strong foundation for being potential self-directed learners (p-value 0.03). The top 4 highest mean were in the domain of Informed Acceptance of Responsibility for One's Own Learning. Love of Learning, Positive Orientation to the Future, and Openness to Learning Opportunities. On the contrary, the predominant features of truly successful self-directed learners, namely, *Ability to Use Basic Study Skills and Problem-solving Skills, Self-concept as an Effective Learner, Creativity, and Initiative and Independence in Learning*, were, however, in the 4 lower halves. The fact that there were learners with a high mean score in the category of "emotional need for dependence" (3.99) might accentuate this issue. Looking into the difficulty encountered in online computer skills and English capability of the learners, the mean score was 3.61, while learners with the pursuit of degree-seeking behaviors had the lowest mean score of 3.35. From the correlation test, it showed that learners with SDLRS had in general the positive correlation among one another on a moderate to high level. Difficulty encountered in online computer skills and English capability had a negative relationship on a moderate level (r=-0.431) with "Ability to Use Basic Study Skills and Problem-solving Skills". Learners in the category of Emotional need for dependence had a positive relation on a moderate level with majority of truly successful self-directed learner qualifications. While learners in the group of pursuit of degree-seeking behaviors had no correlation with other factors.

From FGD session, LWP learners were homogeneous as they were from the same province. Nevertheless, due to their work backgrounds, they were quite heterogeneous. Being physician, professional nurse, public health administrator, public health technical officer, public health worker, dentist, and radiologist, naturally added more perspectives to FGD. Overall, the subjects understood that distance learning program were similar to Open University in Thailand though it is, in fact, not. Open University tends to serve mass market of students, while LWP Program of the College is more small group-oriented. Technologies in use also differ as the College's program is more prone to 2-way interaction communication than one-way mass communication as in the Open University. Learners chose LWP Program because they were still employed, their position and work status still remained, and their financial liquidation stayed unchanged. From the view of their colleagues, they were persons who always seek for progress, were self-learners, and had high potential to develop their respective organizations and to solve health and public health issues in their community with academic knowledge. By sharing their research result through publications, they hoped that their colleagues did not have to "Reinvent the Wheel" for the issues in similar environment, but to springboard from their findings instead. Regarding Chulalongkorn University, the subjects appreciated the chance that they could enroll at this prestige educational institute. Having experienced teaching staff at the College as their thesis advisors with collaboration from the local preceptors, the learners had a strong belief that the direction of gained knowledge and skills would be geared toward the local felt needs. The goal of their chief was to provide quality healthcare services to the area-based people of all age groups for better health outcomes, better quality of life, as well as better organizational human resource development.

6) RECOMMENDATIONS

In response to the classification of distance learning program, it might be concluded that among Chulalongkorn University LWP learners year batch 2008, they were more inclined to dialogue-oriented with less emphasis on the pursuit of degree-seeking behaviors. The challenge to the program management is to first, maintain the strong foundation of SDLRS the learners currently possess, second, to increase the qualifications for truly successful self-directed learning skills, and third, to provide technological support and required English capability throughout the study period. The key goal is to lessen the degree and to

reduce the extent of emotional need for dependence among learners to the least level. Possible suggestion is to provide them with instructional materials that allow modifications to suit their needs, learning style, and pace. For instance, available communication and information technology Chulalongkorn University has provided, such as Blackboard System, Macromedia Breeze, and Teleconference, should be fully optimized. While the asynchronous and synchronous modes of learning could be utilized, some site visits to their study center (or blended learning) should also be made in order to secure their transitional adjustment period from work place to higher education learning context. Human touch in highly advanced education technology has to be remained.

In terms of "learner autonomy" - the issues of how to study, what to study, when, where, in what ways, and to what extent - it is evident that group learning will play a key role in this learner batch. Several literatures on collaborative learning and social construction of knowledge confirmed that upon "conceptualizing learning as socially situated, group-based collaborative learning enables development of learning communities in the short term and potential communities of practice in the longer term (Gunawardena and Zittle, 1997: 8-26). Research suggests that the affection, inclusion, and sense of solidarity of the group, and the ease of expression and synthesis of multiple viewpoints with no one student dominating, are important characteristics in this successful social construction of knowledge online. From the study of Cheng et al (1991), it reported a higher completion rate for those learners who worked collaboratively (90 percent) than for those who worked independently (22 percent) (Cheng, Lehman, and Armstrong, 1991 cited in Moore and Kearsley, 2005: 230-231).

Skills in self-directed learning and planned learning are expected to keep the learner's retention and satisfaction rate on a high level. These key outputs are a win-win solution to all concerned. While the higher educational institute can be in a position to stimulate the life-time learning skills to the learners, the learners themselves can realize how to become self-directed learners – a qualification required in the world of work now and in the future.

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APPENDIX

Appendix A: Table 2-G Correlation among SDLRS; difficulty encountered in online computer skills and English capability; emotional need for dependence; and pursuit of degree-seeking behaviors among LWP learners.

Table 2 – G Correlation among SDLRS; difficulty encountered in online computer skills and English capability; emotional need for dependence; and pursuit of degree-seeking behaviors among LWP learners												
		1	2	3	4	5	6	7	8	Difficulty	Emotional need	Degree-seeking
1	Correlation Coefficient	1.000										
2	Correlation Coefficient	0.661	1.000									
	p-Value	0.001										
3	Correlation Coefficient	0.657	0.698	1.000								
	p-Value	0.001	0.000									
4	Correlation Coefficient	0.675	0.436	0.349	1.000							
	p-Value	0.000	0.038	NS								
5	Correlation Coefficient	0.873	0.722	0.568	0.590	1.000						
	p-Value	0.000	0.000	0.005	0.003							
6	Correlation Coefficient	0.492	0.729	0.529	0.225	0.601	1.000					
	p-Value	0.017	0.000	0.009	NS	0.002						
7	Correlation Coefficient	0.740	0.651	0.465	0.649	0.741	0.478	1.000				

	p-Value	0.000	0.001	0.025	0.001	0.000	0.021					
8	Correlation Coefficient	0.892	0.738	0.763	0.573	0.808	0.517	0.591	1.000			
	p-Value	0.000	0.000	0.000	0.004	0.000	0.012	0.003				
Difficulty	Correlation Coefficient	-0.225	-0.162	-0.380	-0.087	-0.251	-0.191	0.153	-0.431	1.000		
	p-Value	NS	NS	NS	NS	NS	NS	NS	0.040			
Emotional need	Correlation Coefficient	0.534	0.513	0.366	0.212	0.387	0.508	0.325	0.577	-0.015	1.000	
	p-Value	0.009	0.012	NS	NS	NS	0.013	NS	0.004	NS		
Degree-seeking	Correlation Coefficient	0.164	0.113	0.028	0.060	0.129	0.125	0.157	0.077	0.127	0.068	1.000
	p-Value	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	

NS = non-significant
Domain 1 - Openness to Learning Opportunities
Domain 2 - Self-concept as an Effective Learner
Domain 3 - Initiative and Independence in Learning
Domain 4 - Informed Acceptance of Responsibility for One's Own Learning
Domain 5 - Love of Learning
Domain 6 – Creativity
Domain 7 - Positive Orientation to the Future
Domain 8 - Ability to Use Basic Study Skills and Problem-solving Skills
Difficulty – Difficulty encountered in online computer skills and English capability
Emotional need – Learners with emotional need for dependence
Degree – seeking - Learners with the pursuit of degree-seeking behaviors

THE DESIGN OF LEARNING MANAGEMENT SYSTEM THAT ADAPT CONTENT LEARNING PATH AND LEARNING TASK ACCORDING TO LEARNER

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ABSTRACT

This research is aimed to design the Learning Management System of which the lessons can be adapted to the individual learners, and to drive the learners' ability to study in accordance with their potentials, interests, which, consequently, lead to the motivation in learning and the better learning achievements. In this study, there were 3 types of adaptive methods; namely, adaptive content, adaptive learning path, and adaptive learning task. Researchers followed the learning theory of Honey & Mumford in terms of learning style of the learners. In addition, researchers designed the lessons in form of learning object, which possessed the structure of SCORM standard. With regarding the other relevant learning information such as student database, test bank, statistic and so on, we stored such information in the structure of IMS standard so that the designed system can be interoperating with the other softwares. The Learning Management System designed in this study was conducted for teaching computer related subjects. The results obtained from this study can be the prototype for developing the further adaptive Learning Management Systems.

Keywords Adaptive LMS, design LMS

1) INTRODUCTION

Adapting Learning Management System which is able to adapt the content suite for the individual learners, in order to them can learn for their abilities and interest. From many kinds of researches find out that there are 4 types of strategies to improve the content suit for individual learners. They are Adaptive Content , Adaptive Navigation , Adaptive Presentation and Adaptive Learning Task *(Panarat Sangvigit,Sursak Mungsing and Anuchai Theeraroungcaisri,2007:26),* in present standard instruct for collecting learning information in many systems such as AICC ,SCORM ,IEEE LTSC ,IMS ,LRN,etc. The Design of Learning Management System that is able to adapt the content suit for the individual learners can work with standard structure. It can provide the adapting e-Learning working with other component of learning styles. Learning Management System which cooperate with the same standard structure as such Content Management System, Assessment system that providing the adapting e-Learning can apply in different circumstances. In this presentation, researchers is going to present about designing the adapting Learning Management System for individual which cooperate with standard structure of IMS Global Learning Consortium.

2) A KNOWLEDGE BASED ARCHITECTURE FOR ADAPTIVE LEARNING MANAGEMENT SYSTEM

According to the previous studies, researchers found that there are 3 components consisted in adaptive Learning Management System which is able to adapt the content suite for the individual learners, there are based on 3 components. They are *Domain Model* , *Pedagogical Model* and *Learner Model*. The examples of the systems developed under the scheme mentioned are EDUCE (Brusilovsky,2003), *NetCoach-Couses (Gerhard Weber, Hans-Christian Kuhl, and Stephan Weibelzahl,2002),* and Inspire *(Kyparisia A. Papanikolaou , Maria Grigoriadou , Harry Kornilakis, George D.Magoulas , 2002)*system. The details for each of them are elaborate as follows *(Marcus Specht and Reinhard Oppermann,1999,4)*

2.1 Domain Model is the component that collect the content structure. It divides into unit. It can be called in different in each course for example Knowledge Items, Topics, Knowledge Elements , Learning Object , Learning Outcomes*(Brusilovsky,2003),* etc. However, in divides the content structure like this, the content must be arranged in order such as the prerequisite course in order to increase the ability in adaptation the learning path of the learners through their basic knowledge*(Brusilovsky,1996)*. In addition, the divides content must be related to the current knowledge of the learners as well so that the learning path of the learners would be appropriate to individual.

2.2 Pedagogical Model is the component that collect the unit presentation, by adapt learning style that according with the learning styles of individual learners. It provides each learner practice and succeeds the lessons.

2.3Learner Model , this component is important. Because of it collects the learner's information to adapt content, adapt learning path, and adapt learning task according with each individual learning.

According to the component architectures, researchers has designed a Model. It is the Adaptive Learning Management System as follow figure 1*(Panarat Sangvigit,Sursak Mungsing and Anuchai Theeraroungcaisri,2007:25-31).*

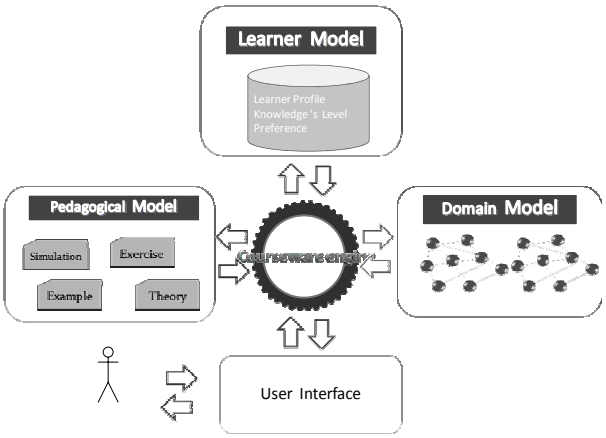

Figure 1: The design of Adaptive Learning Management System

3) ADAPTIVE METHOD

The working process of 3 components mentioned is consisted of 3 types of reaction processes which are in accordance to the content presentation and learning activities as follows (Nora Parcus de Knoch,2000), *(Panarat Sangvigit,Sursak Mungsing and Anuchai Theeraroungcaisri,2007:25-31).*

3.1 Adaptive Content: It is the presentation method basing on the former knowledge of the learners. The system will test the basic knowledge of the learners, the learning goals, as well as their preferences. In the adaptive content process, it would process the appropriate priority for presenting the content, adding the extra content to the basic knowledge and the goal of the learners.

3.2 Adaptive Learning path: It is the tool for adapting the learners' learning path as appropriate to the individual. The aim of this part is to drive the learners realizing the relation of the spatial map and lead to the learners' learning goals finally. The working process between adaptive content and adaptive learning path is related to each other through the adaptive process.

3.3 Adaptive Learning Task: It is the channel for adapting the order in presenting learning activities in accordance with learning styles.

In this research, the researchers has chosen the learning style by Honey & Munford's theory. They divided the learning style into 4 types to provide the method that according with learner's learning style as follow *(Richard Mobbs,2005).*

- *Activist* : It is the learning style emphasizing on "learning by doing" concept. Therefore, they believed that to instill the learners about doing the activities at the beginning of learning process would make them successful in learning easier. They have to learn from the simulation first then they will easily succeed.
- *Reflectors* : It focuses on the intuition before doing. The learners in this group prefer observing things and very careful in working; hence they can work effectively when there is not time constraint. Beginning from the example provides learners think and understand by themselves first and they will easily succeed.
- *Theorists* : It is the learning style clinging to the understanding of the theories before doing any activities. The learners in this group always study the principles and theories. On the contrary, they can not do well in the circumstances which emotions and feelings are crucial for making the decision or reading strategies. It can provide this group easily succeed.
- *Pragmatists* : It is the learning style that the learners prefer applying or testing the things they study with the work they face. They try to transform the techniques they obtained to personal needs. They can understand everything easily. However, they are offended with the rules, theory, and principles. They have to learn from the exercise first then they will easily succeed.

From the learning styles by Honey & Mumford, each learner groups would begin with different activities (but contents of 4 types of learning styles) Choosing the appropriate activity learning styles give the chance the learners understand the contents very well. Researchers has designed the Model of easier understanding learning activities as figure 2*(Panarat Sangvigit,Sursak Mungsing and Anuchai Theeraroungcaisri,2007:25-31*).

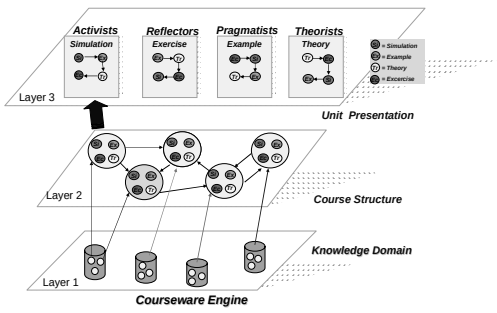

Figure 2 : Courseware engine Model

The learners' responding by Adaptive that according with individual learner is valuable toward adaptive Learning Management System in present. However, adaptive LMS has occurred variously. The structure of LMS is different from each other. Therefore, designing towards the individual learners' responding has to consider about standard structure of adaptive Learning Management System be interoperability. It is worth-while and reduces the expenses of production.

Intentionally, as represented by Picture 3, the analyst has designed a model to describe factors relative to co-functioning system based on *Adaptive Content, Adaptive Learning Path, Adaptive Learning Task* principle with the aim to enable the *Adaptive Learning Management System* benefits each learner.

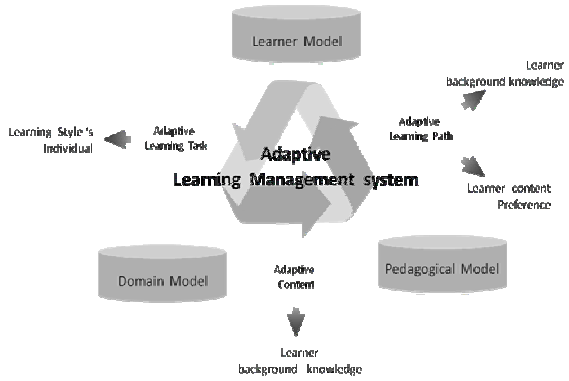

Figure 3 : Adaptive Method Integration Model

4) SCREEN DESIGN OF ADAPTIVE LEARNING MANAGEMENT SYSTEM

The analyst has designed applications on monitor that suits each learner for the *Adaptive Content, Adaptive Learning Path, and Adaptive Learning Task*, as being shown in figure 4, 5, 6 as follows.

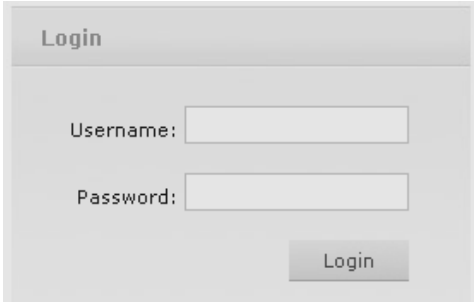

Figure 4 : Learner Login

Figure 4 : Monitor is ready to work whenever learner wishes to login the Adaptive Learning Management System.

Figure 5 : Subject unit example

From the figure 5, researchers can describe the details of subjects available in the system is listed out, enabling learner to make choice.

Figure 6 : Spatial map of Adaptive Learning Management System

From the figure 6, the aim of this part is to drive the learners realizing the relation of the spatial map and lead to the learners' learning goals finally. The working process between adaptive content and adaptive learning path is related to each other through the adaptive process.

By means of *special map* in varying colors, learner is able to view and recognize own learning path.

Table 1 : COLOR DESCRIPTION

Color	Description
grey	represents learner's past lessons
green	represents the selectable lessons based on learner's basic knowledge
red	represents lessons for learner who has no sufficient basic knowledge - or - represents prerequisite content from instructor
blue	represents lessons that learner is occupying - or - represents status of learner's knowledge level

Figure 7: An example of lesson about variable and operation in the *Adaptive Learning Management System* is presented.

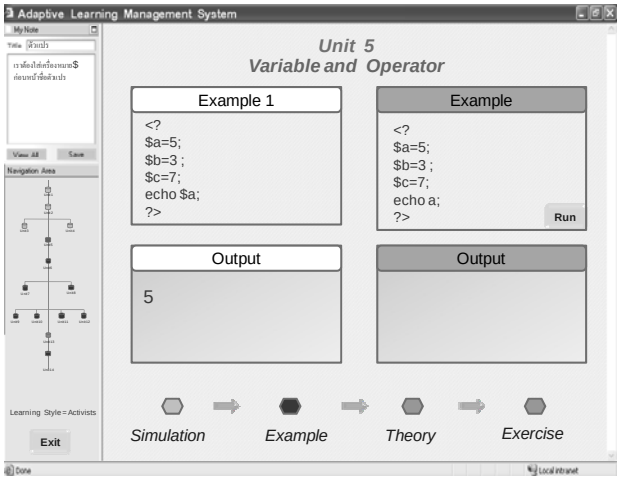

Figure 7 : Present unit in the Adaptive Learning Management System

4) LEARNING MANAGEMENT SYSTEM IN STANDARD

In developing the Learning Management System , there are many organizations issuing the concerned standard. Those are considered well-known are AICC ,SCORM ,IEEE LTSC ,IMS ,LRN, (IMS Global Learning Consortium,Inc,2007),(U YRU,2006) etc.

The system developed by the analyst is related to *SCORM* since Thailand's *Moodle* learning management system is interchangeable. Therefore, it is considered as best if all analysts develop the system in relation to *SCORM*, for it will benefit interchangeability with *Moodle* or other systems. Additionally, the system

developed by the analyst is designed to interchange with *IMS* data base as illustrated in Table 2.

Table 2 : IMS IN STANDARD

Abbreviation	Description
IMS LD	This standard helps in providing the priority of learning structure and the content. It can also add the content as appropriate to the basic knowledge of the learners as well as their learning goals. It would manage the structure for the adaptive content and adaptive navigation as appropriate to each learner.
IMS QTI	This standard can help in providing the structure for examination storage for testing the learner achievement. It also helps in providing the database of the examination storage which enables LMS to use the same examination.
IMS CP	This standard is useful in providing the structure of "package" which is the tool for learning activities to use with the other types of LMS.
IMS LIP	It is the standard used for designing the structure for learners' information storage. It is considered the heart of information recalling part for the adaptation in various types. It can also be used with the other systems of LMS.

Studies of remedial standard to design a proper *Learning Management System* for each learner are hereby presented as developing guidelines in Figure 8*(Panarat Sangvigit,Sursak Mungsing and Anuchai Theeraroungcaisri,2007:25-31).*

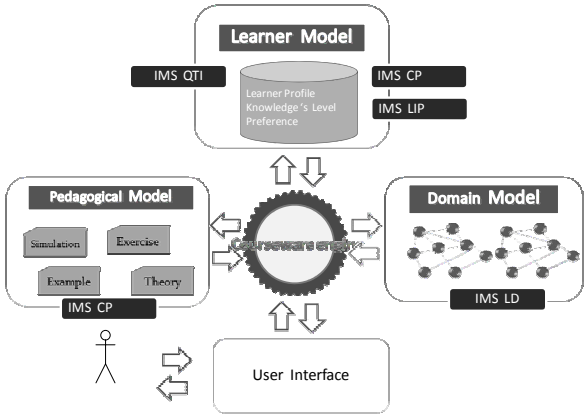

Figure 8 : Integration Standard in Adaptive Learning Management System

5) IMPLEMENTATION OF LEARNING MANAGEMENT SYTEM

การพัฒนาระบบการจัดการเรียนรู้ที่พัฒนาขึ้น เป็นการออกแบบด้วยกัน 2 ส่วน ซึ่งสามารถแสดงได้ดังภาพที่ 9

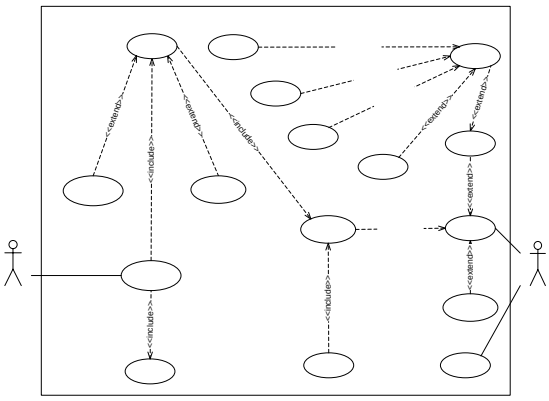

Figure 9 : Adaptive Learning Management System in USE CASE

Learner's Part : When the learner log in to the system, the system would test the learner's knowledge , learning styles as well as learning goals by the system engine which will transform the information to the other models.

Teacher 's Part : When the teacher login to the system, the system is designed to enable to get into it for lesson composition, learning and create activity, and managing learner of each subject.

Conclusively, *Learning Management System* development is regarded as a tool to adapt content, adapt learning task and adapt learning task to individual learner under 3 main architectural parts (*Domain Model, Pedagogical Model, and Learner Model*). The researcher has a design Activity diagram in Figure 10.

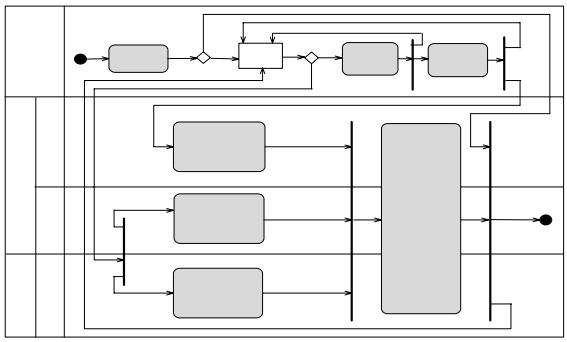

Figure10 : Adaptive Learning Management System in ACTIVITY DIAGRAM

7) CONCLUSIONS AND FUTURE WORK

In this study, the researcher has proposed the frame for designing adaptive Learning Management System used to design *Algorithm* under the standard of IMS. It is helpful for reducing the working joint of LMS which is various. In addition, the cost in developing teaching and learning materials can be reduced, the systems can be worked together effectively, and the investment is worthy by focusing on the adaptation in reusability, interoperability and flexibility of the system development.

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Effects of using problem-based learning activities via internet on self-directed learning and achievement of higher education students

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ABSTRACT

The purposes of this research study were : 1) to study an online instruction by problem-based learning activities via internet, 2) to compare pretest and posttest of learning achievement students who received the online instruction by problem-based learning activities via internet, 3) to compare pretest and posttest of self-directed learning students who received the online instruction by problem-based learning activities via internet, 4) to compare self-directed learning and learning achievement between the online instruction by problem-based learning activities via internet and the traditional problem-based learning activities, and 5) to study the students satisfaction toward the online instruction by problem-based learning via internet. The subjects were 92 students who were enrolled in the computer for education course, during the second semester of the academic year 2007, the Faculty of Education, Silpakorn University. Two classes were assigned to the experimental group (n=46) and control group (n=46) by simple random sampling. Data were analyzed by using mean, standard deviation, and t-test statistics. Results of the research were as follows:

1) The developed online instruction model by problem-based learning activities via internet should be included the 5 principal components and 16 subcomponents. Design of problem-based learning method was approve by a panel of experts. Efficiency of the online instruction by problem-based learning activities developed the researcher was 80.22/84.22 that compounded with the criteria. 2) Posttest of the learning achievement of online instruction by problem-based learning activities was higher than pretest at.01 level of significance. 3) There was significant difference of learning achievement between online instruction by problem-based learning activities and the traditional problem-based learning activities. 4) There was non significant between pretest and posttest of self-directed learning score of online instruction problem-based learning activities. There was non significant difference of self-directed learning between the online instruction by problem-based learning activities via internet and the traditional problem-based learning activities. 5) The students who learn via online instruction by problem-based learning activities on law and ethics in information technology lessons had high satisfaction.

Keywords :
Problem-based learning via internet, self-directed learning, achievement, higher education

1) INTRODUCTION

Thailand education focuses on the development of information technology for education in order to keep up with the changes in both society and economics. This could be seen in the National Education Act B.E. 2542 which states that there should be an application of technology for education in order that the personnel have knowledge and ability to use appropriate technology with quality and efficiency. Educational technology will help learners learn in a broader sense, faster so that they can learn anytime and anyplace. The learners are free to search for knowledge and responsible for themselves. This allows the learners to learn according to their potential which can meet each individual's need.

Education at the present time contains a lot of contents in a limited time. Instructors, therefore, choose to lecture and present only what they consider as essential for their work. Some contents are already old. The instruction is mainly instructor-based, that is to say, the instructors choose the contents, the teaching method, the suitable time and duration. They decide who passes or fail the tools the instructors developed. As a result, most learners learn by remembering and following the contents that the instructors provided. They will not develop skills in thinking, doing survey and applying their knowledge in their real work because educational technology changes rapidly. New instructions replace old ones along with learning activities as well as teaching method which progress to great extent. More importantly, the instruction done by the teaching staff must require practical skills along with knowledge from many fields. During real work, they must encounter the diversity of situations and problems. If learners do not practice differently from the instruction, they might not be able to work in real life. The instruction to develop the personnel to enter this career, therefore, must be based on problem-solving skill by right procedure. This new procedure for problem-solving skill consists of content integration for many subjects. Educational management must focus on skills like searching for new knowledge and solutions. The learners must be taught what and how to select their own lessons in order to become up-to-date with the present situations in the real world which they must face after graduation. The learners must also realize that what contents are useful for their work and how they can learn without instructors. Learning to learn is what we should focus (Ruecha, 1993). Self-directed learning or SDL is a process in which learners initiate their own learning by considering their own need for study, setting goals and learning materials, contacting others, searching for knowledge, choosing learning method, and evaluating their own learning achievements which can be under the supervision by others. Learners learn better when they learn by themselves instead of waiting for the contents provided by the instructors because they have high intentions and motivations. They are independent and able to lead their own life (Knowles, 1975). It is widely acknowledged that the important characteristics which need to be developed in everybody is to incubate learners to learn by themselves and learn all the time. This is called "Lifelong Learning" which is the result done by the organizations responsible for the education in all level. The fundamental philosophy of higher education is to search for and share the knowledge in order to find newer one which is beneficial for the development of academy and society. In reality, however, the learning method most learners use is still based more on remembering than on analysis and creativity. Knowles (1975) says that the roles of instructors are to create learning atmosphere, plan, analyze the learners' need, set goals, design learning plan, participate in learning activities, and evaluate the learners' learning results. The learners must be independent in searching for knowledge and being responsible for their own learning activities. This can be done by using packaged material or by themselves like reading, thinking, testing and doing by them (Jen-obrom, 1989). Problem-based learning or PBL is a learning Activity which originates from the learning theory called "Constructivism" which allows students to create new knowledge from the actual problems in the real world as their learning context so that the learners have skills in thinking and solving problems. They also use their knowledge according to their field of study. Problem-based learning is, therefore, the

result from working process which depends on understanding and solving problems (,Thammabut, 1992). The role of instruction is no longer based on instructors because instructors are to design activities for learners in the form of problem and provide learners with learning resources so that learners can learn by themselves along with their instructors as their facilitators (Hongladarom, 1997). Problem-based learning, therefore, focuses on student-based learning in which the learners search for knowledge required to solve the assigned problems according to the procedure and steps as well as actual knowledge. This makes learners able to apply their knowledge in real life.

Online Instruction is different from the traditional instruction in classroom in that traditional instruction is based on instructors. The instructors explain and express their own opinions; students do not have time to express their opinions and ask their questions because there are too many students in class. The instruction is limited by time. The students who are different from others are not brave enough to show themselves. There are too many contents to learn in each day, resulting in no connection between the lessons. The electronic online instruction can facilitate learners by allowing them to set their own schedule as required and giving them flexibility to link much information. This kind of instruction can save time up to 50% and reduce the cost up to 30-60%. Moreover, internet network allows learners to participate in many learning activities. This will result in community of learner (Anderson, 1994).

This research aims to study problem-based learning activities which include both PBL and online instruction in order to support instructional activities by using technology, developing self-directed learning and adding new channels to instruction.

2) OBJECTIVE

1) To develop online instruction by problem-based learning activities on law and ethics in information technology lessons

2) To compare pretest and posttest of learning achievement of students who studied online instruction by problem-based learning activities on law and ethics in information technology lessons

3) To compare pretest and posttest of self-directed learning of students in experimental group who studied online instruction by problem-based learning activities on law and ethics in information technology lessons and students in control group who studied the traditional problem-based learning activities

4) To study the students' satisfaction towards the online instruction by problem-based learning activities on law and ethics in information technology lessons

3) RESEARCH METHODOLOGY

The sampling group used in this study was composed of 130 first-year students who enrolled in the 468102 computer for education course during the second semester of the academic year 2007, the Faculty of Education, Silpakorn University. 92 were chosen by simple random sampling method. There were two groups as the experimental group and control group, in each of which there were 46 students.

This research was done in accordance with the following research and development procedure:

This research was done in accordance with the following research and development procedure:

3.1) Step 1

The problem-based learning activities on law and ethics in information technology lessons and the efficiency of online instruction was developed by the researcher. This started with the literature review on online instruction by problem-based learning activities, principles, concepts, instruction process, designing activities, measuring and evaluating methods. Both local and international documents were studied, analyzed and put into a summary after structured interview with experts. The procedure for online instruction by problem-based learning activities was achieved. The elements were then set as the concepts to design the online instruction. 12 experts in curriculum and teaching reviewed and evaluated

the appropriateness of elements and procedure for online instruction by problem-based learning activities. The results were as follows:

The review and evaluation by the experts in terms of appropriateness of elements and procedure was in overall at high level ($\overline{X}$ =4.30, SD=.46) (The average score above 3.51 can be counted as applicable; the items with lower score must be considered for revision).

3.2) Step 2

The development of research tools for online instruction by problem-based learning activities on law and ethics in information technology lessons. To develop online instruction, the design was done in the first place by analyzing the structure and the website in terms of specifying the contents, analyzing the contents on law and ethics in information technology along with learning objectives, learning achievement tests and then the accuracy of the contents which was evaluated by 3 experts in the contents. The consistency of the contents and the objectives was evaluated using index of concurrence (IOC). After the evaluation by the experts in 4 dimensions, it was found that the average score of the contents yielded appropriate result ($\overline{X}$ =0.89). After an analysis of the contents, the scope of the contents in terms of main topics and subtopics were put into the content structure and the website was completed and then was put to quality evaluation by the experts in online instruction and educational technology. The quality of online lessons was evaluated using the questionnaire on online lesson quality. The result for the online instruction by problem-based learning activities on law and ethics in information technology lessons yielded highly appropriate ($\overline{X}$ = 4.30, SD = .32).

3.3) Step 3

The contents which were approved by a panel of experts were to be measured in terms of efficiency by students who enrolled in the computer for education course for the chapter entitled “law and ethics in information technology” at the following URL: http://202.44.14.13/PBL3U. The steps to find out the efficiency of online instruction consisted of 3 steps as follows: one-to-one test which was done with 3 students outside the sampling group to find out quality at the first place; small group tryout which was done with 12 students to find out the efficiency of the contents and quality in terms of objectives to get information for revision; and field tryout which was done with 30 students to find out the efficiency of the developed online instruction by problem-based learning activities. The result of efficiency analysis of online instruction by problem-based learning activities was that E1 /E2 were 80.22/84.22 respectively that means it passed the criteria.

3.4) Step 4

The comparison of learning achievement of self-directed learning and the satisfaction towards the online instruction by problem-based learning activities on law and ethics in information technology lessons

4. RESRARCH RESULTS

1) The research result was that the comparison of pretest and posttest of learning achievement of online instruction by problem-based learning activities on law and ethics in information technology lessons showed that posttest learning achievement was higher than pretest at the .01 level of significance. Therefore, online instruction by problem-based learning activities enhanced learning achievements of learners (as shown in Table 1).

Table 1: *The comparison of pretest and posttest of learning achievement*

Score	*N*	$\overline{X}$	*SD*	*t*	*p*
Pretest	46	14.10	3.83	-15.36**	.000
Posttest	46	23.17	3.94		

Note: **p<.01

2) The analysis of learning achievement of posttest of students who used online instruction by problem-based learning activities and learning achievement of posttest of students used problem-based learning activities in classroom showed that it was different at the .01 level of significance. Problem-based learning activities in classroom showed higher average score than online instruction by problem-based learning activities. After considering the overall score of 2 methods, it was found that both learning achievements were not quite different. Therefore, both methods can be applied for the instruction in accordance with the appropriateness and the needs
(as shown in Table 2).

Table 2: *The comparison of posttest learning achievement Experimental group students who used online instruction and Control Group students who used PBL Traditional Classroom*

Score	*N*	$\overline{X}$	*SD*	*t*	*p*
PBLOnline Instruction	46	23.17	3.94	-3.581**	.001
PBLTraditional Classroom	46	25.69	2.69		

Note: **p<.01

3) The analysis of pretest and posttest of self-directed learning of the experimental group using online instruction by problem-based learning activities showed that posttest of learning achievement was different from pretest without significance. The average score of posttest for the sampling group in terms of self-directed learning increased only a little compared to pretest.

4) The comparative analysis of posttest of self-directed learning of experimental group students who used online instruction by problem-based learning activities and control group students who used problem-based learning activities in classroom showed that self-directed learning for both experimental group and control group was different without significance. It could be concluded that both kinds of problem-based learning activities yielded the same self-directed learning (as shown in Table 4).

Table 4: *The comparative analysis of posttest of self-directed learning Experimental Group and Control Group*

Score	*N*	$\overline{X}$	*SD*	*t*	*p*
PBLOnline Instruction	46	3.44	.30	.576	.566
PBLTraditional Classroom	46	3.47	.23		

5) The students' satisfaction towards the online instruction by problem-based learning activities on law and ethics in information technology lessons which was done by the students who completed the online instruction by problem-based learning activities showed that the students' satisfaction (the average score) towards the online instruction by problem-based learning activities on law and ethics in information technology lessons was at high level ($\overline{X}$ = 3.84, SD = .39)

5. CONCLUSIONS AND DISCUSSIONS

1. The development of online instruction by problem-based learning activities was done in a systematic and step-by-step manner because problem-based learning activities were new to be developed online. Therefore, it was important to develop the steps and procedure in the most appropriate level which was evaluated by the experts. The development of such activities complied with the research and development procedure by using information technology and new method (Chaicharoen, 2004) and student-based learning and constructivism. proposes that the developed instruction must provide learners with all information. This complied with Kaemanee (1998) who says systematic instruction depends not only on philosophy, theories, and concepts but also on various techniques to enhance the efficiency of the online instruction by problem-based learning activities. The developed online instruction passed the criteria set at 80/80. That means the developed online

instruction could be used as instruction activities. Sikhabundit (1995) says that media creation needs tryout and revision to pass the standards before it can be used with real population. The development of online instruction by problem-based learning activities followed such procedure and process; therefore, the efficiency passed the criteria.

2. The results from the development of online instruction by problem-based learning activities helped learners achieve the set objectives in terms of learning achievement. The experimental group who used the online instruction by problem-based learning activities showed higher learning achievement. This complies with Dejakup (2003) in that instruction which allows learners to think in a systematic way instead of remembering will help learners think analytically, synthesize and build bodies of knowledge to develop their own thinking skills. Besides, problem-based learning activities must be done individually, that is to say, the students will become active learners. They are different from the learners in traditional classroom (passive learners) in that passive learners wait for the contents. The activities or problems they are given are stimulus or what drives learners to learn. As for learning achievement, it complies with the research done by Saiseesod (2001) which studied the development of instruction system by internet for Rajabhat institute. The finding was that posttest of learning achievement by online lessons was higher than pretest at .05 level of significance. Horpaisarn (2001) studied the development of online lessons on general subjects to increase learning efficiency of the learners and found that the developed online lessons helped the experimental group achieve higher average posttest, self-directed learning and ethics than the control group. However, creativity and academic learning achievement of the experimental group was lower than the control group. After the lessons, the average score of self-directed learning, critical thinking, ethics and morals was higher than the pretest at the .05 level of significance.

3. According to the comparative study of learning achievement of the experimental group who used online instruction by problem-based learning activities and the control group who used problem-based learning activities in traditional classroom, it was found that they were different at the .01 level of significance. Problem-based learning activities in traditional classroom (the control group) showed higher average posttest score than online instruction by problem-based learning activities (the experimental group). If both instructions were considered in terms of overall score, it was found that both were not quite different. Both can be applied for instruction according to the appropriateness and the need. That means the developed online instruction by problem-based learning activities can replace and be used along with problem-based learning activities in traditional classroom. Chaicharoen (2004) suggests that the instruction which integrates media attribution, especially knowledge linked to other nodes in an unlimited way, will be a background for building new bodies of knowledge and broaden learners' thinking skills. Online instruction is open for learning and building bodies of knowledge because learners will think and participle as well as interact all the time (Dabbagh and Bannan-Ritland, 2005). This complies with Hopaisarn (2001) in that online instruction is as effective as traditional classroom but traditional classroom has limitations like schedule needs to be fixed, there should be not too many students and the location might be too far and too small for students. Online instruction solves the above-mentioned problems. Poosuwan and Namchaiprasert (2003) suggest that online instruction is helpful for students since they can choose when to learn. They are satisfied with independent and flexible learning style. Online instruction (e-Learning) reduces the time wasted for learning over 50% and reduces the cost up to 30-60%.

4. As for self-directed learning, the study results revealed that self-directed learning of the experimental group and the control group was not different. Both instructions yielded the same self-directed learning. The comparison of pretest and posttest of the experimental group who used online instruction by problem-based learning showed no significant difference. The average scores of posttest of both groups increased a little. Therefore, both instructions can be used according to the preparedness and the appropriateness in order to develop the desired students' characteristics. The reason

why self-directed learning scores were not different might be because online instruction needs independent study (Maneekul, 2004) and creativity (Chaicharoen, 2004). Online instruction requires that students becomes active learners who really participate in activities in order to broaden their knowledge. The duration of both instructions was 4 weeks and there were only 2 problems, resulting little changes in many characteristics. Watanawilai (2005) says that problem-based learning is considered as difficult and time-consuming. Learners get confused about what they analyze. The instructors must act as facilitators along with online instruction which emphasizes student-based learning (Ministry of Education, 2002). The steps for instruction start with the learners and in each step there are activities for students to search for knowledge from problems. This opens an opportunity for learning and they will love to learn by themselves through planning, working in groups and sharing knowledge. Online instruction by problem-based learning activities, therefore, requires students to be responsible for their activities. Knowles (1975) says that self-directed learning will show obviously when the learners have enthusiasm to learn in learning-friendly environment. Olgren (1998) also says that self-directed learning involves understanding in missions, learning procedure, responsibilities, duration and self-control in terms of learning.

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COLLABORATIVE PROJECT-BASED LEARNING AND BLENDED LEARNING ACCORDING TO THE PRINCIPLE OF EDUTAINMENT OF PARTICIPANTS IN THE APEC EDUTAINMENT EXCHANGE PROGRAM.

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ABSTRACT

The purpose of this study was to study collaborative project-based and blended learning according to the principle of edutainment of participants in the APEC edutainment exchange program. The samples were administrators, and students from APEC Learning Community Builders (ALCoB). The study drew its theoretical basis from project based learning, collaborative learning, blended learning, and research studies on edutainment. A research methodology of quantitative was used. The research design consisted of two steps: collecting data related to factors from literature review and interviewing administrators, and students from APEC Learning Community Builders (ALCoB). The study findings were as follows: The principle of edutainment consisted of 3 factors; learning, playing, and experiencing. Project-based learning approach uses a production model: first, students define the purpose for creating the end product and identify their audience. They research their topic, design their product, and create a plan for project management. Students then begin the project, resolve problems and issues that arise in production, and finish their product. Students may use or present the product they have created, and ideally are given time to reflect on and evaluate their work. And collaborative learning consisted of 6 stages; (1) Topics and teams (2) Planning (3) Action (4) Final Report Preparation (5) Presentation (6) Assessment/Evaluation. Blended learning is learning which combines online and face-to-face approaches. There have 6 criteria for design blended learning; learning, learners, maintenance, scalability, resources, and sustainability.

The results from interviewed ALCoB members showed that AEEP is a fantastic program for everybody who has joined this project because they have got an experienced learning with enjoyment. The factors has effected the successful of the collaborative project-based and blended learning according to the principle of edutainment was management. AEEP has a great leadership and team work to manage project since beginning, between, and after. They combined many patterns of learning as collaborative learning, and project-based learning. Students who join edutainment project should have team work skill, communication skill and creative thinking skill. When design experiential learning, the host must design based on principle of edutainment (learning, playing and experiencing).

Keywords

Blended Learning, Collaborative Learning, Edutainment, Project Based Learning.

1) INTRODUCTION

With the spread of Information Technology, the importance of education is increasing. The educational system changed to be student-centered. Thailand National Education Act of B.E. 2542 (1999) gave the policy that education shall be based on the principle that all learners are capable of learning and self-development, and are regarded as being most important. The teaching-learning process shall aim at enabling the learners to develop

themselves at their own pace and to the best of their potentiality.

Recently, the emerging instructional method of 'playing to learn' has been gaining interest from educators and researchers alike. The difficulties of the instructional method that are the balancing act between enjoyment and educational value.

Edutainment (also educational entertainment or entertainment-education) is a form of entertainment designed to educate as well as to amuse. (Wikipedia, 2008**)** The concept of edutainment or "education and entertainment" is not new in a learning environment and its purpose is to make the learning process more enjoyable.

2) BACKGROUND

As to the unexpected future society and rapid changes of technologies, world famous scholars and experts have deliberated ideal model of future society and suggested a way to overcome the challenges of future society. APEC Future Education Consortium is for developing a community model of future education, embodying a 'Total-supporting System,' and advancing research activities to meet the challenges of the IT-based future society with emphasizing value oriented society and considering the harmony between technologies and human being through implementing the EduPark. (YoungHwan Kim, 2006)

The APEC Future Education Forum under the leadership of South Korea has done various activities during the past 7 years to conceptualize the future education in the Asia Pacific region. As a result, the Forum has come up with AEEP (APEC Edutainment Exchange Program). AEEP is an educational project with 15 of the APEC member countries participating. It aims at international education exchange through online and offline activities. AEEP is being spread through 15 APEC nations including Thailand, Mexico, and Vietnam. It is developing into a global agenda.

AEEP is a new type of model for international education cooperation that integrates the latest IT technology along with field education. Need for a standardized and specialized program that can meet the requirements for globalization and can also strength the educational competitiveness following international exchange. Need for 'Edutainment' increasing as the new concept of education in the future.

The 6th International ALCoB Conference & The 1st ALCoB Edutainment Exchange Program launched on August 15 – 21, 2008 at Busan, Korea. The First Round of ALCoB Edutainment Exchange Program consisted of 64 participants from Korea, Peru, Mexico, China, Indonesia, Vietnam, Philippines, Malaysia, and Thailand.

3) PURPOSE

The purpose of this study was to study collaborative project-based and blended learning according to the principle of edutainment of participants in the APEC edutainment exchange program. The samples were administrators, and students from APEC Learning Community Builders (ALCoB).

4) REVIEW OF LITERATURE

4.1) Collaborative Learning

"Collaborative learning" is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. Collaborative learning activities vary widely, but most center on students' exploration or application of the course material, not simply the teacher's presentation or explication of it. (Smith and MacGregor, 1992)

There are many techniques of collaborative learning, group investigation (GI) is a one of them. The stages of GI are:

- Topics and teams: Topics for study are identified and students are placed in teams.
- Planning: Team members decide what sub-topics are to be investigated as well as the goals of their study and how the topics are to be studied.

- Action: Team members gather information, review it, analyze/evaluate it, and reach some conclusions.
- Final Report Preparation: Each team must prepare a summary activity. It may be in the form of a report, a briefing, etc., for the entire class. The teams, via representatives, must coordinate this activity.
- Presentation: Each team presents its findings to the class. Reduce lecture/telling by using role plays, panels, simulations, etc.
- Assessment/Evaluation: The purposes, methods, and means of evaluation can be negotiated collaboratively among the students and the instructor. This is usually a tremendous learning experience in itself.

4.2) Project- Based Learning

Project-based learning (PBL) is a model for classroom activity that shifts away from the classroom practices of short, isolated, teacher-centered lessons and instead emphasizes learning activities that are long-term, interdisciplinary, student-centered, and integrated with real world issues and practices. One immediate benefit of practicing PBL is the unique way that it can motivate students by engaging them in their own learning. PBL provides opportunities for students to pursue their own interests and questions and make decisions about how they will find answers and solve problems.

Project-based learning typically begins with an end product or "artifact" in mind, the production of which requires specific content knowledge or skills and typically raises one or more problems which students must solve. Projects vary widely in scope and time frame, and end products vary widely in level of technology used and sophistication. The project-based learning approach uses a production model: First, students define the purpose for creating the end product and identify their audience. They research their topic, design their product, and create a plan for project management. Students then begin the project, resolve problems and issues that arise in production, and finish their product. Students may use or present the product they have created, and ideally are given time to reflect on and evaluate their work. The entire process is meant to be authentic, mirroring real world production activities and utilizing students' own ideas and approaches to accomplish the tasks at hand. Though the end product is the driving force in project-based learning, it is the content knowledge and skills acquired during the production process that are important to the success of the approach.

4.3) Blended Learning

Blended Learning is defined as a learning solution, which includes face-to-face, live e-Learning and self-paced learning. At times, blended learning is also used to describe a combination of varied delivery media (ILT and e-Learning) and a mix of technologies such as, e-Learning, electronic performance support, and knowledge management practices. (Valiathan, 2002)

Blended Learning consisted of 2 groups: offline and online. And each group split in to 6 groups.
Six *offline* component groups:
1. Workplace learning
2. Face-to-face tutoring, coaching or mentoring
3. Classroom
4. Distributable print media
5. Distributable electronic media
6. Broadcast media

Six *online* component groups:
1. Online learning content
2. E-tutoring, e-coaching or e-mentoring
3. Online collaborative learning
4. Online knowledge management
5. The web
6. Mobile learning

4.4) APEC Edutainment Exchange Program

AEEP divided into 3 phrases as following:

Pre-Activities (Online)

- Online Application

The participants are requested to fill out the personal- and self-introduction sheets and to select the project that they are interested in. Such data will be used to form multinational groups. All the participants are thus requested to fill out the sheets in a creative way.

- Online lecture and Evaluation

All the participants are requested to obtain copies of the basic lectures, not only those regarding the languages spoken and the etiquettes observed in each economy but also

those regarding information concerning APEC, so they can participate in the program. Thereafter, they are required to take an online test regarding APEC.

- Team-building

When the participants have completed the test, multinational groups or teams will be formed based on the data obtained about the participants. Each team will choose a name and a slogan and will clarify the roles of its members: the team leader, plan maker, secretary, interviewer, and operator.

- Submission of Project Proposals and Preparations for Experiential Learning

Each team is requested to propose a project activity plan based on the theme that will be announced by IACE. After searching for data that are relevant to the project and exchanging ideas among themselves, each team, through its leader, should upload its proposal. Such project proposals will serve as sources of primary data for the preparation of the experiential learning activities.

Experiential Learning Activities (Offline)

- Opening Ceremony and Orientation

The opening ceremony will be held on the first day of the program, and the participants will be provided therein with general information about the program. Each team will also present its project proposal.

- Experiential learning activity 1

On the second day, all the participants will take part in experiential learning activities as teams, based on their respective team projects.

- Interim report and Feedback

All the teams are requested to submit their respective interim reports, and feedback regarding such reports will be given to them by ALCoB-T (APEC Learning Community Builders-Teachers). Such feedback should be utilized to improve the team projects.

- Experiential learning activity 2

Each team will participate in the activity, taking ALCoB-T's feedback into account.

- Prepare for presentation on outcomes of the project

The execution of the team projects through experiential learning activities should be?summarized in a final report. Each team is also requested to prepare to present such final reports at the 6th International ALCoB Conference.

Post Activities (Offline & Online)

- Presentation of the Outcomes of the Team Projects at the 6th International ALCoB Conference (Offline)

The teams will present their respective projects at the 6th International ALCoB Conference. The projects will then be evaluated, as presented, in terms of their expressiveness, concreteness, and creativity. Afterwards, the "Best Team Project" will be announced and awarded.

- Team Activities (Online)

The activities of the 1st AEEP participants will be continually promoted in the online community that was established autonomously. Such online community will serve as a venue for the participants to connect with the participants from other economies.

- Proposal of Follow-up Activities and Preparations for the 2nd AEEP

The participants may propose follow-up activities on the online community. These may be reflected in the next program.

5) METHODOLOGY

A research methodology of quantitative was used. The research design consisted of two steps: 1. collecting data related to factors from literature review and 2. interviewing administrators, and students from APEC Learning Community Builders (ALCoB).

The first step was collected data from literature review, then did content analysis. And the second step was structured-interview. The target of interview was administrators and students who joined The 1st ALCoB Edutainment Exchange Program launched on August 15 – 21, 2008 at Busan, Korea.

The questions were following: 1) "What are your opinions about the APEC Edutainment Exchange Program?", 2) "What do you think about the procedure of the APEC Edutainment Exchange Program?", 3) "What are your opinions about the activities in the APEC Edutainment Exchange Program? And any suggestions", 4) "If The APEC Edutainment Exchange Program launch in your country, what do you think about it? Do they need to

change any activities for suitable with your country's contexts or not?"

6) Results

The findings from reviewed literature were following: 1) The principle of edutainment consisted of 3 factors; learning, playing, and experiencing. , 2) Project-based learning approach uses a production model: first, students define the purpose for creating the end product and identify their audience. They research their topic, design their product, and create a plan for project management. Students then begin the project, resolve problems and issues that arise in production, and finish their product. Students may use or present the product they have created, and ideally are given time to reflect on and evaluate their work., 3) Collaborative learning consisted of 6 stages; (1) Topics and teams (2) Planning (3) Action (4) Final Report Preparation (5) Presentation (6) Assessment/Evaluation., 4) Blended learning is learning which combines online and face-to-face approaches. There have 6 criteria for design blended learning; learning, learners, maintenance, scalability, resources, and sustainability.

The results from interviewed 8 persons who participated in The 1st ALCoB Edutainment Exchange Program launched on August 15 – 21, 2008 at Busan, Korea found that AEEP is a fantastic program for everybody who joined this project because they got an experienced learning with enjoyment.

The first research question asked "What are your opinions about the APEC Edutainment Exchange Program?" Student from Indonesia responded "It's very a good program for me as a student. Because, from this program, I can learn anything which aren't studied in my classroom, like experiential learning, leadership." And student from Mexico said "This program is so awesome because have the opportunity to share with students from other countries about your life, your school, traditions, and gives you the chance to make friends and share information experiences, I really loved this program." It showed that AEEP was an interesting project because it's an international project.

The second research question asked "What do you think about the procedure of the APEC Edutainment Exchange Program?" Student from Vietnam answered "I think the procedure of the AEEP is quite perfect. We will be safe and secure during the program. We can also join the good-quality activities in the program." In this question was pointed out the procedure was well managed. They have teamwork and wonderful leadership although student from Korea said "It was too tight for participants. During both of online activity and offline activity, our young high school students had to try hard for everything. Although I pointed the problems in AEEP, I love AEEP and everything about it because the time just passed. AEEP is the best program for every participant." It can be said that AEEP will keep in mind of all participants.

The third question asked "What are your opinions about the activities in the APEC Edutainment Exchange Program?" Students from Thailand said "I like an experiential learning but making presentation waste time so much." and México's member said ". About the activities over there I think every activity was so good, I know that we have to do a lot of work but everything was so funny." So one of the principle of designing activities is to connect deeply with student's interests and passions although activity is so hard or spend a long time but student's attention retain and joyful.

The last question asked "If The APEC Edutainment Exchange Program launch in your country, what do you think about it? Do they need to change any activities for suitable with your country's contexts or not?" All of the answer have showed that AEEP can be launched in their country by adjust in field of tradition, tourism and education.

7) Conclusions.

The APEC Edutainment Exchange Program can be the pilot project for designing edutainment program in Thailand by using collaborative learning, project-based learning and blended learning according to principle of edutainment.

The research results show most important factors to enhance successful of AEEP found to be the management. AEEP has a great leadership and team work to manage project since beginning, between, and after. They combined many patterns of learning as collaborative learning, and project-based learning. Students who join edutainment project should have team work skill, communication skill and creative thinking skill. Online activities can be a tool to find new friends and pre-survey for self interest of each student in order to indentify topics for study and teamwork. But the host must concern about time-zone of participants to join via online. When design experiential learning, host must design based on principle of edutainment (learning, playing and experiencing). The challenge of the project was one of the attractions. Seymour Papert has found that learners become deeply engaged by “hard fun” – in other words, learners don’t mind activities that are hard as long as the activities connect deeply with their interests and passions (Papert, 1993). So I think it can be possible that edutainment project will launch successful in Thailand because we have a good example project and we can apply suitable activities in context of Thailand.

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Designing Learning Objects for Teaching and Learning Mathematics for Students in Secondary School

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1) Introduction

In the teaching and learning of mathematics for students in secondary schools, it has been found that geometry transformation is one of the concepts that learners find hardest to understand, and has been added to the Basic National Education Curriculum 2001. The media currently used in the teaching and learning of mathematics are mostly in the form of textbooks or handouts which are limited in their visual presentation of the concepts of translation, light reflection and rotation. (The Basic National Education Curriculum, 2001, 2002 and Nomsri Kate, 1992, pp. 55)

Learning objects are the new digital media supported by multimedia technology that makes use of still pictures, 3-D pictures, moving objects, texts and sounds in the presentation of information. The focus is on learners' participation in entertaining learning activities in the form of simulations, games or experiments. These activities aim at creating enthusiasm and enjoyment while learners take part in activities that promote learning through the use of media (Atkins & Jones, 2004). This corresponds with Thanomporn Laohajaratsang (2007, pps. 51-52) defining a learning object as a learning module in a digital format which is self-contained. Each module comprises objectives and content that present one or more integrated concept, with interactive exercises and/or tests to assess the learners' learning results. Learning objects focus on simulation, games, and/or exploration and discovery that are conducive to meaningful learning.

For this reason, it is our belief that if learning objects are used as learning visual aids for the teaching-learning of geometry transformation, learners will be able to better understand the content and practice their mathematical skills through their participation in learning object activities. This is because such media employs multimedia technology that uses still pictures, 3-D pictures, moving objects, texts and sounds in the presentation of information. This will enable learners to visualize and analyze the process in creating the pictures more easily. (Atkin, 2005)

2) Objectives of the Study

To design quality geometry transformation learning objects for the teaching-learning of mathematics for students in secondary school.

3) Scope of the Study

This study focuses on the design of learning objects for the teaching-learning of mathematics, with emphasis on the study of learning object quality in terms of the teaching-learning design, screen and multimedia design, and learning object media application. However, this study did not focus on the effect of integrating learning object media in relation to the scores of learners in class assessments.

4) Concepts Related to Learning objects

4.1) Special Features of Learning Objects

Thanomporn Laohajaratsang (2007, pps. 52-53) described the 6 features of learning objects as: 1. Reusability, 2. Sharability, 3. Interoperability, 4. Bite-sized/Granularity, 5. Self-containment, and 6. Conduciveness to

learning. This study will focus merely features 4-6. (For the details of each feature, please study the referenced paper.)

4.2) Importance of Learning Object Design

In designing learning objects, emphasis should be placed on designs that are conducive to meaningful learning rather than designs that aim merely at presentation of objects. Designs should be in the form of games, simulations, exploration and discovery as these are the formats that best promote meaningful learning. These types of design also encourage active learning on the learners' part and support the "Leaning is Fun" concept. With this method of learning, learners are assigned activities such as problem-solving in the simulated roles and situations, thus making the learning experience both entertaining and educational. (Thanomporn Laohajaratsang, 2007)

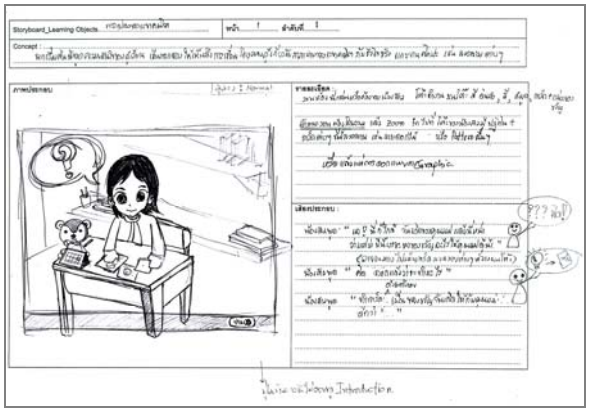

Figure 1: A Sample of Designing Learning Object

5) Research Procedures

5.1) Sample Group

The sample group of this study consisted of 43 students in Mattayom 2 of Chiang Mai University Demonstration School in their first semester, academic year 2008.

5.2) Research and Data Collection Instruments

The research instruments used were the geometry transformation learning objects designed in the form of games. Learners were to work on activities to look for methods to create pictures that would appear as a result of geometry transformation.

The instruments used in data collection were the questionnaires on the use of geometry transformation learning objects covering the following areas: screen and multimedia design, teaching-learning design, content design, and learning object application.

6) The instructional design of geometry transformation learning objects consists of 4 stages:

6.1) Preparation Stage

To study the content of geometry transformation and research learning object media designing.

6.2) Design Stage

To analyze the content to set main topics and types of learning object activities, create storyboards, and have content experts and media design experts check the storyboards.

6.3) Development Stage

To construct learning objects as specified in the storyboards, have content experts and media design experts check it before modifications are made as suggested.

6.4) Modification Stage

To test the learning objects on the sample group to collect data in terms of media quality, analyze the results and draw conclusions. The data is presented in the form of tables as well as a written report. Finally, the learning object users' handbook is prepared.

Figure 2: Samples of Screens from Learning Objects on Geometry Transformation

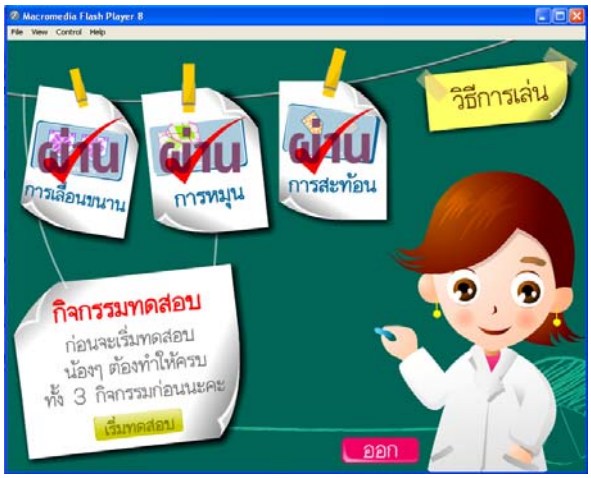

Figure 3: Samples of Screens from Learning Objects on Geometry Transformation

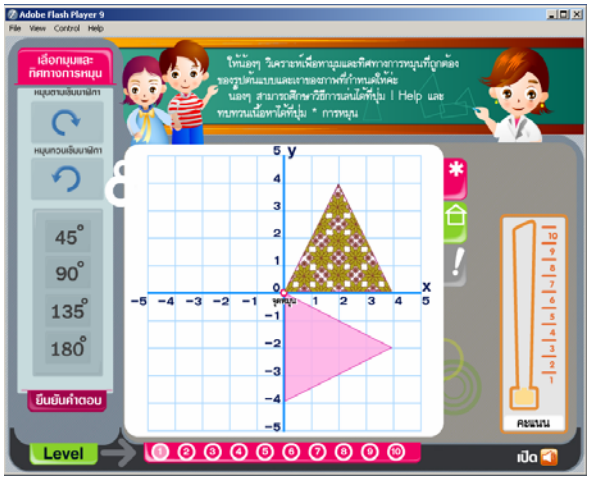

Figure 4: Samples of Screens from Learning Objects on Geometry Transformation

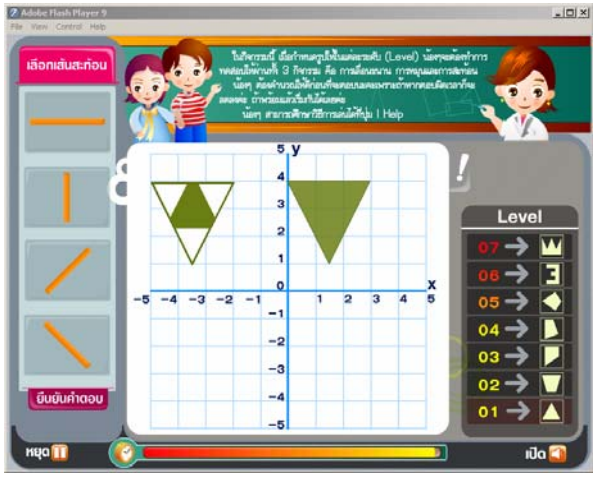

Figure 5: Samples of Screens from Learning Objects on Geometry Transformation

7) Data Collection

The data collection for this study employed the following steps: 1. Introduce the steps of learning object application; 2. Explain the questionnaires to be used after the trial use; 3. Let the learners try out the learning objects using 1 computer/1 learner; 4. After the learners have finished trying out the learning objects, they are required to fill out the learning object application questionnaires.

8) Statistics and Data Analysis

The data collected in this study was analyzed using basic statistical values namely Mean ($\bar{x}$) and standard deviation (S.D.) and presented in the form of tables and a written report.

9) Research Results and Discussion

The study and test of the learning objects found that in terms of the teaching-learning and content design, most learners strongly agreed that the introduction of moving and graphic pictures as part of the learning objects was seen as aiding the learning. Furthermore, the format of activities and their presentation of concepts through the learning objects' graphics and moving pictures helped them to visualize and understand the reflection and rotation concepts more easily. Also, the learners had control and a chance to take part in activities using learning objects, which correlates with Haughey & Muirhead (2005, pps. 1-6) which stated that a learning object design that attracts learners'

attention and stimulates learners is often in the form of simulation, games, act of discovery like in a scientific process, or investigation based on given situations. It is designed by integrating multimedia in interactive activities which enable learners to have control of their own learning through tackling learning object activities.

Regarding the screen and multimedia design, most learners strongly agreed that the colors and font sizes used in the learning object design were clear and easy to read. The learning objects were constructed following the principles of electronic learning media design which state that a good screen design should above all take into consideration the readability for learners, so the emphasis was on contrast of font and background colors such as a black font on a white background. The font size was chosen to suit the age and learning style of learners. (Thanomporn Laohajaratsang, 2002) In addition, the researcher also followed the learning object design concepts of Atkins & Jones (2004, pps. 16-20) which state that the application of graphic and moving pictures in a design not only attracts learners' attention, but also helps present abstract concepts in a concrete form so as to make learners understand more easily.

As for the application of learning object media, most learners strongly agreed that learning through learning object media in the form of games was entertaining and helped enforce their geometry skills. This corresponds with the study done by Clarke & Gronn (2004) which stated that the application of learning objects in the teaching and learning of mathematics helped the learners to understand the subject matter more clearly through novel presentation; making the learning of mathematics interesting and fun as well as easier to understand. The learning object multimedia helps attract the learners' attention through games and allows them to take control of their learning according to their individual ability. This corresponds to Thanomporn Laohajaratsang (2007, pps. 55-58) which stated that the design media in the form of learning objects must be conducive to meaningful learning rather than a mere presentation of objects. Designs should be in the form of games, simulation, discovery and exploration as these are considered conducive to meaningful learning. They also support the concept of active learning.

In addition, the learners also made some recommendations regarding the creation of learning objects. They felt that the learning objects created and usability-tested were interesting and new, and that more learning objects should be developed for other mathematical topics such as factorization, surface area and volume calculation, etc. Also, more activities and more diverse levels of difficulty of learning objects should be developed such as problem solving type questions. From the mathematics teachers' interviews, suggestions were made regarding more diverse types of supplementary activities such as the creation of simulating learning objects that require learners to apply their knowledge of mathematics to solve mathematical problems as well as everyday problems they may face in the real world.

10) Recommendations

1) More diverse learning objects should be developed so that learners can practice their skills. For example, situations or mathematical problems that are set for the students to practice their mathematical problem-solving skills, or scientific experiment activities which are designed for them to practice their scientific skills, etc.

2) More learning objects should be created to cover other mathematical topics such as a calculation of area size, percentage and data collection, etc.

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Borderless eLearning: HITS Model for Web 2.0

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ABSTRACT

Use of eLearning is continuously expanding with the influences of Web 2.0 technologies. The objective of this paper is to detail the ways to successfully organize excellent eLearning projects based on existing Web 2.0 technologies. This paper proposes HITS model for borderless eLearning based on four main aspects- Human, Instruction, Technology and Social. The major argument for this model is that the barriers of eLearning can be removed by proper usage of educational technology components available in Web 2.0. The proposed HITS model for borderless eLearning can play a significant role in improving effectiveness of eLearning projects. The main theme of HITS model is to explain its usage with Web 2.0 for enhancing borderless eLearning.

Keywords: eLearning, Educational Technology, HITS, Human, Instruction, Technology, Social, Net works, Social networking, Web 2.0

"Universities not yet on Education 2.0 will miss out when Education 3.0 hits"
Andrew Lim, Sun's APAC director
(Sambandaraksa, 2008)

1) INTRODUCTION

The main objective of this paper is to propose a borderless eLearning implementation model based on Web 2.0 technologies. The major question needs to be investigated as to how to break down eLearning barriers by proper usage of educational technology components available in Web 2.0. In theory, many eLearning advantages has been recorded however, in practice many eLearning barriers has also been reported. Thus, it is crucial to form a model to setup a guideline for eLearning implementation.

The Web 2.0 phenomenon has increased the eLearning efficiencies. Web 2.0 can heavily influence eLearning as it is all about sharing, collaboration, services, speed, multitasking, multimedia, community, mobility, open content, open technology, open source and contributing information to the Net (Sambandaraksa, 2008). Earlier versions of Web 1.0 represented a passive style of gathering knowledge. In another words, it used passive one-way communication rather than the interactive ways of communication.

The structure of this current paper is based on research questions, relevant literature review research methodology and research result. The research question of this paper is 'How do Web 2.0 based solutions reduce eLearning barriers?' The literature review will focus on eLearning and Web 2.0 including Web 2.0 concepts for education and barriers for eLearning. The research result will detail about how Web 2.0 components should be shaped for borderless eLearning based on the proposed model- **H**uman, **I**nstruction, **T**echnology and **S**ocial (HITS).

2) ELEARNING AND WEB 2.0

This section has been organized to investigate an answer to "How do Web 2.0 potentials reduce eLearning barriers?" The comprehensive information for this discussion is contained in the first sub-section which details the framework of Web 2.0 for education. The second sub-section contains information about potential barriers for eLearning.

2.1 Web 2.0 concepts for education

Web 2.0 has been marked as an important digital tools for institutions in modern society (Virkus, 2008). Many reasons for these are: the potentials of Web 2.0 that advocate constructivist approaches to education including the support for positive socializing based on learning perspectives. The Web 2.0 technologies can influence the way in which students learn, access information and communicate with each other. The system based on Web 2.0 is open for effective information retrieval (Mohan, Choi, & Min, 2008; Virkus, 2008). This has resulted in a growing number of eLearning 2.0 applications. Web 2.0 is providing the power of next-generation to improve students' communication in a virtual learning environment.

The ubiquitous existent Web 2.0 for education provides new functions and applications that can be used for online learning. From huge numbers of Web 2.0 components for education, it is possible to put them into at least two core formats based on major services: collaborative knowledge and collective intelligence (Kesim & Agaoglu, 2007; The New Media Consortium & the EDUCAUSE Learning Initiative, 2008).

***Collaborative Knowledge*:** This is one of the major shifts which have transformed the Web 1.0 to become Web 2.0. The domain of Web 1.0 is "read only web" but Web 2.0 is "read-write web" which encourage users to add, share, rate, and adjust information. The online contents come from co-configuration, co-creation and co-design of a particular learning space (Wikipedia, 2008). While in the past only one lecturer provided the content but today many lecturers provide content for a larger population. However, it is crucial to state that information is not equal to knowledge (Hogg, 2008). Examples of this kind of wider collaboration are reflected in the wikis, wikipedia, pbwiki, and wikispace.

***Collective Intelligence*:** In the sense of education and media, this is one of indispensable concepts which present a new creative form of communication that transfers 'Directories or Taxonomy' to be 'Tagging or Folksonomy'. Examples of this group include delico.us, a social book marking and Google Reader.

In order to demonstrate the impact of Web 2.0 for education, the applications for enhancing students' or professors' productivity have been categorized into five groups based on school situations and activities (Online Education Database, 2008).

i. Education-Specific: Education specific tools are the online applications that are designed to simulate teachers and students tasks, such as a grade book, learning management systems and a classroom organizer. This group includes applications like Engrade, Moodle, Chalksite, Schoopy, Gradefix, CollegeRuled, Tuggle and TeamCowboy for example.

ii. Calendars, Task lists, Planning: These tools are online applications that assist task management as needed, calendar, notification of due dates and so on. This group includes technologies, such as Google Calendar, 30boxes, Neptune, MyTicklerFile, Zoho Projects and MyStickies. .

iii. Research and Documentation Tools: These online tools provide office productivity suites such as word processor, spreadsheets and various research tools. This group includes Google Docs and Spreadsheets, Bloglines, Google Reader and Del.icio.us for example.

iv. Diagramming, Presentation, and Other Visual Tools: These online diagrams and other visual aids often reduce the time spend on the research process, and sometimes, provide facilities for sparking untapped ideas. This group includes applications such as Mindomo, Gliffy, Thumbstacks and Empressr.

v. Miscellaneous Productivity Tools: This group of online applications is provided for general productivity purposes. These applications enable better communication via social networking. This group includes GMail, Meebo, Campfire and Zoho Creator.

Thus, it is very clear that many Web 2.0 applications support a wide range of online educational purposes. The advantages of Web 2.0 for education increase academic productivities very effectively.

2.2 Barriers to eLearning

Possible imbalance between the eLearning content, its effective management and the eLearners' capacity may create a few barriers to eLearning. This paper will cite a list of possible barriers to eLearning.

The barriers to eLearning in institutions included faculty compensation, blended learning expertise, legal issues, evaluation, social interaction and its quality, organizational change barrier, student support services, access, threats created by technology and administrative structure (CAPDM, 2008). These barriers to eLearning do not just occur in the schools or colleges but also in the industrial sector. A recent Industry Engagement Project of the national training system's eLearning strategy conducted by the Australian Flexible Learning Framework found that at the organizational level, the following barriers to implementation existed (Higgins & Keightley, 2007) p. 15:

- making the case for eLearning
- persuading management to invest in eLearning
- equipping learners with the skills to participate in eLearning
- engaging learners in using eLearning and linking this to employability
- measuring the effectiveness of eLearning outcomes and linking them with business targets
- ensuring there is the technical capability to deliver eLearning and there is no difficulty for learners to access the material
- overcoming workplace constraints that can impact eLearning, such as supervisors not providing sufficient time for the learning to occur
- overcoming negative perceptions of eLearning for example, that it is impersonal, or not as good as classroom training, or that the medium is seen as a threat.

On the other hand, in the industrial sector at the employee level there are several predictors of barriers in using eLearning (Higgins & Keightley, 2007):

- Self efficacy- lack of behavioral skills, such as taking responsibility for learning and time management
- Computer competence- insufficient computer and Internet skills and fear of exposure in a new environment
- Organizational- lack of proper policy and planning and supportive culture for example, time for training, incentives, resources.

Consequently, the most frequent and influential barriers encountered is shortage of good infrastructure, technology expertise and acceptance of organizational change (CAPDM, 2008). However, barriers to eLearning can be minimized if there is strong support from leaders, agreement of organizational rules and having positive thinking toward eLearning (CAPDM, 2008). Web 2.0 with open source reduces one of the strongest barrier to eLearning, and that is, 'the investment' in the applications which in turn can provide more options for eLearning implementation (Nigol, 2008). The only need to implement is the creativity and imagination of the stake-holders (Nigol, 2008).

3) HITS MODEL

There are many models that promote best practice for eLearning. The practical guide to eLearning for industry, for example, includes ten parts of consideration: understanding eLearning, deciding about eLearning, preparing for eLearning, funding eLearning, managing eLearning, designing eLearning, producing eLearning, testing and evaluation of eLearning, delivering eLearning and future trends (Higgins & Keightley, 2007). In order to complete the practical guide to eLearning for industry, users need to have a clear understanding of eLearning at a primary stage then follow the other steps. The practical guide to eLearning for industry tends to focus on processes of eLearning production, or in another words, the courseware. Despite, an effective production of eLearning, a comprehensive support of technology used on the Internet needs to be consider (Virkus, 2008). Moreover, the key role of eLearning need to emphasis active learning. The active creation, communication and participation means that the people be involved in every online learning activity (Downes,

2008). The emergence of Web 2.0 is believed as a social revolution rather than a technological revolution (Downes, 2008). The cultures and social trend influence the life-styles and drive people to participate on the Internet activities. These days, the 'blended' models of eLearning might be claimed as the most successful. This is because of the combination of *high-tech* that creates convenient online platforms and the *high-touch* which increases the mental support face-to-face access to mentors plus other learning support services (Aged and Community Services Australia, 2008).

Thus, referring to the information from lists of barriers to eLearning and discussion of existing model of eLearning implementation, the researcher would like to propose a new HITS model for borderless eLearning. This model is based on four main aspects- **H**uman, **I**nstruction, **T**echnology and **S**ocial. The 'HITS' model is a simple model which aims to present four main pillars that the organizers need to consider when creating eLearning solutions (see Figure 1).

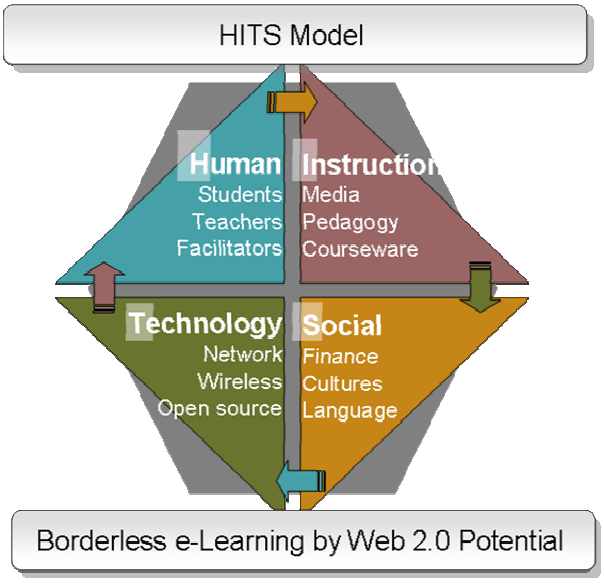

Figure 1: HITS Model for Borderless eLearning

The HITS model for borderless eLearning based on Web 2.0 is a dynamic model. Each pillar of HITS model has been grouped to assist institutions and organizations to tailor their own eLearning. In this cyclic model all elements are equal in terms of their significance. The researcher will describe "Human" as the first item since eLearning is for the people or human beings. The details and functions of each pillar of HITS model are as follows.

Human

'Human' in the HITS model mainly refers to students and teachers. It is crucial to include facilitators who assist both students and teachers to perform online learning tasks. The facilitators could be administrators, monitors, web developer or others who are involved in eLearning. The expect behaviors of both online students and teachers are: good communication skills, good netiquettes, positive thinking toward online learning activity and adequate computer literacy.

The important tasks of online professors in Web 2.0 enabled learning environment are: promote a sense of community within the student group, manage the community, maintain motivation, give prompt feedback, support students as per their needs, offer options and advice to enable learners to complete the tasks (Dain M, Dincic D, & Wheeler S, 2007). The online lecturers should make an effort to facilitate interaction and collaborative experience (Dain M et al., 2007). Moreover, online lecturer have respect for diversity such as ability, age, race and different learning styles (Dain M et al., 2007). The important character of online students is to participate within a community, interact with other learners, engage with the courseware and actively communicate online (Dain M et al., 2007).

Instruction

'Instruction' in the HITS model mainly refers to media, pedagogy and courseware. The Web 2.0 has invented more media application to facilitate learning. For example, video is number one emerging technology which has become mainstream for teaching, learning, or creating new content (The New Media Consortium & the EDUCAUSE Learning Initiative, 2008). The instructional design might be the most important influence on pedagogy and courseware. The courseware should be students centered and include Web 2.0 experiences such as tasks which involve collaboration, multimedia responses, applying key concepts and skills (Dain M et al., 2007). Poor eLearning courseware includes, for

example, many talks then tests. Thus, it should care more about how to make understandable content rather then amount of content (Moore, 2008). Some pitfall that could be avoid include: push learner to work harder than necessary, dull and formal presentations, limit humor, conflicts, and above all, lack of creativity (Moore, 2008). These factors makes eLearning harder and impacts learners' motivation as well as increase production costs (Moore, 2008).

Technology

'Technology' in the HITS model mainly refers to a new wave of networks, wireless and open source. The technology enhances the growth of software, hardware, devices and capacity of networks. The Web 2.0 technology drives online learning to be an active learning by providing many tools such as tracking, tagging, mesh-up and other intelligent solutions. With the frantic growth in technologies there is no doubt that mobile campus and wireless university will be ubiquitous by the year 2015 (Sharples, 2006; UNESCO Bangkok, 2005). The new types of wired and wireless network have been continuously developing to offer more comfortable options for receiving information and rich media, any where, any time and any proper devices (Cobcroft, Towers, Smith, & Bruns, 2006).

Social

'Social' in the HITS model mainly refers to effect of Web 2.0 that minimizes issues of finance, cultures and languages. Web 2.0 creates a better opportunity for eLearning since it is open source. It allows and promotes open courseware and repositioning of contents. In addition, social networking phenomenal has reformed online culture and introduced new concepts of sharable content systems to reduce investment in eLearning. The limitations of non-English languages have also been reduced because of the international translator components. As a result learning a second language using Web 2.0 applications has become more common on the web. The explicable and creative design, graphics, icons and languages used in a courseware support people from different background to be able easily interact with the interface (Moore, 2008).

4) Conclusion

In conclusion, the proposed HITS model describes how Web 2.0 technologies can enhance borderless eLearning. This paper has revealed that Web 2.0 potential allows better eLearning implementations. The existing barriers to eLearning can be decreased if implemented with Web 2.0 for the next learning generation. It might be claimed that HITS model cover all important aspects and the need for instituting a shift from the existing eLearning environment to Web 2.0 format. The appropriate usages of Web 2.0 will make eLearning more effective, flexible, intelligent, and above, all ready to adapt to the next generation of Web 3.0 technologies.

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I POD-BASED LEARNING SYSTEM ON "ADVERTISING DESIGN" FOR COMMUNICATION ART-DIGITAL MEDIA STUDENTS AT SIAM TECHNOLOGY COLLEGE

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ABSTRACT

This paper studies the possibility and effectiveness of developing mobile lessons on i-pod. These lessons can virtually be assessed from any place and anytime at the convenience of learners.

The lessons on i-pod based learning system have an extremely high efficiency of learning process of 80.07/80.44. The pre-test and post-test are 19.33 and 80.44 respectively which transparently demonstrates high level of effectiveness. In addition, it was found that I Pod-based Learning System can be a tool to increase the learning effectiveness to 61.11 and the learners' satisfaction to a higher level of 4.22. The results clearly show that i-pod based learning system is a very effective and satisfying tool for learners.

Keywords
i-pod/ i-pod-based Learning System/ Efficiency/ Effectiveness / Satisfaction

1) INTRODUCTION

Nowadays many learning systems and techniques have been developed continuously. All of these aim at improving effectiveness in learning and suitability to the learners. Taking advantage of new science and technology, learning media has become more and more attractive to learners whose learning ideologies vary significantly at all levels of education. Furthermore, convenience and accessibility are also emphasized. Today learners have many choices of learning medium and products especially with the rise of the popular e-learning. However, this paper aims at enabling learners to learn at any place and anytime of their choice, not only in front of computer. It aims at utilizing I-pod, currently extremely popular for entertainment especially among teenagers and young adults, as a tool for a learning media. With its mobility, learners can truly access lessons at any time and any place as they prefer.

2) RESEARCH METHODOLOGY

This paper aims at studying the effectiveness of electronic lesson on i-pod which will be called 'i-pod based learning system' from this point on. Similarly to the same idea of other e-Learning, i-pod based learning system offers learners lessons and accessibility to knowledge outside classrooms. Learners can study at any time of their convenience and in the environments they prefer. I-pod based learning system has a possible advantage over internet e-learning in that the lessons can be accessed virtually any place of learners' choice as well as time.

To study the effectiveness of the i-pod learning system, 'Advertising Design', which is a subject in the field of Communication Art-Digital Media in Faculty of Art, Siam Technology College, is chosen. An electronic lesson is developed for the i-pod learning system for 3 chapters, namely 'Advertising Types', 'Advertising Graphic' and 'Advertising Text'.

Selected students of the mentioned field are divided into 2 groups of 30 members. The

first group, the control group, is taught in a traditional method of classroom while the other group learns the same chapters via i-pod learning system. Resultant learning outcome of these groups are compared to determine the suitability of the i-pod based learning system.

3) THE I-POD LEARNING SYSTEM

Figures 1 – 3 depicts the examples of presentation for lessons using the i-pod learning system. To achieve this presentation, the research uses the following 3 commercial computer software: Pinnacle Studio Plus 10, Sound Forge 6.0 and Adobe Photoshop 7.0.

Figure 1: Chapter 1 Advertising types

Figure 2: Content of Advertising types

Figure 3: Content of Advertising Graphic

Figure 4 illustrates the usage of the i-pod learning system which is extremely easy to access at any time, any place and with anyone as the learner would prefer.

Figure 4: The I-Pod Learning System

4) RESULTS AND DISCUSSIONS

4.1) Efficiency of lessons on I Pod-based Learning System

Table 1 shows that the efficiency of learning in chapter 1 is 80.7, chapter 2 is 80.3 and chapter 3 is 81.3, giving the efficiency on learning process (E_1) of 80.07. Table 2 shows that the post test results indicate the effectiveness (E_2) of 80.44. Combining these 2 results, these lessons on i-pod learning system has an extremely efficiency of 80.07/80.44.

Table 1: The efficiency of I Pod-based Learning System on Advertising Design on learning process from Chapter 1-3

No. of Chapter	Formative Scores	Efficiency
1	242	80.7
2	241	80.3
3	244	81.3
E1		80.7

Table 2**:** The efficiency of I Pod-based Learning System on Advertising Design after learning process from Chapter 1-3

Items	Students	Full Marks	Total Marks	Effectiveness
Post test (E2)	30	30	746	**80.4**

4.2) Learning effectiveness

Table 3 shows that, for the classroom-based group, the efficiency before the learning process (E_{pre}) is 19.22 and that after the learning process (E_{post}) is 78.44. The difference in these 2 values suggests that the learning effectiveness of classroom-based lessons is 59.22.

This table also shows that, for group that use the i-pod based learning system, the efficiency before the learning process (E_{pre}) is 19.33 and that after the learning process (E_{post}) is 80.44. The difference in these 2 values suggests that the learning effectiveness of i-pod based learning system lessons is 61.11, which is slightly higher that that of the classroom-based lessons.

Table 3: Learning effectiveness

sample group	Items	Total	Efficiency	Learning Effectiveness
group 1	Per-test ($\mathbf{E_{pre}}$)	173	19.22	59.22
	Post-test ($\mathbf{E_{post}}$)	706	78.44	
group 2	Per-test ($\mathbf{E_{pre}}$)	174	19.33	61.11
	Post-test ($\mathbf{E_{post}}$)	724	80.44	

Notes: Group 1 is classroom-based whereas group 2 is i-pod based learning system

These values of learning effectiveness clearly demonstrate the extremely high quality of the i-pod based learning system.

4.3) Learners' satisfaction

Table 4 shows the outcome of a questionnaire regarding the satisfaction of learners on i-pod based learning system. The result clearly indicates high level of satisfaction.

Table 4: Learners' satisfaction

Satisfaction Items	Mean	Level of Satisfaction
Text size	4.27	Much
Suitability of color text	4.23	Much
Suitability of sound	4.20	Much
Suitability of content	4.13	Much
Suitability of Picture	4.03	Much
Convenience of learning	4.60	Very Much
Lesson length	4.17	Much
Color used in lessons	4.20	Much
Attractiveness	4.17	Much
Total	**4.22**	Much

5) CONCLUSION

The results of the research show that the I Pod-based Learning System on Advertising Design improved students' learning effectiveness by 61.11%. Furthermore, it was found that the student's satisfaction levels were at a much higher levels. The results revealed that the I Pod-based Learning System on Advertising Design developed using was considered to be of an excellent quality and extremely suitable for self –learning.

6) REFERENCES

3.1) References

Please conform to the styles of the Publication Manual of the American Psychological Association (APA). Citations in the text appear in parenthesis as (Author, year) or (Author, year: page). If the author's name appears in the text, as Author (year) or Author (year: page).

Importantly, full citation of literature referred to in your paper should always be given in **References**. Please arrange the references alphabetically by first author's name, not by the order of occurrence in the text which should also be punctuated and capitalized as in References of this paper.

3.2) Appendices

Your appendix section should be appeared directly after the Reference section, and should be given an informative title in this format: **Appendix A: Title of Appendix A.**

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TREND AND FUTURE OF THAILAND e-LEARNING STRATEGY

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ABSTRACT

This paper presents the summary of the brainstorm session of Thailand e-Learning Community Forum for developing a coherent strategy for e-Learning in Thailand as an e-Learning roadmap of Thailand. The roadmap reflects the needs that were discussed of a multidisciplinary group of leading experts, researchers, educators and business representatives, and defines the priority areas for future research including roadmap of learning management system and e-Learning management system and e-Learning content technology. The roadmap indicates a tendency growth which summarized from the future requirements of e-Learning usage in Thailand, and it could be a good guideline for far-sighted working plan.

Keywords
e-Learning roadmap, LMS, Authoring tools, Technology roadmap, e-Learning plan, e-Learning strategy, e-Learning requirement, Solution, Technology Application.

1) INTRODUCTION

Since the Internet is widespread used all over the World, people get reach to the source of information easier. The benefits of the internet are taken in many ways such as e-mail, e-commerce and e-Learning. Education opportunity was broadly increased with e-Learning. Open Source Software Development and Promotion Project (ODP) of National Electronics and Computer Technology Center (NECTEC), Thailand organizes two discussion sections to establish important guidelines for e-Learning development; Learning Management System (LMS) technology and contents technology. These guidelines are a direction of Thailand e-Learning technology that has effect on cooperation in e-Learning research and development.

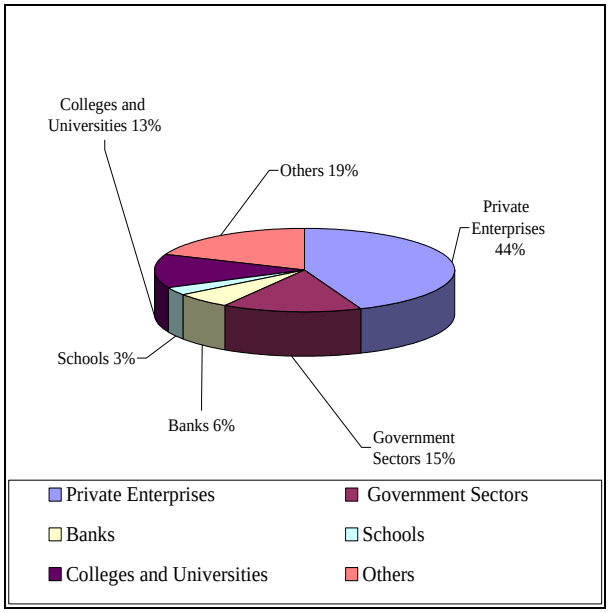

Figure 1: The percentage of the seminar attendances.

On July 27, 2007, 234 e-Learning users attended Thailand e-Learning Community Forum. Figure 1 shows the percentage of the seminar attendances including students, instructors, system administrators and experiences users of e-Learning system. They are from several organizations such as

educational institution, government sectors, private enterprises, telecommunication organizations etc.

The attendances were divided into three LMS discussion groups and six e-Learning contents discussion groups. Everyone in the seminar was encouraged to share their opinion and experience in e-Learning usage.

Moreover, we can collect requirements to enhance e-Learning system and content. The requirements were divided into three periods. Short-term, medium-term, and long-term requirements are expected to be completed in year 2008-2009, 2010-2011, and after 2012, respectively.

2) THE DIRECTION OF LEARNING MANAGEMENT SYSTEM

Requirements for Learning Management System are divided into three periods. All periods are separately shown in tables respectively.

2.1) Short-term Requirements

The requirements for short-term plan, supporting solutions and technology applications are shown in Table 1.

Table 1: Short-term requirements of Technology Roadmap: Learning Management System

User's requirements	***N1-1***:Quality and free e-Learning System ***N1-2***:Fast access in anywhere and anytime ***N1-3***:Accessible for disable students ***N1-4***:High security ***N1-5***:Item Bank /Item Pool ***N1-6***: Student Evaluation ***N1-7***:Data Backup System
Solutions	***S1-1***:Open Source (for N1-1) ***S1-2***:Accessibility Tools(for N1-3) ***S1-3***:Distributed Delivery System (for N1-2) ***S1-4***:Authentication System (for N1-4) ***S1-5***:Security System (for N1-4) ***S1-6***:Item Bank/Item Pool System (for N1-5) ***S1-7***:Backup System (for N1-7) ***S1-8***:Competency/ Evaluation (for N1-6)
Technology Applications	***T1-1***:Web2.0 (for S1-1) ***T1-2***:Open Source Software (for S1-1,S1-6,S1-7) ***T1-3***:Accessibility Technology (for S1-2) ***T1-4***:Text to Speech (for S1-2) ***T1-5***:XDSL Technology (for S1-3) ***T1-6***:Peer to Peer (for S1-3) ***T1-7***:Multicast (for S1-3) ***T1-8***:Web Service (for S1-3) ***T1-9***:Security Technology (for S1-4, S1-5,S1-6) ***T1-10***:Database Technology (S1-7) ***T1-11***:Bloom Taxonomy (for S1-8)

In short-term period, users require *free e-Learning systems with high quality*. *Open Source LMS* is used for support this requirement and *Web 2.0* technology is concerned. *Fast accessible in anywhere and anytime* is the second demand. *Distributed Delivery System* is solution which helps to meet the demand, while sustaining technologies for the need are *XDSL Technology*, *Peer to Peer*, *Multi cast* and *Web Service*.

The third requirement in short-term is accessible *for disable users* such as blind students. The solution is *Accessibility tools*, and technology support for the need is *Accessibility Technology* such as *Text to speech* technology. *High security* is the forth requirement. *Authentication System* and *Security System* are solutions, and *Security System* is the technology support for the need.

Fifth, the users require *Item Bank* or *Item Pool* for collect a large amount of examination questions. The solution is *Item Bank/Item Pool system* with using *Security* as technology. *Student Evaluation* is sixth necessity in the period. Supporting solution is *Competency and evaluation*, while *Bloom Taxonomy* is one of supported technology. The last need is *Data Backup System* which needs *Backup System* for solution and *Database Technology* and *Open Source Software* are technology applications.

2.2) Medium-term Requirements

Table 2 shows two requirements during medium-term. The users needed *LMS cooperation support* which is not only for content sharing but also user and information sharing. *Wrappers* which allow incompatible

functions can cooperate. Moreover, *Web Service* is a technology which supports the idea.

Another need in this period is *accessible from mobile device at anywhere and anytime*. *Ubiquitous Learning* is the solution which supported by *Web Service*, *Mobile Technology*, and *Embedded System* as Technology Applications.

Table 2: Medium-term requirements of Technology Roadmap: Learning Management System

User's requirements	***N2-1***:LMS cooperation support ***N2-2***:Be able to learn in anywhere, at anytime with mobile device
Solutions	***S2-1***:Wrapper (for N2-1) ***S2-2***:Ubiquitous Learning (for N2-2)
Technology Applications	***T2-1***:Web Service (for S2-1,S2-2) ***T2-2***:Mobile Technology (for S2-2) ***T2-3***:Embedded System (for S2-2)

2.3) Long-term Requirements

In long-term period, there are more requirements than medium-term period shown in Table 3. The first one is *effective and reliable evaluation* on LMS. Supporting solution is *e-Assessment*, while technology applications are *user modeling technology* and *tracking model*.

Table 3: Long-term requirements of Technology Roadmap: Learning Management System

User's requirements	***N3-1***:LMS which support effective and reliable learning evaluation ***N3-2***:One-time login among LMS ***N3-3***:Searchable for expert ***N3-4***:Virtual Classroom LMS ***N3-5***:Standard LMS examination
Solutions	***S3-1***:e-Assessment (for N3-1) ***S3-2***:Central Authentication System (for N3-2) ***S3-3***:e-Profile (for N3-3) ***S3-4***:Digital Ecosystem (for N3-4) ***S3-5***:Assessor System (for N3-5)
Technology Applications	***T3-1***:User Modeling Technology (for S3-1,S3-3) ***T3-2***:Tracking Model (for S3-1,S3-3) ***T3-3***:Single Sign on (for S3-2) ***T3-4***: Security Technology (for S3-3) ***T3-5***: Open Source Software (for S3-4,S3-5)

The Second user's requirement is *one-time login among LMS* which users can use only one username, password and profile for log in all LMS they registered which is supported by *central authentication system* as solution and *single sign on technology* application. The third requirement is *searchable for expert* that user can find persons who are expertise in the topics they interested on the system. Appropriated solution is *e-Profile* on the system supported by user *modeling technology*, *tracking model* and *security technology*.

Virtual classroom LMS is another requirement in this period. That needs the user's interface of LMS seems like classroom environments. *Digital ecosystem* is supporting solution, *Open Source software* is technology application. Last, the user's requirement is *standard LMS examinations* which indicate whether one LMS created according to a standard or not. Solution supports for the requirement is *assessor system* which *Open Source software* is supporting as technology application.

3) THE DIRECTION OF CONTENT TECHNOLOGY

Assembled user's requirements are also divided into three groups. After that, the attendance discussed solution and technology application with could support the requirements as follow.

3.1) Short-term Requirements

There are eight requirements supported by seven solutions and eight applications show in Table 4.

Table 4: Short-term requirements of Technology Roadmap: Content Technology

User's requirements	***N1-1***:Free of charge, Easy to use Authoring Tools ***N1-2***:Easy and Clear Instruction Design ***N1-3***:Content can be used in many platform or LMS ***N1-4***:Interesting learning contents ***N1-5***:Rectified learning contents ***N1-6***: Large amount of learning contents ***N1-7***:Learning content resource center ***N1-8***:Sharable learning content

	N1-9:One standard learning contents ***N1-10***:National license authoring tools
Solutions	***S1-1***:Instructional design (for N1-1,N1-2,N1-4,N1-5) ***S1-2***:Open Source Authoring Tools (for N1-1,N1-10) ***S1-3***:Interactive Content (for N1-4) ***S1-4***:Content Template (for N1-1,N1-3,N1-4,N1-6) ***S1-5***:Content Meta-data (for N1-2,N1-3,N1-8,N1-9) ***S1-6***:Sharable Content Object (for N1-2,N1-3,N1-5,N1-6,N1-8,N1-9) ***S1-7***:Repository System (for N1-7,N1-9)
Technology Applications	***T1-1***:Web Technology (for S1-2,S1-3,S1-4,S1-6,S1-7) ***T1-2***:Bloom Taxonomy (for S1-1) ***T1-3***:Flash (for S1-3) ***T1-4***:XML (for S1-2,S1-5,S1-6,S1-7) ***T1-5***:e-Learning Standard (SCORM) (for S1-5,S1-6,S1-7) ***T1-6***:High capacity storage (for S1-7) ***T1-7***:IMS (for S1-5,S1-6,S1-7) ***T1-8***:CORDRA (for S1-5, S1-6,S1-7)

The users require *authoring tools which are free of charge and easy to use* during year 2008-2009. There are three solutions which could support the need that are *Open Source authoring tool*, *instruction design* and *content template*. Each solution is supported a few technology applications which are *web technology* supports Open Source authoring tool and content template, *XML* supports Open Source authoring tools and *Bloom Taxonomy* supports instruction design.

The second requirement in this period is that the users need *easy and clear instruction design*. To meet the need, solutions are *content meta-data*, *sharable content object* and *instructional design* which supported by technology applications that are *web technology*, *Bloom Taxonomy*, *XML*, *learning standard* such as Sharable Content Reference Model (SCORM) [SCORM], *International Metadata Standard (IMS)* [IMS] and *Content Object Repository Discovery and Registration Architecture* (*CORDRA)* [CORDRA]. The third requirement is *portable content* that able to be used in many platforms (or LMS). The solutions for the need are *sharable content object*, *content template* and *content meta-data* which are supported by *web technology*, *XML*, *e-Learning standard* (such as SCORM), *IMS* and *CORDRA*.

Interesting learning content is the forth need of the users who attended the seminar. Solutions which support the requirement are *interactive content*, *instruction design* and *content template*, and technology applications are *web technology*, *Bloom Taxonomy*, and *Flash technology*. *Rectified and reliable content* are needed. Solutions which support it are *sharable content object* and *instruction design*. The sixth requirement is that the users need *large amount of learning contents* supported by *repository system* which technology applications are *learning standard*, *XML*, *web technology*, *IMS* and *CORDRA*.

The last four requirements are learning *content resource center*, *sharable learning content*, *one standard learning content*, and *national license learning authoring tools*.

Learning content resource center needs *repository system* as the solution which supported by *high capacity storage technology*, *web technology*, *XML*, *e-Learning standard*, *IMS* and *CORDRA*. While there are some relationship between *sharable learning content* and *one standard learning content* that supported by *learning content meta-data* and *sharable learning object* as the solutions and *web technology*, *XML*, *e-learning standard*, *IMS* and *CORDRA* as technology applications, though one standard learning content is also supported by repository system as a solution. The last short-term requirement of e-Learning users in Thailand is that the users need *national license e-Learning authoring tools* that allow learning object creators in Thailand produce content with low budget and cost. *Open Source authoring tool* support the need as a solution, and *web technology* and *XML* could be technology applications.

3.2) Medium-term Requirements

During year 2010 and 2011, there are five requirements for e-learning content show in Table 5.

First, users need learning content to be *accessible for learning or mental disability students* for equality. *Dynamic content* and *accessibility tool* support the requirement as solutions which supported by *technology application*; *accessibility technology*, *web technology* and *human computer interaction*.

Table 5: Medium-term requirements of Technology Roadmap: Content Technology

User's requirements	***N2-1***:Learning or Mental disability students accessible ***N2-2***:Responsible learning content ***N2-3***:Instruction Media Retrieval System ***N2-4***:Piracy Prevention System for learning content ***N2-5***:Automatic learning media editor
Solutions	***S2-1***:Dynamic Content (for N2-1,N2-2) ***S2-2***:Interactive Content (for N2-2) ***S2-3***:Search Engine (for N2-3) ***S2-4***:Open Source Flash (for N2-2) ***S2-5***:Accessibility tools (for N2-1) ***S2-6***:Digital Right Management System (for N2-4,N2-5) ***S2-7***:Digital Right Management Clearing House (for N2-4,N2-5) ***S2-8***:Digital Identifier (for N2-4,N2-5) ***S2-9***:Automatic Courseware Construction (for N2-6)
Technology Applications	***T2-1***: Web Technology (for S2-1,S2-2,S2-3,S2-4,S2-9) ***T2-2***:Human computer interaction (for S2-1,S2-5) ***T2-3***:Web Crawler (for S2-3) ***T2-4***:DRM (for S2-6, S2-7) ***T2-5***:Encryption (for S2-6, S2-7, S2-8) ***T2-6***:Water Mark (for S2-8) ***T2-7***:Trusted Platform Module (for S2-6, S2-7) ***T2-8***:XML Security (for S2-6, S2-7, S2-8) ***T2-9***:Accessibility Technology (for S2-5) ***T2-10***:Text to Speech (for S2-5, S2-9) ***T2-11***:Pattern Recognition (for S2-9)

Responsible learning content which make learners pay more attention is the second requirement. Supporting solutions for this requirement are *interactive content*, *dynamic content* and *open source flash*, while the technology applications are *web technology* and *human computer interaction*. Third, *instruction media retrieval system* is needed for helping the users to search for some media that instructors or learning content producers can add it as a part of learning contents. To support the requirement, *search engine* is required as solution, and *web crawler* is technology application for the need.

Piracy prevention System for learning content and *automatic learning media editor* are two last requirements in medium-term which are supported by *Digital Right Management (DRM) Clearing House*, *DRM system* and *digital identifier* are solutions, while *DRM*, *encryption*, *water mark*, *Trusted Platform Module* and *XML* Security are technology application for the requirement.

3.3) Long-term Requirements

There are five requirements for year 2012 and more show in Table 6.

Table 6: Long-term requirements of Technology Roadmap: Content Technology

User's requirements	***N3-1***:Multi-lingual content ***N3-2***:Automatic adaptive learning content ***N3-3***:Visual reality experimental and learning content ***N3-4***:Intelligence content searching system ***N3-5***:Distributed Repository
Solutions	***S3-1***:Adaptive presentation (for N3-2) ***S3-2***:Machine Translation system (for N3-1) ***S3-3***:Visual Reality Tools (for N3-3) ***S3-4***:Semantic Search (for N3-4) ***S3-5***:Simulation Tools (for N3-3) ***S3-6***:Content Delivery System (for N3-5)
Technology Applications	***T3-1***:Artificial Intelligence (for S3-1,S3-4,S3-5) ***T3-2***:Knowledge based Technology (for S3-1,S-3-2,S3-4,S3-6) ***T3-3***:Natural Language Processing (for S3-2,S3-4) ***T3-4***:Image Processing (for S3-3,S3-5) ***T3-5***:Simulation, 3-D technology (for S3-3,S3-5) ***T3-6***:Web Service (for S3-6) ***T3-7***:Semantic Web Technology (for S3-4) ***T3-8***:Computer Graphics (for S3-3)

Multi-lingual content which allow students learn contents in difference languages is the first requirement. *Machine translation* which supported by *artificial intelligence* and *knowledge based technology* as technology application is the solution for the requirement. The second requirement is *automatic adaptive learning content* which supported by *adaptive presentation* as solution and *artificial intelligence* and *knowledge based technology* are technology application.

Virtual reality experimental and learning content is next requirement which let the students learn from simulated situations. Solutions for the requirement are *virtual reality tools* and *simulation tools* that *artificial intelligence*, *image processing*, *simulation*, *3-D technology* and *computer graphics* support the solutions as technology applications.

The last two requirements are *intelligence content searching system* and *distributed repository*. Solution for intelligence content searching system is *semantic search*, and technology applications are *artificial intelligence*, *knowledge based technology*, *natural language processing* and *semantic web technology*. While, distributed repository's solution is *content delivery system*, and its technology applications are *knowledge based technology* and *web service*.

4) CONCLUSION

In this paper, we propose the direction of an e-Learning roadmap in Thailand as a guideline for further research and development. The roadmap is the result of the discussion among e-learning expertise community. It provides the requirement, solution, and supported technology as well. Even though it is neither a plan nor a milestone of any organization or countries. Requirement occurring in the discussion including both LMS and content technology can be represented the need of the e-learning in Thailand. According to this 5-year-roadmap, efficient e-learning components will be ready for e-learning community in Thailand.

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Development of AAA Model for Blended Learning based on the Philosophy of Sufficiency Economy

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ABSTRACT

The objectives of this research study were (1) to construct a Learning Design Model of blended learning based on the Philosophy of Sufficiency Economy, (2) to assess the students' learning achievements by using the concept maps each student created, and (3) to survey students' opinions toward the AAA Model via blended learning using concept maps and e-Learning technology. The sample group in this study consisted of 21 graduate students from the Information and Communication Technology in Technical Education (254506) course, academic year 1/2551, at the Faculty of Technical Education, King Mongkut's University of Technology North Bangkok. For 15 weeks, the students experienced the blended learning design of the AAA Model, where learning took place through both in-class sessions and e-Learning technology. Data were analyzed using percentage, arithmetic mean, and standard deviation. The study found that: (1) AAA Model – a Learning Design Model based on the Philosophy of Sufficiency Economy – consists of three components: A-Analysis, A-Activities, and A-Authentic Assessment. (2) Students were able to construct knowledge and organize their ideas in the form of concept maps (average scores = 90%). The concept maps created were used to evaluate the student's learning achievements. (3) Students have opinions that AAA Model through blended learning using concept map and e-Learning technology was highly effective.

Keywords
AAA Learning Model, Blended Learning, e-Learning Technology, Learning Design Model, Philosophy of Sufficiency Economy for Learning.

1) INTRODUCTION

His Majesty King Bhumibol Adulyadej made his customary birthday address on December 4th, 1997. During the annual nationwide address, His Majesty espoused the virtues of the Philosophy of Sufficiency Economy. Since then, the philosophy has firmly taken root in Thai society. His remarkable speech mentioned that the most important thing for the Thai people was to "have enough to support ourselves." This advice was exceptionally pertinent in 1997 because an economic crisis had struck Thailand in July that year. Bankruptcies had crippled many companies, more than two million jobs were lost, and the economy was shrinking at a rate far faster than it had ever grown. At present, in 2008, the Hamburger Crisis has caused similar ramifications and more economic damage is expected.

Thailand's 10th National Economic and Social Development Plan for 2007-2011 has adopted the King's idea – the Philosophy of Sufficiency Economy – as its guiding principle. The Philosophy of Sufficiency Economy is an approach to, and a conduct of, life which are applicable to every societal level from individuals to families to communities. Everyone has a role in contributing to the development of the nation. Also, for the nation to develop, its people must be educated. The country's success hinges on its people. Therefore, education appropriately and thoughtfully designed will produce intellectual capital through the people. The Philosophy of Sufficiency Economy guides the principles of instructional design to develop effective learning.

The National Education Act B.E. 2542 (1999) encourages educational institutions to adopt a

student-centered approach, where students are active participants in learning rather than passive recipients of information. Active learning enables students to construct their knowledge.

Blended learning, where courses are conducted through both traditional face-to-face classroom interactions and online e-Learning, is gaining popularity with the Thai educational circle. The features of learning in-class and online bring advantages that allow students to learn, construct, and share knowledge collaboratively.

The Information and Communication Technology in Technical Education (254506) course is offered at the Faculty of Technical Education, King Mongkut's University of Technology North Bangkok. Given that technology utilization has grown among higher education institutions in Thailand, it is fitting that the blended learning course makes use of Internet applications such as e-mail and weblog (Web 2.0).

Successful learning can be achieved when an appropriate learning model, tailored according the above needs, is created and applied. This research study will establish how a learning model, based on the Philosophy of Sufficiency Economy, is developed for graduate students in a blended learning context.

2) OBJECTIVES OF THE STUDY

2.1) Develop a Learning Design Model of blended learning based on the Philosophy of Sufficiency Economy for graduate students.

2.2) Assess students' learning achievements through the concept maps they produced weekly.

2.3) Survey students' opinions toward AAA Model through blended learning using concept maps and e-Learning technology.

3) BACKGROUND

The Philosophy of Sufficiency Economy consists of three central tenets: moderation, reasonableness, and self-immunity. Moderation is defined as the "middle way", neither in excess nor lacking. Reasonableness refers to actions and consequences; means and ends. And self-immunity is the built-in resilience; the ability to adapt to external changes and to cope with events that are either unpredictable or uncontrollable.

Forty-four models are available for the designing of learning and teaching in any context (Smith and Ragan, 1999). An example of a generic instructional design model is ADDIE: A-Analysis, D-Design, D-Develop, I-Implication, and E-Evaluation.

Based on constructivism, an appropriate instructional design would enable students to construct their knowledge (Sriwongkol, 2006). Content and activities should be planned according to the needs and types of learners (Dick & Carey, 1985). The term "Learning Design" is centered on learning activities. Assessment is also integrated into every step of the learning design (Britain, 2004).

Although students are resourceful when it comes to searching and collecting data and information, it is the ability to construct knowledge that would ensure the strong foundations students require so that they can survive in a world where technologies are ubiquitous and rapidly changing.

4) RESEARCH METHODOLOGY

4.1) Concepts, principles, and theories relevant to the Philosophy of Sufficiency Economy, instructional and learning design models, blended learning systems, and constructivism were analyzed. After synthesizing and processing the knowledge obtained from the analysis, the researcher developed the AAA Model.

4.2) Concept of the AAA model was applied in the development of a blended learning environment. The model was tested by a sample group of 21 graduate students from the Information and Communication Technology in Technical Education course at King Mongkut's University of Technology North Bangkok. They studied via blended learning for 15 weeks.

The process of learning was:

4.2.1. Each week, the instructor/mentor assigned one group, each of two students, a specific learning topic. The group researched on the topic assigned to them using textbooks, gathered more information from the Internet and the course's weblog, organized all knowledge they had obtained, sent their work to the instructor/mentor via email before class, and then came to class to present its findings.

4.2.2. After the presentation, the instructor/mentor provided feedback, facilitated discussions, and provided elaborations.

4.2.3. After class, each student constructed knowledge by creating his/her own concept map. Then, each student sent the concept map to the instructor/mentor via email.

4.3) Student's learning achievements and their opinions on the learning was investigated by the researcher. Statistics used in the study were the percentage, arithmetic mean, and standard deviation.

5) RESEARCH RESULTS

5.1) AAA Model was a learning model derived from the Philosophy of Sufficiency Economy Two procedures preceded the development of this learning model:

5.1.1. Analyzing the components of the Philosophy of Sufficiency Economy and Instructional/Learning Design.

Table 1: Analysis of Components of Philosophy of Sufficiency Economy and Instructional / Learning Design

Sufficiency Economy	Meaning	Instructional/ Learning Design
Moderation	Adequate to Needs	Needs Analysis
Reasonableness	Cause→Effects	Cause =Analysis Effects=Activities
Self-immunity	Foundations of Life	Foundations of Learning=Abilities to Construct Knowledge

5.1.2. Synthesizing the components of Instructional/Learning Design based on the Philosophy of Sufficiency Economy. The research study found that the AAA Model was an appropriate model.

AAA Learning Model (Tuangrat, 2007)

Figure 1: AAA Learning Model based on the Philosophy of Sufficiency Economy.

The AAA Model based on the Philosophy of Sufficiency Economy consists of three components:

5.1.2.1. Analysis comprising of analyses on Needs, Learner, Context, Content, and Learning Task.

5.1.2.2. Activities consisting of drills and practice, questions-answers, demonstrations, elaborations, reports, group discussions, project work, exhibits, reflections, and etc.

5.1.2.3. Authentic Assessment is integrated into every step of learning.

5.2) Learning achievements were evaluated from the concept maps each student produced weekly. The study found that every student could create concept maps, made linkages between concepts and ideas, and share their knowledge. The average scores of their learning achievements were 90%.

5.3) Students had opinions that the AAA Model of blended learning using concept maps and e-Learning technology was highly effective.

($\bar{X}$ = 4.28, *S.D.* = 0.784).

Table 2: Opinions toward AAA Model through blended learning using concept maps and e-Learning technology

List of Questions	$\bar{x}$	S.D.
1. Weblog helps students in searching for information.	4.29	0.685
2. Weblog helps sharing of ideas between learners and instructor.	4.26	0.784
3. Assigning students to turn in work before class via email helps save time.	4.47	0.874
4. Blended learning approach helps students learn efficiently.	4.29	0.865
5. You have overall satisfaction from the blended learning approach.	4.29	0.865
6. You are able to learn through weblog.	4.12	0.600
7. Concept maps help organize knowledge.	4.50	0.606
8. Concept maps aid long term memory for working efficiently.	4.05	0.705
9. Concept maps make relation with concepts and show what the learner thinks.	4.16	0.764
10. Concept maps are appropriate for use in this class.	4.42	0.692
11. Amount of content is manageable for one semester.	4.32	0.671
12. Amount of concept maps is appropriate to time and content.	3.95	0.779
13. Doing concept maps repeatedly helps visualize the development of learning.	4.42	0.837
14. Concept maps help learners make link between previous and new knowledge.	4.37	0.760
15. Concept maps can be used to assess learning achievements.	3.89	0.737
16. Concept maps help save time for next reading.	4.53	0.696
Total Average	4.26	0.784

6) DISCUSSION

The following discussions support the designed AAA Model that consists of the three components: A-Analysis, A-Activities, and A-Authentic Assessment.

6.1) Analysis can influence the outcome of the learning. Instructors should not force students to learn through designs that do not fit the student's learning needs, styles, context, content, and learning task (Smith & Ragan, 1999; Gagne, Briggs & Wager, 1992).

6.2) Students shared that their most interesting classes were those that they actually got to do something (Goodlad, 1984). Learning design, as we have seen, is centered on learning activities (Britian, 2004). The reason is that people learn better when they are engaged; being actively involved in the task at hand. Hence, this leads to the second component of the AAA Model: Activities.

6.3) According to AAA Model, the third component is Authentic Assessment. To assess the students' learning achievements, they were assigned to create concept maps so that ideas could be organized and knowledge be linked. These would help future retrieval of knowledge to be used and shared between students and instructors. Ivie (1998) cited Ausubel's take on meaningful learning that occurs when learners with their cognitive structure are able to make linkages between new and prior experiences and knowledge (Driscoll, 1994). Britain (2004) also asserted that learning design must be sequenced and structured carefully, where learning can be recorded for sharing and future use. Authentic Assessment is another important component for learning design.

7) CONCLUSION

Good teachers create learning environments that are student-centered and instructor-facilitated rather than pedantic directives. A learning environment conducive to engaging students will foster collaboration on authentic tasks (Britain, 2004) in pursuit of meaningful learning that is useful for life in the real-world (Sriwongkol, 2006). The AAA Model could be used to create effective learning design.

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GLOBE 2.0: TOWARD A NEW FRAMEWORK FOR INTERNATIONAL SHARING AND REUSE OF QUALITY LEARNING RESOURCES

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Under the limitations of human and financial resources, sharing and reuse of digital learning content is one of the effective and sustainable solutions to assure the quality of e-learning or that of technology-enhanced learning. In order to search and discover the content efficiently, some organizations are tagging metadata and building cross-institutional search mechanisms with domestic and/or overseas repositories.
GLOBE (Global Learning Object Brokered Exchange) is the international consortium of the hub organizations in each country and region, which manage a federated repository and/or a meta referatory. The original members were ARIADNE (Alliance of Remote Instructional Authoring & Distribution Networks for Europe, http://www.ariadne-eu.org/, EU), education.au limited (http://www.edna.edu.au/, Australia), eduSource Canada (Canada), MERLOT (the Multimedia Educational Resource for Learning and Online Teaching, http://www.merlot.org/, North America), and NIME (Japan). Now, the number of GLOBE members is eleven; eduSourceCanada was replaced with LORNET (http://www.lornet.org/) in February 2006. Korea Educational Research and Information Services (KERIS, http://english.keris.or.kr/), European Schoolnet (http://www.europeanschoolnet.org/), the Center for Open Sustainable Learning, Utah State University, USA (COSL, http://cosl.usu.edu/), Latin-American Community of Learning Objects (LACLO, http://www.laclo.espol.edu.ec/) joined GLOBE in 2007, and Institute for Information Industry (III, http://www.iii.org.tw/english/, Taiwan) and ISKME (USA) did in 2008.
GLOBE uses IEEE LOM version 1.0 for the metadata standards, and Simple Query Interface (SQI) for the query language. The GLOBE first-generation architecture adopted a simple federated search, in which each member exchanged data in one-to-one correspondence fashion. The target content was mainly open content, which does not need complicated copyright management.
However, in the second stage, in which the increase of the member institutions occurs, both more efficient search strategy and a variety of new value-added services are necessary.
As a result, after February 2008, harvesting (cf. Open Archive Initiative Protocol for Metadata Harvesting, OAI-PMH) was added as a supplementary prerequisite for the participation in GLOBE Initiative. By using several LOM elements in Educational, Rights, Annotation and Classification categories, we can examine new sustainable value-added services for quality assurance, right management or educational/pedagogical information.
The GLOBE Technology Council has started discussions towards GLOBE 2.0 on the new architecture for the next advanced search, harmonizing with international standardization activities. For example, several GLOBE members work for Learning Object Discovery and Exchange (LODE) Group at IMS-Global Learning Consortium (http://www.imsglobal.org/).

Keywords
Federated search, Harvesting, International distribution, Learning object, Metadata, Open educational resources, Repository

DYNAMIC ONLINE LEARNING MODULE: SPHERICAL ASTRONOMY

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Dynamic online learning modules on www.twibl.org have been developed to deliver difficult concepts in Astronomy and Mathematics such as Spherical Trigonometry and Spherical Astronomy. The modules were designed with the concept of inquiry based learning where students can interact with the modules dynamically of the web. Students will learn a great deal of difficult geometry concepts from the visualizations generated real time from students' inquiries such as grid lines on sphere, great circles, spherical triangles, 3D rectangular, spherical, equatorial, horizontal, ecliptic and galactic coordinates including imaginary lines on the surface of celestial spheres such as the celestial equator, ecliptic and the galactic equator.

Keywords
Dynamic Online Learning Module, Web Computation, Sperical Astronomy, The Web Inquiry-Based Learning (TWIBL).

THAILAND KNOLEDGE CENTER, THE KNOWLEDGE MANAGEMENT PORTAL FOR THAI COMMUNITY

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Thailand Knowledge Center (www.tkc.go.th) is knowledge management portal established by the Ministry of Information and Communication Technology with the aim of being the Center for Knowledge Management for Thai people. The portal consisted of knowledge in 13 main areas such as agriculture, laws, economics, science and technology, engineering, education, business, and health. These knowledge contents are developed in forms of multimedia which are easy to understand along with articles and web links for further study. The portal also has infrastructures for supporting new knowledge that captured by Community of Practices (CoPs), such as capturing new knowledge from meeting rooms, web conferences, personal websites, e-mails and e-learning systems.

The coursewares in the e-learning are free for everyone with topic varieties such as: “Mathematics and English for kids”, “How to write a business plan for new SME”, and “Thai cyber law for everyone”. The e-Learning system has full features of standard e-Learning system including student progress tracking and graphics reporting system.

Keywords
Knowledge, Knowledge Management, Knowledge Portal, Community of Practices, e-Learning

A STUDY OF ONLINE LURKING BEHAVIORS IN A THAI KNOWLEDGE MANAGEMENT-RELATED ONLINE COMMUNITY: GotoKnow.org

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In knowledge management practices, storytelling is a means for knowledge transferring. Telling stories with apprenticeship can effectively transfer tacit knowledge that embeds the complete contexts of individuals, places, situations, and experiences. With modern internet technology, storytelling can be conveniently performed through blogs or online journals. Nonetheless, the burdens of managing tacit knowledge still remain while additional issues relating to online internet usages are included. As a result, managing online tacit knowledge sharing is even more challenging.

GotoKnow.org is a reciprocal Thailand's online knowledge management community aiming at creating a nationwide tacit knowledge repository and sharing communities. GotoKnow.org offers blogs together with other social media technologies for Thai knowledge workers to share their tacit knowledge and to build their own online communities. Currently, GotoKnow.org is ranked the top 50^{th} popular websites in Thailand.

It is known throughout this large Thai online community that actively posting in blogs and promptly responding to blog comments can help forming a community of practices, which is a group of active participants who have common interests and experiences. In other words, extensive communications are necessary for trusted knowledge sharing.

Hence, reading and commenting blog entries contained tacit knowledge require time and a domain of knowledge in the particular areas. Apparently, majority of online readers only read posts with no comments. This activity is so-called lurking. Lurkers, or passive observers, are hidden resources of online communities. If an online community can turn lurkers into online contributors, the new posters can further extend the community in many dimensions.

This study aims to explore behaviors and reasons of online lurking in an online knowledge management system. In addition, rationales for contributing expertise knowledge to online communities are investigated. The proposed methodology is quantitative and qualitative. Data are collected through online surveys, contents analysis, and face-to-face interviews. The participants are GotoKnow.org users and visitors.

Keywords
blog, knowledge management, lurker, lurking, online community, social media, social network, weblog

TOWARD THE NECTEC E-LEARNING ROADMAP

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NECTEC or National Electronics and Computer Technology Center is a government-supported research organization under the National Science and Technology Development Agency, Ministry of Science and Technology. Its main responsibilities are to undertake, promote, and support research and development of electronics and computer technologies. Supporting advanced learning by means of e-Learning technologies is also one of our activities.

Recently, NECTEC has just released the new version of learning management system, Learnsquare Version 3. Learnsquare is the only Thai open source SCORM supported LMS which is widely known and implemented by schools, non-formal education sector, as well as private companies.

Together with groups of leading experts, researchers, educators, and business representatives, NECTEC developed a five-year “e-Learning Technology Roadmap in Thailand”. The roadmap indicates the requirement, solution and the needed technologies for enhancing the e-learning development in Thailand. This roadmap is used as a guideline of NECTEC's future research and development plan.

E-Learning repository is one of our significant ongoing projects following the roadmap. The repository will consist of standardized marked learning objects, including text, image, sound, VDO, and multimedia contents which are ready for reusing, retrieving, and reconstructing.

Keywords
e-Learning, LMS, Repository, SCORM

Multi-Dynamic Documentation and Micestro: Web Design and Educational Implications and Applications

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ABSTRACT

This paper introduces Multi-Dynamic Documentation (MDD), research for a web design concept which assimilates current design techniques with new technology and reconstructs them as a synthetic design method for explanatory contents which are accompanied by movement. It describes ongoing efforts to unify static, dynamic, and interactive expression into one form residing three-dimensional space. The paper also proposes applications for using MDD which capitalize on its dynamic and interactive visual expression aspects. The operation of this content uses a new performance device, dubbed Micestro by the authors, which employs natural human movement. No mouse or pointing device is required.

Keywords
Emerging technology, Innovation for education

1) INTRODUCTION

The purpose of this study is to assimilate a variety of previous design techniques with new technology and construct a synthetic design technique for explanatory contents which accompany movement. The objective is therefore to unify static, dynamic and interactive expression into one, inside of three-dimensional space, and to integrate contents using MDD, which is a dynamic and interactive visual expression technique.

Prevailing wisdom recommends making contents “think as separated pages”, however the development discussed here has a feature by which parallel pages are grouped together inside a three-dimensional space and are accompanied by movement. This makes it possible for users to instinctively view contents. By using three-dimensional space, users can both view all needed information and keep a sequence of the whole contents of a web-page. Increasing the amount of information on one page, however, causes the amount of data to also increase. The innovation discussed in this paper was able to achieve its purpose with a smaller amount of data, the details of which will be discussed.

The MDD concept of this paper has numerous immediate applications for contents which are best accompanied by movement, such as anatomy explanations, medical procedure explanations, practice simulations, physical training and mechanical assembly instructions. MDD also makes possible the ability for personal viewing at an infinite number of angles with numerous software programs. Documents which employ the MDD element and Micestro as an interface, constitute a valuable and innovative communication environment which has immediate applications in numerous fields. This paper details concrete examples of work accomplished, as well as this development’s further implications.

2) BACKGROUND AND PURPOSE OF THE STUDY

The Horizon Report 2008 has noted that the effect of new displays and increased access to

web content is having a major impact on computing usage. Even though it was never intended as an iron-clad law, Moore's (1965) statement that the number of transistors on a chip doubles approximately every two years has important implications for this study. While it is true that improved hardware does not necessarily imply a proportionate increase in software performance (Wirth, 1995), this ability to fit more transistors into less space does allow for increasingly complex devices which integrate many capabilities. The cumulative effect is to enable increasingly sophisticated and diverse machines and applications. It also implies that any consideration of user interface must be periodically examined and reformulated due to the speed at which technology in general is changing. It is necessary to update and continue research in this area, in order to stay informed of emerging possibilities. Examples of personal and professional uses abound. Ahonen and O'Reilly (2007) have described seven forms of mass media which may all be delivered in a web format: print, recordings, cinema, radio, TV, Internet and cellular phone applications. These media have become an essential part of daily living, rather than a luxury, and are changing the way people relate to machines. The popularization of high-performance computing devices, the diversification of media, and an increasing number of channels for its delivery have lead to a vast increase in the amount of information that users are required to retain and manage in the media environment as they interface in and interface with it. Paradoxically, this has limited the range of expression for users as they encounter basic environmental restrictions imposed by the original conception of the web. Fragmentary web information and one-dimensional expression of information causes users to lose their way and prevents them from returning to a given point of departure. The traditional web interface has been to separate the context of whole contents into several groups and place them in an order of priority and level within a designed layer constitution. This technique of "think as separated pages" for aimed content is the norm (see figure 1).

In contrast, the present study describes innovation which assimilates a variety of previous design techniques with new technology, and reconstructs them in a synthetic design technique for explanatory contents with accompanying movement. The system unifies static, dynamic and interactive expression into a whole, inside of three-dimensional (3D) space, which interfaces with contents using Multi-Dynamic Documentation (MDD), a dynamic and interactive visual expression technique. The operation of this content uses a human's natural movement instead of a mouse or a pointing device and thereby makes powerful advances a possibility. It is therefore a goal of this study to update knowledge in the field to reflect the current situation, and to examine the possibility that emerging technologies have enabled a new interface context where users might communicate more efficiently with and in web-based environments.

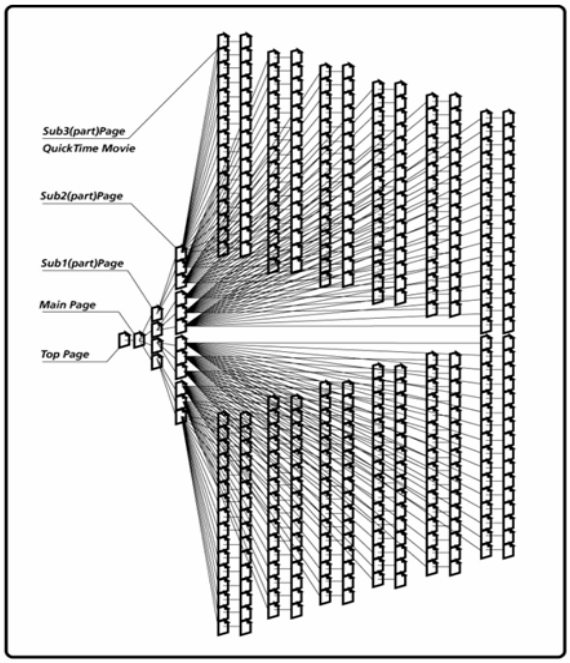

Figure 1: Current web page configuration

3) MDD OUTLINE

Multi-Dynamic Documentation can be defined as a system which unifies two-dimensional and three-dimensional spaces, whereby contents can be offered as information space directly, resulting in the possibility to simultaneously incorporate text, pictures, movies and 3D objects in real time on the same page . The technique proposed in this paper enables

parallel pages which are grouped together inside a three-dimensional space and accompanied by movement. This enables users to instinctively view contents. By using three-dimensional space, users can not only view all needed information as well as keep a sequence of all of the contents of an environment (see figure 2). However, increasing the amount of information on one page causes the amount of data that needs to be processed to also increase. By separating and prioritizing polygons, a fundamental aspect of 3D design, the current research was able to produce a fully dynamic 3D image of the entire human body and its organs. Furthermore, it was able to shrink the amount of memory required from an original 30 MB to 2MB. Although cellular phone operating systems and requisite memory vary, the above innovation is possible here too, a development which will have significant implications for fields such as distance learning.

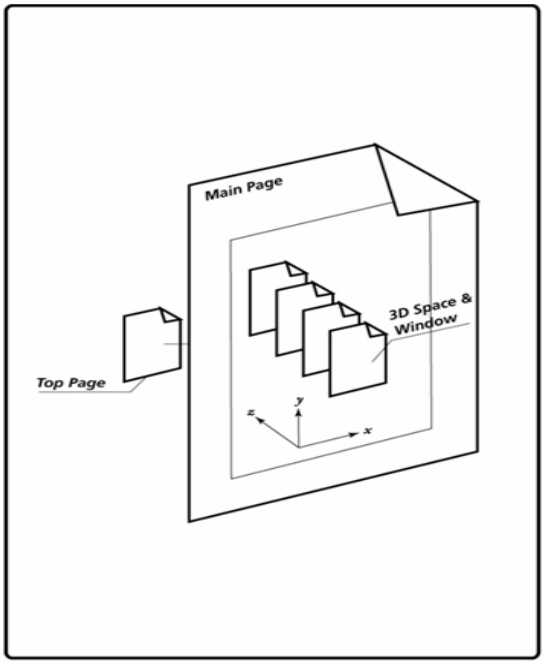

Figure 2: MDD web configuration

4) MICESTRO THE PERFORMANCE DEVICE

The development of Micestro the performance device anticipates a freedom of movement and interface that will surpass the potential of a mouse or other pointing devices. Using Micestro, users will be able to access contents freely. At present, to acquire a user's operating information, a technique has been developed that follows a dynamic image of the movement of the users' hands without any equipment except for a web camera. Micestro establishes a convenient, user-friendly environment without the use of large-size position measuring devices or the need to equip users with cumbersome peripherals. It employs a technique of following the area around a user's hands, which is an application of the Continuously Adaptive Mean Shift Algorithm (CAMSHIFT). CAMSHIFT is an adaptation of the Mean Shift algorithm for object tracking that is intended as a step towards object tracking for a perceptual user interface. In a several step process Micestro identifies a user's hand color, sharpens the color contrast and focuses on the strongest frequency located around the fingers. It then impregnates itself as a mouse in the operating system (see figure 3).

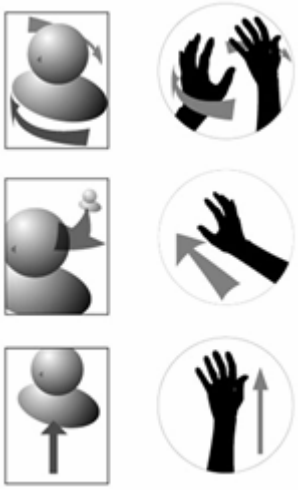

Figure 3: Micestro the performance device: hand & head identification

5) DISCUSSION

Based on the above points, this study on Multi-Dynamic Documentation (MDD) contents found notable contrasts with existing technology, particularly in the following four main features.

5.1) Transition to links

Previous web contents are based on links from numerous sources and integrated according to a resource taxing system of priorities, thereby giving rise to the term "world wide wait". Problematic aspects include how to turn over

several two-dimensional pages, how to understand the constitution of links and how to arrive at destinations easily. In contrast, MDD unifies all two-dimensional information with the resultant feature that a user can navigate smoothly and unconsciously without need for negotiating difficulties during transition between links. Using a PC with a Celeron 5000 chip and a normal LAN connection, it was possible to download and view the above mentioned MDD configuration of the entire human anatomy in 1.5 seconds (see figure 4). Following this initial caching interval, it was possible to view images in real time (0.2 seconds), which is significant not only because of its speed, but because such an interactive 3D format is impossible to achieve within the current web configuration.

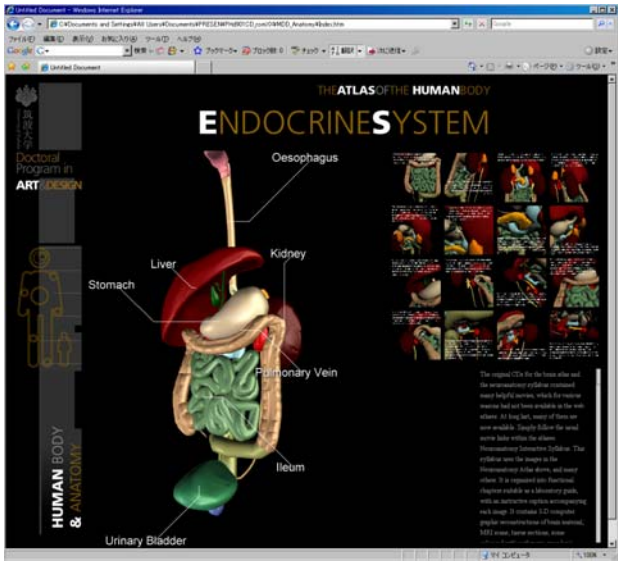

Figure 4: MDD anatomy

5.2) Layer constitution

Traditional web viewing in the proposed environment requires cumbersome switching between applications, such as dynamic objects, Realtime 3D, and Shockwave. Users must browse by turning over several pages to search for required information and, generally, this means users enter the deep layer constitution of contents. The deeper the contents, the higher the probability that one gets lost. However, MDD makes it possible to view all of the above applications simultaneously inside one space, without switching between applications (see figure 5). There is no layer constitution to MDD, therefore users browse by moving through contents, not by navigating successive pages.

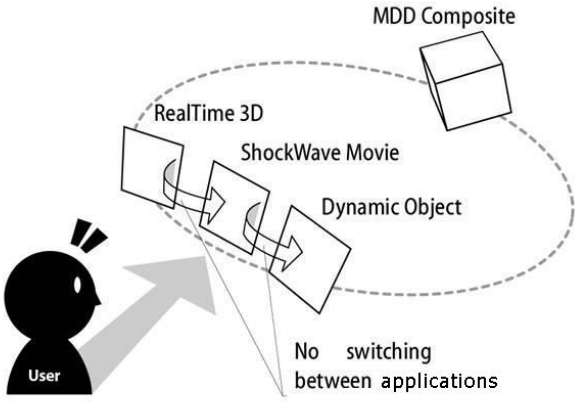

Figure 5: Traditional layer constitution versus MDD constitution

5.3) Applicability on general personal computers

Previous visualizations were only possible on large-size computers equipped with high-performance CPU. However, an MDD environment can reproduce contents which handle movements and operations in real time on a normal personal computer.

5.4) Application of three-dimensions

In many cases, previous web contents images are – in the final analysis - motionless and employ the same motion picture technique which was first pioneered over a century ago. At its best, this technique results in a perception of something resembling 3D, however it is a complicated and resource intensive operation (see above). Such “3D” viewing will allow the user to view across an image in increments of ten to thirty percent (10-30%). The layer constitution renders one image at a time and must turn over two-dimensional pages individually, which results in a characteristic, jerky effect as the system loads various components of the image. In contrast, MDD uses raw data to produce 3D polygon data in very fine detail and it is possible in real time. Visible parts are two-dimensional on both previous web contents and MDD, but MDD results in a depth which can give significantly more reality to images. Furthermore, users can decide viewing angles freely. Finally, using MDD, it is possible for users to move across

the view of an image in increments of less than one percent (1%), enabling far greater detail and a more authentic viewing experience.

6) IMPLICATIONS OF THIS STUDY

This preliminary study has only begun to reveal the implications of Multi-Dynamic Documentation (MDD), however it is clearly an improved format for structuring and disseminating web design, particularly in the following three areas.

6.1) Improved access and viewing

Accessing information through the Internet has many restrictions because of the amount of data required and the current system of information storage. Current web contents are expressed by separating several pages, whereas MDD can express movement and shape by taking in 3DCG itself within the web. In addition, it can heighten and perfect rather than degenerate graphic elements. It is possible to view images within 3DD at a full 16000000 true color 32 bit resolution, as opposed to 256 8-bit or 6500 16-bit color.

6.2) Improved graphic expression

The technology described in this study enables a new approach to movement in web design which excludes useless movement that does not relate to contents directly. The requirements of long loading time on dynamic elements of the present web contents (many unneeded files, slow processes) are delaying future innovations. There are many excellent graphic expressions in movies and animations (albeit in fixed sequence) and various elements of movement exist in previous contents, which are applied as a linear motion picture system. However, the Web is not linear, and its full potential cannot be realized using this linear motion picture system. The true dimensionality of the web requires methods of expression suited for non-linear applications. MDD enables real-time movement, it significantly reduces loading time and produces images of superior quality using a lesser amount of information.

6.3) Unified content

MDD is able to load 3D images directly and thus overcomes the need for extensive links to provide a 3D effect. Its interface does not to make users feel as if they are switching images, rather it unifies contents into one page and results in a more authentic viewing experience. It can therefore be envisioned that the concept of MDD has various applications for contents which accompany movement.

7) RANGE OF APPLICATIONS

The range of applications for MDD includes the following kinds of things: contents which accompany movement, movement itself as contents and explanations for mechanism assembly. In addition, it can be an integral tool for understanding various contents. It can thus be considered that a more valuable communication environment is constructed by applying documents that have MDD elements to various fields including the following.

7.1) Entertainment

3D movies made with the MDD format will enable viewers to watch a movie from an infinite number of angles. They will be able to zoom in on any feature in the picture, such as a character’s watch, and also view it from a number of angles. The above features will also become available for video games. Combined with the improved graphic expression discussed above, Micestro’s improved pointing functions will make possible a range of game configurations that are more lifelike than those currently available.

7.2) Education

MDD and Micestro will enable a new generation of interactive teaching materials, including the following. Employees working in assembly will be able to view enhanced schematics accompanied by movement when assembling devices. Students will no longer need to dissect lab animals in biology class, rather they will be able to virtually dissect an image designed with MDD in an operation controlled using Micestro. Similarly, the slim design of MDD will enable mobile distance education applications. Ultimately, medical students in remote developing countries will be

able to perform virtual operations for their instructors from a cellular phone as improved peripherals become available.

7.3) e-Commerce

Internet shopping will be facilitated by the improved web design made possible by MDD. Better viewing of merchandise, expanded possibilities for advertisements and more realistic virtual shopping malls will all become possible.

7.4) Database field

Improved information expression made possible by MDD will facilitate better mapping of information, such as a virtual space map of a web site. A virtual 3D library where users retrieve books or MP3 files in a three-dimensional cyber-space also becomes possible. In the field of medical science, explanation tools for patients and curators as well as meeting systems for medical students and doctors will be enabled using the technology described in this report.

8) FUTURE CONSIDERATIONS

The MDD contents proposed in this paper can be constructed if one has a certain level of knowledge about web technology. The technical bases are Web 3D, JavaScript, XML and HTML. Each technology has its own software for automatic generation, but there is no unifying software to produce MDD contents. The next step in the realization of the full potential of the innovations described in this paper will become possible once applications which support MDD contents are positively considered. No matter how excellent the contents are, it is difficult to popularize such an innovation unless there is a way of extending its applications to a more general audience. At present, the developer is extending the research described above toward an automated MDD page and image builder which can be used with programs like Dreamweaver instead of requiring designers to manually reduce polygons. It is envisioned that this will result in a seamless, easily used application which will reduce memory requirements and further sharpen pictures.

9) CONCLUSION

The MDD concept of this paper, combined with the Micestro performance device, represent the advent of a completely new form of web experience for computer and cellular phone users. The developments have various possible applications for contents which accompany movement or movement which in itself is content, such as anatomy explanations, medical procedure explanations, practice simulations, physical training and mechanical assembly instructions. MDD also makes possible the ability for personal viewing at an infinite number of angles with numerous software programs. Documents which employ the MDD element and the Micestro performance device as an interface will enable a more valuable communication environment, and will result in improvements and innovations in numerous fields. It will enable users to *experience* and *participate* in the viewing process to a much more thorough extent.

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Assessing the Acceptability of Adaptive E-Learning System

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ABSTRACT

AEL based on students' knowledge-level contribute many benefits to its users. The study on such system is vital as currently, most AEL only consider student's preferences, interest, and browsing behaviour when investigating student's behaviour for personalized services. Further, compared to previous studies on AEL system, user's acceptance towards this type of system, however, has not been assessed and understood thoroughly. In order to get more experience about the acceptance of AEL system that tailored learning content based on students' knowledge-level, a survey consisting of 314 students have been conducted. Based on TAM, this study proposed a conceptual model of AEL system acceptance. The result of regression analysis shows a positive indication on the acceptance of such system among students with the adaptability feature affect student's intention to use the system. The study provides insight into the usefulness of an AEL system based on students' knowledge-level. Moreover, it is an important step towards a better understanding of the user's intention on using the system in the future as it gives a more intensive view of the AEL system users.

Keywords
Adaptive e-Learning, Knowledge-level, Technology Acceptance Model (TAM)

1) INTRODUCTION

Due to the ability of adaptive e-learning (AEL) system in providing an individualized learning to each of its users, the learning system has become an increasingly useful tool to improve the quality of education in our evolving society (Brusilovsky, 1996). Despite the benefits offered by AEL system which tailored it learning content according to students' knowledge-level, the acceptance of such system among students has not been tested. The purpose of this study is to assess the acceptance of AEL system among students and indirectly examine the preparation of students in adopting AEL into their learning activity. It focuses in predicting the system future usage (acceptance) and to assist the system future development. This is so as according to DeLone & McLean (1992), user acceptance is an important primary measure of system success.

The acceptance is measure by employing the Technology Acceptance Model (TAM) proposed by Davis (1989) because the model provides an adequate foundation to evaluate students' preparation and readiness for the AEL system. Since adaptability feature is claimed to be an added value of AEL, thus the feature is predicted as the external stimulus that affects students' acceptance toward the system. Understanding the acceptance of AEL with the influenced of adaptability feature should be considered as an important issue because it will determine the importance and usefulness of integrating adaptability into any electronic-based learning system in the future.

2) THEORETICAL BACKGROUND

2.1) Technology Acceptance Model (TAM)

TAM is one of the theoretical models that attempts to predict a person's intention to accept and use IS technology (Davis, 1989; Davis *et al.*, 1989). Igbaria & Iivari (1995) conclude that the TAM is one of the simplest, easiest to use, and most powerful computer usage models. The following is the figure of TAM.

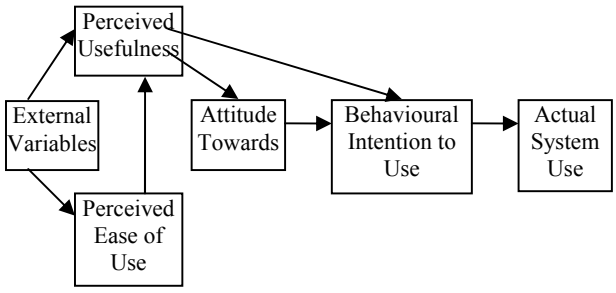


Figure 1: Technology acceptance model (TAM)

Based on the figure 1, TAM posits that the behavioural intention on system usage is determined by individual's attitude in using the system and perceived usefulness. Davis (1989), Chen *et al.* (2002) and Chen *et al.* (2007) said that behavioural intention is a powerful determinant and a predictor of performing actual behaviour. In the case of system adoption, this behavioural intention is claimed to be a powerful determinant and predictor of actual system usage. Attitude towards the system is jointly influenced by perceived usefulness and perceived ease of use.

According to many studies, perceived usefulness and perceived ease of use are the two important factors in determining the use of information system as these factors will generate attitude and intention towards system use (Chen *et al.*, 2002; Legris *et al.*, 2003; Pituch & Lee, 2006; Roca *et al.*, 2006; Ngai *et al.*, 2007; Chakraborty *et al.*, 2007). Further, perceived ease of use directly affect perceived usefulness. Perceived usefulness is defined as the degree to which a person believes that using the new technology will enhance his or her performance, and perceived ease of use is the degree to which a person believes that using the technology is free of effort (Davis, 1989). Therefore, in the present study, the perceived usefulness of AEL system is defined as the degree to which the user believes that using the system would enhance his/her learning performance, whereas, the perceived ease of use is defined as the degree to which the user believes that using the AEL system will be free of effort.

The significant relationship between perceived usefulness and perceived ease of use had been justified in many studies, for instance, study by Lee (2006) in investigating the factor influence the adoption of an e-learning system. The empirical result found in Lee (2006) showed that perceived ease of use significantly and positively affect perceived usefulness. Other than that, study by Ngai *et al.* (2007) in determining the acceptance of WebCT showed that the ease of use of WebCT directly affects the usage of it. Both of these major drivers of technology acceptance are influenced by many external variables such as system characteristics and user characteristics. TAM proposed that the effect of external variables is completely mediated by user's beliefs. In another words, the external variables are expected to influence 'attitude toward' and 'behaviour intention to use' new technology by affecting beliefs toward the system that consist of perceived usefulness and perceived ease of use.

2.2) AEL based on students' knowledge-level

AEL is generally defined as an e-learning system that can adapt e-learning content to meets the characteristic(s) of individual users (Gu & Sumner, 2006; Vu Minh Chieu *et al.*, 2006). Adaptive system uses the information about a particular user, reflects in user record,

to adapt the information and/or links presented to that user. Basically, learning content can be adapted whether to student learning style, preferences, cognitive style, or knowledge-level (Mosston & Ashworth, 1990; Srisethanil & Baker, 1995; Beaumont & Brusilovsky, 1995; Brusilovsky, 1996; Brusilovsky, 2001; Ary *et al.*, 2006). As for this present research, the focus is on accommodating the learning content based on student's current knowledge-level in subject being learned. This adaptation works by providing the student with the most appropriate learning content, which has been customized into distinguished learning modules, according to their knowledge-level. Therefore, based on the above definition of adaptation and also by taking into account the general and specific definition of an AEL system, e-learning adaptation in the present research context is defined as the process of changing or providing e-learning content that suits to student's knowledge-level.

There are two components that can be adapted within an AEL system which are content pages (content-level adaptation or adaptive presentation) and links pages (link-level adaptation or adaptive navigation) (Beaumont & Brusilovsky, 1995; Brusilovsky, 1996). Content-level adaptation is used to solve the problem of hypermedia system that being used by different classes of user, whereas, link-level adaptation is used to provide navigation support and prevent users from getting lost in hyperspace (Brusilovsky, 1996; Brusilovsky, 1997; Brusilovsky, 1999). Attention is given to the content-level adaptation in order to adapt the AEL content based on students' knowledge-level. Student's knowledge-level pertaining to the domain presented in e-learning appears to be the most important feature of the user that needs consideration for an adaptation support (Chen *et al.*, 2006). Four of the five operational criteria proposed by Brusilovsky (1999) are focussed in order to facilitate adaptive supports in an AEL system. These four operational criteria are as follows:

i) Adaptive presentation of learning content – at any given time during the learning process, the learner is provided with learning contents that are appropriate to his/her present competence.
ii) Adaptive use of pedagogical devices – at any given time during the learning process, the learner is encouraged to do learning activities that are appropriate to his/her present competence.
iii) Adaptive communication support – for any learning discussion, the learner is suggested with peers who are appropriate to help him/her overcome his/her own difficulties.
iv) Adaptive problem solving support – for any problem solving session, the learner is supported with appropriate feedback (e.g. hints) to solve the problem effectively.

3) Conceptual model and hypotheses

Figure 2 illustrates the TAM-based model examined in the study. It asserts that the intention to use AEL system is a function of its perceived usefulness, perceived ease of use, and adaptability feature. Intention is the extent to which the user would like to reuse AEL in the future.

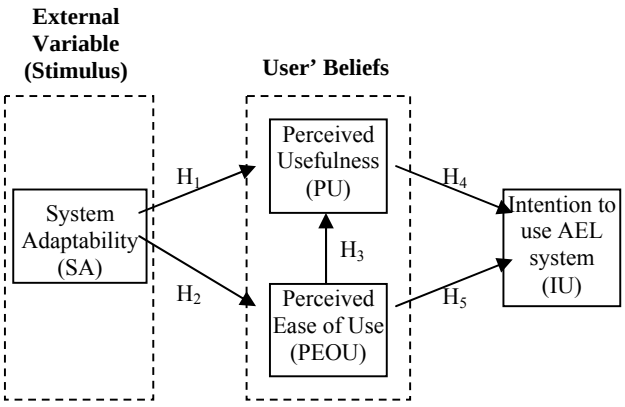


Figure 2: TAM-based conceptual model

According to many researchers, adaptability could increase students' learning activity and

their understanding on subject learns (Jih, 1996; Cantoni *et al.*, 2004). Conceivably, there is likelihood that the students will accept e-learning due to these reasons. Specifically, the researcher predicts that because of the benefits offers by AEL system, student will find the system as a useful and easy to be used. Thus, there is likelihood that the students' intention to use AEL system would increase through the mediating effect of perceived usefulness and perceived ease of use. Hence, system adaptability is hypothesized as being indirectly related to intention to use AEL system through perceived usefulness and perceived ease of use. This prediction is supported by McCormack & Jones (1998) as according to them the extent to which a student will use a particular e-learning system is often based on their belief on the system usefulness and ease of use. Additionally, perceived ease of use directly influences perceived usefulness of AEL system. Accordingly, the following hypotheses are proposed:

H1: System adaptability has a significant positive relationship with the perceived usefulness.

H2: System adaptability has a significant positive relationship with the perceived ease of use.

H3: Perceived ease of use has a significant positive relationship with perceived usefulness.

H4: Perceived usefulness has a significant positive relationship with intention to use AEL system.

H5: Perceived ease of use has a significant positive relationship with intention to use AEL system.

Figure 2 also envisage that the 'attitude' component is excluded from that TAM-based conceptual model in predicting AEL system acceptance. This is because Davis *et al.* (1989) have found that the influence of attitude on IS use disappeared when perceived usefulness was considered to predict system intention to use. According to Yang & Yoo (2004), the validity and reliability of model constructed without attitude as a mediating effect have been well supported by various studies. One of it is the study by Chen *et al.* (2007) where they found that there is no significant relationship existed between attitude and behavioural intention to use web-based learning system. Thus, it is relevant to exclude attitude as a mediating effect on intention to use the system in the present model.

4) Research methodology

4.1) Instrument development

The survey instruments consisted of 15 items (listed in Appendix A) to assess four constructs of the TAM-based conceptual model. Items for perceived usefulness and perceived ease of use were adapted from previous studies in TAM research area and were refined to make them specifically relevant to the present study. Specifically, the items were adapted from Davis (1989), Yi & Hwang (2003) and Ngai *et al.* (2007). Whereas, items for adaptability and intention to use were self-developed by reviewing previous literatures related to AEL as the researcher unable to locate previously validated items that matched these present research components of interest. These four constructs were measured on a five-point Likert scale ranging from '1' as 'strongly disagree' to '5' as 'strongly agree'. The scale is adapted from Saade *et al.* (2007).

4.2) Sample and data collection

The research methodology was based on empirical data collected through a questionnaire survey of students enrolled in Universiti Malaysia Sabah (UMS), one of the universities base in Malaysia. The sample population comprises of 483 undergraduate students from the School of Informatics Science (SSIL) of UMS who never have the experience in using AEL system before. From 483 students, 314 have voluntarily participated

in the present study. The main reason of selecting this student as the population is because the AEL system is in Differentiation domain. Differentiation is part of the topic learn in Basic Mathematic (IT1113) course taken by the SSIL student.

Before the questionnaire is used in the actual survey, the questionnaire is pre-tested for its reliability, relevant, and validity. The questionnaire is disseminated randomly to the target population through Sample Random Sampling (SRS) technique. The respondents who completed the questionnaire did so voluntarily with no reimbursement for their participation. SRS technique is used in order to avoid biases in answering the questionnaire (Ary *et al.*, 2006).

4.3) Experimental treatment

Respondents were asked whether they have any priori experience in using AEL system to verify that respondents only comprises of students who never use AEL system before. The respondents with experience in using AEL were omitted from this study. Then, they were given a brief (ten minutes) demonstration of the learning system. The researcher informed the respondents regarding the objective of the study.

Immediately following this demonstration, respondents were given a brief (one hour) period to experience the AEL system. During this session, respondents were allowed to perform any type of learning activities provided within the system.

4.4) Data analysis method

The data gathered from the valid questionnaire were transferred directly into personal computer. Analyses were performed using the Statistical Package of Social Science (SPSS) Version 11.0. The analyses used involved frequency analysis, reliability analysis, factor analysis, and regression analysis. Further, the research hypotheses is analyzed based on the series of linear regression analyses performed to estimates the path coefficients (standardized regression weight, β) associated with the TAM-based conceptual acceptance model of AEL system.

5) Analysis and results

5.1) Descriptive statistics

A total of 314 undergraduate students has participated in the survey with majority of the respondents are third years of study. Of the respondents, 56.1% are female students while 43.9% are male.

5.2) Analysis validity and reliability

Construct validity is assessed through principal component analysis using varimax rotation. Table 1 showed the result of PCA after varimax rotation and the value for Cronbach's α for each of the respective factors.

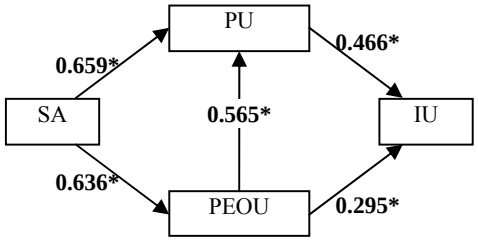
Table 1: Results of PCA and Cronbach's α from reliability analysis

	Component			
	Factor 1 SA	Factor 3 PU	Factor 2 PEOU	Factor 4 IU
Variables				
SA1	**0.389**	0.384		
SA2	**0.584**			0.361
SA3	**0.766**	0.332		
SA4	**0.629**	0.384		
SA5	**0.737**			
SA6	**0.720**			
SA7	**0.597**			0.456
PU1		**0.647**		0.458
PU2		**0.756**	0.291	0.295
PU3		**0.815**		
PEOU1			**0.757**	
PEOU2		0.310	**0.757**	
PEOU3			**0.846**	
IU1				**0.779**
IU2	0.326			**0.731**
Cronbach's α	**0.8602**	**0.8386**	**0.8429**	**0.7681**

The result from PCA on 15 suggested variables has extracted four factors which are "system adaptability", "perceived usefulness", "perceived ease of use", and "intention to use AEL system". As suggested by Stevens (1992) factor loading greater than 0.3 is used for a sample size greater than 300. The result shows that all fifteen variables perfectly load into their own respective factor (factor loading value exceed 0.3), thus, it has verify that the variables measures exhibit sufficient validity and proved that that the variables claimed by the researcher are well predicting the factors. Table 1 also presents the value of Cronbach's α where the α-value for each of the respective factors is greater than the minimum threshold level which is 0.6 (Uma Sekaran, 2003; Malhotra, 2004). Thus, it indicates that the variables used in the study are reliable and consistent.

5.3) Results of regression analysis

Regression analysis is conducted to assess the relationship between predictors (independent variable) and outcomes (dependent variables). Figure 3 illustrates the graphical presentation of the β-value for each of the variables.



indicates that $p < 0.001$

Figure 3 Graphical representations of β-values

Figure 3 shows that SA has a significant positive relationship with PU ($\beta = 0.659$, $p < 0.001$) and PEOU ($\beta = 0.636$, $p < 0.001$). This indicates that both H1 and H2 are accepted. In addition, PEOU also has a significant direct effect on PU ($\beta = 0.565$, $p < 0.001$). Hence, H3 is supported. Finally, figure 3 also presents that PU as well PEOU have a significant positive relationship with IU with the β-value is equal to 0.466 and 0.295 respectively. Therefore, H4 and H5 are well accepted in this study.

6) Discussion and conclusion

Through the regression analysis performed in the study, it is found that adaptability feature affect the usefulness of AEL system. Specifically, adaptability made student's learning more effective and increases their learning performance. This has attested the justification stated by many researchers regarding on the benefits and usefulness of adaptability based on students' knowledge-level such as Cantoni *et al.* (2004), Chen *et al.* (2006) and Waite *et al.* (2007). The result also supported the first research hypothesis of the present study that is system adaptability has a significant positive relationship with the perceived usefulness. Besides that, system adaptability also found to influence students' belief on the system ease of use. Therefore, the second research hypothesis which stated that system adaptability has a significant positive relationship with perceived ease of use is accepted.

Apart from this, it also found that system adaptability and perceived ease of use has a positive relationship with perceived usefulness whereby system adaptability contributes highly compared to perceived ease of use. This is consistent with other previous studies on TAM, such as the study done by Davis (1989) and Szajna (1996), where the studies also found that there is a significant direct effect of perceived ease use on perceived usefulness. The present finding indicates that the third research hypothesis is well accepted. Furthermore, the study also found that both of the student's beliefs which are perceived usefulness and perceived ease of use of the AEL system has a significant positive direct effect on the students' intention to use the system. This means that students' intention to

use AEL system increased as their belief on the system usefulness and ease of use increased. The result appears to confirm the statement by McCormack & Jones (1998) that the extent to which a student will use a particular electronic-based learning system is often based on their belief towards the system usefulness and ease of use. This is similar to the findings obtained by several researchers who conducted study pertaining to the acceptance of other IS technology with the application of TAM. Such researchers are Davis (1989), Szajna (1996), Pituch & Lee (2006) and Ngai *et al.* (2007). Thus, the forth and fifth research hypotheses has been accepted in this present study.

As the conclusion, system adaptability contributes to the acceptance of AEL system. This system characteristic indirectly influenced students' intention to used AEL system by significantly affect students' belief on AEL system usefulness and ease of use. Ensue, both of these beliefs is found to be significantly influence the acceptance of AEL system with perceived usefulness contributes greatly on the intention to use AEL system than the component of perceives ease of use. This implies that, the ease of use of a learning system is not the major determinant of the system acceptance. The result similar to the finding obtained from the study conducted by Deng *et al.* (2004) and Lee (2006) where perceived usefulness is a stronger predictor of students' intention to use the AEL system compared to perceived ease of use. Further, the regression model created during the analysis is found to be significant. As illustrated in figure 3, the standardized regression weight, β are significant with $p < 0.001$. Thus the TAM-based conceptual model which was developed to explain the acceptance of AEL system has been successfully tested and validated. This implies that the developed conceptual acceptance model of AEL system is significant in explaining AEL system acceptance.

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Appendix A: Research questionnaire

SECTION A
Please select the appropriate answer.

1. Program:
- ☐ HC12 Multimedia Technology
- ☐ HC13 E-Commerce

2. Gender:
- ☐ Male
- ☐ Female

3. Age:
- ☐ 19 - 22
- ☐ 23 - 26
- ☐ > 26

4. Year of study:
- ☐ Year 1
- ☐ Year 2
- ☐ Year 3
- ☐ > Year 3

5. PC ownership:
- ☐ Yes
- ☐ No

6. Home internet Connection:
- ☐ Yes
- ☐ No

7. Have you ever used an adaptive e-learning before?
- ☐ Yes
- ☐ No

SECTION B
Please justify your level of agreement based on the statements below.
1 = Strongly disagree (**SD**), **2** = Disagree (**D**), **3** = Neutral (**N**), **4** = Agree (**A**), **5** = Strongly agree (**SA**)

	System usefulness	**SD**	**D**	**N**	**A**	**SA**
1.	The AEL system enhances the effectiveness of my learning	1	2	3	4	5
2.	The AEL system improves my learning performance	1	2	3	4	5
3.	Overall, I find the AEL system to be advantageous to my learning	1	2	3	4	5

	System ease of use	**SD**	**D**	**N**	**A**	**SA**
1.	Learning to use the AEL system is easy for me	1	2	3	4	5
2.	The process of using the AEL system is clear and understandable	1	2	3	4	5
3.	Overall, I believe that the AEL system is easy to use	1	2	3	4	5

	System adaptability	**SD**	**D**	**N**	**A**	**SA**
1.	The provided learning content suit to my current knowledge-level	1	2	3	4	5
2.	The learning content which is presented according to my current knowledge-level improves my comprehension on the learning topic	1	2	3	4	5
3.	The suggested students provided by the system gives me the possibility to learn with other students	1	2	3	4	5
4.	The system assist me in deepen my understanding in topic learned as I exposed to a multiple perspectives of solution from other students suggested by the system	1	2	3	4	5
5.	The self-test enable me to instantly evaluate my comprehension on topic learned	1	2	3	4	5
6.	The feedback (hint) assists me to identify problem areas	1	2	3	4	5
7.	The feedback (hint) assists me to solve the problem effectively	1	2	3	4	5

	Intention to use the system	**SD**	**D**	**N**	**A**	**SA**
1.	I intend to use the AEL system in the future as an alternative learning method other than class-based lecture	1	2	3	4	5
2.	I intend to use the AEL in the future as an alternative learning method if I having problem in understanding the topic taught during class-based lecture	1	2	3	4	5

Roles for New Technologies in Mitigating the Detrimental Effects of Poor Integration and Other Issues that are Connected with the Curriculum-Development and Provision of Double Degrees

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ABSTRACT

This paper discusses four primary issues associated with double degrees, and considers ways in which new technologies may help in addressing those issues. The four issues are (1) in a double degree, each of the two degrees is "shortened", which raises questions relating to the sufficiency of "coverage" of required material; (2) students can find it difficult to know where to turn for help; (3) the two programs tend to be not well integrated, and (4) it can be more difficult for double degree students to participate in peer networks. Some double degree programs are "international", and these are particularly problematic, especially in programs where lecturers from one institution visit the other for brief periods (typically week-ends) to deliver lectures before returning to their home country. To some extent many courses are already trending towards on-line delivery modes, and this in itself may help double degree students. Even so, there may be potential to provide additional resources to enabling additional e-Learning capacity to certain subjects if those subjects are identified as causing specific bottlenecks for double degree students. It is concluded that even though double degrees present serious educational challenges, if reasonable effort is expended in a few well-targeted areas, new technologies may play a significant role in improving the educational outcomes for students of double degrees.

Keywords

double degree, e-Learning, new technologies, curricula

1) INTRODUCTION

Double degrees are different things in different universities. In this paper, "double degree" refers to a particular type of cross disciplinary educational program model where students complete two degrees, undergraduate or postgraduate, either consecutively or simultaneously, through two faculties or disciplines of one or two institutions.

Examples of Thailand-Australia international double degree programs include:

- The double degree in Aerospace Engineering and Business Administration from Kasetsart University and Royal Melbourne Institute of Technology (RMIT)
- The Marketing and Management Double Degree Program from the College of Management, Mahidol University (CMMU) and University of Technology, Sydney

Double degrees which combine engineering and science have a long history in Australia, and the combination is thought to build capacity for highly demanding technical and research oriented engineering (King, 2008). Double degrees that combine engineering with arts, business, commerce and management were introduced from the early 1990s, and have proven particularly attractive to women – these degrees are presumed to provide students and graduates with broader study and career options.

For disciplines such as science and engineering, there is a perception that double degree programs retain students who might otherwise have solely undertaken studies in business or management.

In Australia, it seems that about 15% of engineering students are taking double degrees. The majority of these are combining engineering with business, commerce or management. At UTS, the Faculty of Engineering is responsible for 448 double degree students, of which 263 are enrolled in a Bachelor of Engineering Bachelor of Business double degree (BE-BBus). The Faculty of Engineering provides primary academic support for the overall BE-BBus program, whereas the Faculty of Business provides support re issues that specifically relate only to Business subjects.

2) ISSUES ASSOCIATED WITH DOUBLE DEGREES

Four issues associated with double degrees have been identified by a recent pilot survey of UTS engineering double degree students together with a review of the literature.
The four issues are:

1. Each of the two degrees is "shortened"
2. Where do students go for help?
3. Are the two programs well integrated?
4. Peer networks

Each of these issues is discussed in more detail in the following sections. The potential for e-Learning tools to address each of these issues is considered in Section 3.

2.1) Each of the two degrees is "shortened"

A student would ordinarily require 7 years to complete a BE and a BBus. When the two are combined as a double degree, this can be reduced to 5 years.

Another way of viewing the issue is to look at the total number of hours studied. At UTS, students typically study 4 subjects at a time. Each subject nominally 'expects' 9-12 hours of study per week. (Thus a typical full time student has a total nominal load of about 40 hours per week.) In the case of the BE-BBus, the total nominal hours studied might look as follows:

BE: 4032 hours (4 yrs)
BBus: 3024 hours (3 yrs)
The two as separate degrees: 7056 hours (7 yrs)
BE-Bus double degree: 5040 hours (5 yrs)

What happens to the other 2 years? The answer relies in part on recognition of prior learning.

To explain, when a student enrolls in a degree, exemptions from certain subjects may be granted if the student has already undertaken prior tertiary studies. An engineering student who already has a business degree might be exempted from 2-6 subjects, which would typically include an introductory mathematics subject, an introductory physics subject and up to 4 elective subjects.

When a student undertakes a double degree, the prior learning that occurs in the each degree permits exemptions in the other degree – each degree recognises the prior learning of the other.

This raises a question of whether the double degree has *sufficient coverage*. An engineering graduate of the BE-BBus has studied less engineering subjects than a graduate of a single BE. Has the double degree graduate studied "enough engineering"?

It might be argued that a double degree does not need to be twice as long as two single degrees, in the same way that a two bedroom house does not need to be twice as large as a one bedroom house. Certain aspects of the two curricula, for example, introductory finance and management, would be repeated if the two degrees were taken separately. Notwithstanding, a counter argument might point out that double degree students are permitted a greater number of exemptions than would ordinarily be granted if undertaking the degrees consecutively.

A common misconception is that double degree students undertake more subjects at any given moment than single degrees students. The

reality is that a full time student carries a nominal load of about 1000 hours per year, regardless of whether they are enrolled in a single or double degree

2.2) Where do students go for help?

Students of double degrees can find it difficult to know where to go for help. For example, if a student wishes to seek information or alter her study plan, and if she is undertaking an MBA based in Melbourne and a BE based in Bangkok, the question arises as to which administration office or lecturer or program head or university does she communicate with.

This issue is highlighted in prior research. For example, in a study at another university, a double degree student said "I would not recommend my double degree to anyone as it stands—it was too difficult to find help when I needed it." (Russell, Dolnicar & Ayoub, 2008, p. 585).

It is necessary for universities to find the right balance when allocating resources to programs, and the costs associated with developing and maintaining new technologies can be relatively high. However, students are more likely to succeed in settings that provide readily available academic support – this is borne out by prior research such as that of Tinto (2003).

Finding a good balance can be a particular challenge for *international* double degrees, especially for programs where lecturers from one institution visit the other for brief periods (typically week-ends) to deliver lectures before returning to their home country. Students can find it difficult to access lecturers at the best of times, let alone when they are in different countries. Designating roles for local or "*home"* academic and administrative support is one measure in mitigating this issue. ("Home" takes on different meanings depending on whether the context is something such as "home university" in the case of international double degrees, or "home faculty" in the case of inter-faculty double degrees.) More importantly, email, on-line learning tools, wikis and blogs may play a major role in facilitating communication in such situations.

2.3) Are the two programs well integrated?

Double degrees are commonly associated with highly specialised 'niche areas'. Two examples are science-law and engineering-management. Such integrated niches are thought to be valued by employers. Students and employers might understandably assume double degree curricula in such niche areas would include coverage at the interface of the two degrees.

For example, it might be expected that a course such as BEngBMedSci would enable graduate attributes in the area of biomedical engineering. However, in reality, the course may simply include 'standard' engineering alongside 'standard' medical science. Thus it is proposed that double degree curriculum development/ and renewal processes, particularly in relation to the interfaces of disciplines, may be below expectations.

In most cases, a double degree program is essentially a selection of subjects drawn from two different faculties, without many (if any) additional resources allocated specifically for double degrees. According to Welsman (2007), double degrees are "not interdisciplinary and barely integrated" and "students are challenged to progress two separate courses almost in spite of the system" (p. 149).

A 1996 review by The Institution of Engineers Australia, known as *Changing the Culture*, encouraged schools of engineering to develop curricula that would enable graduates to work across disciplines. Twelve years later, the 2008 ACED review expresses the view that with respect to work across the disciplines, there has only been a limited degree of progress (King, 2008, p. 81). The review finds "the undergraduate programs in the two disciplines have tended to remain completely separate" (King, 2008, p. 81), and that although engineering practice regularly takes place in business environments, apart from some coverage re introductory management, there appear to be few curriculum links with management schools. The review also finds that there are not many opportunities for students of engineering-management double

degrees to undertake projects that explicitly take advantage of the combined disciplinary coverage.

2.4) Peer networks

It seems that students of double degrees may also face disproportionate challenges with respect to forming peer networks and becoming part of a lifelong learning community. An arts-commence student highlights this issue as follows:

> Students undertaking single degrees move at almost double the speed, friends move on in all faculties and you are left in fourth year with new second-years etc. You make new friends, but it is hard to make close friends and achieve continuity (Russell, Dolnicar & Ayoub, 2008).

Tinto (2003) suggests "students are more likely to persist and graduate in settings that provide academic, social and personal support", and that such supports need to be readily available and connected with the student university experience.

3) THE POTENTIAL FOR NEW TECHNOLOGIES TO ADDRESS THESE ISSUES

The previous section discusses some of the challenges faced by double degree programs.

Table 2. Potential roles for new technologies in supporting double degrees

Issue	*Potential roles for new technologies*	*Effort Required*	*Impact*
1. Each of the two degrees is shortened	Timetables and programs are usually organised in way that allows single degree students to undertake their studies with a minimum of clashes – this is much less the case for double degree programs. However, new technologies may help to alleviate the effect of this. For example, podcasts of lectures and asynchronous learning modes enable students to learn at times when it suits them rather than at timetabled times. To some extent many subjects are already trending towards on-line delivery modes, and this in itself may help double degree students. Even so, there may be potential to provide additional resources to enabling additional e-Learning capacity to certain subjects if those subjects are identified as causing specific bottlenecks for double degree students.	medium to high?	medium to high?
2. Where do students go for help?	A webpage with specific information for students of double degrees may include links to resources such as relevant information and contact details of relevant academic and administrative staff. In addition, double degree students may be particularly receptive to regular and timely information emails specifically tailored to the particular needs and issues of double degree students	low to medium?	medium to high?
3. Are the two programs well integrated?	Expertise in mapping and tracking generic and graduate skills is being developed at many institutions. This expertise requires aligning the skills with the institution's mission and integrating the skills into curricula as demonstrable outcomes. The extent to which the skills are achieved requires concerted measurement (Stevens, 2005). Program developers of double degrees may be particularly assisted by new technologies/software that is specifically designed to allow graduate attribute tracking – especially in situations where the two degrees are situated in different countries.	medium to high?	medium to high?
4. Peer networks	Students of double degrees tend to progress through their courses at a slower rate than their single-degree peers, and can face challenges in forming new friendships etc throughout their studies. The effects of this issue may be mitigated to some extent by electronic forums or other web-based peer networking approaches that could allow double degree students to communicate with each other and pool experiences and knowledge.	low to medium?	low to medium?

Table 2 shows some considerations relating to how new technologies might best be applied to addressing the above issues.

Given that substantial resources may already have been expended in developing each "single degree", it is understandable that universities may tend to see limited value in expending further resources to simply combine the programs. However, considering the issues

faced by students of double degrees, along with the popularity of double degrees with students, universities may find it fruitful to build on existing e-Learning infrastructure, perhaps making comparatively small additions or alterations specially targeted at addressing double degree challenges.

4) CONCLUDING REMARKS

Each of the four issues discussed here presents significant challenges for the development and provision of double degrees. When taken together, the challenges are serious, and raise major questions about the quality of double degree programs. However, if reasonable effort is expended in a few well targeted areas, it seems that new technologies may play a significant role in improving the educational outcomes for students of double degrees.

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Going Mobile: New technologies and their implications for education

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ABSTRACT

The following report will consider what has come to be known as mobile learning (m-learning), describe a number of mobile devices and their potential applications for the instruction of Modern Foreign Languages (MFL) with reference to applications in use, potential applications, and studies to date. Finally, it will situate these applications within the context of existing pedagogical principles and. identify future issues and considerations surrounding the incorporation of mobile learning in education.

Keywords
Innovative Technology in Learning, Learning Effectiveness, M-Learning

1) INTRODUCTION

Mobile technologies such as the cellular phone are a ubiquitous aspect of modern life. Students entering universities today take it for granted that from almost any location and at almost any time they can make telephone calls, send mail, listen to music, take pictures or videos and perform a range of other functions that are made possible by mobile technologies. Indeed, students are often more adept at employing these mobile technologies than many of their instructors. This was made altogether clear to the author in the twilight one evening, when he witnessed a student riding his bicycle - all the while inputting something on his mobile phone. Within such a context there is an excellent opportunity for educational institutions to make effective use of student capabilities in this domain. In an environment where financial resources are often strained to meet Information Technology (IT) needs, schools should actively examine and pilot educational applications of mobile technologies, devices which students have purchased themselves and often are able to make powerful use of without any instruction from their professors. The following report will consider what has come to be known as mobile learning (m-learning), describe a number of mobile devices and their potential applications for the instruction of Modern Foreign Languages (MFL) with reference to applications in use, potential applications, and studies to date. Finally, it will situate these applications within the context of existing pedagogical principles and identify future issues and considerations surrounding the incorporation of mobile learning in education.

2) MOBILE LEARNING AND RELEVANT TECHNOLOGY

M-learning is an emerging consideration in education which is being driven by technological improvements in three areas – increased computing power and memory in handheld devices, better communications infrastructures, and the development of intelligent, user-friendly interfaces. For the purposes of this report, mobile devices will be defined as devices that are small enough to fit comfortably in a pocket or purse, that have software features, and which are used for computing, communication, entertainment, or educational purposes. Mobile learning will be considered as any type of learning which employs mobile devices to engage in learning and which occurs in an environment that is unconstrained by location. With the exception of Personal digital assistants (PDAs) and Personal Response Systems (PRSs), this report will focus mainly on mobile devices and functions which are in common usage by students in their personal lives.

2.1) PERSONAL DIGITAL ASSISTANTS

One device which has had great potential where mobile learning is concerned is the PDA. PDAs are sophisticated handheld devices that perform many of the functions of desktop and notebook computers. Recent models are equipped for wireless Internet and e-mail access, as well as multimedia functions. They can be used for word processing, spreadsheets, databases, and also include personal organizer software for functions such as maintaining a diary, scheduler, calendar, to-do lists, and so on. A pilot project which occurred recently at two Canadian community colleges (Roberts, Beke, Zen, Mercer, & Soetaert, 2003) reported the mixed results of an attempt to assess the effectiveness of PDAs as a learning device. Of 300 participating students, 100 were given PDAs, 50 were given laptops, and 150 students made up a control group. Results at one institution showed the average grade for the PDA group to be significantly higher statistically than the control group, however no such statistical difference was reported at the other institution. Both faculty and students at each institution reported that they found the increased potential of the use of PDAs was helpful for learning and instruction, however there were issues constraining widespread use of the devices for educational purposes. Chief among the impediments was their cost. Due to the high price of owning and operating them, PDAs have a low market penetration rate and are not in general use by students. Because of their many potential education applications, it would be intriguing to explore the possibilities allowed by providing them to students. Unfortunately, this is cost-prohibitive at present. Therefore, despite their immense potential, further consideration of widespread PDA use for educational purposes is not a consideration of this report. An assessment of their potential, however, has been a useful exercise because many of their functions are being incorporated into a more common device described next.

2.2) MOBILE PHONES

A more pervasive, and therefore important device to consider for its educational applications is the mobile phone. There has never been a device that has spread so rapidly and with so many implications as the mobile phone. A recent report from the International Telecommunications Union (2007) reported that the number of mobile phone subscribers tripled in the five years up to 2005, reaching well over 2 billion in 2005, and it is forecast that this figure will reach 3 billion subscribers in 2008. Over 95% of households in Japan owned cellular phones in 2005 (Ipsos Insight, 2006a). A study by Thornton and Houser (2005) found that 100% of 333 participating Japanese university students had mobile phones which could view standard web pages as well as send and receive standard Internet e-mail. Mobile phones vary in their capabilities, but many recent mobile phones feature the principal advantages of PDAs and include a range of functionalities that are more than ample for numerous applications in an educational setting.

Today's mobile phones provide an opportunity to enrich and enliven conventional lessons, and allow for independent and collaborative undertakings. They are unobtrusive and fit back in the learner's pocket after use. Furthermore, they allow teachers to circumvent learners' sometimes low IT skills in the computing domain by employing knowledge of mobile phones that learners have acquired for their own purposes, such as sharing music, sending mail to friends, or playing games.

2.2.1. Mobile Phone Features

Current model phones, especially "smart phones," include an increasing number of the following features in various combinations:

- camera/video
- voice recording
- Bluetooth or infrared file transfer capability
- internet access
- keyboard/handwriting recognition
- standard word processing database capabilities
- global positioning (GPS)

- external media link/expandable memory slot
- voice over Internet protocol (VOIP) applications such as Skype (2007)
- instant messaging

The above features make it possible for students to realize ambitious projects which not only further their language skills, but also build the student's confidence, strengthen valuable skills that can be used in the everyday world, and are personally relevant and meaningful for them. As another researcher has noted, "The new technologies allow students to have more control over their own learning, to think analytically and critically, and to work collaboratively. This 'constructivist' approach is one effort at educational reform made easier by technology and perhaps even driven by it" (Kosakowski, 1998, p. 1). For the past four years the author has assigned homework to students over summer vacation and the New Year's holiday requiring them to take at least five pictures using their mobile phones. Students make presentations based on the pictures in a context where they have ownership of the material, and they are the 'experts' who decide what is important. The exercises allow them to make meaningful use of their language skills and to communicate with their peers within a framework that makes use of their personal interests, all the while in a manner that allows them to generate and strengthen knowledge connections in the form of their own learning product. Another exercise which makes similar use of mobile phones is short video skits with improvised or prescribed dialogs for groups of multiple students. Such video applications incorporate a social element that promotes interaction, collaboration and negotiation, all of which are important elements for most modern pedagogies, such as Communicative Language Teaching, Cognitive Constructivism, Social Constructivism, Sociocultural Theory and Learner Centered Instruction.

2.2.2. Bluetooth

Bluetooth (2007) or infrared file transfer systems and mobile phone voice recorders make a number of other exercises possible that will extend teachers' abilities to monitor student efforts and to give and receive feedback on an individual basis. The author recently performed an experiment where he recorded someone's voice using a mobile phone and transferred it to his computer via Bluetooth technology. The file is five seconds long and occupies 12kb on disc. It took under two seconds to transfer it to the computer. Given these results it is within the realm of imagination to have students record and submit their in-class pair discussions, to set dialogs with open or prescribed topics, and to assign homework where students recite passages as part of a sound system learning agenda. I am recently finished an experiment in which use of this technology was a key element for assessing the impact of explicit instruction of prosodic speech. Using Bluetooth, it was anticipated it would be possible in a class of 48 students to assign a thirty-second dialog transcribed into prosodic speech, have students record it and upload it onto a public folder on the instructor's computer. Unfortunately, Bluetooth is not yet a common feature on Japanese mobile phones, and so the data was transmitted by having the students mail me their recordings. Other applications made possible by Bluetooth include the potential for students to record or write comments or communicate with their teacher in a form that is anonymous, if they wish, and always discrete. The potential also exists to download standard word processing and database files from the teacher's computer when they are made available in a public folder. Another experiment that I performed achieved a transfer of an Excel (2003) spreadsheet from a mobile phone to the my computer in approximately four seconds.

2.2.3. Other applications

Other mobile learning applications that are currently possible if wireless Internet is employed include numerous opportunities for spoken and written communication and study. Thornton and Houser (2005) set a vocabulary development program for their students using web-based short message service (SMS) where 93% of their students evaluated the exercise as a valuable teaching method. Attewell (2005) reported that SMS is being used to good effect for a mini-language course in southern Italy. Improvements in mobile phones also make

synchronous and asynchronous collaborative undertakings a distinct possibility in the near future, something that was formerly only possible with a web camera and a PC,. Finally, mobile books are a growing form of diversion for commuters and soon should be available at a price that will make them a viable option in reading courses. Torstar, the world's largest publisher of romance and women's literature, recently announced it will make all its new titles available online for downloading in the coming year ("Harlequin to make," 2007).

2.2.4 Known issues

There are a number of known issues that should be considered when implementing mobile learning, including the following. Viruses are beginning to make an appearance in the mobile world. A virus named Cabir has been recently discovered, and has the potential to infect phones which use the Symbian operating system via Bluetooth (Attewell, 2005). Privacy and data protection are issues that must also carefully be monitored in an m-learning environment. Finally, there have been studies in the past which suggested that low levels of radiofrequency energy exposure might accelerate the development of cancer in laboratory animals, however these studies have failed to be replicated, and more recent studies have shown no adverse health effect associated with mobile phone usage. Both the United States Food and Drug Administration (FDA) and the United Kingdom's National Radiological Protection Board (NRPB) have issued reports concluding that there is no solid evidence of adverse health effects from exposure to radiofrequency energy while using wireless communication devices for everyday use (United States Food and Drug Administration, 2005).

2.2.5 Future directions

At least two developments that are likely in the near future make mobile learning with devices such as the mobile phone an even more powerful opportunity. First, mobile phone providers will be able to offer increased speed potential as TV broadcasters hand back the wireless spectrum that analog TV now occupies and providers fill the void. The 700 mHz spectrum will provide faster Internet access than today's cellular or even Wifi networks, all the while working without interruption, even in poor weather (Stephens, 2007). Second, recent reports (Informa Telecoms & Media, 2007) are documenting a gradual shift towards open source operating systems for mobile phones. Up to now, mobile phone manufacturers have been doing everything in-house. This is increasingly being seen as a drawback for them, as it consumes too much time and too many resources. Google is leading an Open Handset Alliance of some 30 technology and mobile companies which are developing an open source platform that should become available in the near future (Google 2007). Open source operating systems would make it possible for users to download freeware and custom-designed software, which would be universal. In such an environment, it would be increasingly easy to design and deliver mobile educational applications which are a seamless part of the course curriculum and are ready for students to download as part of their course preparation prior to the beginning of the school year.

2.3) Personal Response Systems (PRSs)

PRSs are in-class electronic polling systems which employ specialized radio-frequency handheld devices connected to a laptop computer via a USB hub. The system can be set up in any classroom in a few minutes. The student remotes associated with this system allow for every student to respond to every question that their teacher asks. Student responses are aggregated and stored in computer files that can be made accessible in real time, both for grading purposes and for educational research to improve the quality of teaching. An example of a teaching question used by the author in recent language classes is "What do you think of the July-August vacation term at Tsukuba University?" The response of every student is compiled and results are immediately available for display as a pie or bar graph, and make for the basis of more extended and meaningful discussion and instruction in the target language. The PRS system can be used in lecture courses to more deeply involve students in learning material, to give quizzes, to administer

surveys, and even to verify attendance. Questions are presently available in True/False, multiple-choice, numerical, survey, serial, and short answer (text to 11 letters) forms, and work is ongoing to recognize other input forms such as phrases and even sentences. A comparable language laboratory system is many times the price of these units. Makers of the units claim the devices can be used for lectures of up to 2000 (two thousand) students (Interwrite Learning, 2007).

PRS units allow teachers to better fulfill the expectations of learner-centered pedagogy and constructivist principles in numerous ways. They allow an instructor to monitor student understanding, reveal common misperceptions and promote subsequent group discussion. Students receive much more feedback, and the devices allow them to remain anonymous. Peer-evaluation applications are also possible with this technology.

2.4) Electronic dictionaries

Electronic dictionaries are a part of the mobile learning rubric that have been in use for many years now. Electronic dictionaries also include full encyclopedias that allow students access to a wealth of information. Students can investigate alternate sources of information during content/sheltered content lectures and the devices can be used to promote critical thinking and the exchange of information in the target language between students. MFL instructors can encourage students to make use of such tools to mitigate gaps in understanding by investigating class topics in their L1 using their dictionaries and thus overcoming comprehension issues associated with a lack of background information.

2.5) Mobile gaming devices

Entertainment devices such as Nintendo's DS lite and Sony's PSP are becoming increasingly common and may also be used as mobile learning tools. They are part of a market that is coming to be known as "edutainment", and they allow users to study the vocabulary of a foreign language as part of a systematic, graded program that gives the learner feedback about their progress. Programs such as *Eigo Zuke* (2007) are also available for these units which enable study in a game-like format of standardized tests such as the SAT, the TOEIC, and the TOEFL.

2.5) Personal media players

Personal Media Players (PMPs) make powerful use of the MP3 format to enable learners to download various files, such as podcasts to further their knowledge as part of formal or informal learning experiences. Many students own MP3 devices and use them to download and listen to music, although they can be used for study, too. A recent search using Google yielded close to 1.4 million hits for ESL/EFL sites such as ESL Café or eslpod.com, where students can access listening texts of authentic and sheltered learning materials.

3) OUTLOOK

There is an immediate need to make industry aware of the needs of educators where mobile learning is concerned, but those needs may go unidentified until the use of mobile devices becomes more widespread in education. For example, devices such as the PRS described above use radio frequency kindred to Bluetooth and interface with relatively simple software that could easily be packaged into a cellular phone. However, without input from educational institutions, makers are hardly aware of, let alone concerned with incorporating such features in to their future designs. Keegan's (2002) statement still rings true:

> [W]ireless technologies and applications are replacing wired ones: e-commerce is moving to m-[mobile] commerce, m-business is replacing e-business … the list of 3G (third generation) wireless services is breathtaking, with applications already developed for refrigerators, business and the home … only in the fields of education and training are there no applications in development or planning. (p. 10)

Modern education needs to integrate mobile devices into existing teaching practices in a

manner that expands them but does not replace them. Mobile learning should be an opportunity to enliven and activate our students by transforming them from passive recipients of knowledge to enquiring participants who make use of technology to better understand their environment and mitigate the demands it places on them.

Technology cannot exist in a vacuum. To realize its potential, it has to be more effectively incorporated in to the whole education environment and its results should be assessed as part of the entire instructional process, with due consideration of instructional design, content, and teaching strategies associated with both the technology and the classroom environment. Until educational institutions and teachers attempt to use the resources at their disposal, there will be an increasingly widening gap between educational practices and the reality that is the world outside the classroom.

4) CONCLUSION

Author Marc Prensky (2004) has written that a discontinuity has taken place in the world's most recent generation that has changed the modern context so fundamentally that it may be considered a singularity, from which there is no return. He contends that current students' ubiquitous and constant exposure to technology and their interaction with it have had the effect that they "*think and process information fundamentally differently* from their predecessors" (italics in original). Prensky refers to this generation as "digital natives," as opposed to their "digital immigrant" predecessors, and extends the analogy by using terms such as "digital accent," which closely parallel the native speaker non-native speaker parlance of the MFL profession (Prensky, 2004 pp. 1-2). His point is that it is essential in the years to come for teachers to consider students' perspectives of the world and make efforts to employ technology in the classroom if they wish to keep education relevant. While Prensky's assessment of today's situation is somewhat premature, the technology described in this report would easily be perceived as relevant by students and well received, if it was used competently and in conjunction with clear educational objectives. The technology presented above has great potential for application in modern education and it is easily wed to longstanding principles of sound pedagogy. It has the potential to take learning outside the confines of the classroom, as well as to bring the larger world *in* to the classroom. It is unconstrained by time or space, and promotes a vision of learning that fosters learner-centered instruction, collaboration and life long learning. There is an urgent need for further debate, research, and consideration as to how mobile technology can be applied in modern education. Today is the time for tomorrow.

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Introducing Classroom Feedback Systems

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ABSTRACT

Personal Response Systems, or clickers, are wireless in-class polling devices which allow an entire class of up to 2000 students to respond to questions and immediately receive feedback on an individual basis. The following paper will briefly describe the background in which clickers were developed. It will further describe the devices and provide a rationale for their use, as well as a brief review of literature. The report will also consider student responses to use of the devices in one EFL setting, as well as discuss the devices' implications for materials designers. Finally, current developments in the mobile phone market will be considered to suggest that such devices have the potential to become a standard part of higher education instruction.

Keywords
Classroom applications for emerging technology, Delivery Systems, Innovation for education, Polling technology

1) INTRODUCTION

Polling devices, such as eInstruction's Interwrite PRS, make it possible for students to participate more actively in lectures and receive automatic feedback about their progress. Polling devices, or clickers, enable instant feedback and are increasingly becoming a standard feature in many classes in North America. They are often sold together with a text, especially in the sciences, a fact that should not be lost on materials developers and textbook publishers in the English as a Foreign Language (EFL) and English as a Second Language (ESL) field. It is timely and desirable that future EFL/ESL materials development consider the potential of the devices to, among other things, pre-test student knowledge, to assess the impact of instruction, to promote peer discussion and to deepen underlying knowledge of important concepts. However, the technology unto itself does not enable an improved learning environment. It must be used together with progressive approaches to instruction which put the learner at the center of the process and allow for the most efficient use of polling technology. It is central to this approach that the devices not be used to incessantly pepper students with questions, rather they should be used discreetly and strategically.

2) BACKGROUND

Horowitz (1988) describes the emergence of early polling technology at IBM Corporate Management Development center in a paper, which also considers the impact of the interactive capability of such devices on the design and delivery of courses, and the potential for improving instruction. As part of a quest to improve instructional techniques, the organization undertook a six month classroom observation trial. Instructors were classified as either 'facilitative', which involved the use of more spontaneous dialogue, Q&A using Socratic questioning methods and encouragement of active participation, or more oriented to the 'traditional lecture style', which involved a straightforward presentation of material in a teacher-fronted manner. Analysis showed that the lecture style was more effective to cover all of the syllabus material in the allotted time, however the facilitative style was more effective at maintaining student interest and attentiveness. Further observation of student behavior in these 2 classroom environments scored attentiveness, according to an index whereby 100 would indicate attentiveness of every student at every point.

The traditional lecture style index indicated just under half of the class was attentive at any given time, with an index of 47, whereas classes taught with the facilitative style had an index of 68. Furthermore, short-term retention was 19 percent higher amongst students who learned in a facilitative lecture after 3 days. IBM then deployed an early version of polling devices similar to those discussed in this paper. Attentiveness rose to an index score of 83, and retention improved from 19 percent to 27 percent. Students were asked to compare interaction and feedback as accomplished by either the use of student response systems or via conventional Q&A techniques, and stated an overwhelming preference for student response systems (6.6 out of 7).

3) PERSONAL RESPONSE SYSTEMS

Personal Response Systems (PRSs) are in-class electronic polling systems which use radio-frequency handheld devices connected to a laptop computer via a USB hub. Set up time for the system takes no more than a few minutes in any classroom. Student remote controls associated with this system allow for every student to respond to every question that their teacher asks (see Figure 1). It should be noted however that this paper does not advocate over-use of this potential, rather it suggests that less-frequent, strategic use of the devices will maintain student engagement and generate more considered responses. Student responses are aggregated and stored in computer files that can be made accessible in real time, both for grading purposes and for educational research to improve the quality of teaching. An example of a teaching question used by the authors in recent language classes to Japanese students is “What do you know about the Muslim world?” Students were asked to rate their knowledge in increments of 10 between 0 and 100. Using PRS, the response of every student is compiled and results are immediately available for display as a pie graph, a bar graph or a histogram, and make for the basis of more extended and meaningful discussion and instruction in the target language, or baseline data for planning future lessons. In this case, results revealed that students largely perceived that they had very little knowledge of the topic (see Figure 2). The PRS system is also used in lecture courses to more deeply involve students in learning material, to give quizzes, to administer surveys, and even to verify attendance.

At the beginning of a class, the instructor activates a ‘class’ using the software associated with the voting system (in this case eInstruction’s Interwrite PRS) which allows for any number of ‘sessions’. Each session can be saved as a data file for further review in PDF, CSV or other formats. The session files can also be exported to classroom management systems, such as Blackboard Learning System, WebAssign and WebCT. Instructors can therefore view responses to a given lesson in real-time or after a lesson, at a global level or on a student-by-student basis. Such features are of great value to reflective practitioners and materials designers who review their instruction and the impact of teaching materials used. They are also useful in situations where teacher accountability is an issue, and can be referred to during parent-teacher conferences and other such review processes. Saved files can be a valuable source of data when reviewing a class or a particular student’s performance.

4) RATIONALE

PRS units allow teachers to better fulfill the expectations of learner-centered pedagogy and constructivist principles in numerous ways. They allow an instructor to monitor student understanding of complex concepts, reveal common misperceptions and promote subsequent group discussion. Students receive much more feedback and the devices allow them to remain anonymous, which can be an important feature in classrooms with students who come from sociocultural contexts, such as Japan, where speaking out in a large group may be problematic. Such students often have difficulty asking or answering questions in class or venturing opinions because of fears of ‘sticking out’ or diverging from the group, to the point where Albon and Jewels (2007) found that some students were actually willing to be wrong in order to feel accepted within their cohort. With this in mind, systems such as Interwrite PRS allow for students to respond to questions anonymously and without fear of

creating disharmony or 'losing face'. Furthermore, the devices allow students to see how other members of a group respond to a question.

5) TYPES OF QUESTIONS

A variety of question types are available to survey prior knowledge, student attitudes and opinions and to follow up instruction. Formats include multiple-choice, true or false, numerical, survey, serial, and short answer forms (text to 11 letters), and work is ongoing to recognize other input forms such as phrases and even sentences. Multiple choice questions can be readily used with TOEIC and TOEFL questions, which often present plausible yet incorrect answers, also known as distractors, alongside the correct answer. Such distractors can be a valuable opportunity for instructors to deepen student knowledge by explaining why plausible but incorrect examples are not satisfactory answers. Numeric questions can be used to have students assemble parts of a sentence in correct order. True or false questions can be used to good effect if the question introduces an element of surprise and stimulates subsequent conversation.

6) LITERATURE TO DATE

An extensive review of literature to date is beyond the scope of this paper. Interested readers should refer to Roschelle et al (2004) or Fies & Marshal (2006) for extended reviews. However, what becomes clear in the literature is that, while both lecturers and students perceive positive outcomes from using the technology, studies to date have not been able to substantiate those benefits in any rigourous fashion. Furthermore, Penuel et al (2006) noted that none of the dominant theories of education are able to accommodate all of the experiences reported by instructors using polling devices and this has resulted in "major gaps in the knowledge base guiding research and development in the area of audience response systems" (p. 188). In the field of Second Language Acquisition (SLA) such research is virtually non-existent. Euline Cutrim Schmid (2007, 2008) has written about the use of Promethean's ACTIVote polling system in ESL classes. She found that the devices had a positive impact on affective aspects of classroom dynamics and that the anonymity factor was also an important highlight. However, she concludes that research in this area is still in an early stage and that further long-term studies need to be undertaken.

7) STUDENT RESPONSES TO SURVEYS

The popularity of the game show "Who wants to be a Millionaire?" gives some indication of the attractiveness of polling technology when questions incorporate a game-like element. Judson and Sawada (2002) have reported on decades of studies which have shown that polling technology has been perceived as an interesting and beneficial feature amongst students. Similarly, the students implicated for this paper (n = 250) responded positively to use of the devices. They were all able to use the technology without excessive difficulty. They rated their ability to understand the devices with a mean of 3.49 on a 5-point scale, with 1 being "not at all" and 5 being "I fully agree". They perceived the use of the devices as enjoyable and interesting (average = 4.25). Moreover they were clearly able to see a place for such devices in language instruction (4.11), although they were somewhat less optimistic for their use in other subjects (3.78). These findings lend credence to the plausibility of Wagner's (2005) prediction that language instruction will be one of the areas leading advances in e-learning areas such mobile-based education.

8) A MOBILE FUTURE

Already there are clear indications that the polling technology described in this report will migrate to mobile phones (e.g. Day, Sas, Dix, Toma, Bevan & Clare 2007, Paulos, Joki, Vora & Burke 2007, Pitt, Kamara, Sergot & Artikis 2006, Illsley, Kaldor, Berglund & Feinbier 2005). The mobile phone has become the most widespread electronic device in human history. Studies have found that 100% of Japanese university students had mobile phones (MacLean & Elwood, 2008, Thornton & Houser, 2005) and this will soon be the case in many countries, if it is not so already. Already a popular television program in Japan, Fuji Television's *Manningen*, has adapted polling

technology in a game show quiz format in which tens of thousands of viewers vote using their mobile phones. It is quite possible that polling could become a standard procedure in higher education in the near future. To be effective, such mobile learning programs will require new digital communication skills, new pedagogies, and new practices. They will also require a thorough consideration by materials designers and publishing firms. Further research as to how to deploy this new technology in language classrooms is therefore needed.

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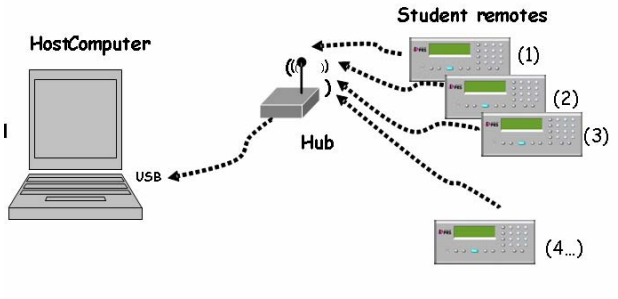
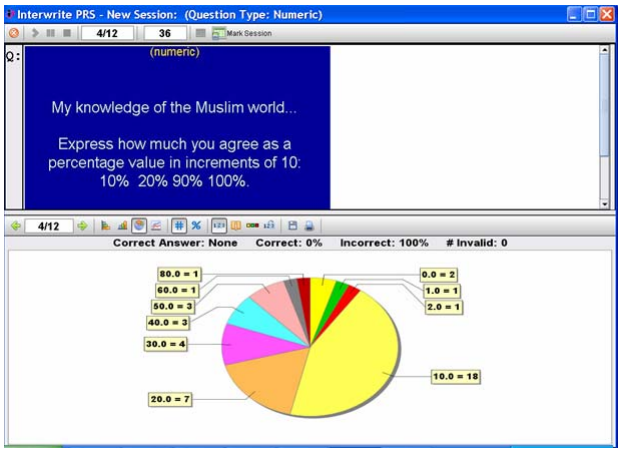
APPENDIX A: PRS RF System Architecture.



APPENDIX B: PRS Display Format



Process of adaptation of the activities and the documents in a course on line

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ABSTRACT

learning is the process of acquisition of knowledge, competences, attitudes or values, through studing, experimenting or teaching. The problems of the design of the adaptive situations of learning by the teacher occupy a strategic place in the field of the EIAH. We propose respectively a double process of adaptation relative to the activities and the resources. This process uses a comparison of the metadata extracted from diagrams LOM, IMS-LD and IMS-LIP which qualify respectively the resources, the activities and the learner.

Keywords
E-Learning, Adaptation, learning scenario, Activity, learning object.

1) INTRODUCTION

E-Learning. This one is based on the access to formations on line, interactive and sometimes personalized, diffused by the intermediary of a network (Internet or Intranet) or other electronic media. This access makes it possible to develop competences of the learner, while returning the process of learning independent of time and place. This development led to use the concept of adaptation; it is a mechanism which aims at answering in a way adapted to the needs and characteristics single and particular of each learner.

In this new direction of research, we are interested in the mechanism adaptive of learning scenario to the profiles of learner. The process which we propose is carried out in two successive steps:

The first, establishes an adaptive mechanism of contents of the activities in a learning situation, via the interaction of the system with the learner, which brings us to a dynamic scenarisation allowing the update of a predictive scenario. In this part the adaptation based on IMS LD which deals with the objectives of the learner. The major interest of this proposal rests on its formal character which opens prospects for indexing and of re-use, like on its independence of the system of implementation, the units of learning being expressed in the form of documents structured with the format XML which offers a structure to us facilitating considerably the adaptive mechanism to us by the use of XSLT which is a language completely adapted to the treatment of documents XML.

The second, establishes an adaptive mechanism of navigation of the resources handled by the activities where we deal with the preferences of the learner. This adaptation aims to give to the learner a certain flexibility in the use of these documents. In this level, the adaptation is based on model LOM [LOM;2002].

The adaptation in the two steps is based on a modeling of the user. In our context, we have to take into account the objectives and the preferences which will be modelled by IMS LIP.

2) THE ADAPTATION IN E-LEARNING

The adaptation in the context of e-Learning aims at creating the experiment of the learner over a certain period of time. There are many projects which treat the concept of adaptation on the two axes, the learning scenario and the learning object. They are different; one is compared to the others according to various facets, for example: method and technique of adaptation, learning model, learning situation, the characteristics of learner and standard of e-Learning.

In the projects which treat the concept of

adaptation on the learning scenario, our analysis is made by taking into account the type of adaptation, dimension of adaptation and criteria of adaptation. We noticed that the solutions suggested based either on the static adaptation it is the case of Alfanet project [ALFANET.2003], or on the dynamic adaptation such as the project Explora Graph [DUFRENSE.2001] and team work arcade [Alonso;2005]. For the dimension of adaptation, there are those which are interested in the adaptation of contents such as the team work arcade and the Alfanet project and those which are based on the adaptation of navigation it is the case of project Explora Graph. For the criteria of adaptation, the various projects above at the same time do not treat all the characteristics of learner, they are based on the knowledge of the learner.

In the projects which treat the concept of adaptation on the learner object, our analysis was made by taking into account the model of the document where there are two concepts to represent a document "Brique Elémentaire" or "Page". Several work was completed in the field of the modeling of the electronic documents. In METADYNE [DELESTRE.2000] a granularity finer than Brick of Information was adopted, it acts as 'Brique Elémentaire'. A building bloc is defined as the basic element which composes the document. It can be a textual element, an image, a diagram, an animation, etc the document is an assembly of BE which are selected either by the author or, in other situations, by the system. In EDPHA [HABIB.2004], the document is seen like a whole of pages (within the meaning of the Web pages). Each page is cut out in storage blocks. A block is a collection of elements of which each one is a description of the same concept (definition, example, description, exercise, etc.) starting from various media ("texte+image+son", "texte+son", "animation+son"). The elements, are represented by a collection of media such as an image with a text (what corresponds for example to an image with its legend).

The analysis presented above, leads to the report which the studied projects are strongly centered on the adaptation of contents or navigation compared to the knowledge of learner. On the basis of these reports, we thus locate our work in the provision of an environment adapted to learner, allowing the dynamic modification of a learning scenario, and take into account the advantage of the approach centered on the contents and the approach centered on the process.

3) REFERENCES AND APPENDICES

The adaptation of the formations in which we are interested mainly are of the formations of the e-Learning type. More precisely, adopting a constructivist point of view, we consider that the learner must have an active role in its formation. The contents placed at its disposal are not a simple course in presentiel. It acts on the contrary of a learning scenario: the scenario envisages the course of learning activity and understands a definition of the objectives, a planning of the activities, definition of task and of the evaluation methods. We want by our work to better support learner. we are interested in dimension of adaptation used in taxonomy of Dieterich [DIETERICHE.1993] [HABIB.2004]. We study the dynamic adaptation ` adaptivity initiated by the learner' which will be modelled by the construction of an interactive interface with the learner where it allows the capture and the treatment of the requests which act on the course of the scenario to update the profiles of the learner such as: preferences, objectives. In doing our analysis we tacke an important question ` the ` method' is reusable in another context? ' Let us consider the following remark: "Thanks to the independence of the components, IMS LD largely supports the re-use of the components in others ` Learning Design'. The only not easily reusable component is the section ` method' because it creates the bond between all the others [MALEVERGNE.2003], therefore instead of using ` method' we propose to use the following pieces: Activity and Resource. In the light of this remark, our step is shared in two successive parts:

The 1st step: To establish an adaptive mechanism of contents of the activities in a learning situation, via the interaction of the system with the learner, which leads us to a dynamic scenarisation to allow us the update of a predictive scenario, in this part the adaptation based on IMS LD deals with the objectives of

the learner. This adaptation makes it possible for the learner to follow a course adapted to their formation. We use the concept ` Adaptability' on the level of predictive scenario, such as the scenario is designed satisfying the needs of the generic learner. The choice of scenario makes according to what the author of the course specified like characteristic of the learner at the macro level.

The 2nd step: To establish an adaptive mechanism of navigation of the resources handled by the activities, we deal with the preferences of the learner. This adaptation aims to give to the learner certain flexibility in the use of these documents. This method is seen as a solution for two major risks for the user: the confusion and the phenomenon of cognitive overload. This level, the adaptation is based on model LOM.

The figure.1 presents the total architecture of the process of adaptation.

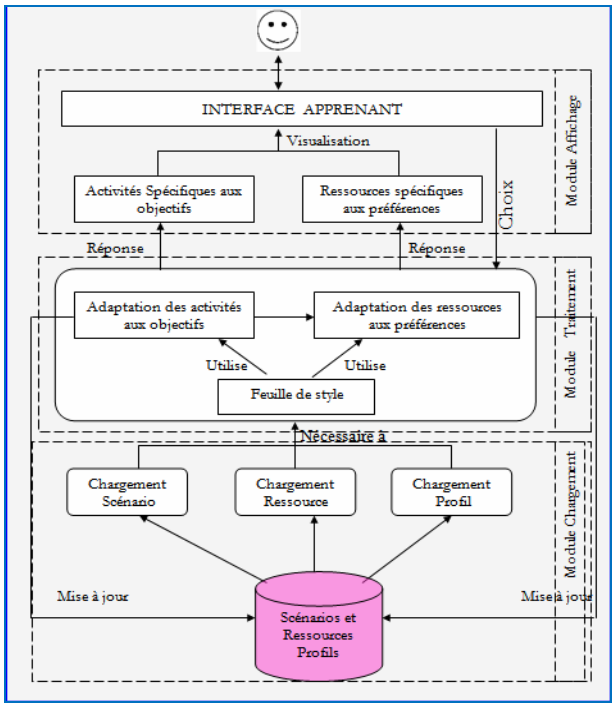

Figure 1: General architecture of the process of adaptation

Our system is broken up into three modules on which the process of adaptation of the scenario is based.

1. The load module: this module gathers a data base, among which we distinguish which is related to the scenarios and resources, as well as information related to the learner. Via this module, the system makes it possible to charge, save the various scenarios, the resources and the characteristics of the learner with format XML.

2. The module of treatment: in fact the intelligent process produces the adaptation. It consists in confronting the data and to carry out by observing the rules of adaptation, it is based on the selection of the activities which are most compatible with the objectives of the learner in the first stage. For the second stage that will be a whole of choice carried out by the learner in order to launch a research to select a whole of bricks.

3. The module posting: This module gathers an organized whole of interactive objects defining the perceptible part of the system (buttons, cursor, bars run, menus unrolling, etc). The objective of module, is to make the system easy to handle while presenting to the learner preference.

4) CONCLUSION

In this work, we are interested in the concept of adaptation in the field of e-Learning, the field of explored work is that of the adaptivity of contents of the activities to the objectives of the learner and the adaptation from navigation of the resources to the preferences of the learner.

In our case, we chose to use standard IMS - LD to model the learning scenario . We adopted this model to select the learning activities which are appropriate to it. In the model IMS-LD, each activity has a place towards a whole of resources; thus learner is confronted with a quantity of information, from where the need for another level of adaptation, it is the adaptation to the preferences. This adaptation, leads us to adopt the LOM, for the indexing of the learning objects. We proposed an extension of the LOM which facilitates the filtering to us of bricks according to preferences of the learner. In addition, research in the standards to model of the user, leads us to adopt the standard IMS-LIP which defines a structure of data to be able to be imported or exported between the systems interopérables. For the management of adaptation, we are based on technology XML and more particularly XSLT.

The adaptation is a very wide field, in the short run, we think of reflecting to evolve move

dimensions of adaptability. With this intention we plan to continue the development of the environment of learning by traceability of unfolding of the learner in a scenario. It is also possible to take into account the adaptation in a learning situation collaboratif based on the model of user group.

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Issues and Challenges in Courseware Development: A Project Manager's Perspective

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ABSTRACT

Many educational institutes venturing into courseware development to create online learning materials for their own students are often not aware of the challenges that lie ahead in managing courseware development projects. This paper highlights the potential challenges a courseware development project may face. It discusses lessons learnt from development projects carried out in Malaysia for content and language-based courses. Particularly, real cases will be presented to highlight challenges and the steps that were taken to overcome them within the constraints of time, budget, curriculum demands, client expectations, and competencies of content providers.

Keywords
content-based courseware, courseware development, language-based courseware, project management

1) INTRODUCTION

With the advent of computer technologies, popularisation of blended approaches to learning, and the availability of online and distance learning modes, many educational institutions have ventured into courseware development to create their own online learning resources for their students. For example, at Universiti Putra Malaysia, the creation of online e-learning materials for students is one of the key performance indexes used to assess the performance of the lecturer. Many institutions have jumped onto the bandwagon by actively customising and developing open source e-learning platforms to encourage and facilitate the lecturers in producing online learner-centered learning materials. Many of these projects, however, have not met with the level of success expected and many institutions have had to outsource the work to professional courseware development companies.

Educators as well as institutions are often not aware of the challenges that lie ahead in managing courseware development projects when they embark on such projects. Professional courseware developers, on the other hand, are well aware that courseware development is fraught with uncertainties and problems because it involves more than just converting teaching material into electronic format. Often, unforeseen difficulties arise to derail projects handled by an inexperienced project manager or an inexperienced lecturer entrusted with the responsibilities of a project manager. For ease of reference, we will use the term 'project manager' to refer to all who are engaged formally or informally in managing courseware development.

This paper is organised in the following ways. Section 2 discusses some of the general misconceptions about courseware development that is held by inexperienced project managers. Section 3 presents various challenges that are faced in managing content-based and language-based courseware projects. Examples

of cases are drawn from the years of experience the first author has in dealing with both types of projects. Section 4 concludes the paper by highlighting the role that is played by the project manager in managing courseware development.

2) GENERAL MISCONCEPTIONS ABOUT COURSEWARE DEVELOPMENT

The ambitious and the inexperienced are often caught unaware of the tremendous amount of planning, revising and coordinating of resources that are required in a courseware development project. We believe some of the unexpected pitfalls that hit a project midway result from some of the following misconceptions about courseware development. Busting these misconceptions, we feel, is the first step towards successful management of a courseware development project.

2.1) Misconception 1: Get a text, module or book in print and convert it into electronic format

Those who are not trained in instructional design and who do not understand the difference between online learning and traditional learning approaches make the mistake in assuming that courseware development involves a simple conversion of offline materials into electronic format. Hence, there have been cases where course instructors either voluntarily offered or were told to turn in their lecture notes for conversion into the electronic format. Many assume that the project should be completed within a very short period of time. After all, how long does it take to have a typist type out the relevant lecture notes, and include some exercises with answer keys into the computer?

However, courseware development is not merely a simple process of converting lecture notes or even a module with exercises into electronic form (e.g. Golas, 1993; Ng et al., 1997; Norhayati & Siew, 2004). Lecture notes and textbooks are often supplementary to face-to-face sessions with an instructor. An effective courseware, on the other hand, may replace the instructor as in the case with some distance learning programmes and self-access learning modules. Unlike lecture notes and textbooks, a courseware may not be used only to supplement face-to-face lessons. Even when it is supplementary, it is often used without the supervision of an instructor. Courseware, therefore, have to be self-sufficient in themselves.

Providing the answer key alone to exercises or quizzes may not be the best option available to aid learning. Instructional designers involved in courseware development often brainstorm and even pilot-run the courseware to identify various learning paths that may be sought by the learner. For example, it is common to find the following options on the menu of a courseware: a glossary of terms for definitions of technical jargon, a dictionary for second language learners, a key to the answer for quizzes, a key to more explanation, a key that allows students to review content that they have read prior to the quiz, and a key for more quiz items, just to name a few. These options are often not available in lecture notes or books, but they are indispensable elements for a digital courseware.

2.2) Misconception 2: Make use of freely available tools to make your online materials and quizzes

With more and more open source software available for free on the Internet, many have also thought that the cost for developing a courseware should be very minimal. After all, the technical platform is available free of charge. However, many may not have the technical expertise to customise these available resources for their own needs (Sloan, n.d.). More frequently, the subject matter may require features that are not readily available in these open source software.

2.3) Misconception 3: Get the lecturers to provide the content for the course

Realistically, the content providers would be the lecturers of the course. However, not all lecturers know how to do everything on their own to create the needed materials for the courseware. In a traditional classroom,

instructors often photocopy or play videos to demonstrate a learning point. Resources can be obtained from libraries and on the Internet and provided to learners. These methods however cannot be replicated with ease in a courseware development project. For one, there are issues with copyright that have to be addressed.

Course instructors may not be able to provide original and authentic materials that can be utilised in the courseware. What is needed in such situations is a team of developers. You need, in addition to the content experts, the graphics experts, the multimedia experts, the voice or even sound and music experts, the programmers, the language experts, and the instructional designers. The role of the project manager is to coordinate the expertise that is brought to the table by these experts.

2.4) Misconception 4: Face-to-face teaching is the same as online teaching.

There are some pedagogical principles that are shared between face-to-face teaching and learning situations, and between online teaching and learning situations. However to think that these two situations are the same and would require the same input would definitely lead one down a disastrous path for courseware development. A good courseware often anticipates in advance all possible options taken by students. Assumptions are explicitly mapped to ensure that learning progress is not blocked by an unmet or unrealistic assumption. Students following an online course do not have the luxury of asking the instructor questions while working on the materials. This is why a lot of time and effort is spent to ensure that these stumbling blocks are removed from the learning path engaged in by the learners (Smith, P.L. & Ragan, T.J).

3) ISSUES AND CHALLENGES

In this section, we will present real cases to exemplify the different challenges that a project manager may face when developing content-based and language-based courseware.

3.1) Content-based courses

3.1.1. Pedagogical knowledge of content providers

Understanding how to effectively transfer content knowledge to the learners is critical to effective courseware development. While content lecturers are experts in their own fields of specialisation, most of them do not have explicit knowledge of pedagogy. Some teach the way they were taught. Very few have been exposed to online learning. Therefore, they do not have the experience of using online e-Learning materials to appreciate the impact of the materials on the fresh minds of the learners. How can a project manager deal with such a challenge?

In one such project to produce a courseware for an introductory course to quantity surveying, the project manager, together with the instructional designers, had to sit through a series of lectures given by the content expert to learn the subject matter before providing feedback to instructional designers on how to work on the storyboard for the course. During these sessions, when the project manager or the instructional designers had difficulty understanding a specific concept, they posed their questions to the content expert. This was how they discovered that the content expert had assumed that the learners already knew a fundamental concept (that would have been taught by another lecturer in a different area) which was not covered in the course materials. This was the missing link discovered that was crucial to the progress of students in the course. The project manager made sure that provision was made to have this fundamental concept covered in order to provide a proper and systematic structure in the initial lessons provided in the courseware, an important aspect of instructional design.

3.1.2. Commitment of content providers in the process

Embarking on a project without clearly understanding the level of commitment that is

required of the content providers in the process of courseware development could jeopardise the quality of the courseware developed.

In another project, the content lecturers were merely given a directive to be involved in the courseware development project. No immediate incentives were provided. They were merely asked to work with the project manager brought in to oversee the whole project. Since there were no tangible incentives, some instructors merely surrendered their lecture notes, power point slides and their textbooks to the project manager.

Realising that the content providers had little understanding of the process involved, the project manager called for regular meetings and had to even conduct demonstration and training sessions for the content providers to understand the magnitude of the project and what is required of them in the project. Having understood the regular involvement needed, although they were happy with the results from the discussions and the quality of courseware produced from the iterative process of ongoing evaluation and feedback, these lecturers were not motivated to continue sacrificing the long hours needed, without immediate or short term returns. As such, the management had to work out some immediate incentives and travelling allowances to motivate them.

Content lecturers often make this complaint, which we have paraphrased in our own words:

“We are engaged to teach in this institution. Nothing in our appointment letter says anything about producing authentic materials for the college. Besides we are not paid for writing materials for these courseware and we are also not given the credit for the materials produced. This does not seem like a fair deal. We don’t have time for this.”

This is a legitimate complaint. When credit and motivation of the content providers are not addressed, the chances of getting anywhere near completion of the project is rather slim. The project manager would have to work doubly hard with the administrators to work around this problem, which involves constraints of time and budget.

3.1.3. Lack of one real expert in the field

Most instructors are experts in the subject matter that they teach. Often their areas of specialisation are very specific.

In a courseware project for a foundation course of a professional subject, a few subject matter experts of the subject were needed for the different areas, as according to the lecturers, each area was taught by a different lecturer who was the expert for that particular area. When the particular lecturer was not available for a period of time, production of the course content had to be delayed.

To make the learning tasks meaningful, the expertise that is needed for development of a good courseware may not involve depth but breadth of content knowledge as well as other related general knowledge (Siemens, 2002).

For example, in one project undertaken, an authentic video recording of practical work in the workshop was required. Since the courseware could not make use of available copyrighted videos, the decision was made to have the content expert conduct and record the experiment on video.

Getting the content expert to conduct the experiment in the workshop was not a problem. However, upon reviewing the video made, the video could not be used because standard workshop safety procedures were not followed during the shooting of the video. The content provider wore a watch during the demonstration of the practical work and did not have protective gloves on – contravening one of the requirements of the video which is to showcase that standard workshop safety measures have been taken.

3.2) Language-based courses

A different set of problems presents itself in the development of language-based courseware. The examples chosen here are courseware for developing proficiency in the English language.

3.2.1. Curriculum constraints

One of the major challenges faced is working within the curriculum demands of the courseware. In Malaysia, for example, the Ministry of Education requires stories used to teach language to project the local culture and to include specific moral values identified in the curriculum (Kementerian Pelajaran Malaysia, 2000).

How does this affect the courseware development process? Courseware developers cannot buy stories from native writers in English speaking countries like the US, UK or Australia. Local writers have to be commissioned to write authentic stories that include specific moral values. This is one of the major challenges faced. Local writers who can write well in English are difficult to find. Local writers who can interpret the curriculum and write within the constraints of the curriculum are even harder to come by. Also, often there are budget constraints that rule out engagement of professional writers for the job.

A project manager working on such a project would often have to work with non-professional writers who may lack the creativity needed to produce engaging reading passages. This often causes many rounds of rejections and revisions, resulting in frustrations for the non-professional writers engaged for the project and for the whole project team who see their work going in fruitless circles. One way to solve this problem is to have a realistic budget allocation right from the beginning for the procurement of stories so that experienced and good writers can be engaged.

3.2.2. Leveling

The next major challenge in developing a language-based courseware is dealing with the issue of determining the right difficulty levels for materials used in the courseware.

Perception of levels is dependent on the context in which the courseware is to be used. For example, materials that are considered as elementary for an urban school setting may be considered as intermediate or even advanced for a rural school setting. When content providers write stories for different levels, a uniform understanding of the intended levels has to be achieved.

With some projects, this problem was not really resolved. However, with a current preschool project, a prototype was shown to a group of preschool teachers to get their comments on the leveling. For the first prototype shown, the comment was that it was too difficult, and the voice-over was too fast. Using this feedback, the materials were simplified, and shorter simple sentences were used. Graphics that illustrated the meaning of some words were also included to make sure that difficult words were explained on demand. (i.e with hyperlink).

Having an experienced courseware quality assurance (QA) personnel who has taught different levels helps to standardise the leveling. This person needs to be able to edit and simplify the language used based on the content given by the writer or make requests for the writer to enhance the content with more challenging words. Having a group of content QA personnel who can do this and having an avenue to check the suitability is an advantage to the project team.

4) THE ROLE OF THE PROJECT MANAGER

In conclusion, we would like to recapitulate on the role of project managers. Project managers need to have a sound knowledge of pedagogical principles and instructional design. They should also have an understanding of the power of technology and how that can be utilised to make learning effective. Having this understanding, they need to be able to transfer their knowledge to the rest of the team, as a courseware development project involves a whole team of people: content providers, instructional designers, programmers, technical assistants for graphics, video and sound recording, free-lance writers, editors, and the stakeholders of the project (i.e. the institution or college).

Project managers play the role of leader, moderator and mediator. They have to deal

with the instructional designers, the programmers, the content providers and the clients to make sure that the project is progressing within budgetary and time constraints. When things fall through, they have to negotiate for more time or for a bigger budget. They have to deal with changes in demands and expectations made by clients as the project progresses. They have to be able to recognise when a new demand from a client is or is not a variation order: changes that involve additional charges. In short, a project manager is the central person who pulls together people of diverse expertise to make the project a success.

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E-Learning and Libraries: Collaborative Services under a User-Centered Option

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ABSTRACT

The past few years have seen some radical improvements in educational technology, and with them distance education is being transformed from a poor cousin of the "real" classroom to a key delivery channel for educational content of all types. The paper attempts to identify strategic issues for libraries wishing to pursue a more active policy with regard to the changes affecting librarian system due to the increased use of information and communication technologies. We can identify two major areas in which libraries can develop strategies to enhance services for their patrons. Following domains are discussed: collaborative design and the relation between physical and virtual learning environments. Next, possible implications for library staff regarding the changes are discussed. Once synonymous with distance learning, e-Learning has quickly evolved to include not only courses which are taught primarily online and over a distance, but also to include traditional “brick and mortar” courses which have been enhanced with electronic elements. Course management systems (or virtual learning environments’) have moved swiftly from scattered implementations that support a few online classes to enterprise-wide services that support and extend the entire curriculum and related institutional services. They are providing new opportunities for libraries to design and to disseminate new e-Learning services.

As they create these new services, libraries will also need to highlight their expertise, abilities and irreplaceable resources in order to take a leading role in the new environment. Librarians must develop and fund expanded services to meet the demand created by the new distance learning in the Cyberspace Age. Librarians must teach distance learners the Internet, Netscape, World Wide Web and access to a variety of CD-ROM databases. They must also prepare "how to" research guides and make them available electronically. Distance learners should also take a special computer applications course as soon as possible in their distance education program. Course work in information technology should also be expanded. Some other areas for development include: on-line tutorials, such as a library instruction homepage. Faculty should work with librarians to anticipate distance learners' needs and develop strategies to meet them.

Distance learning using information technology grows continuously in the Cyberspace Age. As more students attempt to accommodate their studies around busy family and professional lives, it promises to become increasingly important in providing an alternative to traditional on-campus education. Only by planning to meeting these challenges of this new environment, will libraries be able to serve the higher education community of the 21st Century case**.**

Keywords

e-Learning, libraries, collaboration, interactivity, virtual environments.

1) INTRODUCTION

This Real-time online reference services, like e-reference and e-learning, have been around for some time now. As with many newer technologies, the academic libraries picked them up first, due in large part to their flexible funding and staffing structures. In the last few years, public libraries have jumped on board, with school libraries following hot on their heels. From my point of view, the managers of the modern libraries should be most interested in the book as it deals with such important issues as infrastructure for digital

reference, management of an integrated reference service, setting performance targets for virtual reference service, staffing and training personnel for this interesting and challenging work task.

Once synonymous with distance learning, e-Learning has quickly evolved to include not only courses which are taught primarily online and over a distance, but also to include traditional "brick and mortar" courses which have been enhanced with electronic elements. Course management systems (or virtual learning environments') have moved swiftly from scattered implementations that support a few online classes to enterprise-wide services that support and extend the entire curriculum and related institutional services. They are providing new opportunities for libraries to design and to disseminate new e-Learning services. As they create these new services, libraries will also need to highlight their expertise, abilities and irreplaceable resources in order to take a leading role in the new environment.

3.E-Learning: Pedagogy, learning methodologies and technology have become linked and the inter-relationship between the three needs to be better understood and more radically reassessed. At the heart of the learning/technology nexus are learning objects – a concept which does not have a standard definition or application. The use and reuse of learning objects, their discovery and share ability, their existence as digital entities and the context in which they can be used, are the key elements to creating broader, inter-institutional applications of technology and learning.

In order for learning objects to have value, they first require the use of semantically consistent, easily created metadata which allows for the objects themselves to be found and transported between institutions and repositories. The management of digital asset repositories, learning object repositories and the metadata governing their use are inextricably linked, and the issues surrounding learning object repositories are equal to and a part of the issues surrounding digital asset repositories.

In addition to the concerns surrounding digital repositories, learning objects and metadata, libraries are also interested in developing ways to integrate and expose their existing systems, resources and services in university-wide course management systems. Of strategic importance to these efforts is the understanding and development of service convergence (as opposed to organizational or institutional convergence). The group decided that practical efforts need to proceed despite the lack of current industry uniformity and the possibility of occasional failures. The group repeatedly declared the need for the creation of standards and of ongoing functional technical solutions.

New standards and technical solutions are required for high-quality and cost-effective teaching. To that end, the Task Force called for the collaborative mechanisms and collective expertise of the library community to provide both leadership and timely, cost-effective input to the development of institutional infrastructure and appropriately developed and placed services. The collaborative possibilities reside under three categories: exposing library services, creating and maintaining digital asset repositories and creating standards for interoperability.

4.E-reference: I believe libraries and the students they serve have the most to gain from real-time online reference. The users, in this case students, are generally very comfortable with computers and with chat technology. In fact, many of them would rather chat online with a teacher or librarian than ask for help in person. I have seen students in the public library chatting away on an online reference service, while there is a real-life librarian sitting not twenty feet away at the reference desk. Clearly "online" is a preferred medium, at least for some students.

There are two basic forms of real-time online reference that schools can consider offering to their students: web-based chat and instant messaging.

1.1.1 4.1Web-based Chat Reference

Web-based chat requires that the library purchase server-side software (such as QuestionPoint). This software allows the library to set up a webpage with a built-in chat module. In short, students go to a specific webpage, click on a button to connect to a

librarian, and then chat back and forth on the webpage. Web-based chat often has extra features, beyond simple chatting. Librarians may be able to "push" webpages to the student, which causes a webpage to open up on the student's computer without the student having to do anything. Librarians and students may be able to "co-browse," allowing both the librarian and the student to see the same page, as text is entered, search buttons clicked, and so on. Web-based chat will also often provide both the student and the librarian with a transcript of the chat for future reference.

The downside to many web-based chat products on the market (besides the fact that the library has to shell out some serious dollars for the software) is that they have rather strict system requirements, due in large part to these extra features. Some services do not support browsers other than Internet Explorer, Macintosh computers, or certain firewall configurations. Some users experience a bad session due to these requirements and don't come back for a second try.

Cooperatives of this nature offer a large return on time investment, and significantly reduce the initial financial commitment from each library as all member libraries share in the cost for the purchase and maintenance of the software.

1.1.2 4.2 Instant Messaging Reference

Instant Messaging Reference works using free downloadable instant messaging software. Examples include AOL Instant Messenger (AIM), MSN Messenger, Yahoo! Messenger. To use this type of reference service, students must have downloaded one of these free chat programs onto their computers. The librarians must do the same.

This option is certainly attractive, as it allows the library to offer services to many of its students regardless of which chat program they prefer. The user's experience is this: in the chat program, the student will send a message to the library's screen name (e.g. "MyLibrary"), and then the librarian & student chat back and forth.

The chief downside to Instant Messaging is that, unless you cooperate with other libraries, you cannot possibly offer the service for as many hours as a cooperative web-based chat service can provide. Currently, I do not know of any group of libraries that is cooperatively offering Instant Messaging Reference, but I think this would be a huge leap forward. Just as libraries can cooperate with a web-based chat service, why can't they cooperate to offer IM services?

5. Empowering Libraries means Empowering Librarians

10 Roles for Empowering Librarians - Seeing an empowered and empowering librarian as:

1. **A gateway to the future and to the past**. Providing Internet access is a necessary function of the school library. This demands from us a sense of obligation to provide this type of service as a major step towards connecting students with the information they seek.

2. **A collaborative teacher and learner**. A librarian should actively seek out users in a variety of settings to provide instruction and inspiration. It is of utmost importance for Greek libraries to have as a primary goal the empowerment of the school librarian's role – both as a teacher of students who collaborates with classroom teachers in the design and delivery of instruction, and as a colleague who attends local library staff meetings and national conferences on a regular basis.

3. **A knowledge manager/worker**. The school librarian's future is in doing what computers cannot do. Computers can collect, identify, and organize information. The librarian should therefore be an information 'lifeguard', in order to protect clients from drowning in the information overflow.

4. **An organizer of networked resources**. Librarians need to take the initiative in creating a better sense of organization and access to what is available on and through the school databases, investigating the feasibility of cataloging and organizing Internet resources.

5. **An advocate of information policy development**. Librarians need to become involved in policy decisions concerning resources and services in order to ensure users rights of universal access are respected, as well as issues of intellectual property rights, censorship and privacy.

6. **A community partner**. Libraries need to make themselves felt in the community as a valuable resource and tool for students and the local community.

7. **A "sifter" of information resources**. The Internet provides access to excess. Skilled sifters are needed to help students make sense of the searched resources and put them in some preferred order. The future belongs neither to the conduit nor to the content players but to those who control the filtering, searching, and sense-making tools we will be relying on to navigate through the expanses of cyberspace.

8. **A collaborator with technology resource providers**. Librarians should be involved in the development of the databases and search tools needed for effective exploitation of digital and web technologies. Librarians should become designers, synthesizers, and navigators.

9. **A technician**. With the increasing use of the Internet, librarians may find it necessary to expand their skills in this area. Librarians will need to provide technical advice on workstation configuration, modem access, networks, etc.

10. **An individual information consultant**. Librarians will focus more on individual, customized services and controlled access/facilitation by remote users.

6.The Web is not enough: The Web-search tools are not sufficient: As library use decreases and with more and more information found online on the Web, will we still need reference, even e-reference librarians? A search of the World Wide Web will turn up only the online information. Instead of that, certainly a National Library or every other library has sources more accurate and reliable. Especially a library-to-library services operation with reference experts submitting patrons' questions online guarantees more the thorough tracking of the existing material and pusses away the danger of many times "dull" web sites with strange scopes and motives. Steven Bell, director of the library at Philadelphia University, says "librarians need to know much more than just mainstream librarianship to maintain their professional vitality" and we would like to add that librarians need to practice librarianship for their country's and their nation's good, feeling technology as a good mean for teaching people and learning by their collaborators. Really is the Internet always everything? It may catch the moment, the year, the decade but surely without the librarian's collaboration it can't give birth to everything. That's why and most of e-reference projects named "Ask a Librarian". The Internet itself does not go where the information is and research is a multi-library process. Information can be true and still wrong. Only after a comprehensive investigation can be objective.

7. Social Issues:

Staff-Staff collaborations

Despite the stereotypes, librarians are not solitary types. Just as other workers do, they interact with colleagues to get their work done. One of the great contributions of ethnography to our vision is to reveal the complexity of these kinds of interactions. They can be both formalised, where a complex task is broken down and tackled by a number of people with varying levels and different kinds of expertise, and also informal, where a problem arises and people creatively use their colleagues as resources to help them work around the problem and come up with innovative solutions. Frequently, ethnographic studies have revealed the creativity and flexibility with which people deal with exceptions to the normal flow of work. Staff-staff collaboration can be learning-oriented as well as work-oriented. A powerful and effective way of acquiring skills is by working alongside more experienced colleagues Staff-staff collaboration can be learning-oriented as well as work-oriented. This is known as the socio-technical design challenge. It involves determining what should be built not merely by reference to what is technically possible, but what would be useful to the organisation and acceptable to the organisation. Collaborative work is necessarily social. Thus a system that flouts social rules, norms or customs, even if it does useful things, may fail to be used. The key to selecting, or developing, successful collaborative systems appears to involve an understanding of what is currently done, and designing systems that not

only can mesh with that way of working, but can adapt gracefully as people change their way of working over time.

I think it is very important what Abbas summarizes a number of roles that others have identified for future librarians:

- **Librarian as gateway to future and to the past.**
- **Librarian as teacher**
- **Librarian as knowledge manager/worker.**
- **Librarians as organizers of networked resources.**
- **Librarians as advocates for information policy development.**
- **Librarians as community partners.**
- **Librarians as "sifters" of information resources.**
- **Librarians as collaborators with technology resource providers.**
- **Librarians as technicians.**
- **Librarians as individual information consultants**.

The Importance of Digital Reference in Supporting Critical Thinking in Distance Education – What skills Librarians should have:

Knowledge Skills

- Have an appropriate level of literacy and numeracy skills
- Be able to identify, access, organize and communicate knowledge in both written and oral English
- Have good listening skills
- Have an international awareness Have the ability to use appropriate technology to further the above

Thinking Skills

- Be willing to challenge current knowledge and thinking
- Have conceptual skills
- Have problem-solving skills
- Be creative and imaginative thinkers
- Be able to combine theory and practice
- Be able to reflect on and evaluate their own performance

The field where academic and national librarians can be partners is e-educating students in librarianship. So, we seek to expose them to the benefits and the difficulties that are associated with remote or digital reference and to become increasingly aware of the processes that are involved in information seeking. Learning is structured so that students first read widely to develop a sense of the issues and problems that are being studied and argued, and then develop a situation or problem-based scenario that can be addressed. Once such a problem scenario has been developed, the students then think through the possible approaches to take to resolve the various aspects of the problem and the types of resources and services that would assist in its resolution. In addressing this scenario, they also consider the audience or individuals concerned, the education and facilities that they can likely access, the suitability of the available systems, and services to which they will have access.

8. Policy – Management:

The chief administrative officers on The Committee of Libraries and that of the National Council for Libraries and Archives bear the administrative responsibility, through the active leadership of e-library administration, to supervise library services in support of the ‘Empowering Libraries’ programme. As the principal and direct agent of ‘e-guidance’ implementation, the two government foundations have the obligation to:

1. assure that the e-services plan meets national and also regional accreditation standards as well as professional association standards and guidelines;
2. provide and elaborate, on an ongoing basis, a suitable interactive ‘interlibrary’ e-services schedule, including instruction and the facilities utilized. The innovative approaches used in the design and evaluation of special procedures or systems that meet these electronic needs in other countries are encouraged;
3. prepare a written profile of the community’s information and skills needs;
4. develop a written statement of immediate and long-range goals and objectives for virtual reference, a statement which addresses the relevant needs and also outlines the methods by which progress and a timetable of results can be determined;
5. promote the incorporation of the mission statement, goals, and objectives of remote

services into those of every kind of library and of the originating institution;

6. involve librarian community representatives including administrators, faculty, academics, information scientists, governmental representatives and professionals, in the formation of the objectives and the regular evaluation of their achievement;
7. respect the special characteristics each library and each collection with regard to the development and periodic review of formal, documented, written agreements with them;
8. Assess the written profile of needs as well as the existing library support for distance learning nationwide, its availability, appropriateness and effectiveness - using qualitative, quantitative, and outcome measurement statistics. Examples of these measures include, but are not limited to:
    1. using evaluation checklists for librarian instruction to gather feedback from students, other librarians, academic staff and researchers over a period of time;
    2. conducting reviews of specific library and information service areas and/or operations which support electronic library services;
    3. taking into account e-services in the assessment strategies related to national endorsement;
    4. participating together with administrators, library subject specialists, and the teaching faculty, in the curriculum development process and in planning to ensure the appropriateness of library resources and services according to the profile of needs;
    5. promoting library support services to the community with a planned marketing strategy, monitoring and assessing both the appropriateness of their use of services and resources and the degree to which needs are being met and skills acquired;
    6. maintaining a continual 'survey dialogue' with school library users;
    7. initiating dialogue aimed at establishing cooperative agreements, possible resource sharing and/or compensation for unaffiliated libraries;
    8. developing partnerships with computing services departments such as The Greek National Technical University in order to provide the necessary automation support for the librarian community;
    9. practising, applying, and maintaining all the above through the establishment of a virtual environment that will not only facilitate the provision of information but also offer guidance to real knowledge;
    10. keeping in mind that the system must also recognise other languages and be helpful in understanding questions posed by those, for example Greek is a foreign language;
    11. organising a schema with the following characteristics:

- being patron -centred
- being interactive and dynamic
- enabling group work on real time problems
- enabling patrons, particularly students to determine their own learning pathways
- emphasizing competencies such as information literacy to support lifelong learning.

9. Plan for Empowering our Libraries, Empowering our Education System -
Using research results to shape policies that optimize the utility of libraries:

- **Key Policies and Practices for Adults and Children:** to support the cultural, educational and recreational needs of the people, with special emphasis placed on the basic skills of literacy and numeracy. The management of stock in libraries, ensuring sufficient depth and range, is a fundamental consideration in meeting this aim; to provide public access to the widest possible range of information services which meet the information needs of the community in order to support lifelong learning, combat social exclusion and contribute to the quality of life in the community in all its aspects - whether educational, economic, cultural or recreational - and contribute to an informed democracy.

- **Encouraging Participation in Informal Learning:** to establish close links with the Lifelong Learning Service by locating both services in an Education and Lifelong Learning Department; to ensure access to funding from the Learning and Skills Council to support improvements in library access and in the establishment of informal learning opportunities.
- **Development and Monitoring of Reading and Learning Activities:** to establish three main areas of activity: Children's Services, Mainstream Reader Development, and Closer Involvement in Learning Activities.
- **Promote Learning:** to ensure the ongoing delivery of learning activities with key partners, including the delivery of a Museum and Library Education system, the Pilot implementation of the 'Inspiring Learning for All' methodology, and the dual use of school libraries for young students and for elderly lifelong learners.
- **Promotion of reading opportunities and support of existing groups is a key priority:** to facilitate the successful implementation of the People's Network infrastructure as well as a good and supportive relationship with the Council's ICT section.
- **Development and Evaluation of Digital Services:** to establish a network of local and metropolitan community-based libraries; to continue to extend opening hours; to expand the Mobile Library Service to provide better coverage - currently a weekly service - with additional provision in disadvantaged wards; to establish good community links and partnerships fostered by a National Virtual Reference Desk.
- **Develop Libraries as a Community resource:** to set up a *Routes to the Past* Neighborhood Learning Program, a Young Roots Cinema Project, and a Young Roots *Back Home* Project; to develop "out-of-hours" and wider community use of school library buildings; to hold surgeries, as well as advice and training sessions with partners.
- **Offer Services Accessible to all**: to improve the physical environment for children with disabilities; to develop a marketing plan for online services; to encourage 'the exception of the exception'; to emphasize that all categories, despite nationality and capacities, can be parts of the school library community; to create a Virtual Reading Room as part of the Virtual Desk with reading lists, online book reviews, and more.
- Our Philosophy: Typically the key ideas of a learning society are that learning is life-long and that learning must occur in all areas of society enabling everyone to develop through formal and personal learning how they want to, when they want to and where they want to. We believe that a collaborative library service plays a key role in developing school effectiveness. This will be achieved through support and advice in the development and improvement of libraries, through the use of learning resources, the development of effective information handling skills, and access to wider reading choices for all. Inside an interactive and cooperative framework the school library can become the first and most important access point to the world of information and personal development. The 'difficult to reach' or even the seemingly 'impossible to reach' become 'easy and fun to reach', empowering the participant in the learning procedure. The learner, rather than the institutional structure, is placed at the centre of future developments. Many services delivered and maintained along historical patterns will have to change fundamentally if they are to provide for the people which libraries serve. This calls for performance measures to be set for all collaborative strategies.

10. Conclusions

Librarians must develop and fund expanded services to meet the demand created by the new distance learning in the Cyberspace Age. Librarians must teach distance learners the Internet, Netscape, World Wide Web and access to a variety of CD-ROM databases. They must also prepare "how to" research guides and make them available electronically. Distance learners should also take a special computer applications course as soon as possible in their distance education program. Course work in information technology should also be expanded. Some other areas for development include: on-line tutorials, such as a library instruction homepage.. Faculty should work with librarians to anticipate distance learners' needs and develop strategies to meet them.

Only once the primary library concerns of staffing and funding can be settled, can library services begin to exploit the technology available today to better serve their on- and off-campus students. Distance learning using information technology grows continuously in the Cyberspace Age. As more students attempt to accommodate their studies around busy family and professional lives, it promises to become increasingly important in providing an

alternative to traditional on-campus education. Only by planning to meeting these challenges of this new environment, will libraries be able to serve the higher education community of the 21st Century.

"I have always imagined that Paradise will be a kind of library." Jorge Luis Borges had said. It has been underlined that "libraries are much more than repositories of books and reference material. They are, increasingly, vibrant hubs of community life." We can take further steps in this direction. The adoption of a formal definition of how libraries and librarians support lifelong learning in an interactive way, rather than simply as a resource provider, is not just a theoretical question concerning only the librarian community but is a very serious matter for the empowerment of our national education. The library is becoming an increasingly essential partner in the local, regional and national library and information network. By sharing facilities and/or resources with any type of library, such as a public library, the unique aims of the metropolitan library can be materialized and maintained.

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Evaluation of eLearning Program at the College of Internet Distance Education (CIDE), Assumption University of Thailand

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ABSTRACT

Assumption University through its semi autonomous College of Internet Distance Education (CIDE) lead by Prof. Dr. Srisakdi Charmoinman was the first academic institution in Thailand that started the eLearning program in Thailand. Moodle has been used and heavily modified to suit the needs of the College since its inception. This paper evaluates the students' perception of the eLearning programs offered at the two schools of the College using a questionnaire. The questions and replies of the students are analyzed in order to improve the existing eLearning programs.

Keywords
eLearning, eLearning evaluation

1) INTRODUCTION

Assumption University is the first international university in Thailand. Fully accredited as an institution of higher learning by the Ministry of Education in Thailand, it currently serves about 20,000 undergraduate and graduate students from more than 70 countries. The University is a non-profit institution administered by the Brothers of St. Gabriel, a worldwide Catholic religious order, founded in France in 1705 by St. Louis Marie De Montfort, devoted to education and philanthropic activities. The congregation has been operating many educational institutions in Thailand since 1901 (Assumption University, 2007).

The College of Internet Distance Education (CIDE) was established in 2002 as a semi-autonomous organization within Assumption University whose purpose is to provide Internet based eLearning programs to Thai students and those in neighboring countries. Currently it offers 3 master degree programs in Management, ICT, and eLearning Methodology, and also a Ph.D. program in eLearning Methodology (College of Internet Distance Education, 2007). CIDE uses Moodle as the main Learning Management System (LMS) for the eLearning programs. Video of lecturers teaching the courses in various programs are taken in the College studio and after post-production, these video files are stored on the College server alongside other teaching materials as the learning resources accessible through Moodle. Graduate students registered for a given course could access and view the course video on their PCs or notebooks anywhere in the world using video streaming technology. The MP3 audio lectures have been very popular because students are able to download them and listen to them on their MP3 players or smart mobile phones practically anywhere.

The author working as director of courseware production center prepared an online survey to evaluate the CIDE eLearning courses. An online survey was prepared and students were requested to reply anonymously to the survey questions to seek their feedback for improvement. This paper presents the outcome of this survey.

2) SURVEY QUESTIONS

A total number of 34 master degree students replied to the questionnaire from the two programs of ICT and Management. These

students had at least one full semester of experience using the Moodle for their studies, so they were familiar with most features of the Moodle LMS.

Figure 1 presents the gender demographic of the 34 respondents to the questionnaire. Figure 2 displays the schools of the students they are majoring. And figure 3 displays the semester students were studying at the time of the survey (August 2008).

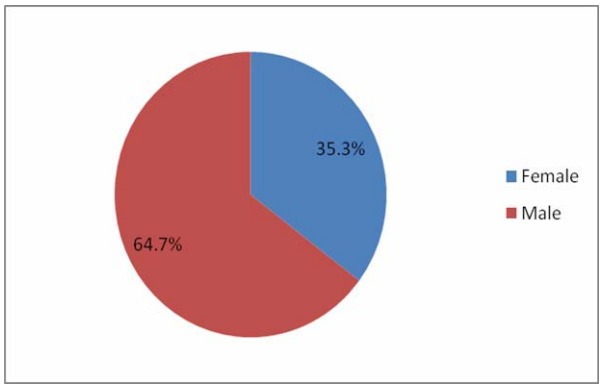


Figure 1: Gender Demographic

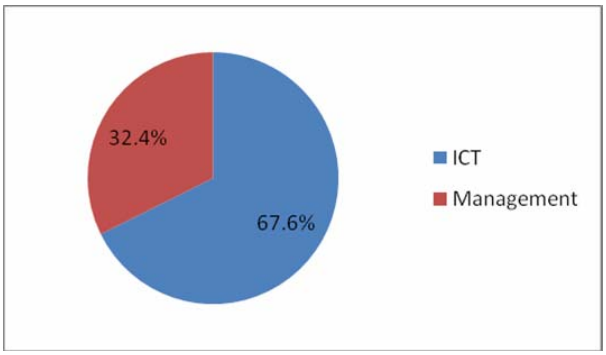


Figure 2: Major Demographic

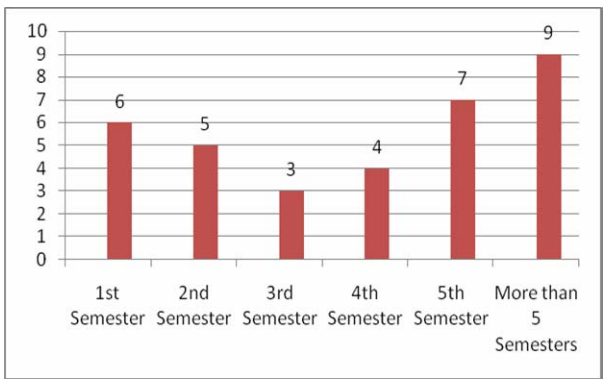


Figure 3: Students' Current Semesters

The students were asked the frequency of watching the video of the lectures (online or offline). Figure 4 shows this frequency. As shown in figure 4, majority of students watch the video lectures at least once or more.

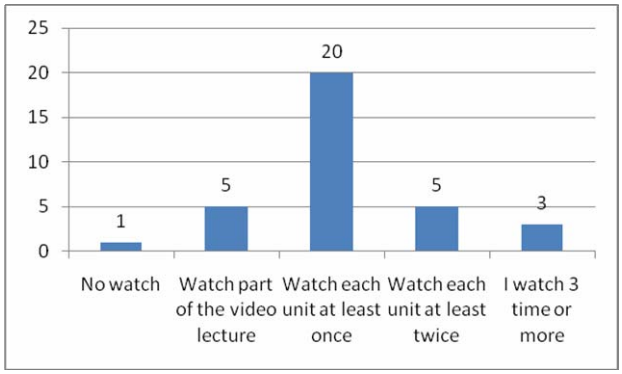


Figure 4: Frequency of watching video lectures

Another question asked students the frequency of listening to the audio (MP3) of the lectures. Figure 5 shows their replies.

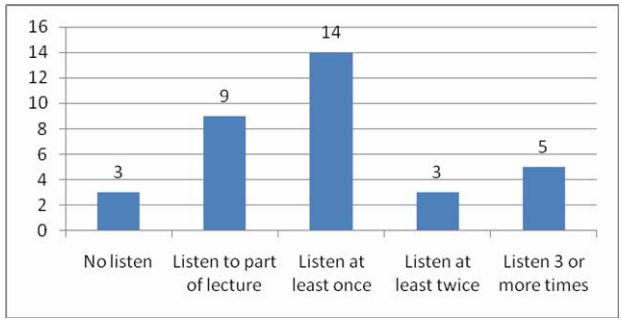


Figure 5: Frequency of listening to audio lectures

As shown in figure 5, majority of students do listen to the audio lectures at least once or more. The lecture audio is directly taken from the lecture video and is converted to MP3 format for downloading and listening on demand. Looking further to figure 6, students have ranked audio lectures slightly more useful than the video lectures.

Students were asked to rank (1-10) the usefulness of various features in Moodle for learning purposes. Figure 6 shows their replies.

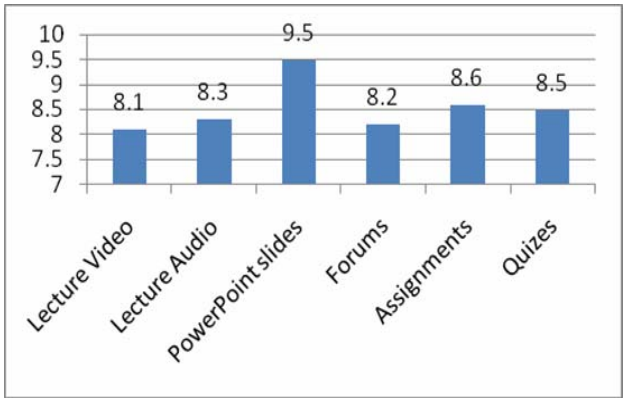


Figure 6: Ranking of usefulness of features

As shown in figure 6, and also in their responses in the comment part of the questions, students prefer to download the PowerPoint slides of the lectures and listen to the lectures rather than watching the video lecture as this makes them multitasking rather than sitting and watching the video lectures. That's why the PowerPoint slide ranked so high with audio lectures. At the same time, students seem to believe that online quizzes and doing their assignments help them a lot in learning.

Students were asked on average how many hours they spent online or offline studying each subject. Figure 7 shows their replies.

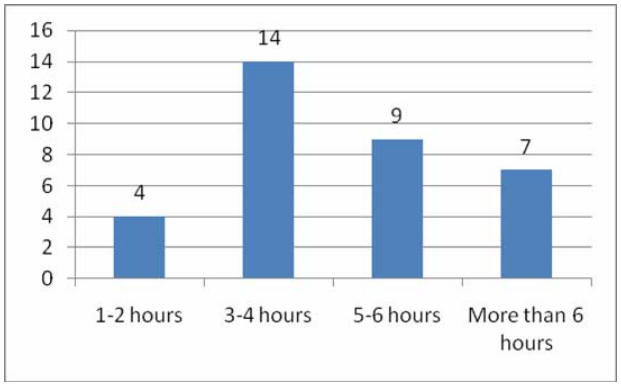
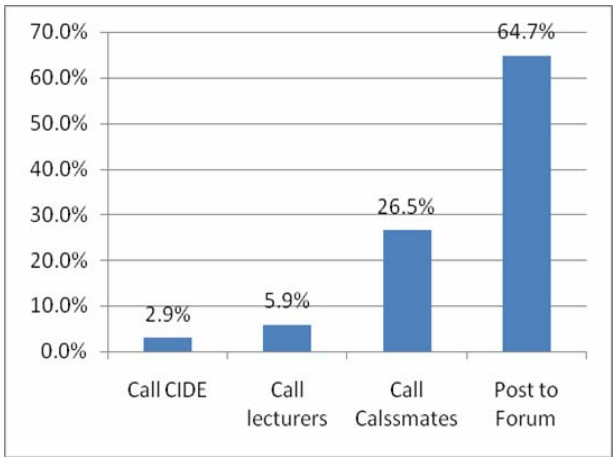


Figure 7: Average hours of study per week per subject

Students were asked what they did when having questions. As shown in figure 8, majority of students prefer to post their questions to the forum. When a question is posted to a course forum, all the students taking the course and the lecturer receive an email about the question asked and the forum gets updated as well. Any other students could reply to a question. This forum feature of Moodle creates a discussion of the question asked and students seem to enjoy participating in the discussions. Of course at any time, the lecture could intervene and/or guide students to the right direction in answering and understanding the question. Looking at both figure 6 and figure 8, it is obvious that asynchronous mode of asking questions is preferable and also more effective in learning purposes. Students can search the forums for similar questions as theirs and see if they have been answered either by fellow students or by the lecturers.



Figur 8: Actions in case of having questions

In order to explore the time span that students' questions were answered, they were asked to identify on average after how long their questions are answered. As shown in figure 9, majority of questions are replied within 3 days. It has been noticed that usually the part-time lecturers check or reply to forum questions less frequently compared to full-time lecturers.

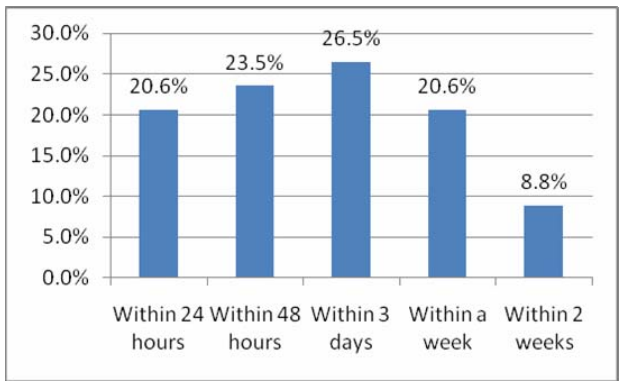


Figure 9: Duration when questions are replied

This researcher wanted to know how the

students compared the eLearning program with the traditional mode of learning. The students were asked "When comparing eLearning to traditional classroom in terms of effectiveness and usefulness, which one do you prefer?" Figure 10 displays their replies. It is apparent that majority of students believe eLearning mod of learning is the same or better than traditional mode of learning. Of course it should be noted that these students chose to study in eLearning mode from the very beginning as they decided to study online due to their works or not being able to attend in person to university.

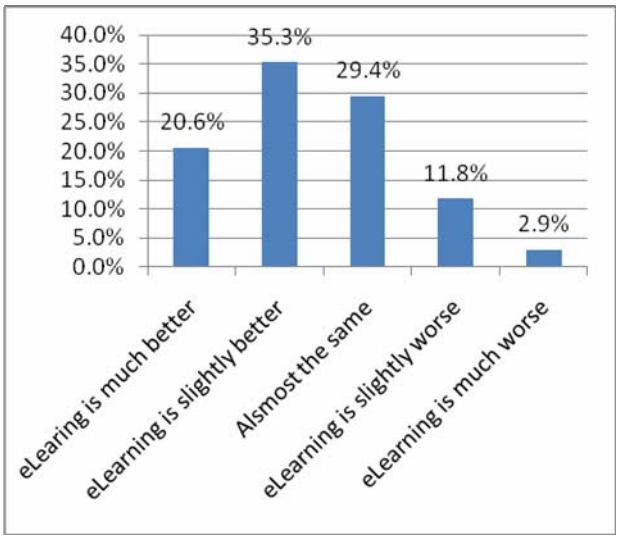


Figure 10: Comparison of eLearning with traditional mode of learning

3) CONCLUSIONS

The students studying in eLearning mode at the College of Internet Distance Education have mostly been happy with the mode of leaning and have a positive view of their learning experience. CIDE has invested a lot on video production of all courses offered. One problem with video lecture is that students should sit and watch the video lectures that at times could be boring for students, so they started using the MP3 audio of the lectures to listen and taking notes on the PowerPoint slides of the lecture. This is due to listening to a lecture make student multitasking. Still video has features that makes learning more effective. CIDE plans to produce video of lectures for mobile devices, like smart mobile phones and PDAs. Most students own these mobile devices which they carry where ever they go. Having the lectures for such mobile devices enable students to learn ay any place and anytime. The author believes mobile learning will become the future of eLearning. Given the ability of today's pocket phones and PDAs to connect us to a variety of information sources and enable communication nearly everywhere we go, mobile technologies may gradually come to extend beyond from occasional supplemental use on accessed through desktop computers; frequent and integral use of personal mobile technologies (Soloway et al., 2001) to augment physical and situated learning may become an important part of the education of the near future (Roschelle & Pea, 2002).

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The Vender Managed Inventory Knowledge Management for Thai Retailer-Based Brand Equity Model

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Abstract : Less research has been managed on the role of brand equity and application of the idea of brand equity to the business-to-business context or even in the retailing context. Retailers are assumed to be unrelated to the origin of brand value for makers, with the result that makers do not target retailers to build staunch brands. There is an argument that traditional ways of thinking about brands, i.e. only from the consumer viewpoint, has produced 'both an incomplete analysis of branding from an academic viewpoint and incomplete management of the brand from a company viewpoint' (Webster 2000). The relationship between makers and retailers should be viewed as a partnership instead of competition for consumer loyalty (Narus & Anderson 1986). (Buzzell, Quelch, & Salmon (1990)) and channel initiatives, such as vendor managed inventory (VMI), coordinated forecasting and replenishment (CFAR), and continuous replenishment (Fites (1996), Verity (1996), Waller, Johnson, & Davis (1999)), can significantly reduce demand variance. Vendor Managed Inventory is one of the most widely discussed partnering initiatives for improving multi-firm supply chain efficiency. Powerful consumer brands not only equip value to makers and consumers, but also offer many obvious benefits to retailers. These benefits include an confirmed consumer demand; favourable consumer attitudes towards the branded product found in their store; a commitment from manufacturers to promote their products; and the credibility and image of the brand itself as an enhancement of the retailer's own credibility and image. Brand equity, therefore, needs to be investigated from the retailers' perspective and target Thai consumers in order to equip a more complete understanding of the role of branding in marketing strategies.

Keywords : Customer-based brand equity, Retailer-based brand equity (RBBE) , Brand trust , Brand loyalty, Brand performance, Vendor managed inventory (VMI)

Introduction

Globalisation become favourite around the world and the Thailand market became attractive to foreign investors. As a result, many famous multinational companies (MNCs) have appeared and developed in Thai's market. The resulting dominance of international brands has led to the recession of local brands (Tran 2002). There is a statement that 'global brands are the only thing that count and the process of global branding the only thing worth spending time on' (Kapferer 2002).

Some recent innovations, such as increased communication about consumer demand, via electronic data interchange (EDI) and the internet, and everyday low pricing (EDLP) (to eliminate forward buying of bulk orders), can mitigate the bullwhip effect. In fact, the number of firms ordering, and receiving orders, via EDI and the Internet is exploding. The information available to supply chain partners, and the speed with which it is available, has the potential to radically reduce inventories and increase customer service. Other initiatives can also mitigate the bullwhip effect. For example, changes in pricing and trade promotions (Buzzell, Quelch, & Salmon (1990)) and channel initiatives, such as vendor managed inventory (VMI), coordinated forecasting and replenishment (CFAR), and continuous replenishment (Fites (1996), Verity (1996), Waller, Johnson, & Davis (1999)), can significantly reduce demand variance. Vendor Managed Inventory is one of the most widely discussed partnering initiatives for improving multi-firm supply chain efficiency. Popularized in the late 1980s by Wal-Mart and Procter & Gamble, VMI became one of the key programs in the grocery industry's pursuit of "efficient consumer response" and the garment industry's "quick response." Successful VMI initiatives have been trumpeted by other companies in the United States, including Campbell Soup and Johnson & Johnson, and by European firms like Barilla (the pasta manufacturer).

In a VMI partnership, the supplier—usually the manufacturer but sometimes a reseller or distributor—makes the main inventory replenishment decisions for the consuming organization. This means the supplier monitors the buyer's inventory levels (physically or via electronic messaging) and makes periodic resupply decisions regarding order quantities, shipping, and timing. Transactions customarily initiated by the buyer (like purchase orders) are initiated by the supplier instead. Indeed, the purchase order acknowledgment from the supplier may be the first indication that a transaction is taking place; an advance shipping notice informs the buyer of materials in transit.

Many studies have been conducted in the consumer context to think that marketing strategies are recognised as the previous of brand equity. (Palazon-Vidal & Delgado-Ballester 2005; Simon & Sullivan 1993; Yoo et al. 2000). Simon and Sullivan (1993) proposed some marketing strategies as proficient tools to build brand equity, such as advertising spending, marketing research expenditures, age of the brand, advertising share, order of entry and product portfolio. Some other strategies have also been considered in brand equity molds, along with public relations (Aaker 1991) and warranties (Boulding and Kirmani 1993). The study of brand equity previous was first searchness and empirically tested in Yoo et al.'s (2000) mold, in which five concepts explained marketing mix strategies, namely, price, store image, distribution intensity, advertising spending and price deals (Yoo et al. 2000). Furthermore, Palazon-Vidal &

Delgado-Ballester (2005) testified that sales promotions are also a tool in making strong brands.

The Study

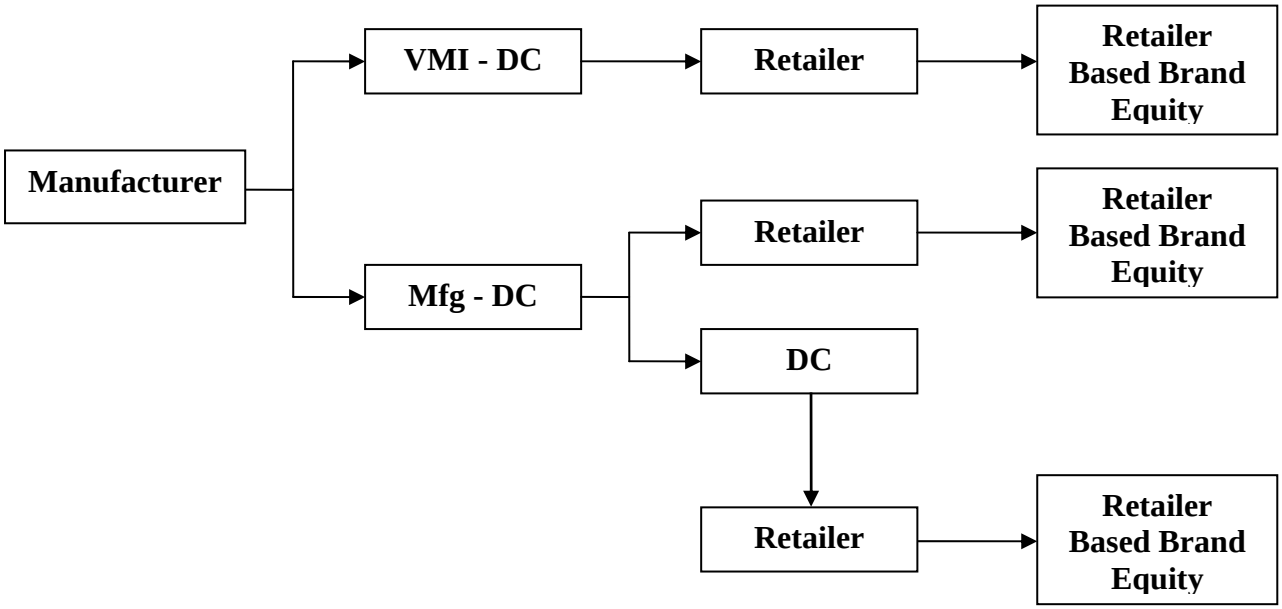
From a supply chain logistics perspective, there is only one study that emerges to have considered marketing strategies in the brand equity model, Glynn's (2004) study on the origin of brand value in supply chains logistics. Glynn (2004) found that manufacturer support, including advertising support, merchandising support, key parts of the range, beneficial category information, key category growth, and additional choice, is the source of brand value. This means that manufacturer support resemble to be the dimension of brand association in term of retailer perception. This result is different from consumer-based brand equity theories.

In terms of customer-based brand equity, brand loyalty has been appreciated as an considerable dimension which indicates how plausible a customer will be to substitute to another brand when that brand makes a change, either in value or in product features (Aaker 1991). Moreover, brand loyalty is the most considerable aim that any brand manager wants to complete (Feldwick 1996). That is the cause why brand loyalty has emerged in most customer-based brand equity models.
Webster (2000) predicted that a strong brand provides a number of advantages to retailers, such as pre-established demand, providing a good image of the retailer with the consumer, and providing a relationship of trust and credibility with the consumer. This means that retailers are concerned about how their consumers experience the value of the manufacturer's brand. Therefore, the second perspective of retailer needs and wants associates to what they believe the consumers think about the brand.

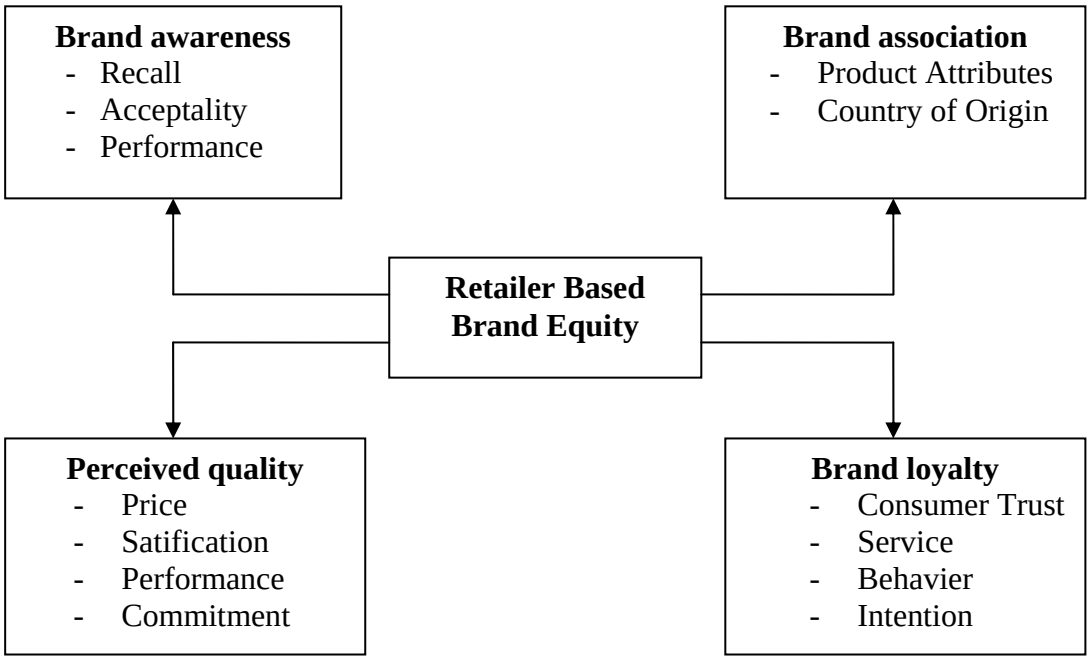
This aspect was referred as the concept of "consumer experienced value" in the brand equity model of Baldauf et al. (2003), in which consumer value was described as 'the consumer's overall assessment of the utility of the product based on recognitions of what is received and what is given' (Zeithaml 1988). Davis (2003) states that consumer-based brand equity is one of the proportions of firm-brand equity, which is measured by the overall consumer-based brand equity from the retailer's perception. In Glynn's (2004) study, consumer anticipation was determined to be the provider of safeguards to the reseller, when doing business with a brand (Glynn 2004).

Brand association is described as the information nodes combined to the brand node inmemory, which creates the significant of the brand for consumers (Keller 1993). The favourability, strength and unusual of brand association are the dimensions of brand knowledge, which is the source that creates the differential response of the consumer, appearing in brand equity (Keller 1993). Aaker (1991) states that brand association is the approved aspect of brand equity, including product attributes; customer benefits; uses; users; lifestyles; product classes; competitors; and countries. Brand association can assist the customer to process or to restore information. It can act as the basis for differentiation and extension, creating the buying reason and positive perception (Aaker 1991). In general, brand association is what customers hold in their intellect about a brand related to their needs and demands (Wood 1998).

Typical vender managed inventory (VMI)



Adapted from Aaker's (1991) Brand Equity Model



Based on consumer-based brand equity theories, brand association in retailer-based brand equity is also described as what the retailers hold in their minds about a brand related to their needs and demands. However, the needs and wants of retailers are completely different to that of the consumer (Fairhurst & Fiorito 1990). Therefore, the brand association measures in the consumer perspective cannot utilize to the retailer context. In other words, what is held in the consumer's mind cannot be pretended to

be the same as what is held in the retailer's mind associated to a manufacturer's brand.

Retailer buying behaviour models state that there are two main determinants influencing retailer detemination about merchandise requirements and supplier accessibility, in which merchandise requirements represent the needs, motives and purchase criteria of the retailers, although supplier accessibility describes the arrange of choices that can fulfil their needs (Sheth 1973). In other words, the main involve of retailers is how to buy the right product at the right time, with the right deal to maximise their profit. Moreover, the objective of retailer buying behaviour is to resell a product to the end consumer (Fairhurst & Fiorito 1990).

Retailing has seen a crucial flux during the last decade, especially in the supermarket and general merchandise industry (Ailawadi & Keller 2004). Many well-known retailer brands have emerged around the world such as Wal-mart, GAP, Cora, Big G while the famous manufacturer brands have still ruled in almost all retailing stores. This conflict has always existed in channel management (Webster 2000)

Webster (2000) predicted that a strong brand provides a number of benefits to retailers, such as pre-established demand, providing a good image of the retailer with the consumer, and providing a association of trust and credibility with the consumer. This means that retailers are concerned about how their consumers experience the value of the manufacturer's brand. Therefore, the second perspective of retailer needs and wants relates to what they accept the consumers think about the brand.

Brand loyalty is the third and final dimension of retailer-based brand equity. The idea of loyalty has been much explored in marketing history and the term loyalty has been used reciprocally with its operational explanation, to variously refer to repeat purchase (Ehrenberg 1988), preference (Guest 1944), commitment (Hawkes 1996), purchase objectives, or customer retention (Rust 1993). However, most loyalty research utilises, or modifies, the explanation of loyalty from the consumer and service contexts while limited attempts have been made to define loyalty in the business-to-business context (Papassapa 2005). In business-to-business marketing, loyalty focuses on a long-term relationship between buyers and sellers. For example, customer loyalty is described as 'a behavioural intention to preserve an progressing relationship with a service provider' (Singh & Sirdeshmukh 2000). In Oliver's (1999) study, loyalty is seen as a deeply-held commitment to re-buy or re-patronise a preferred product/service compatible in the future, thereby causing the same brand to be purchased frequently, despite situational influences and marketing exertions having the capability to cause switching behaviour to other suppliers. Meanwhile, Lam et al. (2004) define loyalty as a buyer's overall attachment or deep commitment to a product, service, brand or organisation .

In terms of customer-based brand equity, brand loyalty has been appreciated as an important dimension which indicates how probable a customer will be to switch to another brand when that brand makes a change, either in price or in product features (Aaker 1991). Moreover, brand loyalty is the most important target that any brand manager wants to execute (Feldwick 1996). That is the reason why brand loyalty has emerged in most customer-based brand equity models.

Based on this consulation, brand loyalty is proposed as an considerable dimension of retailer based brand equity. Moreover, commitment is the highest level of loyalty anticipation of brand manufacturers (Aaker 1991). Based on Oliver (1999) and Lam et al. (2004), brand loyalty in this study is described as a commitment by the retailer to maintain stability in a long-term relationship with the brand manufacturer. This idea is compatible with the findings of Glynn's (2004) and Davis's (2003) studies, in which retailer commitment shows an important function in inter-organisational exchange and acts as the purpose of building strong brand in supply chain.

Conclusions

The importance of brands in terms of the retailer. Retailer-based brand equity is described as the effect of brand knowledge on the retailer's response to the marketing performances of the brand firm. Three components, namely brand association, brand trust and brand loyalty, are determined to make up retailer-based brand equity. Brand association is reflected in the positive image of a brand in the retailer's perception, related to their needs and wants. This leads to the positive feeling towards that brand, which is the trust a retailer holds in a manufacturer's brand. As the result of a strong brand, retailers engage to a long-term business relationship with the brand's manufacturer. Brand performance and manufacturer support act as a outcome and antecedent severally, of the retailer-based brand equity model.

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A Model for the Development of e-Learning by the Role Model Teachers of the Office of Vocational Education Commission, Thailand

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ABSTRACT

The sample group of role model teachers for the research study of the Development of e-Learning through role model teachers of the Vocational Education Commission was selected from the teachers of the following departments: Department of Agriculture, Department of Trade and Industry, and Department of Electronic Media. There were six subjects. For each subject, three teachers specialized in the content and one specialized in the electronics media were selected. Therefore, there were total of 24 teachers. Six subjects were: Post-Harvest Technology, Principle of Agricultural Extension, Plant Science, Electrical Instruments, Basic Electricity and Electronics, and Basic Auto-Mechanics. The role model teachers developed the e-Learning through the Learning Management System of Moodle. They developed the e-Learning followed the five steps of the guideline of technology for human performance technology (HPT) development including performance analysis, cause analysis, intervention selection and design , intervention and change , and evaluation. The study found that the role model teachers were able to develop the e-Learning in all six subjects according to the five steps of human ability development. The specialists evaluated and approved the quality of all subjects of the e-Learning in all four aspects.

Keywords

e-Learning , Role model teacher, Moodle , Vocational Education , Human Performance Technology.

1) Introduction

e-Learning becomes more and more important in the education system. The learning becomes no more taken place at the same time like in the past. The child-centered education through web-based instruction can be provided for all places, all learners and all the time.(Aggarwal and Bento,2002) e-Leaning cannot provide the real time communication. Reading the texts seem still the only one aspect in communication. (Liberati,2004) Online learning might lead the students to be confused and difficult to make up their minds. It is also classify the contents and consider the suitable contents. Then the teachers should advise and suggest the students to get the most advantageous from online learning. (Bonk,Wisher and Lee,2004) Web-based learning should provide the appropriate system design especially the content selected by the subject matter experts to produce the most qualified and the most appropriate instructional media to be the most effective media too.

There is the idea to improve Thailand, our country to be the knowledge society and values in virtue, moral, merit, and culture while the telecommunication system becomes influent.(The office of National Commission of Economy and Society,2006) Several advances

grows incredibly because of the technology. The learning values the students or the learners to find their own knowledge and the teachers lost their importance to be the facilitators. (The office of National Education Commission, 2003). The communication gap between the teachers and the students gets wider. Electronic media becomes more importance in communicating, the students can communicate with the academic institute and their peers by this mean. (Monchai Tienthong,2005) The learning can be held and taken place at any place and anytime.

2) Role model teacher

Role model teachers should be keen on child-centered learning and let the students to learn happily so the role model teachers should join the web-based instruction. The steps in joining are good behavior, good personality, and can be the model for other teacher. Although the teachers who are keen on their subject content, but it is not enough. The good role model teachers must be good at computer and information technology to join the web-based instruction. The committee of the vocational education had a lot of program to improve this kind of teachers (Chanoittha Chongpipatwanit and the others, 2006) to help improving the web-based instruction with the subject matter experts to get the most advantage. The role model teachers must be keen on child-centered education, creative thinking, good at the content and self-responsible. The ideal teacher must be both good at the content and information technology to be suitable in improving the web-based instruction.

3) e-Learning

e-Learning must let the students to search and retrieve the information through the computer with the low expenses. (Tissana Kaemanee,2004) In fact, the all teachers are not experts, then web-based instruction is one of the solutions to improve the human performance technology by good governance, means selection, persuasion, supporting and evaluation.(Van Tiem, Moseley, and Dessinger,2004) It was an applied process to develop media systematically while the instructional design which were analysis, design, development, application and evaluation. It was the suitable to develop the web-based instruction by the role model teachers in the committee of vocational education to be advantageous and useful for teaching all over our country.

4) Research Area

The research's population were the teachers who were responsible in the field of agriculture and in the field of industrial technology in 413 colleges of the committee of vocational education.
The samples were the 24 teachers who were responsible in the field of agriculture and in the field of industrial technology for 6 subjects and also were voluntary selected.

4.1 The 9 role model teachers in agriculture and could be divided in the role model teachers in Post harvest technology, the role model teachers in Principle of agricultural extension, and the role model teachers in Plant science.

4.2 The 9 role model teachers in industrial technology and could be divided in the role model teachers in Electrical instruments, the role model teachers in Basic electricity and electronics, and the role model teachers in Basic auto-mechanics

4.3 The 6 role model teachers in Electronic media who helped to develop E-learning for the certificate and high certificate level in 6 subjects; the course description, the content, the lessons, the exercises, the test, and the questionnaires.

5) Human Performance Technology

To prepare the instruments followed the 5 steps of technology for human development ; performance analysis, cause analysis, intervention selection and design, intervention implementation and change and the evaluation.

The process plan were as followed

5.1 The 1 st stage (Performance analysis)

The performance analysis can be classified

into 2 sections;

5.1.1 Organization analysis
- mission
- readiness
- supporting factors

5.1.2 The evaluation before the development

5.1.3 abilities' analysis

5.1.4 organization's analysis

5.1.5 readiness' analysis

The teachers who wanted to joined the program had to apply for the development program and had to be evaluated by the qualification written in the application forms

5.2 The 2 nd stage (Cause Analysis)

Cause analysis to find out that why the role model teachers were lack of the chance to develop the instructional media, and also divided into 2 sections;

5.2.1 There is no supporting environment

5.2.2 lacking of the organization's support

5.2.3 lacking of the capitals

5.2.4 lacking of the chance in developing

5.2.5 There is no supporting behavior

5.2.6 lacking of the knowledge

5.2.7 lacking of the training course

5.2.8 lacking of motivation

5.2.9 lacking of hope

5.3 The 3 rd stage (Intervention Selection and Design), Intervention selection and design (abilities' supporting, tasks analysis, role model teachers' abilities development, supporting factors such as document and the web's hosting, team teaching, training course about design and systematically develop, LMS Moodle training course)

The process was set into 2 sections; the first section was held on April 23-27,2007 at Agricultural Engineering Training Center Amphoe Muang,Pathumthani province. The selected role model teachers had to join a training course about LMS with Lect.Siam Juangprakon and a 5 day-training course about Web-based design and development with Dr. Prachyanan Nilsook from King Mongkut's University of Technology North Bangkok with the aims to work together.The second section was held between May 8-9,2007 at Agricultural Engineering Training Center again to let the role model teachers to produce their web-based instructional media, presented, evaluated by the specialists.

5.4 The 4 th stage (Intervention and Change)

Intervention Interpretation and Change followed by the role model teachers, by changes from normal learning to the web-based instruction under the experts' help, Moodle's learning development, the simplification of the communicative administration and the networking. The system administration can be divided into 2 parts.

5.4.1 The media should be practiced in all 24 colleges by the role model teachers between May 23-August16 2007 (the 4 th stage)

5.4.2 The media had to evaluated by 24 role model teachers, students using a set of questionnaires (30copies; 15 copies for the students and the rest 15 for the teachers). The evaluation valued in 3 aspects of qualification between May to August 2007.

5.5 The 5 th stage (Evaluation)

The research procedure must be constantly evaluated from the start until meet the end. After being completely evaluated, the role model teachers had to use the web-based instructional media, still being evaluated in class and presented on August 10-12, 2007. The educates (educational experts) were invited to take part in evaluating and using the standard evaluation form to check the points. The evaluation had to be constantly taken by considering the project's result of each group of the role model teachers which were consisted of 4 role model teachers in each subjects. There was also another kind of evaluation. It was the private evaluation. Each role model teacher had to indicate the part which he/ she took the responsibility because the role model teaching valued in co-operative working. The teacher supervisor and the committee were responsible in project's evaluation by considering, and all the web sites were systematically evaluated.

Research analysis and evaluation had to be constantly made. Web-based instructional

media, E-learning produced by the Academic department using in Electronic media evaluation made by Surachet Wejphithak, Boonlert Aroonphiboon, Prachayanan Nilsook and Somkuan Pianphitak (2003). It was a kind of research in practicing web-based instructional media to develop the form and the procedure by the responsible in the committee of Vocational Education with the beliefs and reliance that it is potential and the officers in the department are qualified in doing good thing. But we should find out the appropriate procedure to persuade and motivate the role model teachers to show their best abilities.

6) Conclusion

e-Learning development by the role model teachers under the supporting of the committee of the vocational education was held to research and develop the form and the process in producing the web-based instructional media by the officers of the committee of the vocational education are all qualified and we should persuade and let them try their best abilities. The research results reflected that the systematic procedure the well formed process since the ability's analysis and the steps and design selection. The persuasion to the better changes and the whole system's evaluation and the last, integrated learning development (analysis, design, development, application and evaluation). These will lead the web-based instruction to be successful.

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The Development in Router Configuration Learning using e-Learning

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ABSTRACT

The purpose of this research is to develop in router configuration learning using e-Learning in Computer Laboratories subject. Router configuration learning is an interesting and important part of study in Computer Laboratories subject. The main objective of this laboratory is to make the student's skill on the router configuration. The e-Learning on router configuration is divided into four topics which are the router topology, setting up router, static route, and dynamic route. The sample group of this research was eight bachelor's degree students who studied in computer of engineering education program, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang. Students were taught, learned, and used on the development of the e-Learning on router configuration. The result of this research is indicated that the achievement score of students on score on the e-Learning is higher than the before achievement score of students at less than 0.01 in significant statistical level.

Keywords

e-Learning on Router , e-Learning , Router, Router configuration

1) INTRODUCTION

The good management of computer network will bring the efficiency and stability usage of the computer network. But the studying of network management has several limitations such as the insufficient number of network devices, the space in laboratory is not enough. So in many universities have only the lecture for the computer network subject which led to the lack of skills for network management. We can use the network simulation tools to solve these problems. Unfortunately, the simulation software does not support all functions used in the real lab environment. The virtual laboratories (Duarte & Butz, 2001), that uses the simulation softwares, can solve the insufficient number of network devices only. The remote laboratories such as Chirico, Scapolla, and Bagnasco (2005), Fàbrega, Massaguer, Jové, and Mérida (2002), Klempous, Nikodem, Walkowiak, and Rozenblit (2004), Steinemann, Zimmerli, Jampen, and Braun (2002) which using the real equipments via the Internet and manage these resources for efficeiency sharing is another way to address this issue. In an influential research, Nedic, Machotka, and Nafalski (2003) summarize about the advantage and disadvantage of the remote laboratories and the virtual laboratories. The cost of virtual laboratories is lower than the remote laboratories, but the software does not support all functions of the network device. For remote laboratories, user can interact with the real network device.

The devices that used in Duarte & Butz (2001), Chirico et al. (2005), and Klempous et al. (2004) such as the engineering instruments do not need to store the previous device status for the result processing. So the students simultaneously use these devices. In contrast, the management of computer network devices has to store the previous device status to process the next same instruction from each student for the concurrent usage of the devices as mentioned in Fàbrega et al. (2002), Steinemann et al. (2002). If the previous device status did not store, only one student can use these network devices. The objective of this research is to

develop the virtual laboratory, because the insufficient number of network devices, low cost and need skill of all students. We can use router simulator.

2) RESEARCH OBJECTIVE

In this research, the research objective is to develop the e-Learning on router configuration in computer laboratory subject for students who study in bachelor's degree majoring in computer.

The e-Learning on router configuration is accomplished in four primary goals:

1. Give students increasingly interest on router configurations.
2. Help students understand on network design.
3. Help student achievement on router configuration.
4. Give teachers and students a tool for learning on router configuration.

In this research, the researchers used and listed topics of router configuration that were taught for bachelor's degree students in engineering education program majoring in computer, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang. There are 4 topics on router configuration following as:

1. Router topology
2. Setting up router
3. Static route
4. Dynamic route

3) DEVELOPED CONTENT

In the router configuration, we divided the experiment into 4 contents following as:

3.1) Router Topology

The router topology is the content that helps students know about the details on equipments and how to connect the network line. Originally, one student can practice and connect the network line one at the time. But, now, students can have experimented on network connecting at the same time by using e-Learning based on network design programs shown as figure 1.

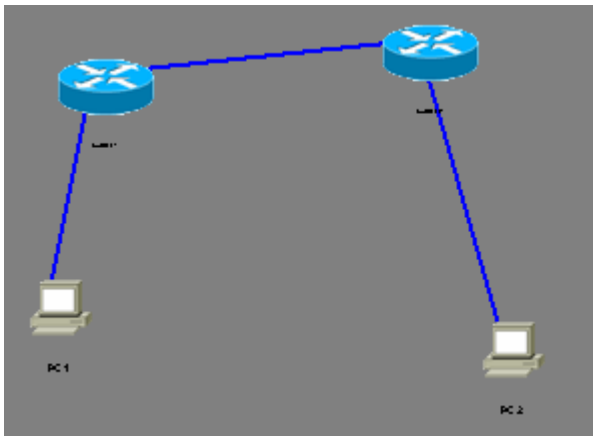

Figure 1: Router topology for basic two routers

3.2) Setting up Router

In the experiment, the students were practiced how to basically set the router. Students were familiar with the command line to set up router on router simulator program. The example on command line and results is shown as figure 2.

```
 transport input none
line aux 0
line vty 0 4
!
no scheduler allocate
end

Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface ethernet 0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Ethernet0, changed state to up
Router(config-if)#
```

Figure 2: Result of setting up router

3.3) Static Route

Static route is the content that supports students to find the network route and understand the concept of stub network by using routing table. The results on the experiment and command line are shown as figure 3.

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.1.1
Router(config)#exit
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route

Gateway of last resort is not set

C    192.168.1.0 is directly connected, Ethernet0
S    192.168.2.0 [1/0] via 192.168.1.1

Router#
```

Figure 3: Routing table after static route setting

3.4) Dynamic Route

Dynamic route is the experiment that uses the routing protocol in distance vector and link state. The distance vector routing protocol is used RIP as the routing protocol and the link state is used OSPF as routing protocol shown as figure 4 and 5 in orderly.

```
disable
disconnect              Disconnect an existing network connection
logout                  Exit from the EXEC
ping                    Send echo messages
traceroute              Trace route to destination
Router# show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route

Gateway of last resort is not set

C    192.168.2.0 is directly connected, Ethernet1
C    192.168.1.0 is directly connected, Ethernet0
R    192.168.3.0 [120/1] via 192.168.2.2, 00:05:16, Ethernet1
Router#
```

Figure 4: Routing table after enable RIP protocol

```
C    192.168.2.0 is directly connected, Ethernet1
C    192.168.1.0 is directly connected, Ethernet0
O    192.168.3.0 [110/10] via 192.168.2.2, 00:00:08, Ethernet1

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route

Gateway of last resort is not set

C    192.168.2.0 is directly connected, Ethernet1
C    192.168.1.0 is directly connected, Ethernet0
O    192.168.3.0 [110/10] via 192.168.2.2, 00:00:16, Ethernet1
Router#
```

Figure 5: Routing table after enable OSPF protocol

By using e-Leaning on router configuration, the students can complexly set the router in the real time status. In the figure 6, there are 5 routers in connecting by RIP protocol. The results of network connecting are shown as figure 7.

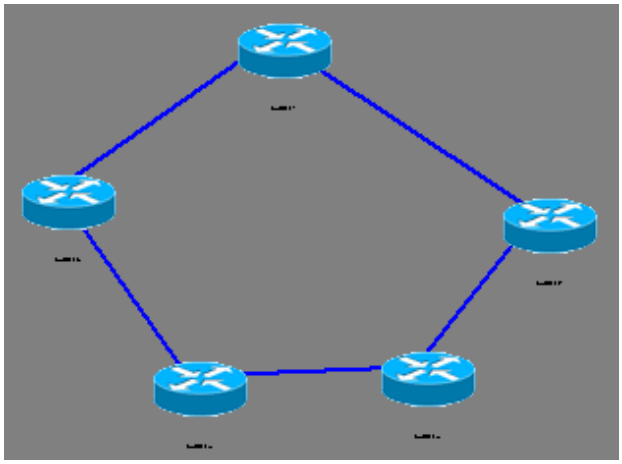

Figure 6: Complex of router topology

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route

Gateway of last resort is not set

C    192.168.3.0 is directly connected, Ethernet0
C    192.168.2.0 is directly connected, Ethernet1
R    192.168.1.0 [120/1] via 192.168.2.1, 00:03:18, Ethernet1
R    192.168.4.0 [120/1] via 192.168.3.2, 00:02:18, Ethernet0
R    192.168.5.0 [120/2] via 192.168.3.2, 00:07:31, Ethernet0

Router#
```

Figure 7: Result of routing table after configuration

4) STUDENTS' ACHIEVEMENT

Students are taught and studied with the e-Learning on router configuration. At the beginning of class, the researchers gave the pretest to students. At the ending of class, the researchers gave the posttest to students. A statistic analysis was conducted to compare learning outcomes measured by pretest and posttest across the students' achievement. The result of student's achievement is shown on Table 1.

Table 1: Students' Achievement

Test	N	$\bar{x}$	SD	t	Sig.
Pretest	8	8.4750	0.89083	-4.558	0.000
Posttest	8	11.8125	1.86964		

Note: The result of this research is the achievement score of students at less than 0.01 in significant statistical level.

The result of using the e-Learning on router configuration in the class teaching indicated that the achievement score of students on score on the e-Learning is higher than the before achievement score of students at less than 0.01 in significant statistical level.

5) CONCLUSIONS

The development of e-Learning on router configuration is the subject content that gives and helps students to learn how to connect the routers in network. The development of e-Learning on router configuration is divided into 4 parts which are the router topology, setting up router, static route, and dynamic route. The result of this research indicated that the achievement of bachelor's degree students who studied in computer program, Department of Engineering Education, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang is improved according to learning with the development of e-Learning on router configuration.

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DEVELOPMENT OF PROBLEM-BASED BLENDED LEARNING MODEL IN DEVELOPING UNDERGRADUATE STUDENTS' CRITICAL THINKING

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ABSTRACT

The purposes of the research study were: 1) to study conceptual framework and to study the opinions of panel experts on a Problem-Based Blended Learning (PBBL) model, 2) to develop a PBBL model which is to develop undergraduate students' critical thinking, 3) to study the effects of using a PBBL model, 4) to study students' opinion on the model, and 5) to propose the verified PBBL model.

The research and development (R&D) procedures were divided into four phases. The first phase was to study conceptual framework, the second phase was to develop a PBBL model, the third phase was to study the effects of using a developed PBBL model, and the fourth phase was to propose the verified PBBL model. The instruments used to assess undergraduate students' critical thinking were Cornell Critical Thinking Test Level Z and MOODLE LMS was used to manage the blended learning system. The sample group in this study consisted of 40 undergraduate students from the Electronic Media Production for Education course at the Faculty of Education, Chulalongkorn University. Students studied via the Internet using PBBL model for eleven weeks. Data were analyzed by using frequency, percentage, arithmetic mean, standard deviation and t-test dependent.

The research results indicated that the PBBL model consisted of four components as followed: 1) principles, 2) objectives, 3) instructional process, and 4) learning evaluation. The instructional process consisted of two stages. The first stage was the preparation stage which included orientation, practice, learner grouping, and pretest on critical thinking skills. The second stage was learning stage which included the study of content, the presentation of situation, the clarification of terms and concepts, the definition of problems, the development and sequences of hypothesis, the formulation of learning objectives, the collection and validation of new information, the synthesis of information, the identification of generalization and principles, and the implementation of knowledge.

The study also found that undergraduate students' posttest score in critical thinking were significantly higher than pretest score in critical thinking at .01 level. The students evaluated the PBBL process as a high level of appropriateness.

Keywords

Blended Learning, Problem-Based Learning, Critical Thinking.

INTRODUCTION

In an information technology era, new educational methods are being introduced to support the complex learning environment and the development of professional competencies. There are also emphasis on collaborative construction of knowledge through active learning and on the importance of higher-order skill such as critical thinking, problem solving, and self-regulation. The important factor to improve students' critical thinking is learning and teaching method such as Problem-Based Learning.

The Problem-Based Learning (PBL) is a absolute approach to education and involves a constructivist approach to learning (Harper-Marinick, 2001). The curriculum consists of carefully designed problems that are in demand from learners in acquisition of

critical knowledge, problem-solving proficiencies, self-directed learning strategies and team participation skills. The learning processes replicate the common use of systemic approach when solving problems or challenges that are encountered in life and career (Barrows and Tamblyn, 1980).

Moreover, flexibility is increased when education is less dependent on time and place by making personalized learning routes available for individual students (Jochems, Merriënboer, and Koper, 2004). Many educational technologies are used to serve the way that curriculum changes. Particularly information and communication technology (ICT) in the sense of the Internet and its applications such as the WWW., e-mail, teleconferencing, groupware for computer supported collaborative learning (CSCL), learning management system (LMS) , web-based learning (WBL) are growing rapidly among higher education in Thailand. However, all of these terms imply that the learners are of distance from the teachers, and computers are used to access learning resources, or to interact with the lessons provided, the teachers or their peers. In practice, many of these terms are used interchangeably.

The options for web-based learning ranges from the use of applications in traditional classrooms to comprehensive online courses in which there is no face to face contact. A blended course utilizes a combination of teaching methods in traditional classrooms and distance learning format via the Web. A blended approach may improve the efficiency of classroom management, especially for large classes (Papo, 2001), which would also increase the degree of student-led learning (Saunders and Klemming, 2003) and student achievement (Johnson, McHugo and Hall, 2006).

The aim of this study is to develop the blended learning model for higher educational level using problem-based learning to develop undergraduate students' critical thinking.

PURPOSE OF THE STUDY

The purposes of this study were;

1. to study the conceptual framework and opinions of panel experts for the approval of Problem-Based Blended Learning model for developing undergraduate students' critical thinking

2. to develop a Problem-Based Blended Learning model for developing undergraduate students' critical thinking

3. to study the effects of using Problem -Based Blended Learning model for developing undergraduate students' critical thinking

4. to study students' opinions on Problem -Based Blended Learning model for developing undergraduate students' critical thinking

5. to propose the verified Problem-Based Blended Learning model for developing undergraduate students' critical thinking

CONCEPTUAL FRAMEWORK

Conceptual framework of this study is shown in figure 1. Three components were used for creating PBBL model which theoretically affected blended learning, Problem-Based Learning, and critical thinking skill of learner.

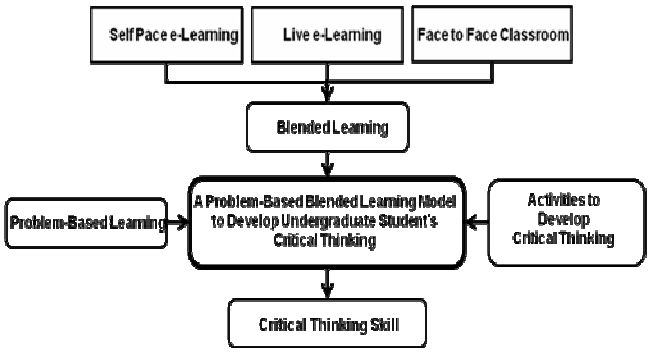

Figure 1: conceptual framework of the study.

RESEARCH METHODOLOGY

The Research and Development (R&D) approach were used.

The research procedures were divided into four phases:

1. The first phase was to study conceptual framework.

In this phase, researcher analyzed and synthesized the concepts, principles, theories, and research study concerning existing Problem-Based Blended Learning (PBBL) model, and the study of opinions from panel experts for the appropriateness of PBBL model. The sample group were 21 instructors from 11 universities and 15 undergraduate students from 3 universities.

2. The second phase was to develop PBBL

model.

In this phase, the researcher used information obtained from the first phase to develop the PBBL model. Then, the model was certified by 15 experts through blended learning, critical thinking, and problem-based learning. Furthermore, it tried out by 40 undergraduate students from the Electronic Media Production for Education course at the Faculty of Education, Chulalongkorn University.

3. The third phase was to study the effects of using a developed PBBL model.

In this phase, the same 40 undergraduate students, who registered for the course, were used as a sample group. The group studied via web with the PBBL model for 11 weeks, followed with a critical thinking test and then asked for their opinions.

4. The fourth phase was to propose the verified PBBL model.

In this phase, the researcher proposed the verified PBBL model from five experts in blended learning, critical thinking, and problem-based learning.

Quantitative statistics used in this study were frequency, percentage, arithmetic mean, standard deviation and t-test dependent.

RESEARCH RESULTS

The results from researching a PBBL model to develop undergraduate students' critical thinking are presented as follows:

Figure 2: A Problem-Based Blended Learning model for developing undergraduate students' critical thinking

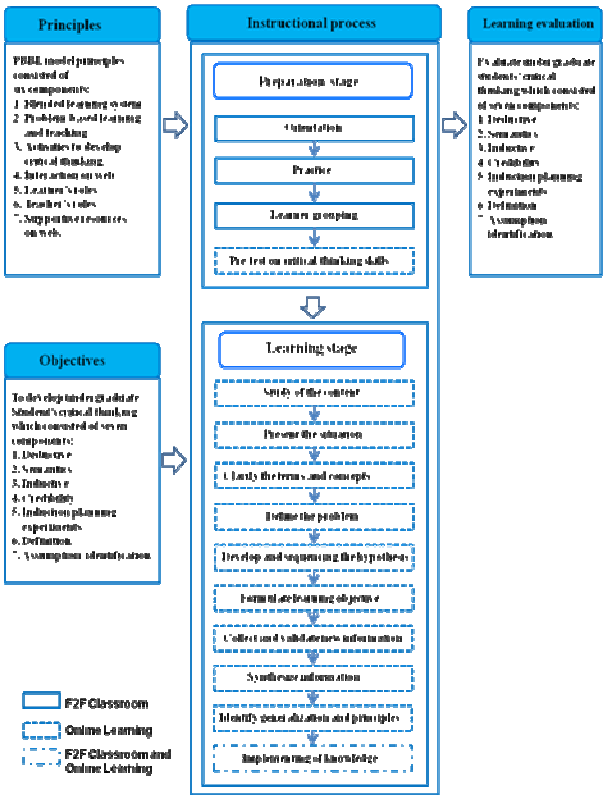

Figure 2: a Problem-Based Blended Learning model for developing undergraduate students' critical thinking

Part 1 Components of a PBBL model for developing undergraduate students' critical thinking.

Figure 3: Components of a PBBL model for developing undergraduate students' critical thinking.

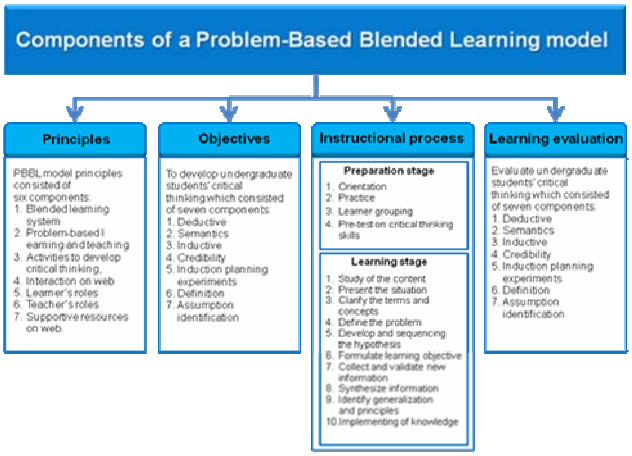

Figure 3: components of a PBBL model for developing undergraduate students' critical thinking.

A PBBL model for developing undergraduate students' critical thinking which is consisted of four components:

1. PBBL model principles

PBBL model principles consist of six components:

1) Blended learning system

The blended learning system consist of two components which include 1.1) web-based learning based on self pace e-Learning and live e-Learning and 1.2) traditional classroom (F2F classroom).

2) Problem-based learning and teaching

The problem-based learning and teaching consist of ten stages which include 2.1) the study of content, 2.2) the presentation of situation, 2.3) the clarification of terms and concepts, 2.4) the definition of problem, 2.5) the development and sequence of hypothesis, 2.6) the formulation of learning objectives, 2.7) the collection and validation of new information, 2.8) the synthesis of information, 2.9) the identification of generalization and principles, and 2.10) the implementation of knowledge.

3) Activities to develop critical thinking

An activities to develop critical thinking consist of six stages which include 3.1) identification and clarification of the problem, 3.2) collection of information, 3.3) analysis and evaluation of the evidence, 3.4) consideration alternatives and implications, 3.5) selection and implementation of the best alternative, 3.6) Conclusion.

4) Interaction on web

The Interaction on web consist of four components which include 4.1) Learner -Content, 4.2) Learner- Learner, 4.3) Learner -Instructor, 4.4) Learner-Interface.

5) Learner's roles

For the theoretical class, students studied through web-based instruction using self place e-Learning and live e-Learning in group learning. For the practical class, participation in traditional classroom (F2F), students shall be eager to find out the answers and present solutions to resolve the problem assigned by the instructor using their own knowledge, learning interchangeably side-by-side, brainstorm for hypothesis, make discussions and investigations for appropriate resources to resolve the problem.

6) Teacher's roles

The teacher have a role to manage the class, assess understanding and process, give feedback on learning log, monitor and give advice to students in the web board, encourage students to assess their own learning, and give formative and summative evaluation.

7) Supportive resources on the web

The supportive resources on the web consist of three components which include 7.1) presentation of situations to problem tool 7.2) communication tools 7.4) online resources

2. PBBL model objectives

The objectives of PBBL model to develop undergraduate students' critical thinking consist of seven components:

2.1) Deductive
2.2) Semantics
2.3) Inductive
2.4) Credibility
2.5) Induction planning experiments
2.6) Definition
2.7) Assumption identification

3. Instructional process of PBBL model

The Instructional process of PBBL model consist of two stages:

3.1) The Preparation stage

1) Orientation
2) Practice
3) Learner grouping
4) Pre-test on critical thinking skills

3.2)The Learning stage

1) Study of content
2) Present the situation
3) Clarify the terms and concepts
4) Define the problem
5) Develop and sequencing the hypothesis
6) Formulate learning objective
7) Collect and validate new information
8) Synthesize information
9) Identify generalization and principles derived from studying this problem
10) Implementation of knowledge

4. Learning evaluation

Evaluation of undergraduate students' critical thinking consist of seven components:

4.1) Deductive

4.2) Semantics
4.3) Inductive
4.4) Credibility
4.5) Induction planning experiments
4.6) Definition
4.7) Assumption identification

Part 2 instructional process of PBBL model for developing undergraduate students' critical thinking

Figure 3 instructional process of PBBL model for developing undergraduate students' critical thinking.

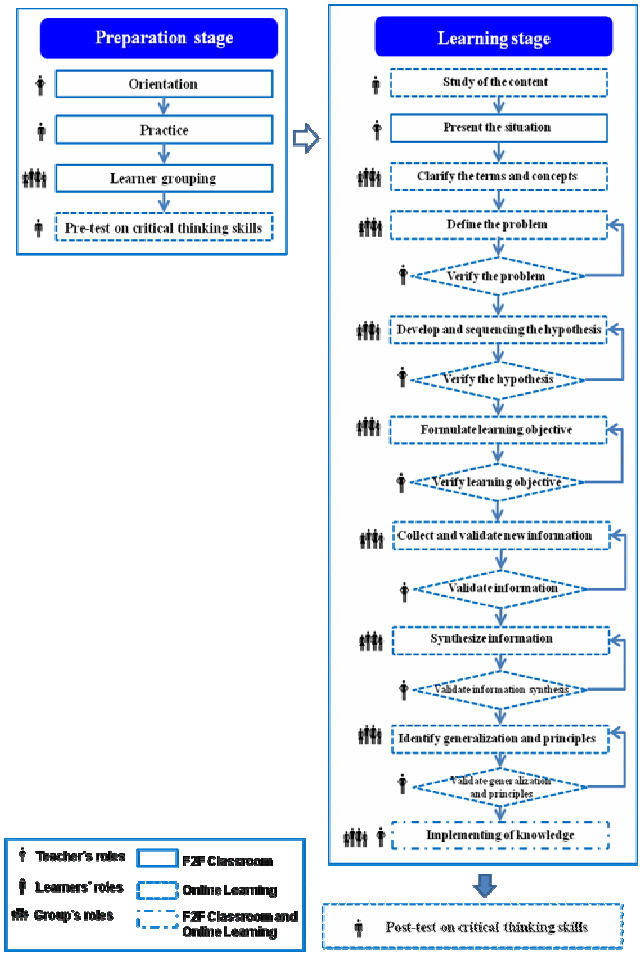

Figure 3: instructional process of PBBL model for developing undergraduate students' critical thinking.

The details of problem-based blended learning stage are shown in table 1

Table1: Problem-Based Blended Learning stage

PBBL Stage	Method / Tools
Preparation stage	
1. Orientation - Teaching Assistant - Student	• Method - F2F Classroom: Lecture • Tools - Teaching handbook - Learning handbook
2. Practice	• Method - F2F Classroom: Demonstration, Drill and practice • Tools - LMS - Computer Lab - Teaching handbook - Learning handbook
3. Learner grouping	• Method - F2F Classroom • Tools - LMS: Web board
4. Pre-test on critical thinking skills	• Method - Online Learning: Online testing • Tools - LMS: Pretest in critical thinking (Cornell Critical Thinking test, Level Z)
Learning stage	
1. Study of the content - Theoretical content	• Method - Online Learning: Self pace e-Learning • Tools - LMS: Online content
- Practical content	• Method - F2F Classroom • Tools - Computer Lab
2. Present the situation	• Method - F2F Classroom • Tools - LMS: Problem situation webpage - LMS: Web board - Computer Lab •
3. Clarify the terms and concepts	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: small group chat room - LMS: Web board

PBBL Stage	Method / Tools
4. Define the problem	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 1 define the problem
5. Develop and sequencing the hypothesis	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 2 develop and sequencing the hypothesis
6. Formulate learning objective	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 3 formulate learning objective
7. Collect and validate new information	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 4 collect and validate new information
8. Synthesize information	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 5 synthesize information
9. Identify generalization and principles	• Method - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - LMS: Online question assignment 6 identify generalization and principles
10. Implementing of knowledge	• Method - F2F Classroom: Classroom discussion, Oral presentation - Online Learning: Live e-Learning, e-Brainstorming • Tools - LMS: Small group chat room - LMS: Web board - Computer Lab
Evaluation stage [after 11 weeks]	
Post-test on critical thinking skills	• Method - Online Learning: Online testing • Tools - LMS: Posttest in critical thinking (Cornell Critical Thinking test, Level Z)

Part 3 the result of implement a PBBL model for developing undergraduate students' critical thinking

The results of using a PBBL model with 40 undergraduate students from the Electronic Media Production for Education course at the Faculty of Education, Chulalongkorn University studied via web with PBBL model for 11 weeks are as follows:

1. Undergraduate students' posttest score in critical thinking ($\bar{X}$ = 41.00, *S.D.* = 6.70) were significantly higher than pretest score in critical thinking ($\bar{X}$ = 30.03, *S.D.* = 8.85) at .01 level. The instruments used to assess undergraduate students critical thinking was Cornell Critical Thinking Test Level Z.

2. Undergraduate students had the opinion that the PBBL process was appropriate in the high level and that the PBBL process would help undergraduate students to develop knowledge, critical thinking skill, problem solving skill and skill in information technology and communication.

CONCLUSION

A PBBL model to develop undergraduate students' critical thinking consisted of principle, objective, instructional process and evaluation. The instructional process of the PBBL model is divided into two main stages: the preparation stage and the learning stage. The findings from this study appear to provide strong support for

the premise that a problem-based learning and teaching approach delivered using blended learning involving web based instruction and face to face instruction could provide strong supports for develop undergraduate students' critical thinking skills and PBBL processes would help undergraduate student to develop knowledge and skills in information and communication technology.

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FACTORS INFLUENCING CONSUMER EXPECTATIONS THROUGH LEARNING CONTENT MANAGEMENT SYSTEM ON BRAND EXTENSION FOR COSMETIC PRODUCTS AMONG THAI CONSUMERS

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Abstract: The purpose of the present study was to examine Thai consumers' perceptions of cosmetic products, as and extension of the traditional product and the factors which influence the consumers in their willingness to purchase those products. These factors include their perception of product attributes and product characteristics. A research model was created to provide the relationships concerning the consumers' perceived product attributes and their evaluations in purchasing through learning content management system.

Consumer perceived factors influencing their decision making were differently related to Thai consumers' willingness to purchase on brand extension of cosmetic products in terms of traditional product attributes, extension product attributes, and their confidences to use the products. Thai consumers more concerned about those factors than other consumers. The study showed the direct relationships between traditional product attributes, extension product line attributes, and behavior in consumption for Thai consumers' willingness to purchase extension product line. Those factors were directly related to Thai consumers' involvement with willingness to purchase extension product lines. For Thai consumers, extension product attributes and factors related to confidences were the best predictors of their decision to purchase extension product lines. (Kapferer ,1995 Aaker ,1990) Aaker ,1991 Reddy, Holak, and Bhat, 1994 Sheinin and Schmitt, 1994 Aaker and Keller , 1990 Sheinin and Schmitt, 1994 Aaker 1996)

Keyword : Brand extension, Expectations, Perception, attitudes, learning content management system.

Introduction

As and extension of the traditional product and the factors which influence the consumers in their intention to buy those products. These factors include their perception of product attributes and product characteristics. direct relationships between traditional product were the best predictors of their decision to buy extension product lines. Brand extension or brand stretching is a marketing strategy in which a company marketing a product with a well-developed image uses the same brand name in a various product category. Organizations use this strategy to extend and leverage brand equity . A brand's "extendibility" depends on how strong consumer's business are to the brand's values and goals.

In 1990s, 81% of new products used brand extension to present new brands and to make sales. Keller, K.L. (1998), “Strategic Brand Management: Creating, Measuring, and Operating Brand Equity”, Hemel Hempstead.

Brand extension is a new product development strategies which can decrease financial risk by using the parent brand name to enhance consumers' perception because of the core brand equity. Muroma, M. and Saari, H (1996), “Fit as a determinant of success”, in Beracs, J., Baure, A. and Simon, J. (Eds), Marketing for Extension Europe, Procedure of 25th Annual Conference of European Marketing Academy, pp. 1953-63. Chen and Liu 2004.

While there can be significant profits in brand extension strategies, there can also be significant risks, resulting in a diluted or violently destroy brand image. Poor choices for brand extension may dilute and deteriorate the core brand and destroy the brand equity. Aaker,D.A.(1990),“Brand extensions: ‘the good, the bad, the ugly’”, Sloan Management Review, pp. 47-56. Martinez and Pina, 2003

Most of the literature concentrete on the consumer evaluation and positive impact on parent brand. In practical cases, the failures of brand extension are at higher rate than the successes. Some studies present that negative impact may dilute brand identity and equity. Loken and John, 1993 Roedder-John, D., Loken, B. and Joiner, C. (1998), “The negative effect on extensions: can flagship products be diluted?”, Journal of Marketing, 62 1, pp. 19-32 In spite of the positive impact of brand extension, negative association and false communication strategy do harm to the parent brand even brand family. (Aaker, 1990; Tauber, 1981; Tauber, 1988)

“categorisation theory” as their fundamental theory to investigate the links about the brand extension. Park, C.W., McCarthy, M.S. and Milberg, S.J. (1993), “The effects of direct and relevant brand extension strategies on consumer reflect to brand extensions”, Advances in Consumer Research, 20, pp. 28-33. Park, C.W., Jun, S.Y. and Shocker, A.D. (1996), “Composite brand alliances: an examination of extension and feedback effects”, Journal of Marketing Research, 33(4), pp. 453-66 When consumers meet thousands of products, they not only initially confused and disorderly in mind, but also effort to categorize the brand association or image with their existing memory. When two or more products exit in front of consumers, they might

reposition memories to scope a brand image and concept toward new introduction. A consumer can determine or evaluate the extension by their category memory. They categorize new information into particular brand or product class label and store it. Park, C.W., Milberg, S.J. and Lawson, R. (1991), "Evaluation of brand extensions: the role of product characteristic similarity and brand idea consistency", Journal of Consumer Research, 18(2), pp. 185-93. Sheinin, D.A. and Schmitt, B.H (1994), "Extending brands with new product idea: the role of grouping attribute congruity, brand affect, and brand breadth", Journal of Business Research, 31, pp. 1-10. This process is not only connected to consumer's experience and knowledge, but also involvement and selection of brand. Nedungadi, P and Hutchinson, J (1985), "The prototypically of brand: relationship with brand awareness, preference and treatment", Advances in Consumer Research, 12, pp. 498-503. If the brand association is highly related to extension, consumer can discern he fit among brand extension. Some studies recommend that consumer may neglect or overcome the dissonance from extension especially flagship product which means the low discerned of fit does not dilute the flagship's equity.

Literature related to negative effect of brand extension is limited and the findings are shown as incongruent. Romeo, Advances in Consumer Research, 18, pp. 399-406. In contrast, point out dilution effect do occur when the extension across inconsistency of product category and brand beliefs. The failure of extension may occur by difficulty of connecting with parent brand, a lack of similarity and familiarity and inconsistent intregrated marketing communication messages.

The Study

This case study presents the phenomenon of brand extension and investigates the correlation of consumer perception on the parent brand and the extended brand personalities. Operating the brand in the fast growing consumer products industry, the brand personality is an important variable and the company makes great efforts to communicate them to their target market. The wider the range of brands extended, the higher the awareness the company needs regarding how their consumers recognize the extended brands.

In order to make it possible to measure such an abstract and intangible predictor such as "brand personality", we conducted the survey at the case company in comparison to the consumer survey undertaken from four various areas. The result points out whether the company could maintain the overall integrity of the brand's personalities, both for the parent and its expand brands.

Brand management under the circumstances of the brand extension become a predominantly significant and hard task whereby this research study could partly explain the importance of the brand personalities. Most companies have a propensity to overlook their final consumer perception and perception towards their brand personalities after the brand extension. Both theoretical and empirical information have been required to get the deeper insight into the problem area. The result of the study is sent to the case of a company to be investigated as the brand indicators for making the durable brand hierarchy whereby the stable platform for the future brand expansion is proactively secured.

Brand extensions might not only increase the returns but also help penetrate and capture a new market. Some brand extensions are not promising because the extended brands might work against the basic personality of the parent brand. By extending the brand, the focal point of its parent brand's personality might get distorted in the minds of the consumer if the extended brand's personalities fall outside the original brand characteristics. Conversely, if brand extension is carried out properly, it will possibly create a tremendous rise in the brand distinctiveness.

The consumer recognition on the brand personality has been discussed by some researchers from many different perspectives. Most of them compare and contrast the brand personalities of various products which are already well set up in the market. We could not find any of them comparing and contrasting the parent brand and its extended brands' personalities to describe any correlations between those two variables. There are many doubts upon what could occur to the consumer recognition on the parent brand while the company extends into new brand concepts and introduces the relatively new brand personality to the consumers. As a result, how significant is the consumer recognition on the parent brand and the extended brands' personality in correlation to each other?

During the last years, the ethnic cosmetic trends and new consumption patterns make a niche for many cosmetic manufacturers and marketers to yield the market share and set up its new or stronger position in this segment. There are doubts that the brand extension might affect the parent brand and its extended brands in various ways. For example, certain extensions might exploit the brand assets, while other extensions might damage the parent brand's personality. Some extensions might have a neutral effect while others help improve and foster the meaning of the parent brand's personality in the consumers' mind.

We arguing, in this study, that it is highly critical for the company to tactically and proactively design their extended brands' identities. The well-judged brand personality design needs to be planned and communicated within the organization and all connected partners have to secure the sustainable brand personalities which are considered, in this study, one of the most important

Kapferer (1997), one of the influential researchers in branding, marks in his context that although high cost are paid for companies with brands, companies are in fact purchasing certain places in the minds of potential consumers. He adds that awareness, image, trust and reputation could promise future success for the brand. So the value of a brand is partly represented by its ability to build such cash flows. If it is true that the brand could give the product meaning and influences its identity then a well-judged brand extension which could make crucial points of differentiation in an ever more crowded market is important in managing the brand.

It is observable that the brand owners must recognize that brands are one of the most precious assets and need to be operated with care and deliberation when deciding to extend the brand. There are many indicators from the consumer perspective, which the company might consider in order to track its external environment's reaction toward their brand executions. Such study would help the company to ensure that the indispensable values and qualities of the brand are clearly understood and communicated to its final consumers. The necessary qualities and attributes of the brand must be completely understood by the brand owner. For the author of this

paper, a brand is not a name, a position or a marketing statement. Instead, it is a commitment made by a company to its customers and supported by the same company. In the same line of thought, accept with Apostolopoulou's (2002) definition of a parent brand as the name of the brand that represents the basis for the extension. In an ever more rising competitive environment, brand marketers are finding out the ways to expand their portfolios and at the same time decrease the costs of the new products introduced as well as decrease the risk of new product failure. One of the most popular ways to achieve this is to put a new product created in another category under the name of an remaining brand. This is called brand extension (Fox et al., 2001).

According to Keller & Sanjay (2003), one of the most significant advantages of a strong trademark is the fact that it creates it easier for consumers to accept a brand extension. Due to the fact that brand extension diminishes the risk regarding consumers and reduces the cost with marketing and promotion, it has become the most frequent product tactics over the last two decades. Still, "brand extension can be a double-edged sword" (Keller & Sanjay, 2003, p.12). To throw light upon Keller & Sanjay's (2003) confirmation, successful and unsuccessful key factors will be informed in the next paragraphs. According to Keller (1998) and Apostolopoulou (2002), brand extensions help organizations by increasing their strength, their customer base and their long term viability. In a study provided in U.S. for professional sport teams,

Apostolopoulou (2002) found six keys to successful brand extension:

- the strength of the parent brand
- the recognized fit between the parent brand and the extended product
- the promotional support and positioning of the extended brand
- the quality of the extension product
- the distribution tactics
- the management of the expansion

However, according to many authors, brand extension seems to be a dangerous thing to rely on. Thus, Chen & Chen (2000) consider, in a study performed in Taiwan, that the following criticizing ideas regarding brand extensions can be found in the suitable literature. The extended brand is perceived as cannibalizing the parent brand by eating into the total sales of the main brand. Moreover, an extension can make consumer confusion concerning the quality of the new created products. Last but no least, brand extension is seen as a lazy version of a new brand.

According to Murphy (1990, p.110), "to improve new brands is extremely *expensive*, *highly risky* and *takes a long time*." When he speaks about expenses, Murphy (1990) does not only mean the cost with making a new brand concept but also the costs with advertising in order to launch the new brand on the market as well as to support it during its whole life cycle. Murphy (1990, p.110) studies that "*the process of branding is one whereby a bond is created between the brand and the consumer and, commonly the consumer has little interest, at least initially, in the brand proposition. Sustained advertising and promotional investment is therefore wanted to create this bond and reassure the consumer that the brand proposition will persist; such on-going support is expensive*."

The maintenance of the brand's visual identity is another necessary factor for the line extension that managers have to take into consideration. By ignoring, this standpoint can have as result the disintegration of brand identity and personality, which can in turn seriously harm the value and power of the core brand (Murphy, 1990). According to Hartley (1998), extension is now an important part of the life of a brand, for it represents growth, development of scope and market adaptability. Furthermore, he believes that the market needs to identify the right time, place and content for the extension, as well as the ways to be implemented for the launch.

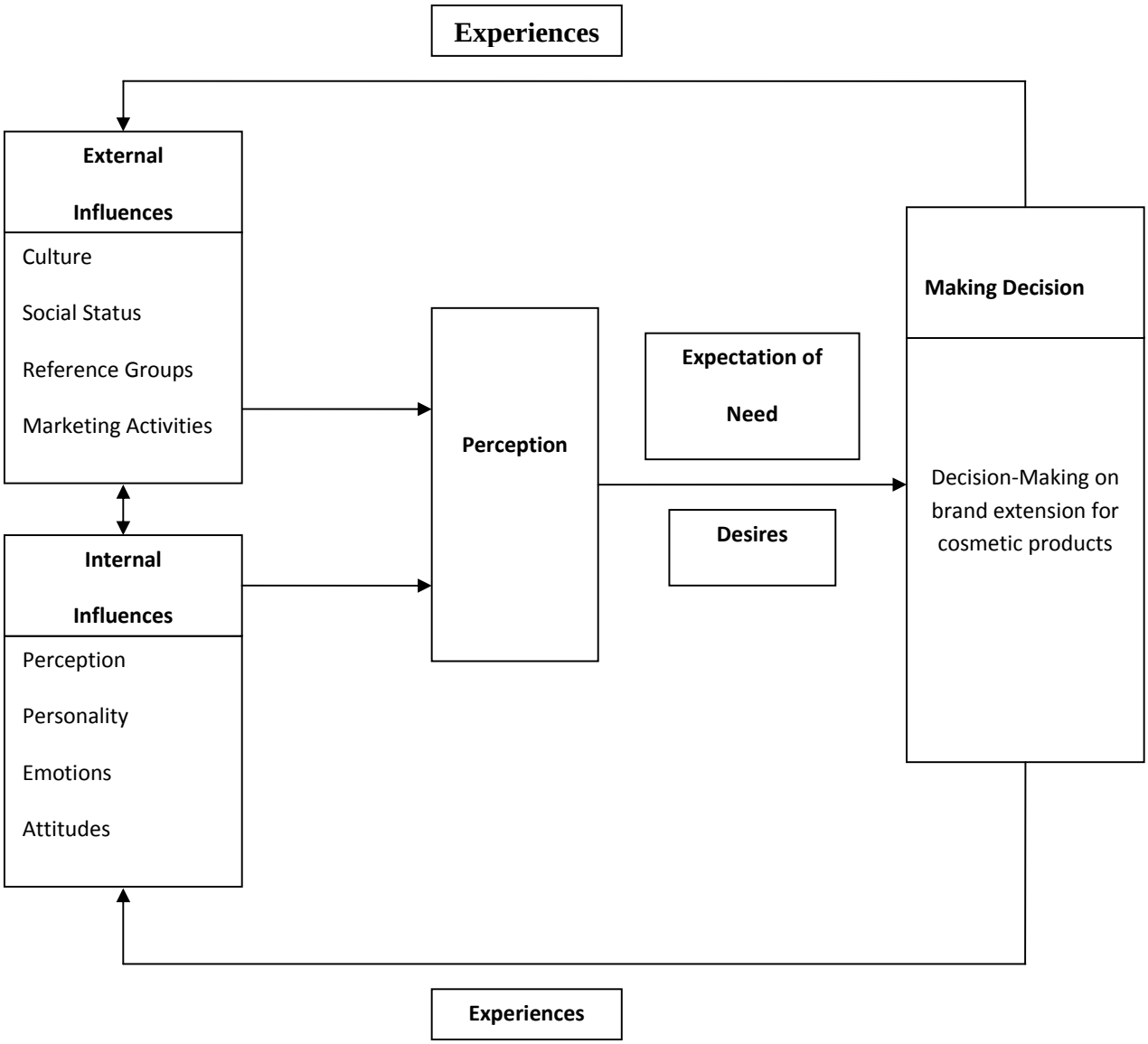
In contrast with Hartley's (1998) opinion, Kapferer (2001) supposes that local or long-standing brands have too little trust in brand extension. He adds that only a few ingredients may be needed to revitalize them and among them, the most essential are courage and enthusiasm, but also a dynamic and exciting product range.

Moreover, Kapferer (2001) believes that there are many bad reasons for extension such as extension is popular, and that is why many brands include this strategy before consuming all the resources for growth of the core product. One might question that every brand is different, and some brands are more flexible than others. We argue that there is no magic formular for brand extension. Some explorative descriptions on the brand extension process will be obtained from our case company in order to lighten the reality with the theories as follows: How does a company know that the extension will "fit" the core brand? Is it necessary that the core value of the extension and its positioning must be identical or very similar to the parent brand? To take a positive attitude, it could be presupposed that brand extension might in contrast create a strong and growing focus on the parent brand. The brand extension, we infer, could appose to new brand development. Perhaps brand extension can also remain interest in the parent brand and may help to make sure that it remains sustainable in the consumer mind.

Perception is a necessary psychological process and is relevant for our study in order to understand how consumers recognition the new products made through brand extension.

"Information processing is a sequence of activities by which stimuli are recognized transformed into information and stored" (Hawkins et al., 2001, p.284). The figure below illustrates an important information-processing model with four main steps or stages: exposure, attention, interpretation and memory. The first three of these constitute perception.

Figure : Expectations through Learning Content Management System



According to Antonides et al. (1998), consumers perceive reality in their own styles Among them, subjective and objective perceptions stand out. Subjective perception is selective. However, this selectivity is necessary nowadays to the overload of information. From the amount of offers on the market, people have to take this decision, which on the other hand can make them miss relevant information (Antonides et al. 1998).

When a new product emarges, the consumers must decide in which category he/she should position it. For this, the consumer is interested in paying attention to the product's characteristics and personalities. Perception is the first step in giving meaning and place to a new product (Antonides et al. 1998).

Taking this into consideration, we will further use the model of Hawkins et al. (2001) to throw some light on what is the nature of perception and how does it work.

Exposure occurs when a stimulus such as a billboard comes within range of a person's sensory receptor nerves - vision, for example. Attention occurs when the receptor nerves pass the sensations on the brain for processing. Interpretation is the assignment of meaning to the received sensations. Memory is the short-term use of the meaning for immediate decision-making or the longer-term retention of the meaning (Hawkins et al. 2001).

The figure above and the discussion suggest a linear flow from exposure to memory. However, these processes occur virtually simultaneously and are clearly interactive. That is, our memory influences the information we are exposed to, attend to and the interpretations we assign. At the same time, memory itself is being shaped by the information it is receiving.

Both perception and memory are extremely selective. Of the massive amounts of information available, an individual can be exposed to only a limited amount. Of the information to which the individual is exposed, only a relatively small percentage is attended to and passed on the central processing part of the brain for interpretations. The meaning assigned to a stimulus is as much or more a function of the individual as it is the stimulus itself. Much of the interpreted information will not be available to active memory when the individual needs to make a purchase decision (Hawkins et al. 2001).

This selectivity sometimes referred to as perceptual defenses, means that individuals are not passive recipients of marketing messages. Rather, consumers largely determine the messages they will encounter and notice as well as the meaning they will assign them. Clearly, the marketing manager faces a challenging task when communicating with consumers.

The figure above and the discussion suggest a linear flow from exposure to memory. However, these processes occur virtually simultaneously and are clearly interactive. That is, our memory influences the information we are exposed to, attend to and the interpretations we assign. At the same time, memory itself is being shaped by the information it is receiving.

After studying the related literature, we can indicate that brand identity represents the public image of a product, line or service. It is the visual link between the company and the consumer. Brand identity covers brand names, logos, positioning, brand associations and brand identity.

Conclusions

The research findings underline a necessary point which is that although consumers are the ones judging the brand and its extensions in terms of expectations, perceptions and attitudes, it still is important for the brand managers to permanently manage the consumer's brand knowledge structures by strengthening the brand, tactic which will not only allow future growth

possibilities but also a shield against failed brand extensions. However, in the present environment, the consumer's brand relationship with the brands is eroding owning to an explosion of offers on the market. Strengthening a brand and permanently looking for methods to achieve growth has never been more demanding in cosmetic products.

We believe that by adopting statistical techniques, marketers can improve and deliver better brand messages more quickly and briefly In this sense, our study can be useful for brand managers and in particular, for Thailand it shows how consumers perceive compared to the expectations of the company with the fact brand extension for cosmetic product with learning content management system.

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RE-DESIGNING AND RE-DEVELOPING E-LEARNING PROGRAMS WITHIN THE UNIVERSITY SYSTEM INCREASING THEIR COMPETENCY LEVEL AND EFFECTIVENESS

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Although e-Learning has become very popular as a didactic tool, there are some problems usually found in the design and development of these programs. Because instructors don't have complete knowledge and background of their subject, they are not able to create e-learning programs that include all the important content making the overall program ineffective. Therefore, it is necessary to increase the competency level of these programs. This research uses CAMT (College of Arts, Media and Technology), CMU (Chiang Mai University) as a case study. Working with real instructors, co-instructors and researchers, different competency levels were developed. The first two levels of competency are identified as the presentation level and the concept map level. The presentation level is the stage where the instructors can convert their power-point presentations into a learning management system (LMS). The concept map allows the instructors to organize their curriculum into different subsections or nodes making it more comprehensible. The results show that the concept map level has a greater importance; this is because the instructors can identify the appropriate knowledge and adjust the content of the e-Learning program in order to make it more efficient.

Keywords
e-Learning, Competency level

DESIGNING AND IMPLEMENTING A BLENDED CONTENT INSTRUMENT FOR BLENDED LEARNING

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The purpose of this research was to design and implement a blended content instrument for a blended learning approach. In this research, the instrument for blended contents was firstly designed in the form of a table. This instrument plays an important role in determining the index of congruence (IOC). Then the developed instrument was implemented for blending the contents of Computer Programming and Algorithm and Computer Programming 1 courses. Finally, the IOC collected from 63 experts, who lecture in Computer Programming courses from 41 campuses of Rajabhat University, was analyzed. As a result, there were 24.36% of the contents that can be blended. Moreover, not only did the developed instrument obtain the IOC of contents, but also it was able to identify the suitable content sequences and presentations.

Keywords
Blended learning, blended contents, index of congruence

THE IMPACT OF CORPORATE LEADERS ATTITUDES ON E-LEARNIG IN SRI LANKA

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This paper will be discussed the corporate leaders attitudes towards the e-Learning applications in Sri Lanka. The sample is drawn from registered listed companies in Colombo stock market. This study also identifies the enabling factors, the bottlenecks and, forecasts the future growth of corporate sector There are positive attitudes among the corporate sector leaders towards the e-Learning but most of them prefer traditional learning because of lack of timing for studies in their business ventures. The Awareness of e-Learning among the corporate sector leaders is very high but investment to develop e-Learning applications in their companies is very poor according to the survey. Most of the companies sponsored their employees traditional learning, training, educational programs than registering e-Learning site. However, there is significant number use Intranet for training purpose among the companies. They conduct real online learning via intranet for new training. There is a trend of using intranet in most of the companies. Further, findings reveal that these companies have also been using e-mail and Internet in addition to training their employees. They have planned to invest number of funds in future in the selected areas of the e- application. The ANOVA result shows that there are significant differences across both forms of corporate sector e-Learning.

THE STUDY OF TELEVISION EXPOSURE BEHAVIORS AND PROGRAM STYLES REQUIRED BY THAI CHILDREN IN BANGKOK METROPOLITAN

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ABSTRACT

This study aimed at studying the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan. The samples were 400 Prathomsuksa 4-6 students from elementary schools under the jurisdiction of the Bangkok Metropolitan Administration by the multi-stage sampling technique. This study used a questionnaire for collecting data. The results about the television exposure behaviors of Thai children in Bangkok Metropolitan revealed that there was the television exposure with the family at 70.8% in the evening on the day that went to school and in the morning on holiday, for the period of 1-2 hours at the highest level. The children ate foods and snacks during television exposure at the highest level. Children consumed television for entertainment at 36.5% and took television contents to be the topic in conversation with other persons. Cartoons program was the first television program that children liked. The results revealed that Thai children in Bangkok Metropolitan required program styles at a middle level ($\bar{X}$ = 2.28). Considering each aspect on 4 items, they preferred drama and movie at the highest level ($\bar{X}$ = 2.68), the highest request for presentation technique were cartoons and animation ($\bar{X}$ = 2.80), the highest role of children on television program were taking in the program and being competitors ($\bar{X}$ = 2.38), the highest request for contents were adventure ($\bar{X}$ = 2.64). Beside, the results revealed that Thai children in Bangkok Metropolitan need morality contents at the lowest level ($\bar{X}$ = 2.20).

Keywords

Television Exposure Behaviors , Television, Program Styles,Thai Children

BACKGROUND AND RATIONALE

Mass media is the result from the human beings who try to communicate and share information as well as experience among themselves . Mass media could be considered as the most influential group because it influences the culture, beliefs, attitude and code of conducts in the society . It could also make people have different behaviors.

Mass media can reach the majority of people at the same time, especially radio and television which are widely distributed and gain popularity from all groups of people in the

society. Due to the fact that mass media is easy to access, exposure to radio and television has become one part of life without realizing, especially “children” who watch television the most.

Behaviors in watching television for children start when they are 2 years old. Children learn to watch television by looking at images and listening to sounds. Young children can watch TV all day long. Elder children can watch after school. Students at Prathom Suksa 5-6 watch TV the most. According to the survey on students at Prathom Suksa 1-6 in Bangkok Metropolitan, students preferred watching TV the most instead of playing sports. On the average, children spend their time in front of TV for 3-4 hours. Television has become one part of the society which is responsible for social development, transfer of knowledge, entertainment, attitude and value. Exposure to TV for a long time can affect children in terms of physical conditions, emotion, intellect as well as positive and negative behaviors .

New television programs have an important role in developing children in terms of physical conditions, intellect, emotion, and behaviors. All effects arise from behaviors in watching TV. Owing to the fact that television is the mass media which children are the most exposed to. Children, especially ones living in Bangkok Metropolitan, spend their time watching television at home instead of going out. The researchers observed the importance of social interaction which has an effect on television exposure behaviors of children and assumed that children’s exposure to television has a link. The researchers wondered what behaviors children had about television exposure. Do children use television as a way to develop social relationship? What program styles do children prefer and require the most. Therefore, the researchers conducted a study of television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan. The results could be used as a way to produce television programs which meet the children’s demand and have good quality to the society.

RESEARCH OBJECTIVES

1) To study the television exposure behaviors of Thai children in Bangkok Metropolitan.
2) To study the program styles required by Thai children in Bangkok Metropolitan.

EXPECTED OUTCOMES

1) The television exposure behaviors of Thai children in Bangkok Metropolitan are understood.
2) The program styles required by Thai children in Bangkok Metropolitan are understood.
3) Ways to produce television programs addressing to children are acquired.

RESEARCH SCOPE

The study of the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan has the following scope:

1) Population and sampling group
The population for this research consisted of 333,722 children aged between 9-12 years old according to population statistics recorded by Department of Provincial Administration ,Ministry of Interior Thailand in December 2007 They were considered as children who could decide and have their own opinions.

The sampling group consisted of 400 Prathom Suksa 4-6 students from schools in Bangkok Metropolitan. Taro Yamane’s formula was used. Error of the sampling group was .05. The group was chosen using multi-stage sampling technique with various steps by divisions, groups of schools and schools in groups.

2) Content
As for program styles required by Thai children in Bangkok Metropolitan, there were 4 aspects to be studied: program type, presentation style, children’s role in television program and program content.

RESEARCH METHODOLOGY

The study of the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan followed this research

procedure.

1) Research tool
Research tool used in this research was questionnaire about the television exposure behaviors and the requirements of program styles in 4 following aspects: program type, presentation, children's role in television program and program content. There were close-ended questions and open-ended questions.

2) Rechearch tool development procedure
Here is research tool development procedure.
2.1) The researchers reviewed the documents, theories, related research works and used them as a way to design questionnaire so that it complied with the research objectives.
2.2)The questionnaire was drafted and reviewed by experts to verify the appropriateness of content and language.
2.3) The questionnaire was reviewed by 5 experts in content validity.
2.4) The questionnaire was revised and piloted with the experiment group of 40 persons, that is to say, 40 students at Wat Prayurawong Thonburi School, Bangkok.
2.5) The validity of the questionnaire was analyzed using Cronbach's alpha and yielded 0.82. The questionnaire was revised and completed to collect the real data.

3) Data collection
The researchers collected the data by distributing the questionnaire to the students and collecting back by ourselves.

4) Data analysis
The researchers checked the completeness and the validity of the questionnaire. Bad questionnaires were picked out. The scores were counted in applied statistical program using descriptive statistics.

RESEARCH RESULTS

The research results from the study of the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan were as follow:
1)Results from the study of the television exposure behaviors

The majority (69%) of the sampling group were exposed to television at home. 14.3% at relatives' home and only 2.8% at public places, stores and department stores.
The majority (70.8%) of the sampling group were exposed to television with family. 23.3% were exposed to television alone and only 6% were exposed to television with friends.
The majority (56.3%) of the sampling group were exposed to television on Saturday. 23% were exposed to television on Sunday and only 1.3 were exposed to television on Thursday.
The period from Monday to Friday which the majority (50%) of the sampling group were exposed to television was the period after school. 45.3% were exposed to television at night. 4% were exposed to television in the morning before school and 0.8% were exposed to television during daytime.

The period from Saturday to Sunday which the majority (48.8%) of the sampling group were exposed to television was the morning. 20.8% were exposed to television at night. 16.8% were exposed to television during daytime and 13.8% were exposed to television in the evening.

The majority (40.8%) of the sampling group were exposed to television for 1-2 hours per time. 28.8% were exposed to television for 3-4 hours per time. 21% were exposed to television for over 4 hours per time and only 9.5% were exposed to television for less than 1 hour per time.

The behavior which the majority (32.2%) of the sampling group did during exposure to television was having meal or snacks. 32.2% talked to other people and only 6.6% watched TV without doing other things. 1.4% did other activities like doing housework and sleeping.
The majority (36.5%) of the sampling group were exposed to television for entertainment. 36.5% were exposed to television because there was nothing to do and they were lonely or bored. 2.5% were exposed to television because other people recommended. 0.8% accounted for other reasons: It was a favorite program; They watched TV with parents; TV was already on; They did not want to go out.

The behavior which the majority (28%) of the sampling group did after exposure to television was talking about the program. 27.5% talked about the program with friends at school and 9.4% used and imitated the speech of the characters.
The majority (36.3%) of the sampling group preferred cartoon programs. 25.8% liked drama and 24.3% liked game show program.

2)Results from the study of the program styles
From Monday to Friday the majority (48.8%) of the sampling group required exposure to television in the evening. 40.3% required exposure to television at night and 2.3% required exposure to television during daytime.
From Saturday to Sunday the majority (48.5%) of the sampling group required exposure to television in the morning. 25% required exposure to television at night and 10.5% required exposure to television in the evening.
The majority (66%) of the sampling group required exposure to television program which runs for over 1 hour. 11.5% required exposure to television program which runs for 46-60 minutes and 1.8% required exposure to television program which runs less than 15 minutes.
The requirement of program types was at middle level ($\overline{X}$ = 2.30). When each program type was considered, it was found that the sampling group would like to watch drama and movie the most ($\overline{X}$ = 2.68). The other types they would like to watch were entertainment program ($\overline{X}$ = 2.65) and news ($\overline{X}$ = 2.00) at middle level.
The requirement of presentation was at high level ($\overline{X}$ = 2.34). When each aspect was considered, it was found that the sampling group like programs with presentation in form of cartoon and animation the most ($\overline{X}$ = 2.80). They like programs with presentation in form of musical ($\overline{X}$ = 2.50) and in form of narration by one person ($\overline{X}$ = 1.93) at middle level.
The requirement of children's role in television program was at middle level ($\overline{X}$ = 2.08). When each aspect was considered, it was found that the request for children as participators/ competitors was at high level ($\overline{X}$ = 2.38). The request for children as main actors/ actress was at high level ($\overline{X}$ = 2.37) and the request for children as audience from home was at low level ($\overline{X}$ = 1.55).
The requirement of program content was at high level ($\overline{X}$ = 2.41). When each aspect was considered, it was found that the sampling group requested for travel/ adventure the most ($\overline{X}$ = 2.64) or at high level. The request for daily application was at high level ($\overline{X}$ = 2.56) and the request for ethics and morals was at middle level ($\overline{X}$ = 2.20).
In overall, the sampling group required the program styles at middle level ($\overline{X}$ = 2.28). When each aspect was considered, it was found that the sampling group requested for program content the most ($\overline{X}$ = 2.41). The lower item was the request for presentation ($\overline{X}$ = 2.34) at high level. They requested for children's role in television program the least ($\overline{X}$ = 2.08) at middle level.

RESEARCH DISCUSSIONS

The study of the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan could be discussed as follows:

Thai children in Bangkok Metropolitan had television exposure behaviors to satisfy themselves. This research result revealed that they were exposed to television for entertainment and pleasure and to avoid boredom as well as they did not have anything to do at home. This complies with Selden in that people always entertain themselves to escape from problems and chaos in daily life. Seeking pleasure is the basic need of human being. This also complies with Merrill and Lowenstein who summarize the basic reason of exposure to television as follows: every child or adult does not like to be alone without interaction with other people. The best way is to live with media of communication. Some people prefer mass media to real person because mass media can take away loneliness but does not put pressure on them.

Thai children in Bangkok Metropolitan were exposed to television to make social interaction. They often talked about the programs they watched on the television with family and school friends. This was the most frequent behavior after exposure to television.

Ennis (as cited by Sittirat Noisa-nga) describes children' social uses of media in structural level as a way to create friendship and activities or conversation. In relational level media exchange can create topic and opinion. Schram, Lyle and Parker states that children like watching program because they could learn a lot from TV. One research result revealed that the minority were exposed to television because others recommend.

Thai children in Bangkok Metropolitan preferred drama and movie the most because drama could present surreal events like miracle and other special effects, making children curious and eager to watch more and more. Moreover, they requested for television programs for children because such programs could provide them with the issues they were facing. Walairat Poonwasin studied the favorite programs for Thai rural children and found that they like programs for children and drama. This showed that Thai children in Bangkok Metropolitan and Thai children in rural areas had the same preference.

Presentation which was required the most was cartoon and animation because animation was beautiful and colorful, interesting and imaginative. Moreover, presentation which allows children to express themselves and move is very important. National Health Foundation states that the television programs suitable for children aged between 10-12 years old are fairytales, cartoons, drama and expression.

In general, children like to show their talents. The research result revealed that Thai children in Bangkok Metropolitan like to participate in the program or become competitors because they can show their talents and want to be seen on TV like other children. Anderson and Levin (as cited by Puri Hiranpruek explain that children like television programs which have children of their age because it seems they belong to those programs.

As for program content, it was found that Thai children in Bangkok Metropolitan liked programs about travel and adventure the most. This is because children like challenges and new places. This is in accord with the report on the development of children aged between 10-12 years old done by National Health Foundation [12] which states that children around this age like to go beyond their imagination and like to observe the surroundings in order to learn to become teenagers and adults. The research results in this study revealed that Thai children in Bangkok Metropolitan liked the content about ethics and morals the least because this content was already learnt at school and they always did and did well.

SUGGESTIONS

Here are suggestions for the study of the television exposure behaviors and program styles required by Thai children in Bangkok Metropolitan:

1) Suggestions from research results

1.1) As for the study of the television exposure behaviors, it was found that most Thai children in Bangkok Metropolitan were exposed to television with family, especially on holiday. This indicates that children are close to their parents while watching various behaviors and activities on TV. Therefore, the parents should give advice on appropriate and inappropriate behaviors in Thai society.

1.2) As for the study of the program styles required by Thai children in Bangkok Metropolitan in 4 aspects: program type, presentation, children's role in television program and program content, it was found that children requested for program content the most. The content they liked the most is about travel and adventure. They liked the content about ethics and morals the least. Therefore, television program producers should indirectly add such content in their program. They can present in the form of travel and let children be the main actor in the story or in the form of cartoons to realize the importance of being a good person.

2) Suggestions for futher study

2.1) A comparison of the television exposure behaviors and program styles required by Thai children in the capital and in other provinces or rural areas should be conducted.

2.2) A study of factors affecting Thai

teenagers' decision of exposure to and participation with television programs about singing contest reality show should be conducted.

2.3) A comparative study between the technology exposure behaviors of Thai teenagers and the television exposure behaviors or exposure behaviors about other media should be conducted.

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THE STUDY OF INTERNET EXPOSURE BEHAVIOR, PROBLEMS AND SOCIAL EFFECT OF TEENAGERS: A CASE STUDY OF SURATTANI VOCATIONAL COLLEGE

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ABSTRACT

This research aimed to study internet exposure behavior, problems and social effect of teenagers: a case study of Surattani Vocational College at high vocational College level. The researcher had collected data by questionnaire for 400 sampling. The data were analyzed by frequency, percentage, mean and standard deviation values. The result in general condition found that most of students were female, aged between 19-20 years old, who had revenue less than 4,000 baht per month. Their families had revenue about 10,001-20,000 baht per month. The parent's education was primary school level. Their houses were detached houses and they were living with family. The internet exposure behavior were as follows: duration of using internet was about 1-3 hours, more than 3 years in internet experience, frequency of using internet in a week was less than 3 times, internet service place was the most favorite place to use internet, they mostly used internet for searching data and transferring data or program, did not get advice from parents. The problems were at low level ($\bar{X}$ = 2.48) such as the problem condition in behavior of using internet ($\bar{X}$ = 2.63), the problem condition in behavior of expressing opinion ($\bar{X}$ = 2.62), and the problem condition in behavior of study ($\bar{X}$ = 2.19). The social effect was at a low level ($\bar{X}$ = 2.11) such as the social effect in relationship ($\bar{X}$ = 2.09), the social effect in behavior ($\bar{X}$ = 2.25) and the social effect in study ($\bar{X}$ = 2.01) respectively

Keywords

Internet Exposure Behavior, Problems, Social Effect, Vocational College

1) BACKGROUND AND RATIONALE

Globalization is caused by advances in sciences and technology, especially Information Technology or IT which is the main factor to make the world without frontiers, resulting in new regulations of economics, society and politics among the nations. There are opportunities and threats to the quality of life of the world's population in many aspects. Thailand has encountered the effects of the globalization since the First National Economic and Societal Development Policy in B.E. 2504 until now because the approach was initiated in the Western world, that is to say, Modernization .

Teenagers in their late years have undergone many changes from their childhood, in terms of physical body, emotion, society and intellect.

All of the mentioned aspects are important, including changes related to their sex. This leads to their interest in themselves and looking for new experiences along with sexual impulse. Their curiosity often leads them to imitate the behaviors of their idols and go out at night, ending up with being addicted to drugs and cigarette .At present, the teenagers can access the information without limitations. Media production is easier than the past, making distribution from one part of the world to the other faster. That is the reason why sexual expression behavior from the West influences the Thai society .

There are numerous research works related to internet at the present time. However, most of them focused on the status, the problems and the requirements about using the internet in educational institutions or about using the internet in classroom. Due to the fact that internet is still new technology, the researchers recognized the importance of teenager's problems arisen by materialism. The researchers would like to study the exposure behaviors, the problems and the social effect of teenagers: a case study of Surattani Vocational College at high vocational college level. There were 2,643 students studying at Surattani Vocational College: 1,864 persons at high vocational college level and 779 at vocational college level. The data could be used as a background for the development of understanding and having a good attitude, resulting in students of high quality to society and good internet users.

2) RESEARCH OBJECTIVES

1. To study the internet exposure behaviors of teenagers or students at Surattani Vocational College.
2. To study the social problems of teenagers: a case study of Surattani Vocational College.
3. To study the social effect of teenagers: a case study of Surattani Vocational College.

3) EXRECTED OUTCOMES

1. The data concerning the internet exposure behaviors of Surattani Vocational College students were acquired.
2. The data concerning the problems of teenagers of Surattani Vocational College students were acquired.
3. The data concerning the social effect of teenagers of Surattani Vocational College students were acquired.
4. The data could be used as a background for the development of the internet exposure behaviors of Surattani Vocational College students.

4) RESEARCH SCOPE

This research was aimed to study "the internet exposure behaviors, problems and social effect of teenagers: a case study of Surattani Vocational College".

5)POPULATION AND SAMPLING GROUP

Population in this research was composed of Surattani Vocational College students aged between 17 to 21 years old at high vocational college level and at vocational college level. There were 2,643 persons. They mostly surfed the internet in Internet café as well as in computer laboratories.

The sampling group in this research was chosen by calculating the sample size and the error
of the group at 5 per cent or at the significance level of 0.5 There were 400 persons.

6) RESEARCH METHODOLOGY

6.1. Research tool

In this research, the researchers used questionnaire about the internet exposure behaviors, problems and social effect of teenagers: a case study of Surattani Vocational College.

6.2.Tool development procedure

6.2.1. The documents, textbooks and articles on such related fields as behavioral study, problem and social effect of teenagers in Thailand as well as opinion about internet were reviewed.

6.2.2. The objectives of the questionnaire were defined in order to collect the data in the research on the study of internet

exposure behaviors, problems and social effect of teenagers: a case study of Surattani Vocational College.

6.2.3. The questionnaire was designed to comply with the topics in the research scope.

6.2.4 .The questionnaire which was approved by the advisors was reviewed by 5 experts in terms of content validity and accuracy.

6.2.5.The reliability of the questionnaire was calculated after the revision by advisors and experts. The questionnaire was tested with 30 Tapee High Vocational College students. After using Cronbach's Alpha, the reliability of the questionnaire was 0.90

7) DATA COLLECTION

The researchers distributed 779 copies of the questionnaire to the selected students. 400 copies were sent back, in other words, 51.35 per cent.

8) RESEARCH RESULTS

1. The internet exposure behaviors of students at Surattani High Vocational College were as follows: 70.5% spent on the average 1-3 hours per time, 19.3% spent less than 1 hour per time and 7.3% spent 3-5 hours per time.
2. The experience of internet exposure behaviors of students at Surattani High Vocational College was as follows:41.3% had 3-5 years of experience surfing the internet,25.8% had 1-3 years of experience and 27.5% had over 5 years of experience.
3. The frequency of internet exposure behaviors of students at Surattani High Vocational College was as follows: 44.5% spent less than 3 times per day, 37.3% spent 3-4 times per day and 12.3% spent 5-7 times per day.
4. The places where students at Surattani High Vocational College frequented were as follows: 52.8% went to Internet café, 35.5% went to educational institution and 11.3% surfed at home.
5. According to the usage, 26.5% of students at Surattani High Vocational College used internet for searching for data and transferring data or program. 22.5% used internet for online games and 22.0% used internet for chatting.
6. As for advice and guidance from the parents, 45.8% did not get advice from their parents. 42.5% rarely got advice and 9.3% often got advice.
7. Problem conditions in society in terms of internet exposure behaviors were at low level ($\bar{X}$ = 2.48). When each item was considered, the most critical problems were behavior of using internet ($\bar{X}$ = 2.63), behavior of expressing opinion ($\bar{X}$ = 2.6) and behavior of study ($\bar{X}$ = 2.19), respectively.
8. Social effects in society were at low level ($\bar{X}$ = 2.11). When each item was considered, the most critical effects were social effect in behavior ($\bar{X}$ = 2.25), social effect in relationship ($\bar{X}$ = 2.09) and social effect in study ($\bar{X}$ = 2.01), respectively.

9) DISCUSSIONS

According to the study of the internet exposure behaviors, problems and social effect of teenagers: a case study of Surattani Vocational College", the results could be discussed as follows:

The behaviors in using internet were at moderate level. Some spent more than 1 hour per time. This complies with the research work done by Chatirot Karawake, Saowaporn Muangkaew, Waraporn Tarawanich and Kobkul Sappakitchamnong which studied the behaviors and objectives of using internet of government university students in Bangkok Metropolitan. The sampling group from 6 government universities (420 persons in total) was surveyed and yielded the following results: Most of them had surfed the internet for 1-2 years and over 5 times per week. Each time took over 4 hours. They surfed between 6pm – 12 pm.

As for problem conditions in society, the behavior of expressing opinion was at moderate level. It was found that the sampling group had difficulties communicating in English. This complies with the research work done by Somlek Leelapratak which studied the conditions of graduate students at Ramkhamhaeng University in 3 dimensions:

students themselves, service, and peripherals. The research also explored the comparison of internet usage by students from different faculties and relationship between computer background and English background. It was found that Law students and Education students showed different difficulties using the internet at the significance level of 0.05. Students at other faculties did not show any significant differences. English knowledge was not related to internet usage at the significance level of 0.05. This could be concluded that the difficulties were directly caused by the factors "computer background" and "English knowledge" but from the interaction between the two factors.

As for social effect on study, it was at low level. It was found that most students opened educational pages as their first page. This was in accord with the research work by Casey in that information highway of teachers and students on the network designed by California State University could lead to students more eager to search for information and they often surf internet at home.

Social effect on relationship was at low level. There was evidence that students made friends with others on the internet. This complies with the research by Zimbardo, Ebbesen and Maslach in that attitude of each person depends on their knowledge. If they have good attitude towards something, they usually express good behaviors. Therefore, knowledge, attitude and behaviors are related to one another.

Social effect on behaviors was at low level. There was evidence that the students surfed internet for longer time than expected. This was in accord with the research by Amphaisi Soprathum which studied the behaviors about being exposed to information and factors affecting acceptance of computer communication through internet with computer users in Bangkok. It was found that study was related to work improvement. Ownership was related to frequency of using. The features of internet were related to the frequency. The necessity was related to communication in business nowadays.

10) SUGGESTIONS

1. Suggestions from the results

1) According to the research results, students at Surattani High Vocational College never got advice from parents about their internet exposure behaviors. We, therefore, suggest parents take care of their children surfing the internet, especially new influences. At present, the information from the internet is very influential in changing teenagers' behaviors. Therefore, the first thing the parents should do is to adapt themselves to be able to give guidance and advice on using internet the right way.

2) According to the research results, problem conditions in behaviors of using internet were critical when students spent over 1 hours surfing internet per time. Therefore, using internet the right way is very important. In other words, students should surf the internet for the real purpose and should divide their time to receive the most effective results in learning, searching for data, planning, communicating as well as entertaining.

3) According to the research results, it was found that social effects on society in terms of relationship were the most critical. The less critical effects were that students surfed the internet for longer time than expected and that they thought internet could bring success to them as it did to other people they noticed. Therefore, surfing the internet should not take longer time because it might lead to effects on health, body and mind, including responsibilities and time management. If students have good time management, they could manage to do other activities to develop themselves in other creative manners.

2. Suggestions for further study

1) A study of knowledge, attitude and behavior in using information technology and exposure to information media in Tapee Vocational College should be conducted.
2) A study of behaviors and objectives of internet usage of students at Surattani Vocational College should be conducted.
3) A study of requirements and problems of

internet usage in instruction in institutions at high education level should be conducted.

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The Development of Computer Multimedia Edutainment Instructional Package Entitled "Introduction to Statistics"

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ABSTRACT

The purposes of the research were to develop a computer multimedia edutainment instructional package entitled "Introduction to Statistics", to find out the efficiency of the package, the learning achievement, and learners' satisfaction towards the package. The research tools were as follows: 1) the computer multimedia edutainment instructional package entitled "Introduction to Statistics", 2) quality evaluation form, 3) achievement tests on the learning achievement, and 4) questionnaire on learners' satisfaction. The research sampling group consisted of 40 bachelor's degree students, in the field of Information Technology, Faculty of Information Technology, King Mongkut's University of Technology Thonburi. The results revealed that the efficiency of the computer multimedia edutainment instructional package was at 82.30 /82.33, which was higher than the criteria of 80/80. As for the effectiveness evaluated by experts in content towards the computer multimedia edutainment instructional package, it was 4.19 on the average, or at a good level, in other words. The effectiveness evaluated by experts in multimedia was 4.16 on the average, or at a good level. When the pre-test and post-test scores were analyzed to find out the learning achievement, it was found that the post-test scores were obviously higher than the pre-test scores at a significant level of 0.01. The satisfaction of learners towards the computer multimedia edutainment instructional package was 3.99 on the average, or at a good level.

Keywords: Computer Multimedia Instructional Package/Edutainment/Introduction to Statistics

BACKGROUND AND RATIONALE

Education in every field needs to apply statistics because statistics is related to effective decision and quality improvement. All of this is based on the correctness of the data in order to analyze and find out solutions to make summary. At present, statistics is still taught in form of lecture in that instructors give and explain the contents or the stories to listeners [1] which might take long or short time. The instructors are the main person who has roles in class. The learners come to receive the contents prepared by the lecturers. This approach is called one-way communication. Moreover, the learners practice and do exercises in books or learning materials prepared by the lecturers only. In order to gain the most effective instruction, each learner must pay attention and receive as well as review all learning materials with all contents.

However, it was found that in statistics classroom, many learners cannot gain full knowledge because the learners have little attention and little endurance to listen for a long time. Basic statistics is known to be a complicated subject. Learners do not want to learn, know and many learners fail, thus. Suchat Prasitrattasin [2] says that many instructors do not use daily situations which are related to numbers in their classroom and their instruction. Many instructors try to force their

learners to remember many formulae and symbols. Therefore, the learners get confused with all the formulae and symbols and many of them are not in the mood for better comprehension. Statistical techniques are mainly taught so that all learners learn by heart instead of being able to apply in real life. This might be due the fact that such instruction method is easy to measure the learning achievement of learners. Unfortunately, many learners neither understand statistics nor know how to apply their knowledge in higher research or instruction.

Priroj Teeranatanakul [3] says that computer can be used to increase the effectiveness of the instruction and help learners learn and develop themselves. Computer multimedia instructional package can be used along with the lesson the instructors teach. In some cases, computer multimedia instructional package can substitute the instructors in that it presents the lessons and the contents instead of the instructors. The learners learn the contents and the lessons with still images, animation, narration, music, sound effect. Learners can do pre-test and post-test and practice skills through computer. They can learn anywhere and anytime. Therefore, computer multimedia instructional package can help all learners learn and develop themselves and help them evaluate, review as well as practice. Basic statistics is a difficult subject, resulting in poor attention from students. The learners also get bored and bad attitude towards basic statistics. Therefore, appropriate learning material will help learners learn and understand the contents more easily. Self-study is also important thing. Since computer multimedia instructional package is intended for individual use, the development is designed in the way that the learners can learn by themselves according to their knowledge and ability without boredom. The most important thing is that the learners should complete all learning objectives. The development of computer multimedia instructional package must be flexible so that each learner can learn with their own pace-fast or slow-according to their ability. This way, all learners can achieve all learning objectives. The researchers, therefore, decided to develop computer multimedia edutainment instructional package entitled “Introduction to Statistics”. This computer multimedia edutainment instructional package contains both contents and entertainment along with images, animations and sounds. Cartoon animation contains both narration and music. Learners can think, absorb and learn without boredom. This way, learners will understand basic statistics better, resulting in learners’ learning effectiveness and their application in higher education.

RESEARCH OBJECTIVE

1. To develop computer multimedia edutainment instructional package entitled “Introduction to Statistics”
2. To find out the efficiency of the developed computer multimedia edutainment instructional package entitled “Introduction to Statistics”
3. To find out the learning achievement of the developed computer multimedia edutainment instructional package entitled “Introduction to Statistics”

To find out learners’ satisfaction towards the developed computer multimedia
edutainment instructional package entitled “Introduction to Statistics”

RESEARCH HYPOTHESES

1. The efficiency of the computer multimedia edutainment instructional package entitled “Introduction to Statistics” meets the specified criteria of 80/80.
2. After studying the computer multimedia edutainment instructional package entitled “Introduction to Statistics”, the learners show more learning achievement with statistically significant level at the 0.01 level.
3. After studying the computer multimedia edutainment instructional package entitled “Introduction to Statistics”, the learners show high satisfaction towards the developed package.

EXPECTED OUTCOMES

1. The computer multimedia edutainment instructional package entitled “Introduction to Statistics” was efficient enough after it was tested in terms of efficiency and learning

achievement. This package can be used as remedial for learners who attend "Introduction to Statistics" class.

2. Learners could self-study. All learners know their responsibilities because they could review the lessons anytime when they are ready.

3. Entertainment is gained along with the contents of the efficient computer multimedia edutainment instructional package entitled "Introduction to Statistics".

4. There will be another approach for instructors and programmers in developing computer multimedia edutainment instructional package for other subjects or related fields.

RESEARCH SCOPE

The development of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" contained 3 contents as follows: 1) Descriptive statistics, 2) Inferential statistics, and 3) Statistics test.

POPULATION AND SAMPLING GROUP

The population for this study consisted of 60 first year students from the Department of Information Technology, Faculty of Information Technology, King Mongkut's University of Technology Thonburi who attended "Introduction to Statistics" course.

The sampling group for this study was chosen by purposive sampling technique. There were 40 first year students from the Department of Information Technology, Faculty of Information Technology, King Mongkut's University of Technology Thonburi who attended "Introduction to Statistics" course in order to find out the efficiency, the learning achievement of the developed computer multimedia edutainment instructional package entitled "Introduction to Statistics" and learners' satisfaction towards the developed package.

RESEARCH METHODOLOGY

The development of the computer multimedia edutainment instructional package entitled "Introduction to Statistics was done using the following research methodology.

RESEARCH TOOLS

The research tools used to develop the computer multimedia edutainment instructional package entitled "Introduction to Statistics" consisted of 1) the computer multimedia edutainment instructional package entitled "Introduction to Statistics", 2) efficiency and learning achievement test, 3) quality evaluation form for the contents and multimedia of the lessons, and 4) questionnaire on learners' satisfaction towards to the computer multimedia edutainment instructional package entitled "Introduction to Statistics"

The development of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" follows the approach in developing computer instruction packaged called IMMCIP (Interactive Multimedia Computer Instruction Package) developed by Priroj Teeranatanakul and Paiboon Kiattikomol. There are 5 major steps which can be divided into 16 sub-steps as follows:

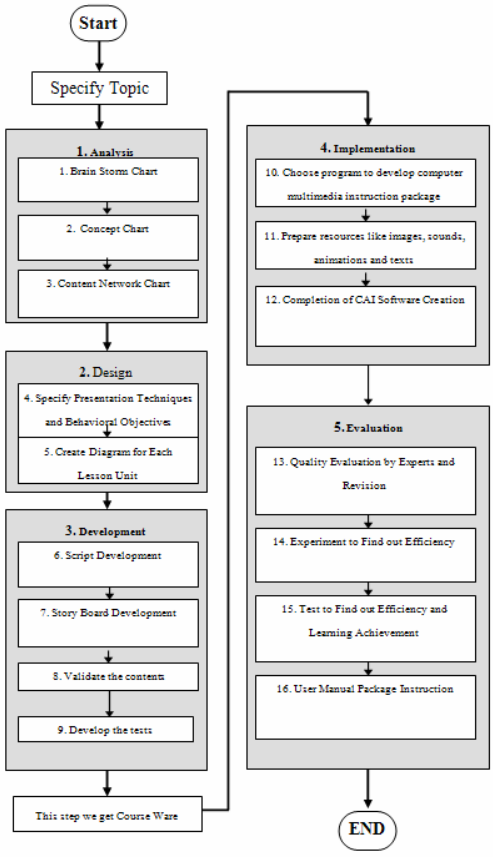

Figure 1: Diagram showing the steps in developing computer multimedia instruction package

Test for Find out the Efficiency and Learning Achievement of the Package and Learners' Satisfaction towards the Package

The researchers did the test to find out the efficiency and learning achievement of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" and learners' satisfaction towards the package in the second semester of the academic year 2007. The test was done with the sampling group of 40 first year bachelor's degree students from the Department of Information Technology, Faculty of Information Technology, King Mongkut's University of Technology Thonburi. Here are the details:

(1) The document was sent to the lecturers to allow the test with the sampling group. The document described the details and the objectives along with other information about the experiment.

(2)The computer multimedia edutainment instructional package entitled "Introduction to Statistics" was tested with the sampling group. The researchers explained how to use the program with the sampling group. The sampling group did pre-test and learned the computer multimedia edutainment instructional package entitled "Introduction to Statistics" lesson by lesson, and then they did exercises for all 3 lesson units.

(3) After completing all lesson units, the sampling group did post-test and the researchers asked them to fill out the questionnaire on their satisfaction towards the computer multimedia edutainment instructional package entitled "Introduction to Statistics" and reported the analysis based on statistical data.

RESEARCH RESULTS

(1) This research was aimed to develop a computer multimedia edutainment instructional package entitled "Introduction to Statistics", to find out the efficiency of the package, the learning achievement, and learners' satisfaction towards the package. The researchers did research according to the following procedure.

(2) The computer multimedia edutainment instructional package entitled "Introduction to Statistics" was developed with efficiency. The quality of the lesson contents and the multimedia which was evaluated by the experts yielded the average scores of 4.19 and 4.16, respectively. That is to say, the instructional package was efficient enough to be used in real "Introduction to Statistics" course. The data were presented in Tables 1-2.

Table1

Summary of Quality Evaluation from Experts in Contents

Items to be Evaluated	$\bar{X}$	S.D.	Quality Level
1. Contents	4.13	0.58	Good
2. Graphics and Sounds	4.17	0.68	Good
3. Exercises	4.28	0.58	Good
Average	4.19	0.61	Good

Table 2

Summary of Quality Evaluation from Experts in Multimedia

Items to be Evaluated	$\bar{X}$	S.D.	Quality Level
1. Texts and Colors	4.00	0.23	Good
2. Still Images	4.20	0.35	Good
3. Sounds	4.20	0.46	Good
4. Interactions	3.93	0.35	Good
5. Other Features such as Display Design, Response with Contents and Learning Result Report	4.47	0.66	Good
Average	4.16	0.41	Good

(3) The efficiency of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" in terms of E1/ E2 was 82.30 /82.33, which was higher than the criteria of 80/80 as shown in Tables 3-4.

Table 3

Scores while learning and the efficiency of the instructional package per lesson unit.

Lesson Unit	Scores while Learning	The efficiency of the lesson while using the

		instructional package (E1)
1	337	84.30
2	321	80.30
3	329	82.30
E1		82.30

Table 4

package entitled "Introduction to Statistics" Scores after using the instructionalpackage to find out the efficiency of the computer multimedia edutainment instructional

Item	Number of Learners	Total Scores	Raw Scores from All	Efficiency
The efficiency of the instructional package after learning (E2)	40	30	988	82.33

(4) The learning achievement of the learners after using the computer multimedia edutainment instructional package entitled "Introduction to Statistics" revealed that the learners showed higher average scores of the post-test when compared to average scores of pre-test at significant level of 0.01. The efficiency of the instructional package after learning was compared with the efficiency of the instructional package while learning and showed the difference of 62.17. That means the computer multimedia edutainment instructional package entitled "Introduction to Statistics" could increase the learning achievement by 62.17 as shown in Tables 5-6.

Table 5

The learning achievement of the learners who used the computer multimedia edutainment instructional package entitled "Introduction to Statistics"

Tests and Results	n	$\bar{X}$	S.D.	t
Pre-test	30	6.05	1.50	40.36**
Post-test	30	24.70	2.57	

Table 6

The increase in learning achievement of the learners who used the computer multimedia edutainment instructional package entitled "Introduction to Statistics"

Results from	Raw Scores from All	S.D.	Efficiency	Achievement
Pre-test (Epre)	242	1.50	20.17	62.17
Post-test (Epost)	988	2.57	2.33	

(5) The learners' satisfaction towards the computer multimedia edutainment instructional package entitled "Introduction to Statistics" was 3.99 on the average. This means the learners showed high satisfaction towards the developed instructional package as shown in Table 7.

Table 7

Summary of learners' satisfaction towards the computer multimedia edutainment instructional package entitled "Introduction to Statistics"

Items to be Evaluated	$\bar{X}$	S.D.	Satisfaction Level
1. The overall program	3.98	0.51	High
2. Texts	4.00	0.64	High
3. Sound Effects and Narration Voices	3.93	0.65	High
4. Images for Content Clarity	3.89	0.61	High
5. Content Presentation	4.03	0.62	High
6. Interactions	4.01	0.57	High
7. Edutainment and Consolidation	4.13	0.70	High
Average	3.99	0.61	High

RESEARCH DISCUSSIONS

This research was aimed to develop the computer multimedia edutainment instructional package entitled "Introduction to Statistics". It was found that the efficiency, the learning achievement of the learners and their satisfaction towards the developed instructional package complied with the hypotheses.

The research results revealed that the quality evaluation of the lessons from experts in contents and experts in multimedia technique and production met the specified criteria, in other words, the content quality and the multimedia quality were on the average 4.19 and 4.16, respectively. That was a good quality. The efficiency of the lessons was 82.30/82.33 and met the criteria and the hypotheses set at 80/80. The efficiency of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" during instruction (Epre) was 20.17 and the efficiency after instruction (Epost)

was 82.33. The difference was 62.17. Therefore, the learners could gain higher learning achievement with the statistically significant difference at the 0.01 level.

As for the presentation of the computer multimedia edutainment instructional package entitled "Introduction to Statistics", the package contained both lessons and entertainment. They were animated images, cartoon animations with narration and sounds. All contents were split into parts so that learners did not get bored before finishing the lesson. The developed computer multimedia edutainment instructional package entitled "Introduction to Statistics" could increase the learning achievement of the learners. This result from using computer multimedia edutainment complies with the research done by Udomlak Anant [9] who developed online edutainment lessons using animation entitled "Measurement and Evaluation in Education" with 30 students at King Mongkut's University of Technology Thonburi. The efficiency of such online edutainment lessons was 87.58/86.41, higher than the criteria of 85/85. It was found that the post-test scores were higher than the pre-test ones with statistically significant difference at the 0.01 level. Due to the fact that entertainment could arouse learners' attention, the contents could be absorbed faster, resulting in pleasure in learning. Learners could also remember more contents from edutainment lessons. The learners' satisfaction towards the developed computer multimedia edutainment instructional package entitled "Introduction to Statistics" was 3.99 on the average. They showed high satisfaction. When each item was considered, it was found that most learners were satisfied with the edutainment and consolidation the most. This item yielded 4.13 on the average. This might be because the researchers made use of cartoon animation with narration to present the contents along with animated graphics. Moreover, there were sound effects and music before and after each lesson units, resulting in learners' pleasure.

It could be concluded that the computer multimedia edutainment instructional package entitled "Introduction to Statistics" yielded efficiency and high satisfaction and helped increase the learning achievement of the learners.

SUGGESTIONS

(1)Suggestions from Research Results

(1.1). The computer multimedia edutainment instructional package entitled "Introduction to Statistics" yielded efficiency for "Introduction to Statistics" course. This might be applied to other courses.

(1.2) The research results revealed that the efficiency of the computer multimedia edutainment instructional package entitled "Introduction to Statistics" met the specified criteria due to the fact that the edutainment contained not only contents but also entertainment such as animated images, cartoon animation with narration voices, sound effects. Moreover, the contents were divided into smaller units so that the learners did not get bored before finishing each lesson. The learners showed higher learning achievement. This approach could be used in studying and developing other instructional package for other subjects.

(1.3)The research results revealed that there was interaction between learners and lessons. Learners could respond to the program in form of exercises and practices. Learners could choose what unit to learn first and least because the lessons could show feedback data. This way, the learners were interested and understood the lessons better. This approach could be used in studying and developing computer multimedia lessons for other subjects.

(1.4) The research results revealed that the computer multimedia edutainment instructional package entitled "Introduction to Statistics" could help the learners learn by themselves. The learners knew their own responsibility because they could spend their free time learning the course anywhere and anytime according to their preferred period. Moreover, they could gain pleasure along with the details of the contents from computer multimedia edutainment instructional package entitled "Introduction to Statistics". This approach could be used in studying and developing computer multimedia instructional package for other subjects.

(2) Suggestions for Further Study

(2.1) In the next development of the computer multimedia edutainment instructional package, the contents should be developed in such a way that it could interact with games so that the learners could remember and understand the contents better through more interactions and participations. The "Introduction to Statistics" course is still the major course.

(2.2) There should be a comparative study of learning tools to determine which learning tool is appropriate for the "Introduction to Statistics" course, resulting in learners having higher learning achievement and high satisfaction towards the instructional package. The results could be used in developing other computer multimedia instructional package in the future.

(2.3) There should be a comparative study of the learning achievement from students who use the computer multimedia edutainment instructional package entitled "Introduction to Statistics" and the learning achievement from students who attend the traditional class.

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THE DEVELOPMENT OF COMPUTER MULTIMEDIA TRAINING WITH THE DEMONSTRATION PROCESS AND THE FOLLOWING PRACTICE ENTITLED "THE CREATION OF PUBLIC RELATIONS WEBSITE": A CASE STUDY OF KHLUNG SUMPHUN CLUSTERING SCHOOLS

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ABSTRACT

This research aimed to develop, to determine the effectiveness of computer multimedia and to find out the satisfaction of training in the development of computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website" : A Case study of Khlung Sumphun Clustering Schools. Instruments used in research were 1) computer multimedia training with demonstration process and the following practice entitled "the Creation of Public Relations Website", 2) computer multimedia quality evaluation form, 3) training achievement form, 4) artifact of and satisfaction evaluation form. Sampling group were 50 teachers in Khlung Sumphun Clustering Schools. The result of this research showed that, the quality of content was good which the average was 4.14, the standard deviation was 0.43 and the developed of multimedia was excellent which the average was 4.58, the standard deviation was 0.40 , the effectiveness of the developed computer multimedia was at 88.22/87.47, which was higher than standard point of 85/85. When the pre-test and post-test scores were analyzed to find out the achievement, it was found that the effectiveness before the treatment was at 21.98 and the effectiveness after the treatment was at 43.70. It could be concluded that the achievement of the developed computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website" after treatment was higher than before treatment which the significant value is .050. The average satisfaction of sampling group was 4.11 which was high satisfaction.

Keyword

Computer Multimedia Training ,Demonstration Process and Following Practice,
Public Relations Website

BACKGROUND AND RATIONALE

At present, the development of information technology has advanced rapidly and their application has been used in many areas and occupations, resulting in effective, quick and accurate performance. The application of information technology also changes the living styles of people in the society. Many organizations need to plan how to adapt themselves and make use of network as well as internet to their works.

Ministry of Education recognizes the importance of information technology and computer's role in education; therefore, the Ministry encourages schools to use computer in their instruction and public relations [1] including website to promote their institutions. This way, many educational institutions will have a good relationship with people outside. It is essential for them to select what to promote and give information which suits their target the most with effectiveness. Internet is one tool to be used in public relations. News and information about school activities as well as archive of lessons and knowledge on website can be accessed all the time. Internet is also useful in making effective interaction and communication, that is to say, people can contact via e-mail in a short time. Another way is web board where people can post their opinions and ask questions immediately. Internet is then a choice which meets the demand of the target group.

Training is a transfer of knowledge to increase the ability so that performance and duties could be done with more effectiveness. In any case, training aimed to increase the working performance [2]. In educational areas, multimedia has more roles in instruction in the form of content presentation, still images, slide, animation, graphic images, sound effects and a lot more. As for instructors who give lecture and use computer multimedia to explain the lesson in order to comply with the learning objectives by demonstration and practice, experience gained from these activities is like to be similar to experience gained directly from real practice. The training in which teachers have chances to observe and practice will help achieve the learning objectives. Teachers from this training can repeat the steps they learned in a short time. Therefore, computer multimedia training with the demonstration process and the following practice is essential as a tool for education.

According to basic survey, it was found that educational institutions under the jurisdiction of Chanthaburi Educational Service Area Office 2 or Klung Sumphun Clustering Schools which consist of 10 schools. 7 schools had no website for public relations and teachers there did not have knowledge about creating website. Training is a good way to encourage teachers to understand and know how to create website to develop their work and their instruction as well as public relations, especially when teachers have skills and are able to do by themselves.

According to the above-mentioned importance, the researchers were interested in developing the computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website": a case study of Klung Sumphun Clustering Schools" in order that teachers could create public relations website with effectiveness.

RESEARCH OBJECTIVES

1.To develop computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website": a case study of Klung Sumphun Clustering Schools.

2. To find out the quality and the effectiveness of the computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website": a case study of Klung Sumphun Clustering Schools.

3. To find out the learning achievement of training before and after using the developed computer multimedia training with the demonstration process and the following practice entitled "the Creation of Public Relations Website": a case study of Klung Sumphun Clustering Schools.

4. To find out the satisfaction of the trainee towards the computer multimedia training with the demonstration process and the following practice.

EXPECTED OUTCOMES

1. The computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools is effective and can be used for training.

2. This could be used as a way to develop other computer multimedia trainings in the future.

HYPOTHESES

1. The quality of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website” is good.

2. The effectiveness of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website” is not less than the criteria set at 85/85.

3. The teachers who use the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website” show their learning achievement before and after using with the statistically significant difference at .05 level.

4. The teachers have satisfaction towards the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.

RESEARCH SCOPE

1. Population and Sampling Group

Population in this study consisted of 138 teachers who did not have knowledge about creating website in 10 Klung Sumphun Clustering Schools. The sampling group for this study consisted of 50 teachers chosen by simple random sampling from the population.

2. Content Scope

The computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools consisted of 8 contents: 1) Basic Knowledge about Internet; 2) Introduction to Macromedia Dreamweaver; 3) Beginning creating website; 4) Adjusting Text and Background; 5) Images and Sounds; 6) Links; 7) Tables; 8) Uploading Website to Internet.

3. Variables

3.1 Independent variable is the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.

3.2 Dependent variables are

- The quality of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.
- The effectiveness of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.
- The learning achievement of the teachers who use the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.
- The satisfaction of the teachers towards the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”.

RESEARCH METHODOLOGY

1. Research Tools

1.1ComputerMultimedia Training

1.2 Computer Multimedia Quality Evaluation Form

1.3 Training Achievement Test

1.4 Satisfaction Evaluation Form

2. Tool Development

2.1 Development of Computer Multimedia Training

The development of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website” follows the approach in developing computer instruction packaged called IMMCIP (Interactive Multimedia Computer Instruction

Package) [3] in 5 following steps: Analysis, Design, Development, Implementation and Evaluation.

2.2 Development of training achievements test

The researchers developed training achievement test after reviewing related documents and research works, setting behavioral objectives and having experts verifying the content validity of the training achievement test. After acquiring index of item objective congruence or IOC [4], the researchers revised and completed the pilot test to test the quality with 50 teachers in 10 Klung Sumphun Clustering Schools who had been trained in creating website. The test was analyzed to find out P value (P) and discrimination value (D) [5] and the reliability of the test. The reliability of the test was 0.91. Afterwards, the real test was obtained.

2.3 Development of computer multimedia quality evaluation form and satisfaction form The evaluation forms contained rating scale for 5 levels as developed by R.A. Likert [5]. The developed computer multimedia quality evaluation form was verified by experts.

3. Experiment

The experiment was done with the sampling group of 50 teachers in 10 Klung Sumphun Clustering Schools.

RESEARCH RESULTS

This research aimed to develop the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools and yielded the following results.

1. The Development of Computer Multimedia Training with the Demonstration Process and the Following Practice Entitled “the Creation of Public Relations Website”: A Case Study of Khlung Sumphun Clustering Schools

The researchers prepared the components essential for the development of the computer multimedia, for example, text, still images, animation, and sounds. The software used in developing computer multimedia consisted of Camtasia Studio, Macromedia Dreamweaver, and Adobe Photoshop. After completing all 8 contents for the computer multimedia, the researchers presented the contents in the following ways: 1) Registration for the training; 2) Pre-test; 3) Training for 8 contents along with the demonstration process and the following practice; and 4) Post-test.

Test Results	**N**	$\overline{X}$	**S.D.**	$\sum D$	$\sum D^2$	**t**
Pre-test	50	21.98	6.78	1086	26316	* 20.583
Post-test	50	43.70	3.19			

2. The Evaluation of Computer Multimedia Training with the Demonstration Process and the Following Practice Entitled “the Creation of Public Relations Website”: A Case Study of Khlung Sumphun Clustering Schools

The average score and the standard deviation for the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools were done by 5 experts. The average score was 4.14 and the standard deviation was 0.43, in other words, the quality was good. The experts in media production gave the average score of 4.58 with the standard deviation of 0.40.

3. The Effectiveness of Computer Multimedia Training with the Demonstration Process and the Following Practice Entitled “the Creation of Public Relations Website”: A Case Study of Khlung Sumphun Clustering Schools

It could be concluded that the effectiveness of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools was

higher than the criterion set at 85/85.

4. The Comparison of Training Achievement Before and After Using the Computer Multimedia Training Entitled “the Creation of Public Relations Website**”**

Table 1
The training achievement of the teachers who use the computer multimedia training

* with statistically significant difference at the .05 level

According to Table 1, the comparison of the average training achievement score after using the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools was higher than the average training achievement score before using it with statistically significant difference at the .05 level.

5. The Teachers’ Satisfaction towards the Computer Multimedia Training with the Demonstration Process and the Following Practice Entitled “the Creation of Public Relations Website”: A Case Study of Khlung Sumphun Clustering Schools

The average score of the teachers’ satisfaction towards the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools was 4.11 and the standard deviation was 0.41.

DISCUSSIONS

The research results from the study of the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools revealed that the quality was good and it complies with the research work done by Athit Jirawattanapol [6] who developed computer-assisted instruction entitled “Computer Hardware” in that the quality was good enough to help learners learn by themselves. It also complies with the research work done by Nipapan Kongkaew [7] who developed computer-assisted instruction entitled “Basic Understanding of Computer for First Year Students at Roi-Et Commercial Vocational College” in that the developed computer-assisted instruction showed good quality and the learning achievement met the defined objectives.

As for the training achievement of the teachers who used the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools, it was found that the average score after training was higher than the average score before training with statistically significant difference at the .05 level. It complies with the research work done by Sakchai Khomkhuntot [8] who developed self-training package for elementary school teacher entitled “Conservation of Work of Art Environment” in that the sampling group had more understanding about conservation of Work of Art environment than the control group and the analysis of the average score before and after using the self-training package showed statistically significant difference at the .05 level. This also complies with Boen [9] who studied and compared the learning achievement between lecture and computer-assisted instruction for skill class in that computer-assisted instruction was more effective than lecture.

As for the satisfaction of the teachers towards the computer multimedia training with the demonstration process and the following practice entitled “the Creation of Public Relations Website”: a case study of Klung Sumphun Clustering Schools, it was found that the teachers who used the training showed high satisfaction towards the computer multimedia and interaction the most because the introduction to the lessons was interesting and the learners could control the lessons by themselves. There was also interaction between the trainers and the computer multimedia. The teachers also liked clear images and the meaningfulness of images to the content. This complies with Krepps [10] who studied the

effect of computer-assisted instruction on the work in terms of emotion and feeling of workers in that after using the training package, there were more analysis and supervision for the work. This means that the developed computer multimedia training had a great effect on the changes of the workers in terms of satisfaction towards the work in general and the stimulus to work as well as their steadiness to work.

SUGGESTIONS

1. Suggestions from Research Results

1.1 According to research results, the teachers showed high satisfaction towards the computer multimedia and interaction. They could control by themselves and there was interaction between computer multimedia and trainee. The images were relevant to the content, making it easier to understand. From this, interaction and images related to the content should be added in other computer multimedia training in the future.

1.2 According to the research results, the demonstration process and practice made it easier for the trainee to learn step by step and understand in a short time. Therefore, the demonstration process and practice should be added in other computer multimedia training in the future so that the trainees understand better.

2. Suggestion for further study

2.1 The development of computer multimedia training can be done using other techniques like Delphi technique in collecting data, making it possible to have different media type in computer multimedia training.

2.2 A study of other effects of computer multimedia training entitled "the Creation of Public Relations Website" should be conducted to find out learning achievement in other aspects and to study factors about time spent for the training and endurance to the training.

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EFFECTS OF WEB-BASED ENGLISH READING INSTRUCTION USING PROJECT-BASED LANGUAGE LEARNING ON READING COMPREHENSION ABILITY OF PHETCHABURI RAJABHAT UNIVERSITY STUDENTS

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ABSTRACT

The purposes of this study were to: 1) investigate the effects of Web-based English reading instruction using Project-based language learning on students' reading comprehension ability; and 2) explore students' opinions towards Web-based English reading instruction using Project-based language learning. A within- group paired-sample t-test and effect size were used to investigate the differences between the mean scores from the pre- and post-reading comprehension test. The qualitative data were analyzed using content analysis. The findings showed that there was a significant difference in students' mean scores on reading comprehension ability at the significant level of 0.05. They also reported the benefits and limitations of Web-based English reading instruction using Project-based language learning on the weblogs.

Keywords

PROJECT-BASED LANGUAGE LEARNING, READING COMPREHENSION ABILITY, WEB-BASED ENGLISH READING INSTRUCTION

1) INTRODUCTION

In many English as a foreign language instructions, students in non-English speaking countries do not frequently have a chance to listen, speak, or write in English. Rather they have more chances to read in English (Piyanukool, 2001). They may read information on a variety of print and online texts, such as newspapers, labels, instructions on merchandise media or textbooks. Reading, thus, serves as an important skill that leads to improvements in English and other academic areas.

Reading in a foreign language should receive a significant focus. However, teaching reading at the university level in Thailand has been largely unsuccessful. Many studies tried to find the causes of their reading comprehension difficulties. According to Chiramance (1992), Thai students' poor reading abilities might result from the fact that most of them were unable to motivate themselves to read English texts. Due to inadequate English reading instruction, students might feel bored, unmotivated or uninterested in reading English. Alderson (2000) pointed out that reading problems can be solved if different kinds of reading materials and other reading instruction were introduced to the foreign language reading class.

In reading ESL class, Singhal (2001) studied the effects of computer assisted instruction and task specific reading strategies. The study examined the effects of a Web- based reading strategy instruction program on 22 ESL students. The results indicated a significant improvement in students' reading comprehension and showed the beneficial effects of computer assisted instruction in

teaching reading. Therefore, the integration of Web-based instruction and Project-based language learning into the EFL reading classroom may be a solution to teach reading in Thailand. According to Warschauer (2000), Web-based instruction focused on using the Internet, the computer network and web-collaborative tool as a medium to enhance students' foreign language learning. Teachers can use online texts on the Internet as a supplementary material to present information and activities to students, assess students' work, and respond to students work. With respect to the focus of this Web-based reading instruction, it might motivate students to read a lot by adding the web-based lessons to link the traditional reading classroom to the world.

Despite the benefits of the computer and the Internet in the reading class, the problem found in teaching reading by using the Web-based instruction is the fact that students lack face-to-face communication with each others (Jung, Jun & Gruenwald, 2000), which can be harmful to a students' social development (Roblyer 2003). The integration of English Web-based reading lessons and Project-based language learning (PBLL) could be an alternative way to promote social interaction through the process of individual and group project works. While developing the reading project, students can work collaboratively in their group in that they have to communicate with others who have different background knowledge, resolve problems or share new information to their peers (Guarasa, Montero, San-Segundo, & Araujo, 2006).

In the Thai educational context, there is a lack of research which shows the positive effects of teaching reading by integrating the Web-based English reading instruction and Project-based language learning. There are only a few studies that examined the effect of Project-based language learning on EFL learning (Sudrung, 2004). Thus, this study attempted to investigate the effects of Web-based English reading instruction using Project-based language learning (WBI-PBLL) on students' reading comprehension ability and to explore students' opinions towards the Web-based English reading instruction using Project-based language learning (WBI-PBLL).

1.1) Research Question

This study sought to explore the following questions based on examination of current studies about Web-Based Instruction, project-based language learning, and reading comprehension ability. The specific research questions for this study were:

1. To what extent does Web-based English reading instruction using Project-based language learning (WBI-PBLL) affect students' reading comprehension ability?

2. What are students' opinions towards Web-Based English Reading Instruction using Project-based language learning (WBI-PBLL)?

2) METHOD

2.1) Samples

The samples in this study were 23 second-year undergraduates in the Faculty of Humanities and Social Sciences. They were majoring in Business English and enrolled in the Paragraph Reading course (1553201) in the first semester of the academic year 2007.

23 students in this study consisted of 21 females and 2 males between the ages of 17 and 19. Most of them were born in Phetchaburi and Prachuap Khiri Khan Provinces. They were selected by purposive sampling.

2.2) Instructional Materials

The instructional materials in this study were 10 web-based lesson plans and Web-based English reading instructional materials. Based on the data gained from the needs analysis, the most preferred themes were selected to develop the web-based lesson plans. Reading texts that related to the theme from the various websites were selected such as "Wolfgang Amadeus Mozart", "Sleep: An Important Part of Life" or "On the beach in Cha-Am". The content of web-based lesson plans and activities were designed based on the process of Project-based language learning and reading strategies. The reading strategies taught in class were selected in relation to the levels of literal and interpretive reading comprehension. The reading texts are illustrated in Table 1.

Table 1. *Themes and reading texts of the lesson plans*

Themes	Reading Texts
1.Entertainment	1. Legally Blonde
	2. Mass Media
	3. Wolfgang Amadeus Mozart
2. Health	4. University students not allowed to drink alcohol.
	5. Sleep: An Important part of Life
3. Travel	6. On the beach in Cha-Am
	7. Maruekkhathayawan Palace (Palace of Love and Hope)

Based on the ADDIE model (Leshin, Polluck and Reigeluth 1999) and the Project-based language learning procedure (Fried - Booth, 1986), the Web-based English reading instructional materials in this study were designed for the Web-based English reading instruction using Project-based language learning. These instructional materials were constructed using Macromedia DreamweaverMX 2004, Macromedia FlashMX 2004, Macromedia CourseBuilder, Adobe Photoshop CS and Macromedia Authorware.

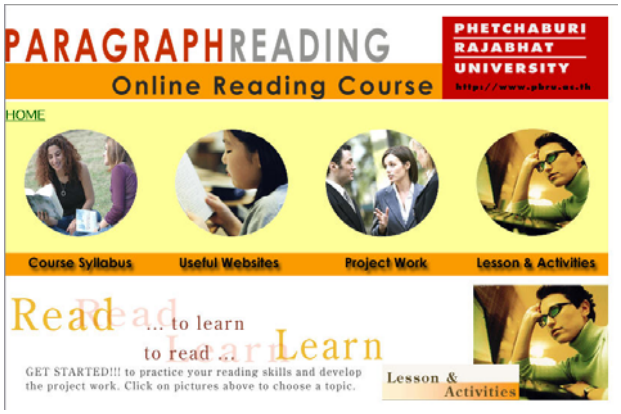

Figure 1. The main page on the course website

In order to practice the reading strategies students were practiced the lessons on the teacher's website and were assigned to create the individual and group projects that related to the reading strategies they learnt in each week. The process of Project-based language learning (PBLL) in this study was based on Fried - Booth (1986) consisted of three stages namely classroom planning, carrying out the project, and reviewing and monitoring the project (See Appendix B). In this study, the projects that students constructed were uploaded to the weblog. The project on the weblog was illustrated as follows.

Figure 2. An example of students' weblog

2.3 Research Instruments

Two research instruments were conducted to assess students' reading comprehension ability and to explore students' opinions towards Web-based English reading instruction using Project-based language learning: 1) the Web-based reading comprehension test, and
2) the weblog.

1. Web-based Reading Comprehension Test. The Web-based reading comprehension test was administered to the students before and after the main study. The topics of the test were chosen based on themes from the course content needs analysis survey. They were "entertainment", "health", and "travel." In addition to the selected reading strategies, the test was 30 multiple-choice questions used for assessing two different levels of reading comprehension ability; namely literal comprehension such as word recognition strategies, and interpretive comprehension such as predicting and summarizing strategies. The time allowed for the test was 90 minutes. In this study, Macromedia DreamweaverMX 2004, PHP and MySQL programs were used to collect and evaluate students' raw scores on the online database.

Figure 3. The example of the Web-based reading comprehension test

2. Weblog. Weblogs were completed three times at the end of each reading strategy session (Unit 3, 5, and 7). Students were required to post comments on the teacher's weblog in order to explore their opinions on the benefits and limitations of the Web-based English reading instruction using Project-based language learning.

2.4 Data Collection

The Web-based English reading instruction using Project-based language learning was applied in the first semester of the academic year 2007. It was designed for Business English major students who enrolled in Paragraph Reading course comprised ten units. The duration of the main study was 12 weeks. Each class met once a week for two hours. The data collection method that was used to measure students' reading comprehension ability was one group pretest-posttest quasi-experimental design. Prior to the main study, a Web-based reading comprehension test and a computer skill inventory questionnaire were administered to the students in order to measure students' reading comprehension ability and students' computer competency and the use of a computer and the Internet in their daily lives. Additionally, computer tutoring guide was given to the students on the first week to ensure their familiarity with the use of computers and the Internet. Therefore, the students had the basic computer literacy in using the computers and the Internet.

During the study, Web-based English reading instruction with Project-based language learning was used throughout the ten weeks plan. The students had to do both individual and group project activities that were related to the themes of their reading. The students were monitored while engaging in the online activities. If they needed more assistance, they would consult the teacher.

After the lessons, the students were post-tested with the Web-based reading comprehension test. The changes in students' reading comprehension ability were measured by a comparison of pre- and post-test mean scores from the Web-based reading comprehension test.

2.5 Data Analysis

To answer whether the students made any progress as a result of the reading instruction, a within-group paired-sample t-test was applied to find out whether there was a significant difference between students' pre-test and post-test mean scores. In order to measure the magnitude of the effect of Web-based English reading instruction using Project-based language learning on students' reading comprehension ability the effect size (Cohen's *d)* was conducted. In addition, students' opinions towards Web-based English reading instruction using Project-based language learning posted on the weblog were transcribed and analyzed by using the content analysis method.

3. FINDINGS

The findings of the study can be summarized in two main aspects namely: 1) the students' English reading comprehension ability and 2) the students' opinions on the benefits and limitations of Web-based instruction using project-based language learning.

3.1 Students' English reading comprehension ability

The results derived from Web-based reading comprehension test indicated that Web-based English reading instruction using Project-based language learning leaded to improvement in students' reading comprehension ability. Within-group paired-sample t-test was used to find out whether there was a significant difference between the pretest and posttest mean scores of students. The students' pretest and posttest mean scores, standard deviation, mean difference, t-values, and statistical significance are presented in Table 2.

Table 2. *A comparison of Web-based reading comprehension pretest and posttest mean scores*

Group	n	Pretest		Posttest		t
		$\overline{X}$	S.D.	$\overline{X}$	S.D.	
Students in Business English Major	23	14.65	2.83	19.43	2.35	6.254

*$p < .05$

It was found from the mean comparison that the students earned a higher Web-based reading comprehension posttest mean score ($\overline{X}$ = 19.435) than Web-based reading comprehension pretest mean score ($\overline{X}$ =14.652). The mean difference was 4.783 and the t value was 6.254 with a degree of freedom of 22(n = 23). The result showed that there was a significant difference between the mean scores from the pre and post Web-based reading comprehension test at a significant level ($p < .05$). In addition, the effect size of Web-based English Reading instruction using Project-based language learning on students' reading comprehension ability was 0.80, which was represented the large effect size. It can thus be concluded that the Web-based English reading instruction using Project-based language learning had large effect on promoting students' reading comprehension ability.

3.2 Benefits and limitations of Web-based English reading instruction using Project-based language learning

Students' comments on the weblog revealed both benefits and limitations in Web-based instruction using Project-based language learning. In terms of the benefits, it was found that Web-based reading instruction using project-based language learning enhanced reading skills, developed computer skills, and increased students' interaction with their teacher, their peers, and online resources. Table 3 shows the students' opinions on the benefits of Web-based English reading instruction using Project-based language learning.

Table 3. *Student's opinions on benefits of Web-based English reading instruction using Project-based language learning*

	Week 5		Week 7		Week 11	
	n = 15	%	n = 20	%	n = 23	%
1. Reading strategies	4	26.67	10	50.00	14	60.86
2. Computer skills	7	46.67	3	15.00	1	4.34
3. Student interaction	4	26.67	7	35.00	8	34.80

By week 4, 46.67% of students thought that they could develop computer skills the most. On the other hand, in weeks 7 and 11 students started to recognize the benefits on reading strategies represented by 50.00% of the students in week 7 and 60.86% in week 11. In addition, some of the students thought that Web-based English reading instruction using Project-based language learning could increase their interaction. See the following examples.

"I always think that in reading classroom, I have to read the assigned text. Now it is very interesting. My friends and I can read the texts and do activities that we want to do and decide by our group members." [In week 11, Chapter 3: Travel]

"I can usually read something and get the general gist and then I use an online dictionary (http://dictionary.cambridge.org/) to look up difficult words." [Week 7, Chapter 2: Health]

"I have learnt a lot going to a website and choosing a text to do my individual project activities each week. I have to read it all in English before I find what I need to know…" [Week 11, Chapter 3: Travel]

However, the students mentioned the difficulties and limitations of the Web-based learning in relation to reading strategies and project activities, computer skills, and time constraint. The majority of the students found that they had limited computer skills; such as signing up the weblog or downloading and uploading files. The problems found in this study were illustrated in Table 4.

Table 4. *Student's opinions on difficulties and limitations in learning through Web-based English reading instruction using Project-based language learning*

	Week 5		Week 7		Week 11	
	(n = 15	%	n = 20	%	n = 23	%
1. Reading strategies and project activities	5	33.33	10	50.00	9	39.13
2. Computer skills	10	66.67	4	35.00	4	17.39
3. Time constraint	0	00.00	6	15.00	9	39.13

Limitations and difficulties related to online learning were found from comments on the weblog. Table 4 shows that, in week 5, 66.67% of the students thought some computer skills were difficult for them. However, fewer students encountered difficulties in computer skills as shown by 35.00% of students in week 7 and 17.39% of students in week 11. In week 7 and 11 students it was found that they had problems in reading strategies and project work represented by 50.00% of students in week 8 and 39.13% in week 11. A few of them had problems with the time allocation to practice the lessons and do the projects work as quoted below.

"I need more time to negotiate with my friends in group to complete the project activities. However, it was not enough time for us to work collaboratively in class." [Week 7, Chapter 2: Health]

"I'm not good at computer, I always had to ask my friend to help me upload individual project to the Multiply weblog." [Week 11, Chapter 3: Travel]

"I don't have a computer at home, so I have to finish my project activities at the university." [Week 11, Chapter 3: Travel]

In conclusion, the students improved their reading comprehension ability after receiving a Web-based English reading instruction using Project-based language learning. Therefore, the reading instruction using Project-based language learning enhanced students' reading comprehension ability. They reported that this instruction enhanced their reading strategies, developed their computer skills, and increased their interaction among peers. Amongst the limitations and difficulties of Web-based English reading instruction, the students had problems in reading strategies and project activities, computer skills, and time constraint.

4. Discussion

4.1) English Reading Comprehension Ability

The Web-Based English reading instruction using Project-based language learning in this study had an effect on students' reading comprehension ability due to the significant differences between students' mean scores on the Web-based reading comprehension test. The results of this study supports the first hypothesis that students who received Web-based English reading instruction using Project-based language learning achieved significantly higher average scores on the post-test than the pre-test at the level of 0.05. It can be concluded that the reading instruction using Project-based language learning significantly improved students' reading comprehension ability.

In the present study, the selected reading strategy instruction was integrated into the design of Web-based English reading instruction using Project-based language learning. The benefits of the instruction with respect to students' reading comprehension improvement can also be discussed in four aspects.

First of all, the data gained from the students' comments on the weblog revealed that Web-based English reading instructional materials facilitated reading comprehension. The Web-based English reading instructional materials were designed to present reading strategies, to assign individual and group project activities as well as preparing useful websites for project works. The students could practice reading strategies, review the lessons, and download handouts from the teacher's Website. For instance, Supachai, a student from "Seven Wonders of the World" project commented on week 7 that *"I can review the lessons, download the worksheet and do the activities wherever and whenever I want."* The results also supported the previous studies of Chun and Plass (1996), Hong (1997), and Lomicka (1998) which indicated that the use of WBI facilitated overall reading comprehension, increased comprehension rates, and promoted a deeper level of reading comprehension. The finding from this study supported the findings of Hong (1997), who investigated the effects of multimedia on reading comprehension in a business Chinese course, indicating that students read with a higher comprehension rate in half the time when they studied with multimedia. In addition, the results of this study are similar to Singhal's study (2001) in that the effects of Web-based reading strategies

instruction program significantly led to improvement in ESL students' reading comprehension. It can be concluded that teaching reading via the web-based instruction should be introduced to EFL reading instruction.

Secondly, the WBI-PBLL engaged students in meaningful tasks and promoted collaborative learning. In order to practice reading strategies that the teacher taught in each week, the students were required to do individual and group projects related to their reading themes. The individual projects engaged the students in personally meaningful tasks. The students selected project topics and reading texts that they found meaningful and motivating to themselves. Additionally, the group projects involved the students working collaboratively in small groups to create an online project in English language. For example, Monthira, a student from "Seven Wonders of the World" project commented on week 5 that *"Group project enhanced our self-responsibility. We cooperate with others and share different ideas."* Another comment from Panida, a student from "Music around the World" project commented on week 7 that *"I feel relaxed when doing group project. We can discuss among group members to select our preferred topic and tasks. For example, Supachai was good at computer, so he took responsibility for creating and decorating the weblog."*

The discussion of Legutke and Thomas's model (Legutke and Thomas, 1991) characterized the practice of Project-based language learning as a collaborative, learner-centered environment. Each student shared responsibility for his or her learning with the teacher and other students in the collaborative activities. The learner-centered classroom provided opportunities for individual to collaborate task-based learning, increased motivation and accommodated student agendas. In the social environment, students engaged in activities which provided opportunities to negotiate, thereby enhanced their language learning. The findings were consistent with a view of collaborative learning proposed by Nunan (1992). Collaborative learning promotes a philosophy of cooperation rather than competition and an environment in which learners are learning from each other in an equitable way. The learning process promote students working together to achieve common learning goals.

Thirdly, WBI-PBLL matched students' interests and engaged them in the learning process that could increase the students' motivation. It was found that motivation was an important factor to assist students in language learning. Even though students' motivation can be influenced by external factors, it was recognized that motivation is important for successful second language acquisition (Taylor, Meynard and Rheault, 1977; Ellis, 1997). The WBI-PBLL motivated students to be involved in the learning process. The individual and group project activities were related to real world situation, and promoted collaborative learning. Since the students involved in the learning process, they were capable of choosing projects that matched their needs. As a result, the projects tended to be interesting, challenging, and motivating for them. The following examples revealed that the project corresponded to students' needs and interests. Watinee, a student from "Travel Europe" project commented on week 11 that *"This course is very interesting. I get a chance to be exposed to a variety of interesting texts online."* Another comment from Sasima, a student from "Good Health" project on week 11 stated that *"I always think that in reading classroom, I have to read the assigned text. Now it is very interesting. I and my friends can read the texts and do activities that we want to do and can decide by our group members."*

The results of this study also confirmed the study of Legutke and Thomas (1991) which indicated that computer technologies provide new spaces where students can negotiate and create projects and new tools for project development. Network also gives access to a new audience for doing so it strengthens students' motivation and a sense of achievement. In addition, Ewing (2000) reported that project-oriented Computer-Assisted Language Learning classes provided students with opportunities to develop linguistic skills that were not available in the traditional classrooms and that students had more control over the linguistic means they used to express themselves. The results also supported the study of Gu (2002) who reported that project

classes in English as a foreign language (EFL) in China have provided students with authentic interaction with a variety of audiences, increased their levels of input and output, and enhanced motivation, engagement and willingness to learn collaboratively.

Finally, this study focused on the design of web-based instructional materials in order to support teaching reading and creating project works. The outcomes of the projects, both individual and group projects were oriented towards the web. The students created the online project via the weblog which was a web-based material that offered students opportunities to publish their projects on the web. These weblogs were a personal online diaries and journals that teachers and peers could immediately reflect to what was posted on their weblogs. According to Ward (2004), the weblog was a website that was updated regularly and organized chronologically according to date. Once students registered on the weblog, they could maintain the site without any prior knowledge about web technology and could receive comments from teachers or peers. Also, they could automatically receive updates of their favorite weblogs whenever they prefer. In addition to the benefits of weblog, it facilitates students to easily create online project works since it provides students with instant feedback, immediate explanations and reinforcement along with quick correction. For examples, Jakkrit, a student from "Travel Europe" project commented on week 5 that *"In my opinion, it is very useful for me to have basic skills in computer. In class, I have a chance to learn and use various kinds of computer applications. For example, I learned how to sign up the Multiply weblog, how to download and upload files and others."* Another student stated that *"I like to use weblog doing the project because I can fix it as much as I could and getting feedback from teacher and others."*

This is consistent to what Richardson (2004) points out under the reading "Subscribe to My Homework Page!" that teachers can subscribe to their students' weblogs and would be notified whenever changes are made to these weblogs. Ward (2004) argued that the weblog offered EFL students opportunities to use a variety of reading strategies in order to gain both reading contents and language forms since it was a source of authentic and communicative language materials. In addition, it provided a variety of free online English texts to which students could get access easily in order to serve their reading purposes. Additionally, Riel and Fulton (2001) stated that Web-based instruction can enhance Project-based language learning by bringing the outside world into the classroom through the use of the computer and the Internet. Rather than viewing technology as a separate feature of PBLL, technology is included in all other features and provides an essential tool for both teachers and students. The computer and the Internet can support students and teachers in accessing, managing, analyzing, and sharing information. It also serves as an important tool in constructing products in project-based activities.

To conclude, even though the Web-based English reading instruction using Project-based language learning has not been widely used in Thailand, this study confirmed that this approach can be used in teaching reading in Thai context. This course facilitated overall reading comprehension, encouraged students to work collaboratively within their group (Wilson, 1995; Hedge, 1993; and Thomas, 2000), enhanced student-student relationships, cooperative learning, motivation and development of social skills (Epstein and Ormiston, 2007). Students interact with these who have different background knowledge in that they can share ideas and new information during the process of project work.

4.2 Classroom Interaction

The students reported that the WBI-PBLL could increase students' interaction with their teacher, peers, and online resources. For example, one of the students stated that *"I can get immediate feedback from the teacher, and I can also read the comments that the teacher gives to my friends…"* Another comment stated the interaction between the students and their peers, *"Group project enhances our self-responsibility. We cooperate with one another and share different ideas."* The other comment stated the interaction between students and online resources *"... I can usually read something and then I use an online dictionary to look up advance words."*

These ideas were consistent with the study of Shrum and Glisan (1994) who found that the interaction occurred when students who already knew how to use the computers would assist those who had less computer skills. In other words, this Web-based English reading instruction using project-based language learning creates a collaborative learning environment in which students can interact with more capable peers. Similarly, Insung (2002) studied the effects of different types of interaction on learning achievement in WBI. The results revealed that the interaction between students and students, and students and online resources can increase learning achievements.

According to Adelskold (1999), the interaction among the students occurred during problem-based learning via a computer network. Students interacted when they worked collaboratively in the process of online project works and on the web. Interaction between students and teacher occurred when the teacher explicitly taught reading skills in class and commented on students' project work. In addition, the interaction between students occurred when they worked collaboratively on a specific topic, discussing issues that were related to their learning on the weblog or shared ideas and materials to solve a problem. Finally, interaction between students and online resources occurred when students searched for specific topics, and downloaded and uploaded files on the Internet.

4.3 Pedagogical Implications

First, the online project was related to the reading strategies taught in class; they should be taught explicitly, such as introducing the selected reading strategies and modeling what and how each strategy works prior to assigning any project work. When students feel familiar with the different reading strategies, they could then develop the project without problems. Second, the instructional reading materials should match students' preferences. Teacher should conduct a needs analysis before designing the instructional materials and activities. The third implication deals with the graphics and multimedia elements. The data gained from students' comments revealed that they had navigational problems arising from issues such as the speed of navigation, the file opening speed, bandwidth, etc. Too many graphics employed may slow down the site's access time. In order to avoid this limitation, the teacher should prepare the web-based lessons on a computer or a CD-ROM that is not dependent on the Internet access. The forth consideration for teacher is to monitor students online projects in case the students publish inappropriate materials. Lastly, teachers should be aware of the time constraints due to complex project assignments and web-based instructional designs. Thus, teachers should inform their students how to manage their time in all phases of the project work.

4.4 Recommendations for Future Research

The following are some recommend-dation for further research that might clarify effects of Web-based English reading instruction using Project-based language learning. Based on these findings, it is suggested that reading strategies should be taught explicitly in class before the students start their project works. Lessons should be relevant to students' interest, and the teachers should prepare their students in the process of project work and the use of the computer and the Internet. Furthermore, it is recommended that the study should take longer period of time. Thus, the result will be more accurate and represent the WBI and PBLL approach. In addition, the sample size should be increased and also selected a broader sample of students who are English majors as well as non-English majors in order to confirm the effectiveness of Web-based English reading instruction using Project-based language learning. Furthermore, the future research should include both Web-based asynchronous learning and Web-based synchronous learning in a language class in order to help students exchange ideas with all their peers in a flexible and dynamic environment.

5. Conclusion

The study of WBI-PBLL was designed to enhance the students' reading comprehension ability. The findings revealed that WBI-PBLL facilitated overall reading comprehension, encouraged students to work collaboratively within their groups, enhanced student-student

relationships, cooperative learning, motivation and development of social skills. During the process of doing project works, the students could interact with those who had different background knowledge and shared ideas or new information. Based on these findings, it is suggested that reading strategies should be taught explicitly in class before the students started constructing the project work. The lessons should be relevant to students' interest and the teachers should prepare their students for learning project work and the use of the computer and the Internet.

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Building Critical Components for Successful a Multimedia-based Collaborative e-Learning Design Framework

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ABSTRACT

With newly developing multimedia and web-based technologies have provided opportunities of developing a multimedia -based collaborative e-Learning systems. The development of e-Learning systems has started a revolution for instructional content delivering, learning activities and social communication. Based on various positions on this issue have been proposed and a number of theoretical perspectives have been recommended. This study attempts to analyze teaching and learning processes of e-Learning instruction as shown in recent literature. Multimedia learning principles, learning models, instructional structure, collaborative environment, pedagogical models, learning metacognition and learner's activities provide the theoretical based for designing and analyzing critical components and develop research model for explaining a Multimedia-based Collaborative e-Learning Systems (MCLS).

Keywords
Critical components of e-Learning, Collaborative e-Learning Systems, Multimedia enhanced e-Learning

1) INTRODUCTION

The term "e-Learning" may have several synonyms such as "distance" "distributed" "flexible" "web-based" or "virtual" learning and these often hides real differences in learning experience, forms of delivery and formal status. e-Learning can be thought of as any learning that is done utilizing an internet or intranet connection. Delivery can be asynchronous (allowing learners to go through learning materials at their own pace within broad time constraints) or synchronous (participants attend the on-line learning session at a scheduled time, allowing for live interaction with the instructor and other students) (Haugen & Behling, 2006). Since the emergence of e-Learning as a means of providing instruction and the fast expansion of interest in these media in the mid 1990's there have been a number of studies investigated their advances in information technology and new developments in learning science provides opportunities to create well-designed, learner-centered, engaging, interactive, affordable, efficient, easily accessible, flexible, meaningful distributed and facilitated e-learning environments (Khan, 2005).

Recent advances in internet and web-based technologies have redefined the boundaries and pedagogies of distance learning by stretching its scope and deepening its interconnectedness (Dabbagh & Bannan-Ritland, 2005). New learning interactions that were not perceived possible before can now be facilitated, such as the coupling of experts from around the world with novices, the instantaneous access to global resources, the opportunity to publish to a world audience, the opportunity to take virtual field

trips, the opportunity to communicate with a diverse audience, and the ability to share and compare information, negotiate meaning and co-construct knowledge. Such activities emphasize learning as a function of interactions with others and with the shared tools of the community prompting (a) the emergence of pedagogical constructs and models such as distributed learning, open/flexible learning, asynchronous learning networks, knowledge building communities, and communities of practice, and (b) the reconceptualization of distance learning as the deliberate organization and coordination of distributed forms of interaction and learning activities to achieve a shared goal.

While the internet and web-based technologies, the problems of providing instruction via these technologies, ie, e-Learning, are not totally new nor is instruction via these media necessarily pedagogically innovative. Pedagogical features for teaching and learning can be understood from the perspectives of already existing theories such as the above. e-Learning can also be analyzed in the context of multimedia-based instruction, incorporating simultaneous presentation of narration, images and text, and thus provide a teaching and learning environment in which texts, pictures, video and audio are integrated into one system. But mostly, how and when should educators use these technologies in the most effective ways to enhance teaching and learning, a method and key elements of the e-Learning on based multimedia systems that has provided a flexible and open learning environment.

Thus, this study attempts to analyze teaching and learning processes of e-Learning as shown in recent literature. The main methodology of the study lies in a critical review of the journal in the field of e-Learning and multimedia in order to provide better understanding of the essential components for teaching and learning and developing research model for a multimedia-based collaborative e-Learning systems.

2) GROUNDING ASSUMPTIONSFOR E- LEARNING

e-Learning, like all instructional technology delivery environments, must be rooted in epistemological frameworks to be effective for teaching and learning. The effective design is possible only if the developer has a reflexive awareness of the theoretical basis underlying the design. The implications of a particular perspective on constructing knowledge are significant in the application of theory and design associated with a specific instructional delivery mechanism. A review of the different perspectives or views on cognition and knowledge is in order. These perspectives include: the cognitive information processing view, the parallel distributed processing view, and the distributed or situated cognition view (Duffy & Cunningham, 1996).

2.1) Cognitive information processing view (CIP)

The Cognitive Information Processing (CIP) perspective, which has roots in behaviorist and cognitivist views on learning. Behaviorists utilize the input output events of a computer system to explain how environmental stimuli become inputs in a learning cycle and behaviors (or responses) become outputs, and cognitivists adding the black box as the intervening and impacting variable between input and output to explain the information processing system of the learner. Implicit in this knowledge acquisition model is the principle that information undergoes a series of transformations in the mind in a serial manner until it can be permanently stored in long-term memory in packets of knowledge that have a fixed structure. Resulting from this view is the specification of instructional and learning strategies that assist the learner in processing information in discrete and linear events that align with internal cognitive processes such as selective attention, encoding, retention, and retrieval. Additional implications for instruction include provision for organized instruction, arrangement of extensive and variable practice, and enhancing learner's self control of information processing (Driscoll, 2000).

2.2) Parallel distributed processing view (PDP)

In this view, also known as connectionism,

long-term memory is perceived as a dynamic structure (or network) that represents knowledge in patterns or connections with multiple pathways instead of fixed schemata such as concept nodes and propositions (Driscoll, 2000; Duffy & Cunningham, 1996). Information processing is understood as a process of activating these patterns, in parallel, to accommodate new information by strengthening the most relevant pattern in the knowledge structure based on the goals of the learner at the time of learning. Knowledge (or cognition) is thought of as "stretched over" or distributed across the whole network structure of long-term memory (much like a neural network hence the mind as a brain analogy) and not residing in fixed loci in our brains (Salomon, 1993). Therefore, a fundamental distinction between Parallel Distributed Processing (PDP) and CIP is that knowledge is stored in an active connectionist representation versus a static and localized representation, and that information processing occurs in parallel instead of a serial manner, activating knowledge patterns simultaneously and adjusting them as a function of new information to resolve cognitive dissonance. PDP does not attempt to describe cognition at a behavioral level since the knowledge network is an interrelated structure of interactions and not a propositional structure.

2.3) Situated cognition view

The situated cognition view bears some resemblance to the PDP model but has additional characteristics that distinguish it from both PDP and CIP. These include (1) the concept that knowledge extends beyond the individual, and (2) the emphasis on perception (how individuals perceive the situation or the environment) rather than memory (how individuals retrieve knowledge). Nardi (1996) explains that situated or distributed cognition is concerned with knowledge representations inside and outside the mind and the transformations these structures go through, suggesting that knowledge representations are dynamic, constantly evolving and changing, and subject to infinite juxtapositions, similar to a rhizome (hence the mind as a rhizome metaphor). Situated cognition suggests that rather than thinking of cognition as an isolated event that takes place inside one's head, cognition is looked at as a distributed phenomenon that is more global in nature—one that goes beyond the boundaries of a person to include environment, artifacts, social interactions, and culture (Hutchins & Hollan, 1999; Rogers, 1997). The idea that cognition or intelligence is distributed suggests that learning spaces are becoming more dynamic and complex and that individuals learn from activity and the tools supporting such activity to extend their cognitive potential (Oubenaissa, Giardina, & Bhattacharya, 2002).

3) COGNITIVE THEROY OF MULTI MEDIA LEARNING

Mayer is well-known and respected for his research in the field of cognitive theory as it relates to multimedia learning. His seminal work, Multimedia Learning (Mayer, 2003), is rich with research on how people learn through various multimedia instructional messages. Mayer links cognitive learning theory to multimedia design issues, validating three theory-based assumptions about how people learn from words and pictures: the (1) dual channel assumption, the (2) limited capacity assumption, and the (3) active processing assumption.

Dual Channel Assumption: the dual channel assumption is based upon the theory that human cognition consists of two distinct channels for representing and handling knowledge: a visual pictorial channel and an auditory-verbal channel. This theory says that pictures enter through the eyes and are processed as pictorial representations in the visual-pictorial channel. The other channel consists of the auditory-verbal channel or verbal representations, which includes the process of spoken words entering the cognitive structure through the ears.

Limited Capacity Assumption: limited capacity assumption is exemplified by auditory-verbal overload, when too many visual materials are presented at one time. Each channel in the human cognitive system has a limited capacity

for holding and manipulating knowledge (Baddeley, 1999a, 1999b), so when a lot of spoken words and other sounds are presented at the same time, the auditory-visual channel can become overloaded.

Active Processing Assumption: the third of Mayer's assumptions, active processing, implies that "meaningful learning occurs when learners engage in active processing within the channels, including selecting relevant words and pictures, organizing them into coherent pictorial and verbal models, and integrating them with each other and appropriate prior knowledge" (2002: 60). Important to this assumption is the fact that these "active verbal processes are more likely to occur when corresponding verbal and pictorial representations are in working memory at the same time" (2002: 60).

All of these assumptions are important points and suffer multimedia learning principle to consider in designing and delivery multimedia enhanced e-Learning that are multimedia principle, spatial contiguity principle, temporal contiguity principle, coherence principle, modality principle, redundancy principle, individual differences principle, personalization principle, interactivity principle and signaling principle.

4) CRITICAL COMPONENTS FOR SUCCESSFUL A MULTIMEDIA-BASED COLLABORATIVE E-LEARNING

In addition to above attributes, this definition of e-Learning multimedia-based stipulates that there are six key components working collectively to foster instructional content delivering, learning activities and social communication: (1) learning models, (2) instructional structure, (3) collaborative environment, (4) pedagogical models, (5) learning metacognition and (6) learner's activities (Liaw, Huang & Chen, 2007; Liaw & Huang, 2003; Liaw, 2003; Vosniadou, 1996; Zurita & Nussbaun, 2007; Dabbagh, 2005; Park & Hyun, 2006).

4.1) Learning models

e-Learning seems to provide individualized learning environments that allow learner to exercise autonomy in their learning. Learning to do things, such as developing computer skills, involves the acquisition and refinement of complex motor skills which become faster, more accurate, and more automatic with the accumulation of experience and expertise. In addition, learning to solve educational problems requires the attainment and development of many learning principles and procedures which in turn, make it possible to devise and execute learning activities or solutions (Vosniadou, 1996). Since e-learning provides more flexible learning environments, learners have more autonomy in making decisions regarding their learning. Learner being autonomous individuals who construct their own knowledge (Laffey et al., 1998; Bullen, 1998; Jonassen et al., 1999) and being autonomous individuals who are actively involved in their learning (Shneiderman et al., 1998; Hillman, 1999).

In addition to autonomous learning, another aspect of e-learning that has appeared in the literature is collaborative learning. Learners in e-learning learn collaboratively as well as individually. Learners especially appreciated having a discussion forum as an avenue for communication when they were having their teaching practice at schools. And interaction among learners is fostered as communication via the web-based technology is simple and convenient when addressing to multiple users.

In essence, The major functions of the teacher are: informing the learner of the objectives, presenting stimuli, increasing learner attention, helping the learn recall what learner has previously learned, providing conditions that will evoke performance, determining sequence of learning activities, and prompting/guiding the learning proves (Joyce & Weil, 1996). From these points of view, teachers are assisted tutors for student's learning. In general, e-learning systems provide various assisted functions. Such as teacher-made online instruction, online conference, online help and suggestions, online examination, and online monitoring. All these

functions offer opportunities for teachers to be assisted tutors.

4.2) Instructional structure

An instructional structure deserves more attention because an effective one will help learners to create their own knowledge. Essentially, learning processes are influenced not only by the nature of the perceptual stimuli but also by the nature of individuals' expectation, based on prior knowledge and past experience. Therefore, an appropriate instructional structure can enhance learners' knowledge construction from their short-term memory to their long-term memory (Atkinson & Shiffrin, 1971).

Essentially, e-Learning offers both multimedia ill-structured and well-structured instructional information. Based on dual-coding theory (Butler & Mautz, 1996) , two separate systems can work independently or together for verbal and imagery processing. In addition, when information coding in both systems, it is easier to retain than information coded only in a verbal or imagery system. Hence, multimedia instructional formats are more helpful for individual learning than text-only formats.

4.3) Collaborative environment

Collaborative environment means students working together to accomplish shared learning goals and to maximize their own and their group members' achievements (Johnson & Johnson, 1999). In general, to achieve learning in collaborative environment the members must encourage each other to ask questions, explain and justify their opinions, articulate their reasoning, and elaborate and reflect upon their knowledge. A successful collaborative environment can be achieved only when the groups are effective and functioning well (Solomon & Globerson, 1989). And the five factors that make for effective collaborative environment, which can be summarized: individual responsibility, mutual support, positive interdependence, face-to-face social interaction and formation of small groups (Adams & Hamm, 1996; Dillenbourg, 1999).

e-Learning has appeared in the literature is collaborative learning. The effectiveness of collaborative learning over the internet has been confirmed by various studies. It is found that students' levels of involvement and incentive to learn have increased significantly with a wider and more complete understanding of the subject knowledge (Lee & Chen, 2000; Nagai et al, 2000; Su, Chen & Tsai, 2000). As a result, learners from different background and disperse locations can share their personal and team experience and pool their ideas to solve problems in the learning process.

4.4) Pedagogical models

As described in this paper, pedagogical models are cognitive models or theoretical constructs derived from knowledge acquisition models or views about cognition and knowledge, which form the basis for learning theory.

Open learning: open learning or flexible learning is a new approach to describing distance education where the emphasis shifts from delivering a pre-established curriculum to focusing on individual and local needs and requirements, and creating open learning places based on the here and now (Edwards, 1995). Key principles of open learning are student-centeredness and a focus on learning rather than teaching (The Open University UK, 2002).

Distributed learning: distributed learning is described as education delivered anytime, anywhere, to multiple location, using one or more technologies or none at all (Jones Knowledge, 2000). When telecommunications media is utilized, distributed learning refers to off-site learning environment where learners complete courses and programs at home or work by communicating with faculty and other students through e-mail, electronic forums, videoconferences, an other forms of computer-mediated communication and internet and web-based technologies.

Learning communities: learning communities are groups of people who support each other in their learning agendas, working together on projects, learning from one another as well as

from their environment and engaging in a collective socio-cultural experience where participation is transformed into a new experience or new learning (Rogoff, 1994; Wilson & Ryder, 1998). Learning communities represent an intentional restructuring of students' time, credit and learning experiences around an interdisciplinary theme to foster more explicit intellectual and emotional connections between students, between students and their faculty, and between disciplines (MacGregor, Smith, Tinto & Levine, 1999).

Communities of practice: communities of practice are groups of people informally bound together by shared expertise and passion for a joint enterprise (Wenger & Snyder, 2000: 139). The construct has become popular in the business community and in organizations that focus on knowledge as an intellectual capital. Communities of practice are different from formal work groups or project teams in that they are defined by knowledge rather than task, and members are self-selecting rather than assigned by a higher authority (Allee, 2000).

Knowledge building communities: knowledge building communities are learning communities in which communication is perceived as transformative through knowledge sharing and generation. Participants in a knowledge building community share a common goal of building meaningful knowledge representations through activities, projects and discussion and the instructor or tutor is and active, learning participant in the community (Selinger & Pearson, 1999: 41).

4.5) Learning matacognition

Metacognitive knowledge consists of knowledge of cognition in general as well as awareness and knowledge of one's own cognition (Anderson et al., 2001, p. 29). It includes identifying strategies to perform tasks, understanding the demands of various tasks, and knowing one's capabilities for accomplishing them. Thus, metacognitive knowledge refers to knowledge about the interplay between individual characteristics, task characteristics and available strategies in a learning situation to improve learner's problem-solving capabilities and thinking skills (Flavell, 1979).

4.6) Learner's Activities

In educational setting, these distributed forms of interaction are manifested in learner-instructor, learner-content, and learner-learner interaction (Moore & Kearsley, 1995). These types of interactions are perceived as necessary in enhancing social learning skills such as communication or group process skills. They are also perceived as tools or activities that promote higher-order thinking and sustain motivation in distance education setting (Navarro & Shoemaker, 2000).

Collaborability refers to "the degree of collaborative activities and behaviors across organizations in terms of resolving conflicts (Kwon & Suh, 2004). It is contrasted with competitive and individualistic behavior. Learners are expected to share their knowledge and skills with others in the group as well as elicit other group members' knowledge and skills. Competition within a group must be discouraged while competition between groups within a larger class is acceptable and often occurs (Lejeune, 2003).

Individual accountability is important for group success, since some members tend to dominate and some to withdraw, unless mechanisms are in place forcing everyone to participate. Individual accountability is established when each group member understands that she/he is required in each cyclic meeting to briefly report what she/he has been working on and what progress has been made (McKinney & Denton, 2005 ; Gillies, 2003).

5) CONCLUSION

Thus, based on grounding assumptions for e-Learning and cognitive theory of multimedia learning foster instructional content delivering, learning activities and social communication. I believes that six key components should be consideration for designing a Multimedia-based Collaborative e-Learning System are : (1) learning models

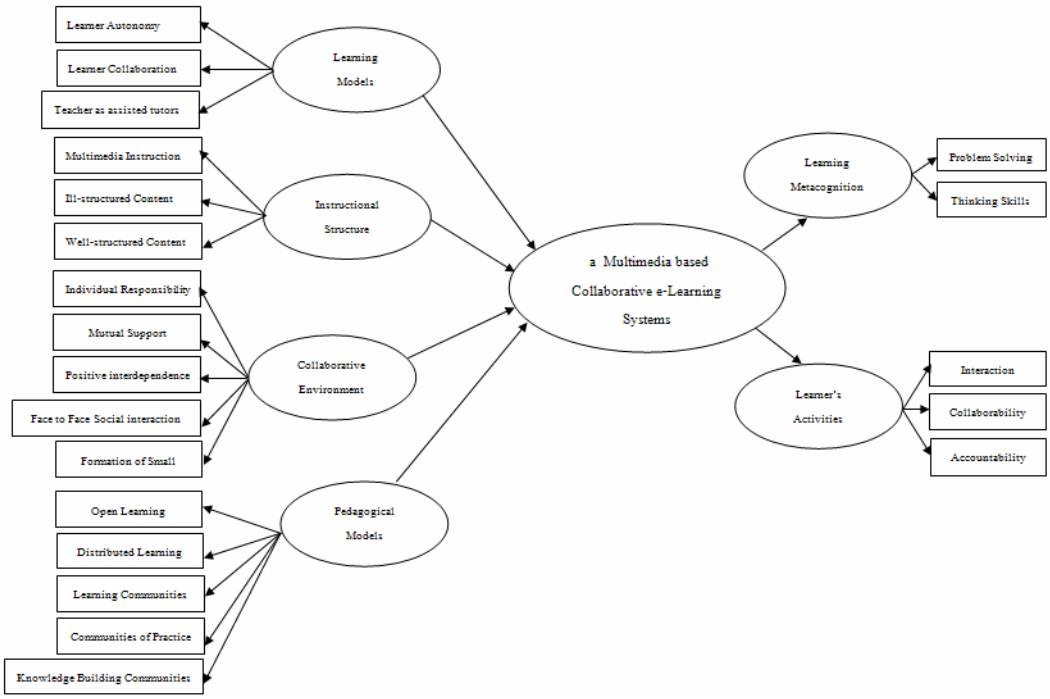

Figure 1: Research Model for Explaining a Multimedia-Based Collaborative e-Learning Systems (MCLS)

constitute learner autonomy, learner collaboration with teachers as assisted tutors, (2) instructional structure should support multimedia content that multimedia instruction, ill-structured and well-structured content, (3) collaborative environment include individual responsibility, mutual support, positive interdependence, face to face social interaction and formation of small groups, (4) pedagogical models should be open learning, distributed learning, learning communities, communities of practice and knowledge building communities, (5) learning metacognition consist problem solving and thinking skills, and (6) learner's activities consist interaction, collaborability and accountability. Fig. 1 presents components and develop research model for explaining a Multimedia- based Collaborative e-Learning Systems (MCLS).

In this study, I try to explore what are the best multimedia pedagogical models and practices are realized for the Collaborative e-Learning System based on the related literature. In other words, this (deriving a set of components from various literature sources) is first part of my work. Then conducting an empirical investigation of lecturers' perceived six key component for the Collaborative e-Learning System in higher education of Thailand, and practitioners to further explore and evaluate the components that they had developed earlier.

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THE INCREMENTAL OF TEACHING EFFICIENCY IN LINUX SERVER CONFIGURATION USING FLASH DRIVE

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For leaning of Linux server configuration in the Computer laboratory subject in the Bachelor of Science in Industrial Education (Continuing program), Program in Computer in the Department of Engineering, Faculty of Industrial Education, KMITL, students have to make some changes in several configuration files. In the previous Linux server configuration laboratory, lecturer installs Linux operating system into the personal computer for the student's experiment. After the experiment, students have to set all changed configuration files to the default for the following students who will study this laboratory. If some students forgot to do this, it will makes the problems for the next experiment. So, the lecturer have to solve this problem by himself.

To solve these problems, we use the USB flash drive that was installed Linux operating system as a booting device. Between the student's experiment, the data can be saved into this flash drive and after student is shutting down the Linux operating system, all data and changed files were set to default.

After changing to use the USB flash drive, teaching efficiency is incremented cause of the time consuming for problems solving are reduced and the maintenance of personal computer in the laboratory is more easier.

Keywords
Configuration, Flash drive, Linux server, Teaching efficiency

DEVELOPMENT OF TUTORIAL WEB-BASED INSTRUCTION IN ELECTRIC CIRCUIT ANALYSIS

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The purposes of this research were to development of efficiency for tutorial Web-Based Instruction and to find the efficiency of the courseware according to the defined criteria 80/80 and to compare the result between pre-test and post-test of subjects who studied with development of tutorial Web-Based Instruction in electric circuit analysis. Sampled groups were 20 students of the Bachelor of Science in Industrial Education from the Department of Education Engineering in Telecommunication Engineering, Faculty of Industrial Education, King Mongkut's Institute of Technology Ladkrabang.

The research tools consisted of 1) tutorial Web-Based Instruction 2) the quality assessment form of tutorial Web-Based Instruction and 3) The achievement test comprised 40 items possessing the degree of difficulty ranging from 0.50 – 0.80, the degree of discrimination between 0.20 – 0.50 and the reliability coefficient of 0.82 .

The results of the research revealed that: 1) The efficiency of the tutorial Web-Based Instruction in electric circuit analysis was 81.33/80.37, which reached the standard criterion. 2) The achievement in electric circuit analysis of students after using the tutorial Web-Based Instruction in electric circuit analysis was statistically significantly higher than that of the students prior to using the tutorial Web-Based Instruction at 0.01 level.

Keywords
Web-Based Instruction, electric circuit analysis