Technologies in Teaching and Learning

Welcome to INSIGHT.

First, I would like to wish all of you a Happy New Year. The year 2008 was an eventful year for CALM and we hope 2009 will similarly be an exciting and successful year for all of us. On top of our existing teaching and learning capacity building, we have planned for more events which include trainings, workshops and short courses for our UNIMAS academics. Some of the events will be jointly organised and run with other divisions and units of the University.

INSIGHT is an avenue for UNIMAS Academic Staffs to share their experiences, valuable thoughts and aspirations in teaching and learning. It is the flagship publication from CALM and we are very thankful to all of you who had contributed various forms of articles and other related materials. To the rest of our academic staffs who have not contributed in the past, we welcome your participation in the upcoming issues. We will announce the themes for the 2009-2010 issues in the UNIMAS official portal (Anjung UNIMAS). The theme for this issue of INSIGHT is **"Technologies in Teaching and Learning,"** and as such all the papers are related to the use of new technologies in the learning environment.

On behalf of all the staff at CALM, I would like to express my sincere thanks to Professor Peter Songan who has successfully led CALM for the past seven years as a Dean. Similarly, I would also like to thank Professor Mohd Azib Salleh, the former DVC (Academic and Internationalisation), for his visionary advice and guidance during his term of office.

We welcome our new DVC (Academic and Internationalisation), Professor Fatimah Abang, who will inspire and guide us in our effort to further strengthen our commitment towards achieving our set goals and objectives at CALM.

Thank you for your continuing support.

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text • inspiration
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Most university educators are familiar with learning theories such as behavourism, cognitivism and constructivism. Indeed, these are the prominent theories that serve as the underlying guide to the design of our instruction. However, Siemens (2005a) argues that these theories are challenged in the digital age as technology nowadays is able to cater or support many of the cognitive processes that are previously handled by learning theories. Technology has also changed the present generation students' learning behaviour and expectation.

Based on these concerns as well as a few other challenges of today's learning, Siemens (2005a) has proposed a relatively new learning theory, known as connectivism, to help the present generation students pursue more effective learning in the digital age. This article is meant to briefly introduce this learning theory and to highlight its relevance to today's learning.

CONNECTIVISM - WHAT IS IT?

"Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialised information sets, and the connections that enable us to learn more are more important than our current state of knowing." (Siemens, 2005a)

In knowledge building, connectivism recognises the importance of making connections between knowledge entities instead of the entities themselves. Although experiencing is known to be very useful in learning, the rapid growth of knowledge makes it impossible for an individual to experience everything. Thus, connectivism suggests that competency can be derived by forming networks that connect knowledge and experience of different sources (either human or non-human appliances).

Knowledge needs to be connected with the right people in the right context in order to produce learning. To cope with the rapid change of incoming information, this learning theory also suggests a breathable structure that allows the network of connections to flexibly expand and contract to maintain the currency and accuracy of the knowledge acquired.

Learning tasks thus focus on the learner's ability to process and evaluate information in a complex and chaotic nature of the knowledge space, build a personal network of trusted knowledge entities (people and content, enhanced by technology), and evaluate new incoming information as well as decide on the necessary adjustments to the formed connection.

WHY CONNECTIVISM?

The rapid advancement of the information and communication technology has enabled knowledge to grow at a tremendous rate. According to the American Society of Training and Documentation (ASTD), world knowledge has doubled in the past ten years and is doubling every 18 months. Information is also in a constant flux of change.

As university educators, we are expected to ensure the currency and accuracy of our course contents in our respective fields. Indeed, the rapid knowledge growth has challenged the university educators to reflect on appropriate strategies to enable themselves and their students to cope with such fast evolving and exponential growth of knowledge.

> "connectivism suggests that competency can be derived by forming networks that connect knowledge and experience of different sources (either human or non-human appliances)."

This leaves no room for university educators to be contented with course contents that are developed for students of previous academic sessions as the contents may already be out-dated and/or inaccurate by the time they are delivered in the present academic session. *The vast amount of ever-growing and evolving knowledge has also made it impossible to design comprehensive course contents that cover every aspect of a subject matter.*

Recognising the fact that a student will not be able to know and experience everything in this digital age, the connectivist view of learning emphasises the importance of forming networks of knowledge entities, which may then reside in other human and/or non-human resources. When knowledge is required, the students'

ability to form the right network for the right context is more crucial than trying to know everything within each entity.

The current established learning theories view learning as a centralised process, in which it places emphasis on the learning that occurs within the learner. It has a structure and knowledge is passed along to the students. Although social constructivism stresses the importance of social interaction and collaboration between individuals to construct knowledge, the knowledge construction process still focuses on the individuals within the group and the tasks for meaning making are often predefined. Such learning theories that emphasise hierarchical learning may not be dynamic enough to cope with the rapid knowledge growth. A more dynamic and breathable structure is needed to react to what is occurring.

Today, we have a generation of students arriving in our lecture rooms that are more and more comfortable with technology. New and emerging technologies are connecting them in ways never before possible. Through instant messaging, blogs, wikis, social networking platforms, multimedia and other "Web 2.0" tools as well as mobile technologies, their worlds are becoming more and more networked and engaging. Technologies are woven into their lives and cause a major influence on the culture and development of this generation.

As pointed out by Deubel (2006), student nowadays expect learning on demand, technology literate, multitasking, prefer active activities, and use tools to stay connected with each other. *This leads to the question whether the changing behaviour and needs of students demands reshaping of the learning approaches.*

IMPLICATIONS OF CONNECTIVISM TO EDUCATORS

Recognising learning as a network creation process will definitely impact the way we, the educators, design our instruction. It shifts our focus from merely delivering lectures to the tasks of presenting information as well as building a student's ability to navigate the information (Siemens, 2005b). He also stressed the importance of providing access to what is necessary to complement the knowledge a student currently possesses.

Educators of today should consider incorporating the use of available emerging technologies such as instant messaging, blogs, wikis, RSS, VoIP, and other social networking applications that support connectivity, knowledge sharing and collaboration into their instruction. Such tools will facilitate the development of connections by enabling our students to create their own learning paths.

The breathable structure suggested in connectivism also implies that decisions are based on rapidly altering

foundations. New information is continually being acquired. Hence, educators should focus on building our students' ability to draw distinctions between important and unimportant information. Educators should also equip the students with pattern recognition capability (Downes, 2005) to enable them to make sense out of the chaotic nature of knowledge space.

The ability to recognise when new information alters the validity of the state of knowledge gained yesterday is also critical. As emphasised in Siemens (2005b), knowing is no longer a destination but rather it is an alignment process to the dynamic environment. Indeed, this learning theory seems to prepare our students with the necessary abilities for lifelong learning.

CONCLUSION

Connectivism is not meant to replace the existing ideologies of learning. The conventional way of delivering the fundamental concepts, facts, and principles of a subject matter as part of the course content is still indispensable. This also means that the established learning theories are here to stay. Nevertheless, educators should also seriously consider complementing the current methods of instruction with the principles of connectivist learning as to meet the challenges of today's learning in the digital age as well as to prepare our students for lifelong learning.

> "educators should also seriously consider complementing the current methods of instruction with the principles of connectivist learning as to meet the challenges of today's learning in the digital age as well as to prepare our students for lifelong learning."

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Enhancing Lecturer-Student Interaction with Web 2.0 Technologies

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I n the '90s, embracing the Internet for teaching and learning (T&L) activities is seen as eerie and weird. However, as the end of the new Millennium's first decade approaches, the ways on how we use the Internet have begun to change. Developments in Web 2.0 tools such as blogs, Google docs, wikis and photo sharing are tremendous. Web 2.0 is used to describe current web applications, thus distinguishing themselves from previous generations of web software (Web 1.0).

Why Web 2.0 for T&L?

Traditional e-Learning (e-Learning 1.0) focused on using the Internet to replicate lecturer-led activities virtually. e-Learning 2.0 (i.e. the second version of e-Learning) is built around the concept of collaboration between students and the instructor. The T&L activity takes place through conversations and interaction among these two main entities. In this case, e-Learning 2.0 is believed to be 'a new torch' for knowledge acquiring processes, especially in the university settings (Ferretti et al., 2008).

Currently, the usage of social networking sites is a serious business. Major social networking sites include Facebook. com, MySpace.com and Bebo.com (Kelly et al., 2008). An interesting fact is that as of May 2007, there were over 14,000 Facebook users who identified themselves as employees of IBM (DiMicco & Millen, 2007). It is so popular that since January 2007 to date, an average of 250,000 new registrations per day has been recorded.

Social networking, as a promising technology in e-Learning, is seen to likely have huge impacts on T&L

process in the near future (Saeed &Yang, 2008). In my opinion, one central reason for using social networking in an academic setting is to investigate whether it enhances student's learning experience or otherwise. In the higher education context, a group of researchers from Newcastle University studied how social networking environments such as Friendster.com could enhance the learning process of university students (Charlton, Marshall, & Devlin, 2008).

As for myself, over the last couple of years, I have started embracing various Web 2.0 tools for carrying out academic activities. I am currently using blogs for TMT2053 (Computer Games Design and Development) and TMT1013 (Web Design and Technology) courses. In addition, I have also uploaded my lecture notes and conference presentations at www.slideshare.net, and shared other documents at www.scribd.com.

A question at this point would be whether the use of these Web 2.0 tools are instructionally sound? My response to this question is quite simple. The real issue here is whether we, as academics, have done what is necessary to achieve the learning outcomes (LO) of our courses.

Using Ning.com for T&L Activity

Unimas has its own learning management system (LMS) at http://morpheus.calm.unimas.my. This LMS is the official course authoring tool. I do use this facility to upload my PowerPoint lecture notes. However, I noticed the additional benefits of using Ning.com to facilitate communication among students. Ning.com provides

an additional room beyond the normal classroom environment. This is slightly beyond the scope of what LMS can offer.

During the 2008/2009 session, I require my students to sign up on *Ning.com* for the TMT1013 Web Design and Technology course. This site enables me to communicate with my students in a personalised shared learning environment. *Ning.com* also combines blogging with discussion boards.

This unique experience does not differ much from the normal physical classroom setting. However, this setting is far more powerful—it is available 24/7. Sometimes I receive messages from my students even at 3 o'clock in the morning! Any of my students can show up anytime and from any part of the world. Figure 1 shows two students who are online at a particular time.
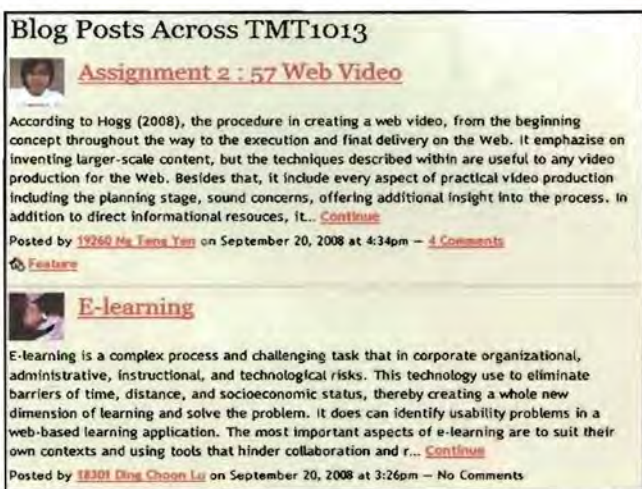

Figure 1: The 'Online' indicator.

Figure 2: Student blog posts.

At *http://tmt1013.ning.com*, the course homepage also works as a living room. Here the students can share ideas, posts questions or initiate discussions. As a site administrator, I can detect whether students respond to a particular discussion topic in real-time. In addition, students can extend their academic chats beyond the boundaries of certain learning units.

I meet my students face-to-face only once a week. Therefore, online communication is normally the easiest

way for me to reach them. I have realised that many students communicate much better through *Ning.com* online discussion forums and messages rather than in the classroom. Some of them become extremely active online as opposed to their normally shy and uncommunicative behaviour in the classroom.

In addition to participating in discussions, I had asked my students to post their assignments using the *Ning.com* blog tools. My reason for doing this is to provide them with a platform to showcase their work to the world from their own personal page. Figure 2 depicts a screenshot of students' assignment blog posts. The whole class could even comment on these assignments and contribute to idea development.

Survey and Discussions

Data was collected from 21 students, aged 20-28 years (an average of 22.4 years) from different faculties (n = 5) in Unimas. Students' responses on their satisfaction of using *Ning.com* were obtained. The questionnaire contains 18-item (under 6 main categories) on a 5-point Likert scale (with 1 being Strongly Disagree and 5 being Strongly Agree). The means and standard deviations were calculated for each question. Overall, the students were satisfied (mean = 3.8, S.D. = 0.934) with this online class management system (see Graph 1).
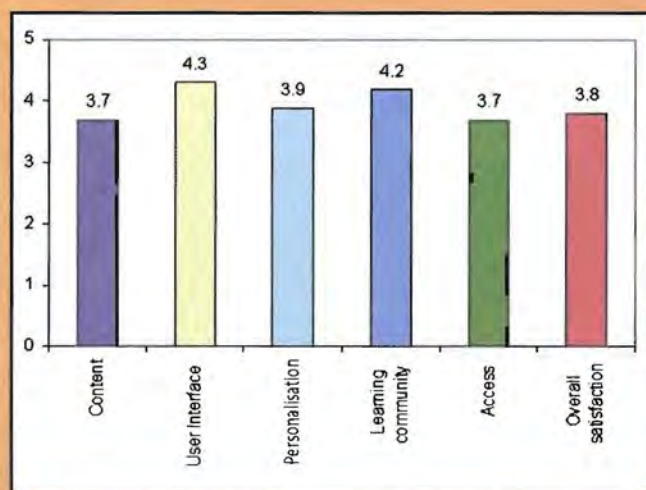
Graph 1: Students' satisfaction survey results.

For site registration, I made it compulsory for students to use their matric numbers and real names. Nicknames were not allowed so that the students took this social activity more seriously. I also use *Ning.com* to better learn and remember my students' names. During the last semester, I had students from five different faculties. Their online profiles and portrait avatars helped me to match faces to names quicker.

One key concern about social networking in a university setting is the issue of privacy. During this run, only my students and I could access this site. First, my students will receive an invitation e-mail to allow them to register. *Ning.com* also provides options for students to protect their privacy. They can opt to screen the comments that they received before displaying them.

Conclusion

Personally, I think among the important questions to ponder include: 'What are the educational uses a tool like Ning.com have in the academic setting?'; 'How do using these e-Learning 2.0 tools help us become more effective lecturers?'; and 'Can this tool assist us to meet our course goals and learning outcomes (LO)?'.

The implications of this article can be extended into research and practice. More research needs to be conducted to differentiate the effectiveness of the university LMS and Web 2.0 tools such as social networking sites. This is vital to assist academics achieve learning objectives.

In a nutshell, I strongly agree with the "need first, technology second" paradigm. Let us move toward using Web 2.0 technologies to enrich our teaching and learning activities. I anticipate that in the near future, everyone will consider Web 2.0 as really HOT STUFF!!

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Application of Technologies in Teaching and Learning of Engineering Courses

Technology may be regarded as the application of science to an area. The use of technology in many aspects of life has become a necessity. In view of this, technology has been applied in teaching and learning. In particular, educating future engineers require extensive use of technology. A recent transformation in the engineering education system employs Outcome Based Education (OBE) that makes technology an important component of teaching and learning. Technology can be regarded not only as the use of advanced teaching equipment but of equal importance, the knowledge of the teaching and learning process.

It is important to understand the method of OBE. OBE requires a shift in teaching where the results are the outcomes that reflect the understanding and change in attitude of the students towards knowledge that has been imparted. Technologies in teaching would cover aspects such as learning methods, resources, online learning or maybe practical training.

Generally, technology refers to the use of advanced equipment in teaching. However, the understanding of the teaching and learning process, learning theories, learning styles, instructional design and so forth are crucial in order to choose the appropriate teaching method. The choice of the teaching method then leads to the selection of appropriate tools such as slides, video and so forth.

Technology is not only useful for conducting teaching-learning activities but also meant to enhance lecturers' and students' understanding of a subject. The implementation of new technology may vary. The latest model of projectors enables lecturers to write onto the wall directly while online learning, e-book, e-journal, video conference and other related technologies are very useful for the dissemination of information. Technology-based instruction not only facilitates the learning process but also makes the learning process more enjoyable.

Courses in engineering often require practical demonstrations. This would require certain equipment be made available for the teaching and learning process. Such advanced equipment requires specialised skills to operate. Demonstration of such technology makes the learning process more meaningful and students would be able to critically analyse related problems or solutions.

With technology, group projects can be designed in such a way that will provide engineering insight. This implies that students need to engage with methods such as Computer Aided Design (CAD), robots, automation, modeling and simulation in order to accomplish the task. Using these technologies would make the students' projects more interesting, insightful, and exciting as well as ensuring students' continuous interest in the subject.

The process of teaching and learning requires a variety of methods. These methods may demand the use of different types of technologies. Such technologies may be costly, but the capabilities of the technologies to enhance students' understanding of a subject matter is priceless.

Tips for Creating Engaging Multimedia Learning

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INTRODUCTION

The use of multimedia in the classroom contributes towards innovative teaching and learning environments (Szabo & Kanuka, 1988). Effective instructional support has crucial impact on learning process, especially on the students' cognition. There is a rich collection of research and knowledge on how to effectively use media for instruction. Some aspects of teaching with media seem to be governed by common sense, while other aspects of using media in instruction are far more subtle and gained though experience and experimentation. "Visual literacy is an acquired competency in visual expression and communication that involves insights and skills no less disciplined that those required for proficiency in engineering and construction" (Szabo & Kanuka, 1988).

This article provides some useful tips on how to use multimedia effectively and efficiently in order to produce engaging multimedia learning environments.

CHOOSING INSTRUCTIONAL MEDIA

Some media formats are able to present particular types of content better than the others. Making a thoughtful decision on which media type is most appropriate for the content is the first step towards the successful use of media. PowerPoint can be used to show low resolution colour images, graphics, and video that cannot be reproduced on printed handouts (Tufte, 2003). Animation is appropriate when video may overload the students with too much detail, or when students must focus on specific details (Deubel, 2003). Video can be used when the content requires movement to clearly illustrate a concept (Orr, Golas, & Yao, 2004).

TIPS FOR EFFECTIVE USE OF MULTIMEDIA ELEMENTS

Graphics

• Avoid irrelevant graphics or clipart (Rieber, 1994).

• Incorporate text into the graphics. Include text frames with visual cues, graphics with an equal amount of text, and/or graphics with some text cues (Wileman, 1993).

• Keep the detail of a graphics at the level appropriate to the learning objective (Rieber, 1994).

• Use relevant images, and if possible, attach real life photos.

Audio

- Limit audio to what is relevant and use active voice. Use short sentences. Write the script for the ear (Orr et al., 2004).

- Break long message into chunks (Orr et al.,2004).

- Watch out for acronyms, technical jargon, and unfamiliar terms (Orr et al., 2004).

- Avoid long pauses in visuals while waiting for extended narration to finish (Orr et al., 2004)

- Alternate male and female voices to provide variety (Orr et al., 2004).

- When possible, provide a corresponding visual for the narration (Deubel, 2003).

Video

- Balance the level of detail with the pace of the video (Rieber, 1994).

- Present all information in three shot sequences: long, medium and close-up. Use close up shots to grab student's attention and imply that something is important. Use long-shots to establish frames of reference (Orr et al., 2004).

- Focus on a new subject sufficiently long to enable students to register what is being shown   (Orr et al., 2004).

- Keep the main subject well lit and watch for possible background distractions (Orr et al., 2004).

- The eye focuses on lighted instead of dark areas, and movement instead of static images (Orr et al., 2004).

- Use audio and video to reinforce each other (Orr et al., 2004).

- Present a series of visuals before or at the end of instruction to stimulate recall of prerequisites (Orr et al., 2004).

- Use still frames. Video has lower resolution than graphics. Use graphics to reduce irrelevant details and highlight key information (Orr et al., 2004).

- Use a tripod

- Keep video to 3-5 minutes.

CONCLUSION

This article highlights the importance of choosing the appropriate multimedia elements for delivering a particular content. It also provides useful tips on how to effectively use the multimedia elements to enhance the teaching and learning process.

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Augmented Reality in Education

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Unlike Virtual Reality (VR) that aims at replacing the perception of the world with an artificial one, Augmented Reality (AR) has the goal of enhancing a person's perception of his surroundings. Being partly virtual and real, the new interface technology of AR offers many potential applications. These applications include aiding education, training, repair or maintenancemanufacturing, medicine, warfare, and etc.

Most of these potential applications stem from the fact that the interface can display relevant information at the appropriate time and location. One crucial problem in the development of an AR system is how a user's performance can be affected by different decisions made when using a three-dimensional illustration.

The Educational Potentials of AR

The use of AR technology in the training and learning environment is encouraging because this technology offers learning through visualization to users. The users of an AR educational system have the freedom to take risks, undertake adventurous or novel actions without suffering the real life consequences of mistakes caused by their actions. As such, AR provides a safe environment for learning or training to take place.

AR techniques offer potential solutions for training tasks. With AR, the computer provides additional information in the user's field-of-view, typically via the Head-Mounted Display (HMD), that enhances or augments his view of the real world (Janin, Mizell, & Caudell, 1993). This contrasts with the Virtual Reality (VR) approach, which replaces the real world environment with a virtual one (Azuma, 1997).

AR potentially provides training guidance and experience via the virtual world or desktop environment while allowing the user to see and touch real objects. The help provided by the AR system may include annotated support for naming system components, functionality of the system or the presentation of documentation such as maintenance or manufacturing records.

AR has many advantages over traditional manual-based and VR models for training and learning applications. A main advantage is that the user can see and touch real objects while having interactive guided support which allows the user to work at his own pace (Ng, Ma, & Ritchings, 2004). This support includes highlighting and sequencing specific objects in the user's field-of-view depending on the task and his experience or the way documentation is presented. In addition, it would be possible for a remote expert to provide assistance through controlling the information displayed by the system.

AR techniques will have major influences on the educational process in the future with a huge range of potential applications. This technology has the potential to revolutionise education, particularly for higher education. Multimedia-based systems are probably better suited for primary and secondary education since the subjects taught at these levels focus on broad principles or general concepts. However, highereducationdemands more in-depth understanding of complex subjects. These subjects are often multi-disciplinary in nature with subtle blends of theoretical and practical knowledge.

AR, for example, could be used to provide access to sophisticated laboratory facilities without imposing high costs which are normally associated with the maintenance of such facilities. The exact form of these virtual teaching aids depends very much on the nature of the subject to be delivered. A broad spectrum of technology concepts can be made available but it will be important to understand where and how to apply them.

Recent advances in information technology have made it feasible to employ distance learning systems to support the growing demands for educational services. These courses can be made available to people at home, making it easier to gain additional qualifications outside normal working hours. Whilst it is possible to deal with theoretically-based courses this way, it is much more difficult to deliver 'hands-on' practical courses that are important for many design-based subjects.

For design courses, it is very important to allow the student to be in 'contact' with the design environment. In this regard, AR can be used to simulate studios or workshops that are conventionally used for generating, visualising, developing and evaluating ideas in two and three dimensions. The AR system is essentially an interactive simulation that can represent a real or abstract system. The simulation is a representative computer-based model which provides appropriate data for visualisation (may also include auditory and haptic/kinaesthetic information) or a representation of the system.

In order to deliver an effective service over a network, it will be necessary to understand the performance requirements of the AR system. The remote user's computer will have to be based on a relatively high performance system where the interaction and image rendering will be undertaken. User interaction and the system modeling will be confined to the host machine thus overcoming

the performance limitations of high performance networks.

The value of new technologies, such as AR, in education is obvious. Giving people hands-on experience is always better than trying to describe them. Schools may also benefit from the use of this new teaching paradigm and approach. More capabilities can be introduced to and implemented by teachers and students through those sophisticated technologies (Dave, Bernie, & John, 1993).

Another interesting use of AR in education is the creation of books with three-dimensional virtual models appearing out of the pages when the users look at them through a handheld AR display. These models will appear attached to the real page. The users can see the AR scene from any perspective simply by either moving themselves or the book. Such models can be of any size and can be animated. Indeed, such an AR view produces an enhanced version of a traditional 3D pop-up book (Mark, 2002). By implementing this technology, we will then not regard textbooks as static sources of information like what they are traditionally supposed to be. Through the use of AR, the printed pages can give more benefits to the students where they can take part in as well as interact with the pages.

//Conventional //Conventional

//Future //Future

Augmented Toys Technology
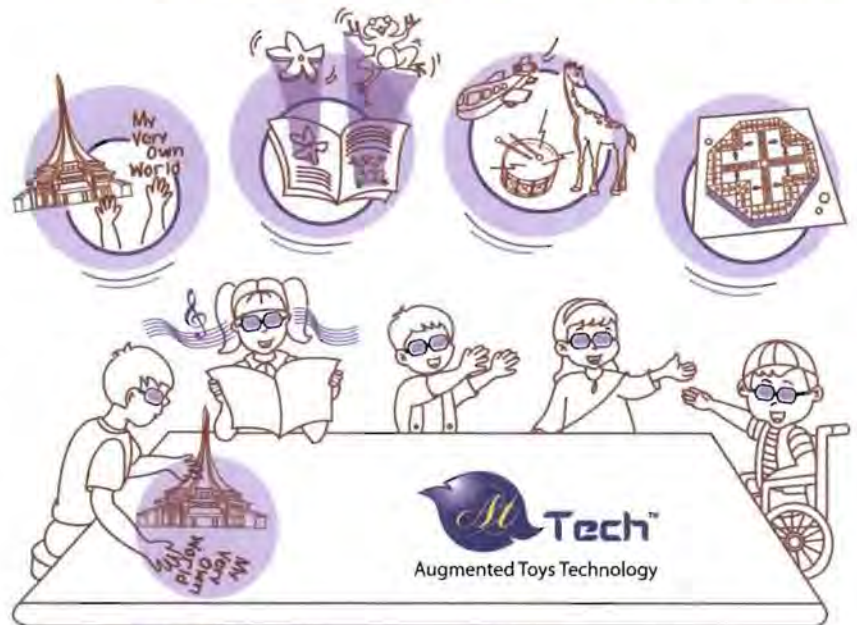
AR in Education

// Advantages

i. Provide inherently safe visualization and interaction
ii. Allow intuitive interaction
iii. Motivating
iv. Allow interactivity
v. Allow learning by 'doing'
vi. Allow mistakes without the real consequences
vii. Enhance sense of presence

// Disadvantages

i. AR is frequently seen as a visualisation front end
ii. Low cost AR systems suffer from poor quality interface
iii. AR does not work for all kinds of educational problems

Conclusions

Learning through direct experience is considered to be more effective than just passively receiving information. The AR approach supports this view. This approach promotes 'active' learning, both psychologically and physically thus encouraging students to have diverse thinking perspectives which would better prepare them for their other daily activities.

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How To Take Attendance for 200 (or more) Students Within 15 minutes

"An Experience from FCSIT's 1st Year Subject: TMP1613: Multimedia Technology"

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Taking attendance during a class session can be an irksome task, especially if the number of students exceeds 150. Based on my survey, students require 10 to 15 seconds to identify and locate their name and then sign off on the attendance sheet. In most instances, this task is not complete even at the end of class. This situation can thus disturb and reduce the concentration of the students.

My article presents a new method that can effectively reduce the time taken for this task. This article will explain how by utilising sorting methods, reallocating seating positions and by using different coloured paper for the attendance sheets, contribute towards the effectiveness of the task.

The implementation of this new method shows that it can shave 3 to 7 seconds off the time taken for each student to identify and locate his/her name. In conclusion, by reducing the time taken for recording attendance, it gives more time for the students to concentrate in class and hence, increases the effectiveness of the teaching and learning process.

Current Problem

In UNIMAS, the task of recording attendance during class session can be tiresome, especially if the number of students exceeds 150 (Sidi, Junaini, & Ling; 2007a). Based on my 5 years experience teaching TMP 1613, a multimedia technology

subject, each student normally requires 10 to 15 seconds to locate his/her name on the attendance sheets and then sign off. This task is not normally completed even at the end of class (Sidi, Ling, & Junaini; 2007). Thus, this scenario can distract the students' concentration in class (Sidi, Junaini, & Ling; (2007b). On the other hand, students may also use this method of taking attendance as an opportunity to cheat about their presence for class as they can sign in after the class.

Methods

Two methods had been implemented to reduce the amount of time to undertake this task: the sorting method and the parallel method.

Sorting Method

In this method, the list of students' names is sorted according to faculty and matric number, either in ascending or descending order. The basic idea is to organise a list with a unique identity. Although the identity card number is unique for each student, the matric number is more often used in the university.

Parallel Method

The main idea behind this method is to divide a large list into smaller lists and then to execute them in parallel. Each of the resultant attendance sheets comprises a maximum of 50 names. Next, the above sorting method is applied to each attendance sheet. These sheets are then labelled with the faculty's

name as well as the range of matric numbers on that sheet. After that, these sheets are printed on different coloured papers. Finally, they are placed at different locations in the lecture room and these placements with respect to locations remain until the end of the semester. It is not mandatory for students to sit at the locations specified in the name sheet. They are still allowed to sit anywhere according to their preference. However, students must first sign off on the attendance and then search for their preferred seats.

How to prepare these attendance sheets?

- Divide students' names list based on faculty. (If only one faculty is involved, sort the students' names according to matric numbers in ascending order.)
- For each faculty, sort the students' names based on matric numbers in ascending order.
- Select only 50 names for each attendance sheet. Do not exceed this limit.
- Label every sheet with the faculty's name together with the range of matric numbers. (If only one faculty involved, label the sheet with the range of matric numbers only.)
- Print these attendance sheets on different coloured papers, for example white, yellow, green or pink.
- Identify the most suitable location for every sheet. For example, you may want to divide the lecture hall into 4 different locations. In the Lecture Hall at CFT1,
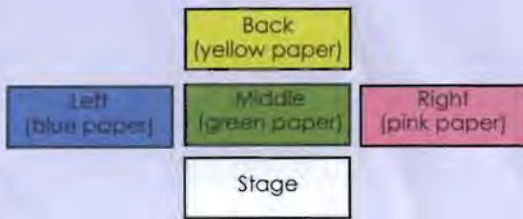
Figure 1: Proposed locations for the attendance

Average time taken for a student to complete the task	Total number of students completing the task in 1 minute	Time required to complete a 50-students name list
5 seconds	12 students	4 minutes 10 seconds
10 seconds	6 students	8 minutes 20 seconds
15 seconds	4 students	12 minutes 30 seconds

Table 1: A comparison of time needed to complete the task

have identified the locations as Middle, Left, Right, and Back (as illustrated in Figure 1).

- Place attendance sheets at these locations.
- Re-allocate the students' seats based on these 4 locations. However, it is not compulsory for students to sit at that specified location.
- Request for the attendance sheet 30 minutes after it is distributed. The task should be completed by that time. Repeat this process for the next class.

Let us verify this result through a quick calculation.

1. If a student required an average of 5 seconds to find his/her matric number and sign off, then within 1 minute, 12 students manage to complete the task. Thus 50 students require 4 minutes 10 seconds to complete the task.

2. If a student required an average time of 10 seconds to find his/her matric number and sign off, then within 1 minute, 6 students manage to complete the task.

Conclusion

This article shows that utilising the sorting and parallel methods has shortened the time required to take students' attendance for a large class. With an average of 15 seconds per student, the task to complete a 50-students name list required 12 minutes and 30 seconds only. Therefore, this method can be used to cater for any classes or tutorial slots without fear with respect to the number of students.

Therefore, sort them out and parallel run them! Happy Teaching!!

Figure 2: Sample of attendance sheets in different coloured papers.

Implementation and Discussion

Based on my survey, before these methods were implemented, each student required an average of 10–15 seconds to find his/her matric number and sign off his/her attendance. Due to the large number of students per class, normally within the two hours of lecture, only 80% of the attendance sheet was completed. In contrast, after these methods were implemented, 100% of this task was successfully completed within a much shorter period of time.

Thus 50 students required 8 minutes 20 seconds to complete the task.

3. If a student required an average time of 15 seconds to find his/her matric number and sign off, then within 1 minute, 4 students manage to complete the task. Thus 50 students required 12 minutes 30 seconds to complete the task

As the attendance sheets are executed in parallel, 4 different attendance sheets are completed almost at the same time.

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Adopting Technologies in Engineering Teaching and Learning

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In 1977, educational technology was defined as a complex integrated process involving people, procedures, ideas, devices, and organisation for analysing problems as well as devising, implementing, evaluating and managing solutions to those problems (Zarina, 2007). This definition was revisited in 1994 where the importance of acknowledging the roles of media, systematic instructional design and performance technology was highlighted. This includes the use of various teaching tools to improve students' learning.

Learning is not a spectator sport. Students do not learn much just by sitting in the classes listening to lecturers, memorising pre-packaged assignments and spitting out answers (Chikering & Gamson, 1991). Instead, students must make what they learnt as part of themselves by talking about what they are learning, relating it to past experiences and applying it to their daily lives. These promote dynamic and active learning.

In order to create an active and effective teaching and learning process in engineering studies, adoption of technology in teaching strategies is necessary.

This technology does not only refer to the abilities and skills in using computer or electronic devices but also dedicated to the theory and practice of design, development, utilisation, management and evaluation of processes and resources for learning.

The most commonly used technology in the Faculty of Engineering is PowerPoint presentation. Adopting PowerPoint presentation can be beneficial for certain courses. The effectiveness of PowerPoint depends on the creativity of a lecturer to imbed slides that require activity during the learning process. For example, the utilisation of PowerPoint games templates can help lecturers trigger students' interest (Rozaitits & Baepler, 2006).

Adopting the Internet into a class activity is another strategy that can enhance active learning. This strategy can be integrated with the Problem Based Learning approach where lecturers pose a topical problem and require the students to solve it using the World Wide Web. Nothing has captured the imagination and interest of educators simultaneously around the globe more than the Web.

With the Web, learners are able to access a variety of resources that help them to discover things on their own. Learners can also engage and keep themselves updated with current technologies and ongoing developments of the world. Developing a webquest is a way to make the activity more interesting. However, there are some demerits to this approach, such as plagiarism and copyright issue. Lecturers are advised to give proper guidelines to the learners.

Review of journals is also one of the strategies in engineering that can be integrated with technology to improve learning. Lecturers can employ case studies, debate or journal writing. The use of internet, online test and surveys, online discussion board, video conference, e-book and e-journal can enhance the effectiveness of these activities. One of the activities that can be carried out to make the journal reviewing activity more interesting and effective is by adopting the Half-life Game (Salmon, 2003).

In this game, students are required to summarise a journal and post it on a discussion board. Other students are asked to reduce their friends'

summary to half the original length. This process is repeated until the write-up is summarised to only a few words. A further step, in order to make the activity more interesting is to require the students to publish their summary regarding the journal on an online blog. Students will not only learn engineering knowledge but also familiarise themselves with the current technologies as well as improve their computing skills.

Other technologies such as podcasting, vodcasting, wikis and game simulation can also be adopted into the teaching and learning of engineering. In addition to these, with the current engineering technology, the world also witnesses the development of new innovations to be used as teaching and learning aid such as portable projector, wireless tablet PC, "SMART Board", document camera and so forth. "SMART Board" is a large interactive white board that is connected to a classroom computer and installed with a software.

The software allows instructors to interact with a touch-sensitive whiteboard surface using their hand as a mouse and the presentation screen as a computer monitor. Touching the presentation screen allows the instructors to open Web pages and files, control applications installed on the computer and also write and save notes.

A document camera is a high quality digital camera that is able to project books, photos, transparencies and three-dimensional objects onto the screen in a classroom. This camera allows instructors to zoom in and focus on small fonts or details on the objects. All these aid can support and ease the teaching-learning process.

Various researchers have suggested that adopting technology can enhance and improve learning (Owston, 1997). In engineering, the use of technologies offers various advantages. However there is no consensus as to how the enhancement and improvement can be accomplished.

It is generally recognised that technology by itself is insufficient to achieve the types of changes envisioned by reformers. Adoption of technologies in teaching and learning is only effective when treated as one component of the implementation strategies that also encompass curricular reform, sophisticated and multiple assessments, effective professional development, well-maintained technology infrastructures and support systems, attention to equity and the restructuring of organisational practices, budgets and policies.

Therefore, in adopting new technology to all areas of teaching-learning for the field of engineering in particular, instructors should consider the contribution of technology from the perspective of whether the technology increases access to education, improves learning and is cost effective.

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TREE METHODOLOGY:
A Fun Way To Enhance Students' Writing

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"A fool sees not the same tree that a wise man sees," William Brake once wrote. My creative writing students are no fools. They just need reminding now and then. Theory is what they get inside the classroom, inside their textbooks, inside their heads as they listen to their teachers. In theory, a tree is just a tree. Or worse, a metaphor, such as the tree of knowledge. True, but trite, and done to death. Alexander Pope wrote about it three hundred years ago:

'Tis education forms the common mind,
Just as the twig is bent, the tree's inclined.

Ask your students to write a sentence about a tree and they'll scratch their heads and look at you funny, but they will come up with a sentence. Then read the sentences aloud, without identifying (or embarrassing) the culprit. This lets the students hear how their classmates approached the same sentence – though with very different, or even startling results. Some will not be sentences at all, but sentence fragments, missing either a subject or a verb. Now you can turn this into a mini lesson on grammar: what constitutes a sentence and why. Or a lesson on style: are there too many adjectives and adverbs? Are word choices appropriate, or do the connotation of some words go against what they are trying to say? Are the sentences vague or specific? Are they interesting or bland? Are they thought provoking, insightful or as lifeless as a dead leaf?

For another lesson (after they have had plenty of time to forget), ask your students to write a descriptive paragraph or an essay about a tree and they will probably groan. They will say that the topic is boring. It is not the topic that is boring; it is their preconceived ideas about the topic that is boring. They will write, but their writing will lack focus because they are thinking about trees in general. Instead of probing their brain a little, they will limit themselves to the most obvious details: the leaves, the branches, the trunk, and the roots. And yawn.

"Go beyond the obvious!" I tell them, and they blame the subject. In addition to their lackluster writing, they will be missing an opportunity to learn about writing. So every semester I take my writing students outside for a little tree methodology. Not once, but twice.

First off, writing is about making choices: subject, purpose, approach.

So I approach my tree, point and say, "What is this?"

"A tree," they all reply, as if I'm stupid.

"You're wrong!" I reply. Unlike theory, practical experience and life are rarely straight forward. "This is *not* a tree," I insist.

They start to protest. "Look at the leaves!"

"Yes, but those leaves don't belong to the *original* tree. They belong to the strangler that grew around it and strangled the host. I point out the hollow inside, where the original tree had decayed. I also show them clumps of old bark trapped among the strangler branches and point to another tree with the same bark.

"That's your tree over there – that's what it looked like. So how would you describe this so-called tree?"

"It's haunted," a student from Sarawak says, and gives his reasons based on his Bidayuh beliefs about strangler trees.

Fascinated, we all listen and learn.

Others join in, saying why they don't like this tree, especially after I mention two types of snakes I had seen in the tree as well as a bat. Some point out the trash thrown inside and around the tree, including chunks of concrete, wire, as well as the mosquitoes they are slapping away from their faces and arms.

"So you could describe this tree as a haunted tree and support it with all the examples you just gave me, right?"

They agree they can. They start writing, and I stop them. Writing, as I mentioned, is about choices, so I ask them, "How else can you describe this tree?"

"As a living tree," a student replies. "It's full of birds."

"And leaves," adds another student.

Forgetting that it is haunted and also the mosquitoes, which seem to have disappeared, they start seeing the vibrant life in the tree – the wide variety of birds and nests and all of the insects.

"Is there another way you can describe this tree?" They're stumped.

"Can you climb this tree?" I ask.

"Easy," some of the guys say.

Noting the wide girth, a lady says, "You can play catch around this tree or hide and seek."

I ask, "Can you describe this tree as a playground?"

"Yes."

"What else can you add for support?"

They draw a blank, until I point at a branch, where one section is parallel with the ground.

"You can hang a swing from there!"

Others see the possibilities, as they think back to their childhood.

Writing involves some thinking and reflecting.

The Sarawak student adds, "You could build a tree house, right there," and points out the branches that would support it.

"Any other way to describe this tree?"

"You could describe it physically," someone says.

"Yes," I say, "either an accurate depiction like a painter, or an impression of it – depending on the light, your mood, and your purpose."

We discuss various ways to approach it as a writer – from a holistic impression to something more straightforward, starting at the top and working down to the roots.

"And you don't have to describe the whole tree either," I add. "You could concentrate on the leaves, or the trunk, or the roots, or the branches – one or all of them."

Students are nodding, seeing the possibilities,

limited only by their imagination.

"Any more ways to describe this tree?"

They look at me with big question marks in their eyes as if to say, "You mean there's more?"

I nod and wait.

"You could describe the ambiance around the tree," someone says.

"Yeah, the shade," another points out.

"The breeze."

"The view."

We all turn to look away from the tree and admire the surrounding scenery – a view they can't find in the classroom.

Now the lesson.

I tell them, "I don't care how you describe this tree, so long as you support what you say with concrete examples, reasons, details and facts. Be selective with your details, too. Don't start saying this is a haunted tree and end up calling it a living tree or a playground – unless your *purpose* is to write a compare and contrast."

Suddenly the topic of writing about a tree is no longer boring to them, and neither will their writing be boring to read. When you give students choices, and let them choose their own approach, they will take a personal interest in the subject – as they did this tree – and their writing will improve dramatically.

Later, back in class, I tell them, if they wanted to, they could also write a narrative about a tree experience they may have had, like the time they fell out of a tree or when the tree down the road fell on a car during a storm. Or they could write an article about the history of an unusual tree, or an essay on why they like a particular tree or the significance of trees in their lives (and in their studies). Or they could even write a poem about a tree or trees in general and emulate Joyce Kilmer who wrote:

> Poems are made by fools like me,
> But only God can make a tree.

Later in the semester, I will take them outside again to recite their poems – the ones they wrote or ones they wished they had written – beneath another tree. But before we begin, I will teach them about sensory details in order to make their writing more alive for the reader. Again, I get them involved by telling them to close their eyes and concentrate on the sounds, the odors, what they feel (and how they feel), and taste, and have them write them down (momentarily opening their eyes, of course). After about fifteen minutes, we list out what we heard.

"Birds, rustling of leaves, rustling of newspapers (which they're sitting on), twigs snapping, leaves falling."

"Traffic," someone adds.

"Traffic is vague," I say. "Be more specific."

"The steady drone of traffic."

"Better. Is that near or far away?"

"The steady drone of distant traffic."

"Good."

Others can hear motorcycles or buses or even an airplane flying overhead.

"Smell anything," I ask.

"Perspiration, perfume, dirt, dried grass, leaves..."

"Taste?"

"Dryness, an earthy taste, left-over lunch, the hair in my mouth pushed by the breeze."

"I like that last one – it's vivid. We can picture it. How about feel?"

"The breeze."

"Where?" I ask.

"On my face," says one student.

"Through my hair," says another.

"I feel totally relaxed," someone adds. "This is fun!"

Theory is rarely fun, but tree methodology? Every time.

"And sleepy – I was up late last night writing my poem."

"That's fine – those are feelings. And yes, you'll have a chance to read your poem. Feeling anything more?"

"Ants crawling on me!"

"A mosquito bit my leg."

"A leaf just fell on my head!"

"How is that for inspiration?" I say.

Later, after they recite their poems, I give them a fun topic inspired by the leaf: "It fell from the sky."

"Now when you write – whether it's a poem or a narrative or even an essay – try to use sensory details, especially what you see and hear, because you are the eyes and ears for the reader."

They write that down. I'm getting through.

"Sensory details also makes your writing, your settings, seem more real, too," I tell them. "But you can't always go outside to the actual location and describe it. Sometimes, you can only visit it in your mind's eye. Just tune everything else out and concentrate and let those sensory details inside of your memory come back to you and pretend you're standing in front of that very tree."

Since students do not use their eyes often enough (let alone their other senses) to see what's out there in the real world, away from the classrooms, I remind them of what Helen Keller wrote in an article titled, "Three Days to See."

...Use your eyes as if tomorrow you would be stricken blind. And the same method can be applied to the other senses. Hear the music of voices, the song of a bird, the mighty strains of an orchestra, as if you would be stricken deaf tomorrow. Touch each object you want to touch as if tomorrow your tactile sense would fail. Smell the perfume of flowers, taste with relish each morsel as if tomorrow you could never smell and taste again. Make the most of every sense: glory in all the facets of pleasure and beauty which the world reveals to you through the several means of contact which Nature provides.

Students, I feel – based on their writing that I have been marking for over a decade – whether English is their first or their second or third language, need less theory and more tree methodology. Otherwise, all of their content seems more or less the same. They need to be taken outside or led to the nearest window to see the world as it is (even if there is not a tree in sight). They need to see the possibilities that are waiting for them to write about. As a teacher, my goal is not just to teach these students to write better, but to teach them to see, to understand, and to appreciate not only trees but also life, as well as the world they are living in, so they too can become wise and see a tree like Blake's wise man.

Besides, as Goethe once wrote:
> Dear friend, theory is all grey,
> And the golden tree of life is green.

My point exactly.

# # #

Morpheus @ UNIMAS:
An Update

Morpheus, the UNIMAS online learning system was introduced in 2006. It is powered by Moodle, a free learning management system that enables us to create powerful, flexible, and engaging online learning experiences. Morpheus runs as an interactive web site that allows various learning resources and activities to be incorporated to create engaging, collaborative, and student-centred learning environments.

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UNIMAS practises a blended learning policy, in which online learning is not to replace the lecturer but rather to enhance the teaching-learning process. Learning solution is created through a mixture of face-to-face and online learning so that the online component becomes a natural extension of the face-to-face learning. In other words, lecturers are expected to give a well-structured introductory lesson in the lecture room and then provide follow-up online materials and activities to enrich as well as enhance students' learning experience.

Promotion Initiatives
University-Wide Training Series

As an effort to promote the use of this online learning system, the Centre for Applied Learning and Multimedia (CALM) has initiated two series of training session targeted at the academic staff of all faculties and the Centre for Language Studies in the year 2008. Such effort is in line with the aim of CALM to equip all academic staff of the university with the necessary instructional knowledge and technical skills to incorporate the various online activities supported by the Morpheus system into their courses. Indeed, we are very encouraged to see the enthusiastic participation of many academic staff members in the training sessions that we conducted.

Such university-wide training seems to create positive impact. Morpheus has gained popularity among lecturers and students. Our record shows that a total of 180 courses

were actively online last semester - Semester 1 2008/2009. This also implies that slightly more than 40% of the university courses offered during this particular semester were complemented with some online activities.

> "CALM hopes that such initiative will sustain the award recipients' enthusiasm in enhancing their online teaching-learning strategies, inspiring other academic staff members who are currently using Morpheus to improve their online courses, as well as attracting those who are yet to benefit from this system to embark on it."

Many of the instructors of these online courses had made use of the Morpheus system to upload their lecture slides and additional reading materials; provide links to other resources on the WWW; put up announcements; create asynchronous discussion forums that give opportunity for students to pose their thoughts, read and analyse their peers' contributions; moderate the discussion forums with constructive feedback; conduct online quizzes that are automatically marked by the system; as well as support the environmental friendly move by using the system as a platform for students to upload the digital version of their assignments.

UNIMAS Outstanding Online Course Awards

As a way to recognise the efforts undertaken by the academic staff in utilising the Morpheus system,

CALM has initiated the inaugural UNIMAS Outstanding Online Course Awards to acknowledge individual academic staff members who have successfully put up innovative, user-friendly and instructional sound online initiatives for courses offered in Semester 1 2008/2009.

CALM had announced the invitation for nominations of these awards in October 2008 for a period of one month. All registered Morpheus users are allowed to nominate the courses that they would like to be considered for the awards. This includes allowing the lecturers to nominate their own courses. Nomination process is kept simple. Nominees are only required to fill out a form and send it via e-mail or by hand to CALM.

The centre has also appointed an evaluation panel that comprises a number of university experts of various related fields for this purpose. Members of this evaluation panel are expected to seriously consider aspects such as the organisation and layout of the online contents, appropriate use of language as well as the instructional methods used, in determining the best online courses. At the time this article is written, the members of the evaluation panel are still in the process of evaluating the shortlisted courses. Results will be made known in early 2009.

CALM hopes that such initiative will sustain the award recipients' enthusiasm in enhancing their online teaching-learning strategies, inspiring other academic staff members who are currently using Morpheus to improve their online courses, as well as attracting those who are yet to benefit from this system to embark on it. The centre plans to run this promotion initiative every semester.

Things You Can Do With Morpheus

(which you might not have known)

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Finding ways to keep your online courses 'alive' with minimum effort? Why not try these two Morpheus features?

RSS feeds – A simple step to keep your online course updated with the latest contents from other web sites

RSS stands for Really Simple Syndication and is a format for distributing news and headlines on the web. Morpheus has a block which enables the headlines from external websites to be displayed within the system. These headlines are linked to the detail contents. The block will update to show the latest information as the information on the external web site is changed.

Indeed, with such features, the instructor will only need to add the resource once and the system will automatically check for updates and display the latest information. This helps to keep an online course 'alive' with minimum effort. Students will be able to stay abreast of the latest update every time they access these online courses. Nevertheless, do note that not all web sites make their contents available for syndication by providing a copy of their content formatted according to RSS standards.

For technical enquiries, please e-mail our IT Officer at wzsnorizan@ calm.unimas.my.

Wiki – An easy way to facilitate collaborative work on your online courses

Wiki is another interesting feature available in Morpheus. However, not many online course instructors have attempted this feature in designing their learning activities. I believe those who had made use of this feature, including myself, found it rewarding.

Wiki in the Morpheus system provides a common online editing space. Just think of it as the web pages that we are familiar with. It provides a simple interface for adding pages, formatting text, inserting images, and creating links; allowing the easy creation of web pages with multimedia content by non-technical users.

The instructor may assign a wiki to each student to work on or in a group project, the instructor may assign a wiki to each group for presenting the outcomes of their work. Group members build and edit the content of the wiki page. This common editing space enable group members to track their most recent version of their work from any places with internet access, check for overlapping or similar ideas or resources and provide them a central place to collectively prepare the final product.

In addition, the instructor can easily monitor the progress of each group, provide constructive feedback if necessary and easily verify the contribution of each group member through the system. Indeed, such monitoring and verification are often unfeasible in group projects that are based on the conventional paper-based reports.

In brief, with such online activity, the instructor will only need to spend some time to set up the necessary wikis and leave it to the students to keep the online course 'alive' through their active participation and collaboration to get their projects done online.

Want to add this learning activity to your online course but unsure of how to start it; do drop an e-mail to our IT Officer at wzsnorizan@calm.unimas. my.
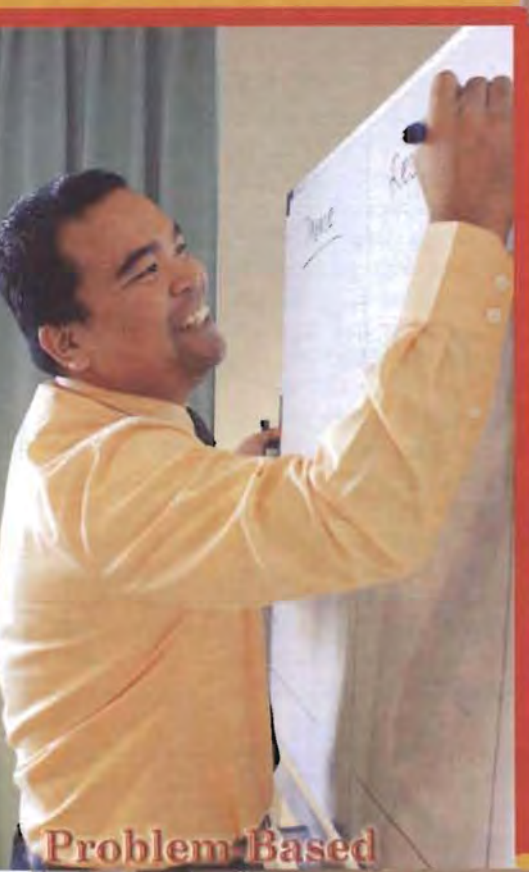
PGDip in Teaching and Learning
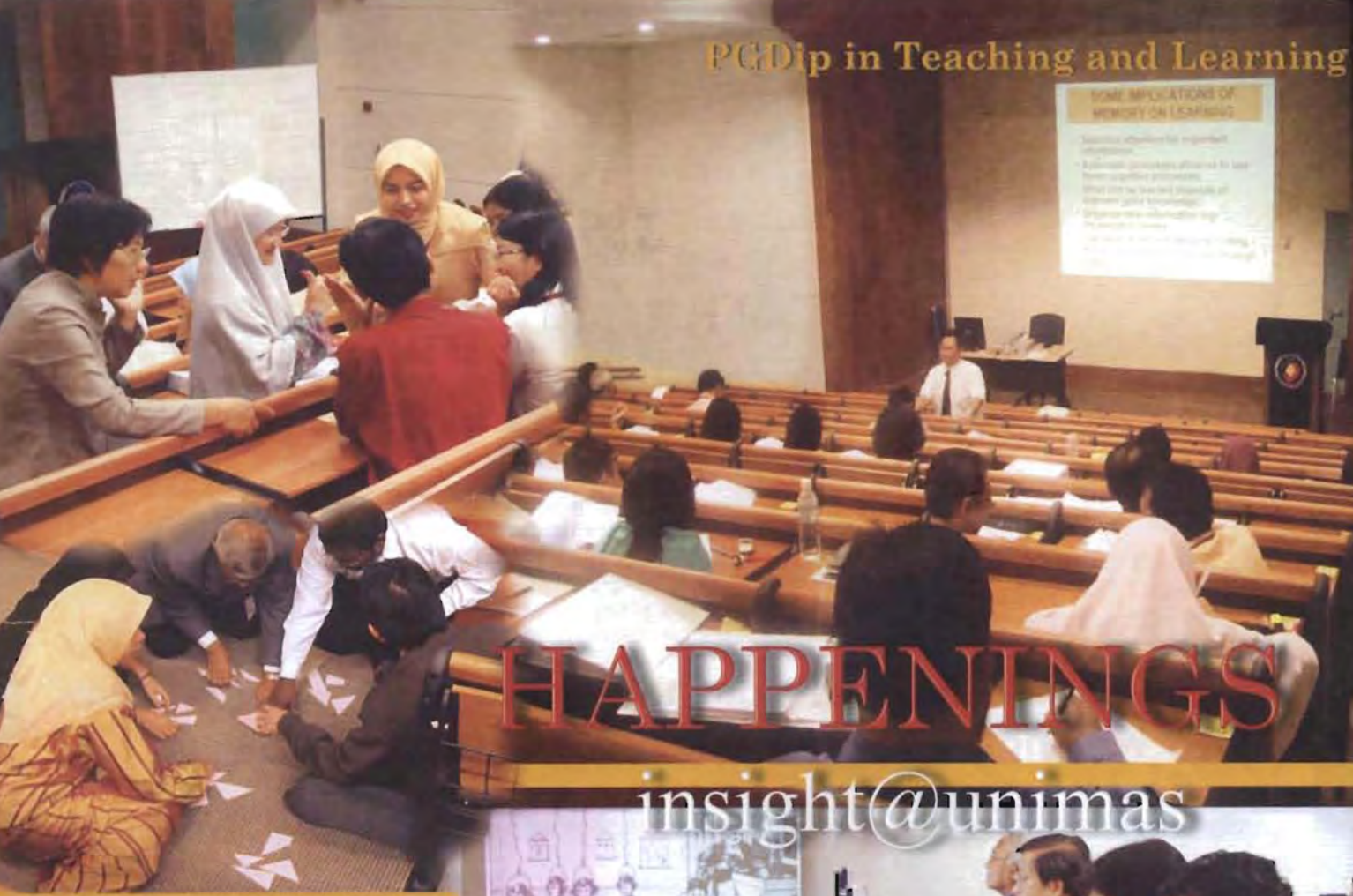
HAPPENINGS

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UNIMAS Online Learning System Training

Problem Based
Learning Workshop