A THEORETICAL FRAMEWORK FOR THE INTEGRATION OF INTERNET-BASED e-LEARNING FOR MARA HIGHER INSTITUTION (INSTITUT KEMAHIRAN TINGGI MARA (IKTM))

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A Theoretical Framework for the Integration of Internet-based e-Learning for MARA Higher Institution (Institut Kemahiran Tinggi MARA(IKTM))

By

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ABSTRACT

Abstract of thesis submitted to the Senate of Universiti Putra Malaysia as Patial fulfilment of the requirements for the degree of Master of Science

A Theoretical Framework for the Integration of Internet-based e-Learning for MARA Higher Institution (Institut Kemahiran Tinggi MARA(IKTM))

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The internet and its different tools have brought momentous changes in the way people think, create, store, disseminate and acquire knowledge. Easier access to internet information resources, the ability to find timely information from different sources such as online databases, and instantaneous communication with experts worldwide, have helped create innovative teaching and learning environments and opportunities for educators and learners. These transformations have been reshaping the teaching and learning environment, whether in educational institutions or in professional organizations and have led to the emerging of the new phenomenon known as the internet-based e-learning.

A meaningful implementation of e-learning via the Internet depends on many different factors but at the same time it is also faced by several problems. This project is aimed to propose a theoretical framework for e-learning via the internet for MARA Higher Institution(IKTM), that takes into consideration the factors and problems discussed. The study explores the factors, or elements and predicaments affecting internet-based e-learning, in terms of planning, designing, implementing and managing internet technology in teaching and learning. A Soft System Methodology (SSM) approach is applied to the problems and a survey was carried out to help identify the internet tools that are appropriate for the type of training offered in the institution. Based on the study made, a theoretical framework for the production of Internet-based e-learning is proposed to guide or improve its implementation in MARA Higher Institution.

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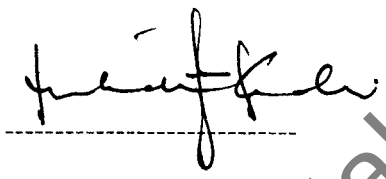
Saya mengaku bahawa ini hasil karya saya sendiri kecuali nukilan-nukilan dan ringkasan-ringkasan yang tiap-tiap satunya telah dijelaskan sumbernya.



NORLIDA BT ABDUL KADIR

NOVEMBER 2002

Saya mengesahkan telah memeriksa kertas projeck bertajuk - 'A Theoretical Framework for the Integration of Internet-based e-Learning for MARA Higher Institution (Institut Kemahiran Tinggi MARA(IKTM))' oleh NORLIDA BT ABDUL KADIR.

Saya memperakukan bahawa projek ini di terima bagi memenuhi sebahagian syarat ijazah Master Sains.

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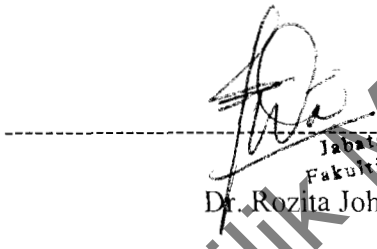
Tarikh:

Projek ini telah dikemukakan kepada Fakulti Sains Komputer dan Teknologi Maklumat, Universiti Putra Malaysia dan diterima bagi memenuhi sebahagian syarat Ijazah Master Sains.



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Background

The technology and the methodology to use the Internet as a tool for delivery for learning, or in a generic sense 'online learning', are evolving. During this evolution, it is possible to see two extremes in the use of the Internet as a delivery tool. Some educational institutions are putting course material online in order to be able to claim that they are a leading educational institution, because they have course material online. As a generalization, the course material is no more than an on-screen presentation of lecture notes. Fortunately, this seems to be a declining practice.

Other educational institutions have courses online showing every indication that online delivery factors have been considered. There are courses offered by educational institutions that fall between these extremes. It is understandable that educatiors see the delivering of courses online as desirable, particularly in the current climate of lifelong learning.

What is more critical is that, institutions in their race to deliver courses online, fail to see the need for onlne instructor support and the complementary activities that are vital for true learning to happen. Institutions overlooked the fact that when courses are delivered online, many of the necessary interactions requred to facilitate learning which normally occurred in a face-to-face learning are lost. Using a mix and appropriate Internet tools for complementary learning activities has not been given emphasis in the teaching and learning.

It is also seen that the use of flexible delivery methods is seen as the panacea for the continual upgrading of skills to cope with technological change. The use of the Internet as a delivery/interactive tool is the flavour of the month in flexible delivery.

The belief that an information-rich society is developing has encourage the use of the Internet. Individuals, learners and institutions are gearing up themselves with Internet technology to ensure that they will survive in the new environment. But in this hype, many discussions exclude the consideration that, whether the Internet is just a place for placing teaching and learning materials, whether learners capable to access information, and whether learners able to make sense of the information. The type of learners that will benefit most from the Internet-based e-learning should be considered.

Within the setting of a community of learning, what are the factors that determine if a course should be offerred via the Internet/ if the starting point is to determine the need of course delivery and the parameters that make the course offering educationally responsible and justifiable as a an appropriate use of resources, perhaps not all aspects or parts of a course are suitable for Internet delivery. In reality the need for Internet delivery should be based on the needs of the students and learning and the teaching infrastructure and the community of learning that this involves.

The Internet is a conduit. Rogers(1969) wrote that teachers are coordinators of learning experiences. This was the case for face-to-face teachers and still the case for Internet-based e-learning. Many of the considerations will be the same. These will include the need for backup

material for the learners, question and answer options,and the possibility for the student peer group to chat amongst themselves. The Internet becomes a conduit for coordinating learning experiences by learners, their peers, teachers and mentors and those in the educational community. However, the student must have physical access to the learning and the ability and skills to access and utilize the course materials.

Libraries, home, work, cybercafe and the new-generation mobile phones are potential access points to teaching and learning on the Internet. All of them come with some cost and this cost may limit access for some students. At the same time institutions experience difficulty in terms of providing the infrastructure for Internet-based e-learning to cater for higher bandwidth especially for multimedia T/L materials, acquisition of efficient hardware and software due to constraint financial situation and limited funding. Some institution may lack of necessary expertise to set up the Internet-based e-learning environment.

In all reality, the problems of Internet-based e-learning are numerous and they are real and happening. To add more to the discussion above , there are the problem of adapting to the Internet technology, confusion among the practioners, different models used, cost effectiveness and pedagogical implications , to list a few. Institution may experience some or a variety of them as they pursue their implementation for the Internet-based e-learning.

Also, an important aspect in developing Internet-based elearning is whether top management and the instittute's management as a whole, support the implementation and whether it will be confidently accepted by all parties in the insttution.

Problem Statement

Many Institutions are relying much on the existing market to create for their Internet-based e-learning. This approach could results in mismatch of the institute real requirements for Internet-based e-learning, in terms of hardware, software, training, etcetera, if the problems are not being correctly and appropriately defined. And there's always the commercial and profit factor in the case of the e-learning vendors, which institution should keep in mind. It is important for the institute to pause and think of the problems at hand and problems in the future with Internet-based e-learning before rushing into implementing and adopting the said environment.

Many are concerned with the problems associated with online learning and thus, propose guidelines to help institutions in their online learning activities and its implementation. Though guidelines can be beneficial for certain problems in an institution, for other related problems which are more specific to the institution, these guidelines may not be able to help. There are common problems experience by institutions, but the problems occur in a different context, i.e, to a different group of people with different own perspective and perceptions of the problem and in a different culture. Hence by this view, it is necessary to study the problems in its real world context so that the right and appropriate solution can be derived.

With all the existing problems and perhaps more coming and emerging problems of the Internet-based e-learning, there is a need to look at these problems very carefully using suitable

and appropriate approach so that these problems can be correctly defined and given the appropriate solution.

Institutions are free to choose any approach or methodology they find suitable to overcome the problems so long as it best serve its purpose, i.e to solve the problems. They can also model their Internet-based e-learning delivered by other instittutions or dependent on some general guidelines. If they are lucky enough, the model matches their problem in similar context and thus enable them to implement Internet-based e-learning successfully. For others, they might experience problems of different and perhaps similar kinds but at varying degree and maybe more complex. It is then worth investing their time to approach the problems in the form of models of human activity systems with perspectives of what is going on in a real world problem situation.

General Objective

The general objective of this project is to propose a theoretical framework for the integration of Internet-based e-learning for MARA Higher Institution, namely British Malaysian Institute, Malaysia France Institute and German Malaysian Institute using the Soft Systems Methodology(SSM). The context for this framework is the study made on problems of Internet-based e-learning inside and outside the institution.

Specific Objective

From the general objective, the specific objectives of the project are as follows:

1. identify the elements and predicaments of Internet-based e-learning
2. Identify the Internet tools currently use by instructors in the institution (IKTM)
3. Using SSM approach to develop the conceptual model for Internet-based e-learning
4. Compare problems in real world with the purposeful activities of the conceptual model and give recommendations.

Importance of Project

This project is important especially for institution like MARA Higher Institutiion, that manage and deliver courses traditionally, to give the opportunity to their instructors and students to experience an enrich learning environment provided by the Internet, in a smooth and well supported manner. It is important to note that problems of Internet-based e-learning should not be handle in isolation. The problems are interrelated and require careful approach for the success of the Internet-based learning in the institution.

This project gives an insight into the problems that the institution may encounter apart from their own existing ones, and use it to model the activities necessary to solve the problem. This project also helps the institution to look at problems from a 'bigger picture' perspective so that they advantage by able to identify the very root of the problems. Hence, they able to early

identify the problems and propose appropriate solution. If any problems being overlooked, knowing them later may results in further problems and damages.

Limitations of Study

The problems of Internet-based e-learning encountered are limited by the literature review and information gathered during the interviews, obsersations and questionaires made in MARA Higher Learning Institution. More studies, through relevant literature and observations on current Internet-based e-learning implemented in institutions in the country as well as other parts of the world should be made.

The study did not use other application of problem solving tools to compare the theoretical framework that is produced using Soft Systems Methodology (SSM). The only compromise for this is, the research that showed how 'hard' systems approach (Systems Engineering,SE) had failed to solve more complex problem (Peter Checkland, 1989), and from there on the SSM originates.

Chapter 2

Literature Review

Introduction

The use of technology and more specifically the Internet, has been an important advance for distance education. The Internet has the potential to meet students' changing social and educational needs-in particular the need to choose their own time, place and style of study. Universities, Higher Learning Institutions and schools respond to societal trends, and it is natural that they should follow the trend to use technology (Adamson-Macedo, 1996). 'Universities, like other organizations, are having to re-examine their ways of working, stimulated by developments towards 'an information superhighway' and the ease of accessibility to non-discursive global information resources' (Steeples et. Al., 1996). Educators are looking to technology to solve many of their problems – including increasing student-staff ratios and diminishing funding – while at the same time seeking to improve their teaching to provide a better student experience.

Yet innovation comes at some cost, and knock-on effects may include increased demands on staff time, complication of the supporting administrative system, and additional overheads for students (Laurillard, 1993). Many institutions are converting lecture notes or other paper-based materials to HTML for the World Wide Web, but, with little support provided for the student, the gains are minimal. Simply translating material from familiar media into electronic form is rarely productive – and is certainly inadequate for supported distance education, which aims to engage

the student in a community of learning. If we hope to improve rather than translate, we must understand the whole teaching and support process through a critical examination of the functions. What the popular enthusiasm for the Internet and the superficial translation exercise tend to overlook are the fundamental questions:

- Whether technology's effect on the learning it is meant to support is constructive, rather than obstructive, and
- Whether the benefits offered outweigh the costs involved

Making the shift to Internet-based education effective requires cultural change by students and tutors and management. Tutors must adapt their expectations and practices to accommodate a remote, often, invisible student body. The expanded opportunity for communication offers an opportunity for collaboration.

Technology needs to be adapted reflexively to match and encourage student learning. This adaptation needs to be carried out both at software and courseware levels.

The success of a computer-based system depends not only on the functionalities it provides, but also largely on how easily such functionalities are available to the largest possible number of users. Failure to meet with accessibility, usability and availability requirements can compromise the usefulness of most applications (Riva and Bellazzi,1996)

The constantly growing size and pervasiveness of the World Wide Web has opened up new perspectives with regard to the problems just mentioned. The push to add 'intelligence' to the Web has always been strong, and powerful infrastructure can be exploited to effectively provide services that go beyond simple document distribution.

But the real key to successful application of technology is good teaching using technology only when it is a cost-effective servant of pedagogy. Experience has shown that it is easy to propose an electronic solution that is more expensive and time-consuming than the paper-based system it is supposed to improve upon (Pilgrim and Leung, 1996). Institutions must analyse its existing processes deeply and critically in order to provide fully-and appropriately-realized Internet teaching that serves learning well, using the medium to augment the learning process in a compelling and cost-effective manner.

It is becoming evident that there is a shift in the paradigm of teaching and learning as a consequence of the user/student ability to access information. The shift in the paradigm is based in technology and under the control of learners. This learning process is enabled by technology and facilitated by industrial applications that minimize the need for bricks and mortar facilities like schools and universities. The new paradigm faces teachers with a fundamental challenge to their role and will ultimately cause that role to change.

However, the nature of the Internet technology seems to lead to confusion among the education and training fraternity. One view of the Internet is that it is a technology to deliver

information. A more considered view is that access to the Internet as a technology and a delivery tools needs to be considered after the educational methodology is determined.

It is only through an analysis of the educational needs that the use of any technology as a delivery tool is supportable. The requirements on the use of technology such as the Internet need to be on the factors relating to the course and effective delivery.

Factors relating to the use of Internet for effective course delivery includes:

- An analysis of the need for the course to be delivered via the Internet
- Interaction between learners and teachers and the wider learning community; the conduit
- The ability of students to access the course information
- The resource implications for the educational organization
- Maintaining the integrity of the course
- Issues relating to administration of the course
- Evaluation and reporting

What is the appeal of Internet-based learning or network-based learning or online learning? The appeal seems to be based on a belief that an information-rich society is developing. The developers for this new learning environment and other Internet providers seem keen to promote this position. What generally omitted from the discussion are three considerations. The first consideration is the need to place teaching and learning materials on the Internet, or is it access to educational materials via the Internet? What is available via the Internet are formal courses and access to a vast amount of print, audio, video and computer-based learning materials. Each of these materials has pedagogical implications when it is used in a teaching space or accessed

by learners. Therefore, what are the implications these information sources are distributed, through the Internet, to a student's learning space? The second consideration is the capability of learners to access this information. These include considerations of the learner's access and, given the elective data about courses and course content, the learner's meta-cognitive abilities. The third consideration is the ability of learners to assimilate the information they find into their current knowledge. And then there is the community of learning that might be associated with these offerings. This relates to the community of learning and the sanctioning of the learner's learning and that relates to the credibility of the Internet course.

Majlis Amanah Rakyat (MARA- http://www.mara.gov.my/) having one of its mission to provide excellent education, encourages its Higher Learning Institution to deliver their teaching and learning online. This project focus on three MARA's IKTM (Institut Kemahiran Tinggi MARA), namely British Malaysian Institute (BMI), German Malaysian Institute (GMI) and Malaysia France Institute (MFI).

These institutions have separate mission in the education arena in accordance with the unique courses they offer. To date the presence of e-learning in each institution is at various stages. Internet-based learning is still at infancy in these institution. Some are still skeptical of the use of Internet for the delivery of teaching and learning. Some IT and technical knowledgeable instructors are more enthusiastic in using the Internet if they were given the opportunity to use the Internet tools, while deskill instructors shy away from using the technology even if their institution provides a comprehensive intranet which support the teaching and learning online.

It is part of this paper to report main problems of implementing Internet-based e-learning faced by these institutions. This paper aims to propose solution to the identified problems and suggest a holistic approach through a strategic framework for the implementation of an Internet-based e-learning.

Definitions

Weggen & Urdan (2000,p8) describe e-learning as 'the delivery of content via all electronic media, including the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV and CD-ROM'. They use the term synonymously with the term "Technology Based Learning". They describe it as a subset of distance learning and containing online learning and computer based learning as per the recreation of their diagram below.

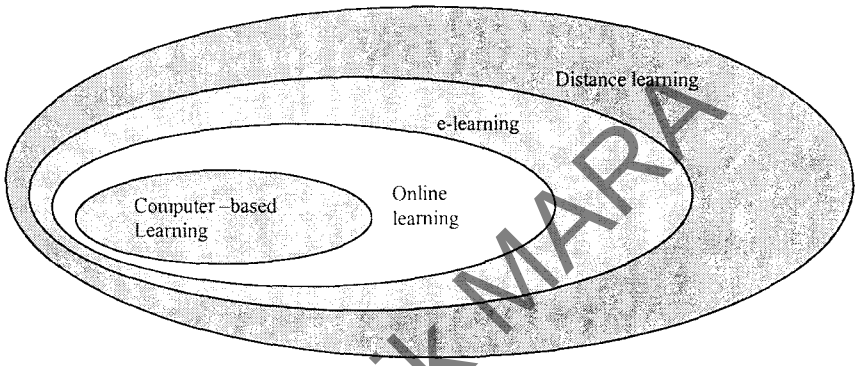


Figure 1.

Online learning occurs on the Network. 'Network learning happens when learners and instructors use computers to exchange information and access resources as part of a learning endeavor" (Haughey, M. & Anderson, T., 1998,p. 3). Also known as Web-based instruction. "An online program refers to web-based and collaborative learning where accessibility is not limited in time and place" (Alrajeh, Nabil & Janco,B., 1998)

Online learning constitutes just one part of technology-based learning and describes learning via Internet, Intranet and Extranet. The focus of this paper is online learning via the Internet.

World Wide Web-based learning is also known as distributed learning and Internet-based learning. It is characterized as learning which can take place anytime, anywhere, but which encompasses the activities of on-campus learners as well as those of the distance learner.

Web-based instruction(WBI) is a hypermedia-based instructional program which utilizes the attributes and resources of the WWW to create a meaningful learning environment where learning is fostered and supported" (Khan, 1997.p.6)

Synchronous Learning stands for a real-time, instructor led online learning event, in which all participants are logged on at the same time and communicate directly with each other while Asynchronous Learning describes a learning event in which people cannot communicate without time delay.

e-Learning can involve a greater variety of equipment than online training or education, for as the name implies, "online" involves using the Internet or an Intranet, but e-learning also comprise the use of CD-ROM and DVD which can be used to provide learning materials.

Distance education provided the base for e-learning's development. e-learning can be "on demand". It overcomes timing, attendance and travel difficulties.

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. Each stage of the e-learning process requires thoughtful analysis and investigation of how to use the Internet's potential in concert with instructional design principles

and issues important to various dimensions of online learning environment: institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethical.

Khan in his book said that, there are numerous names for e-learning activities, including Web-Based Learning (WBL), Web-Based Instruction (WBI), Internet-Based Training (IBT), Web-Based Training (WBT), Distributed Learning (DL), Advanced Distributed Learning (ADL), Online Learning (OL), etc.

Elements and Predicaments of e-Learning

e-Learning Framework

Numerous factors help to create a meaningful online learning environment, and many of these factors are systemically interrelated and interdependent. A systemic understanding of these factors can help us create meaningful e-learning environments.

Systemic thinking is a simple thinking technique for gaining systemic insights into complex situations and problems, as described below (Gary Bartlett, 2001):

Systemic thinking combines analytical thinking and synthetical thinking.

The first step is analytical: list as many elements as you can think of.

The second step is synthetical: find the common theme / repeating pattern across those elements.

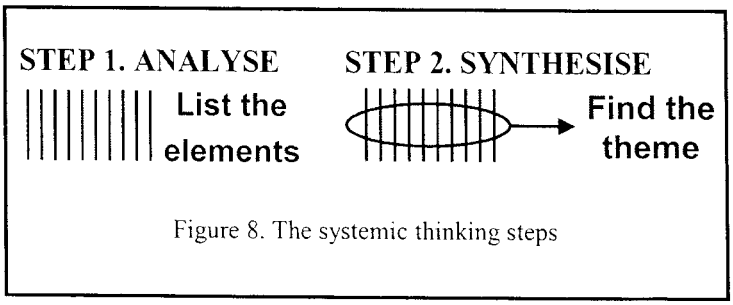
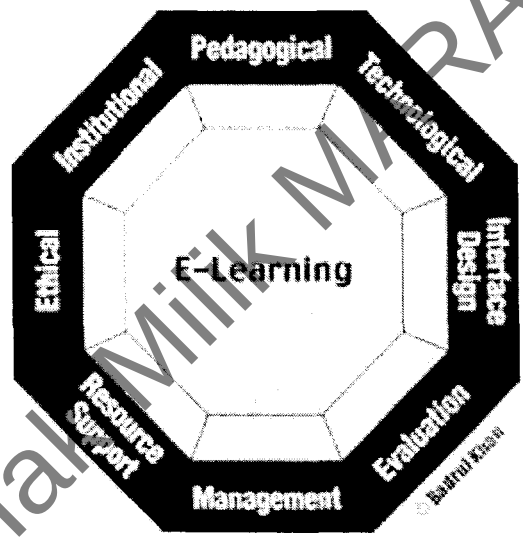


Figure 8. The systemic thinking steps

Figure 2

After reflecting on the factors that must be weighed in creating effective e-learning environments, Khan developed A Framework for e-Learning (Khan, 2001). The seeds for the e-Learning Framework said Khan began germinating with the question "What does it take to provide the best and most meaningful open, flexible and distributed learning environments for learners worldwide?" The framework has eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support and ethical. Each dimension has several sub-dimensions, each consisting of issues focused on a specific aspect of an e-learning environment. As depicted in Khan's diagram below: (Figure 3)



- The **institutional** dimension is concerned with issues of administrative affairs (e.g., organization and change, accreditation, budgeting and return on investment, information technology services, instructional development and media services, marketing, admissions, graduation, and alumni affairs), academic affairs (e.g., faculty and staff support, instructional affairs, workload, class size, compensation and intellectual property rights) and student services (e.g., pre-enrollment services, course and program information, orientation, advising, counseling, financial aid, registration

and payment, library support, bookstore, social support network, tutorial services, internship and employment services and other services) related to e-learning.

- The **pedagogical** dimension of e-learning refers to teaching and learning. This dimension addresses issues concerning goals/objectives, content, design approach, organization, methods and strategies, and medium of e-learning environments. Various e-learning methods and strategies include presentation, demonstration, drill and practice, tutorials, games, story telling, simulations, role-playing, discussion, interaction, modeling, facilitation, collaboration, debate, field trips, apprenticeship, case studies, generative development and motivation.
- The **technological** dimension of the framework examines issues of technology infrastructure in e-learning environments. This includes infrastructure planning, hardware and software.
- The **interface design** refers to the overall look and feel of e-learning programs. Interface design dimension encompasses page and site design, content design, navigation, and usability testing.
- The **evaluation** for e-learning includes both assessment of learners and evaluation of the instruction and learning environment.
- The **management** of e-learning refers to the maintenance of learning environment and distribution of information.
- The **resource support** dimension of the framework examines the online support (e.g., instructional/counseling support, technical support, career counseling services, other online support services) and resources (i.e., both online and offline) required to foster meaningful learning environments.

- The **ethical** considerations of e-learning relate to social and cultural diversity, bias, geographical diversity, learner diversity, information accessibility, etiquette, and the legal issues (e.g., policy and guidelines, privacy, plagiarism, copyright).

In designing e-learning systems, Khan said we should address numerous issues encompassing the eight dimensions of the e-learning environment. For example, in designing interfaces for e-learning system for learners worldwide, we should be sensitive to cross-cultural communication and ethical issues.

Models of Online learning

UWA (University of Western Australia) has articulated a vision of itself as a "high touch, high tech" university that aims to provide a rich learning environment for its students. As the University continues to seek ways to enrich the students' learning environment, online teaching and learning resources are being developed as a supplement or complement to the on-campus learning environment that is so highly valued by the University for its students.

Online learning is a sub-set of flexible teaching and learning that seeks to provide greater access to learning for all students.

An online learning environment is one that goes beyond the replication of learning events that have traditionally occurred in the classroom and are now made available through the Internet. It provides for different ways of learning and the construction of a potentially richer learning environment that provides for fresh approaches to learning, caters for

different learning styles as well as allowing for greater diversification in learning and greater access to learning.

An online learning environment can include any or all of a number of aspects ranging from administration details relevant to the class to learning experiences mediated through interactive multimedia to a total course delivered via the Internet.

An online learning environment can supplement or complement a traditional face-to-face learning environment or it may provide a complete learning package that requires little face-to-face contact. The university defines the different online modes as:

A - Web-Supplemented

A unit is web-supplemented if enrolled students have optional access, via the web, to information on the unit which is additional to the information available in the Faculty Handbook (e.g fuller unit descriptions, assessment overview, examination information, reading lists).

B - Web Dependent

A unit is web-dependent if: participation online for any or all of the activities in (i), (ii) or (iii) below is a compulsory requirement of participation, although some face-to-face component is required.

i. Students must use the web to interact with the education content necessary for study

ii. Students must use the web to communicate with staff and/or other students

iii. Students must use the web both to interact with content and to communicate with staff and/or other students

C - Fully On line

A unit is fully online if all interactions with staff and students, education content, learning activities, assessment and support services are integrated and delivered on line.

D - None of the above

A unit is Mode D if it does not fit into Mode A, B or C (i.e no online material at all)

Robin Mason (http://www-iet.open.c.uk/pp/r.d.mason/main.html) of Open University proposes three models of online learning:

- Content plus support; the traditional approach, where course content is separate from support; it is delivered through materials or Web site, with support provided via e-mail or conferencing as an add-on. Open university students in this model typically spend 20 percent of their time in online support.
- Wraparound; tailor-made study guides to existing materials supported with discussion, application sharing, Web lectures and so forth; this approach leaves students online for about 50 percent of the time.
- Integrate: here the center of the course is a set of assignments, tasks and collaborative experiences, and students are online for most of the time. This may also include creative online learning such as role-play and simulation (for example, of a trial). This is close to pure e-learning and can become a very costly if tutor costs are not controlled.

The trend to 'online anything'

The trend to 'online anything' is powerful and difficult to resist. Education is part of that trend. But does it really amount to anything other than doing what was previously done but doing it faster, on a greater scale and for more people? Economies of scale and wider access are, of course, desirable in themselves, but does the medium add value to the learning experience? Is there anything about the medium suggests that a new educational pedagogy is emerging – one that has something positive to offer teachers and learners alike? If it is not a new paradigm of learning, does online learning make existing approaches more effective?

Many commentators have observed that much online learning appears to have developed because it was possible, technically, to do so and without explicit reference to any pedagogical principles. This has produced some interesting and stimulating learning material but in the main it has produced much of what could best be described as electronic page turning. Moreover, there is little systematic research evidence on which to judge the overall effectiveness of the medium. The medium itself is too young for any satisfactory evaluative longitudinal study to have been completed and is still evolving rapidly. Nevertheless, the drive towards 'online anything' is persuading institutions, companies and governments to invest heavily in the new medium confident that the benefits will justify the costs.

A Physical Environment

There is no doubt that the physical environment has a surprisingly powerful influence on teaching. The lecture theatre makes possible certain forms of large-group presentation; the overhead projector makes possible the presentation of text and images to all those in the room, and the networked computer makes access possible to a vast range of digitized information. The environment makes some activities possible and constrains others but it does not change the fundamental processes of human learning. Students still need to actively engage with what is to be learnt; they still have to have ways of expressing their understanding if they are to be confident that they have learnt and they need to feel that what they are doing is worthwhile.

However in the most basic sense, the online learning environment is just another physical environment: more complex than some others, but a new space for teaching and learning. Technology itself does not improve learning (Alexander and McKenzie, 1998). Its use makes possible some kinds of activity (such as spontaneous spoken conversation).

Acceptance of the online environment as just another space for learning does not deny its potential to reconceptualize what is possible in teaching and learning. Observation of current scenario portray that it has generally failed to do this so far. Online learning has been far more successful in eliminating the limitations of time and space for learning transactions with origins in face-to-face and text-to-text encounters.

It is a fact that most of what we know about teaching and learning is applicable in all learning environments, including online. Given the nature of the medium, it is particularly productive to view online learning as examples of students' learning from experience.

Learning Outcomes – Example: e-lectures

The teaching strategy that has been used for centuries is lecturing – an expert telling groups of students what they should know. Attempts to describe the learning that results from the teacher's actions have resulted in descriptions of the very different reactions and responses that students have (Ramsden,1992).

Some lecturers have attempted to break down this one-way method of communication by using various techniques such as buzz-groups so that students have an opportunity to discuss and compare their understandings with others but, by and large, students spend most of their time listening and writing notes. The effectiveness of this technique has been reported as not being as great as many obviously assume given the popularity of this technique (Bligh, 2000).

The news about lectures is not all bad, however. They can have an impact in stimulating and motivating students interest in a subject. A teacher's personal enthusiasm for a subject can be transmitted through non-verbal behaviors such as eye contact with students, voice projection, body language and story telling. Students can be stimulated by seeing and hearing a person talking about what excites him or her, and proved by observing an expert showing or demonstrating alternative ways of thinking about problems. This physical presence of the lecturer who uses a variety of communication strategies conveys to students that what they are

learning is not something that is disembodied, but something that is humanized. Lecturers who rarely, if ever, use these techniques invariably receive poor feedback from students.

Despite what we know about effective and ineffective lecturing, much of what is passed off as 'online' or 'e-learning' is little more than lectures that are delivered online in the form of text, audio and/or video. e-lectures have been described by Harasim et al (1995: 125) as a way of ' providing a crucial concept or technique that students need to be able to apply to a problem or discussion'. In the case of text and audio-delivered lectures, gone are many of the motivational aspects of the teacher's physical presence as describe above and their ability to respond to the cues presented by a live audience. There is, however, some potential added value in online learning such as that described by Paulsen (1995) who notes, the particular advantage of providing the opportunity for guest experts from around the globe to contribute to a class by posting excerpts of articles, statements and so on.

Despite their potential for stimulation, lectures and their electronic form (e-lectures) are clearly regard as a way for students to be exposed to a body of information. The over-emphasis of knowledge transmission characteristic of the conventional lecture-based courses is often reproduced in new media. As has been noted above, the delivery of information per se does not promote the kind of learning outcomes that constitute a university education where independent thought, reflection and abstraction are valued. It is critical therefore, for learning designers to provide activities to facilitate students engaging with and making sense of that content. These complementary activities should provide opportunities for students to find a bridge between what they already know, and that which they have read, heard or seen in the e-lecture. Students need

opportunities to reflect on the ways in which their individual understanding aligns with that of the lecturers, and the ways in which it is different. Without such activities, learners may attempt to simply memorize information contained in the lecture so they can reproduce it in examinations or other assessment activities but be unable to use it.

The activities should also provide opportunities for students to actively construct their own understanding of the subject matter. Learning is never a passive act. It involves active construction and reconstruction of ideas and experience, usually through a range of carefully designed activities by a teacher who not only has expert knowledge of the content area, but also knows about the ways in which students come to understand that content (Laurillard, 1993). Designing these activities is one of the most important professional roles of the teacher and placed a greater burden on individual learners than they are able to carry.

The complementary activities should promote the social construction of understanding. e-lectures, in isolation of other activities, do not facilitate the important discussion in which the learners' own experiences are interpreted and tested against those of others, resulting in the construction and reconstruction of ideas and meaning.

e-learning Interactions

Studies identifying the characteristics of self-regulated learners underscore the importance of distinguishing learner-self as a primary level of e-learning interactions. Learners are self-regulated to the degree that they actively participate meta-cognitively, motivationally and behaviorally in their learning (Zimmerman & Martinez-Pons, 1986). Self-regulated learners take responsibility for their own learning, initiate efforts to acquire desired skills and knowledge

(Zimmerman & Martinez-Pons, 1988), access metacognitive strategies and take steps to correct learning deficiencies (Zimmerman & Martinez-Pons, 1995), activate, alter and sustain learning (Zimmerman & Martinez-Pons, 1986) and to plan, organize, monitor, and evaluate their learning processes (Corno, 1994; Hagen & Weinstein, 1995; Zimmerman & Paulsen, 1995).

Due to relatively constrained nature of learner-instructor and learner-learner interactions in an online environment, self-regulation may be particularly important for distance learners. Self-regulated learners may have a substantially greater potential for success in distance education than those who have relatively poor self-regulatory skills because they may not need as much prompting from an instructor or help from other learners to monitor, regulate and otherwise facilitate their learning. Fortunately, self-regulation may be learned and instruction may be designed to compensate for possible deficiencies (c.f. Ley and Young, 2001; Northrup, 2001; Corno & Randi, 1999; Butler & Winne, 1995; Iran-Nejad, 1990).

Learner-Instructor Interactions. Learner-instructor interactions are defined as student or instructor initiated communications that occur before, during and immediately after instruction. Moore (1989) characterizes learner-instructor interactions as attempts to motivate and stimulate the learner and allow for the clarification of misunderstanding by the learner in regard to the content. A study of distance educator competencies reveals seven key learner-instructor interactions: (a) to establish learning outcomes/objectives; (b) to provide timely and appropriate feedback; (c) to facilitate information presentation; (d) to monitor and evaluate student performance; (e) to provide (facilitate) learning activities; (f) to initiate, maintain and facilitate discussions; and (g) to determine learning needs and preferences (Thach & Murphy, 1995).

Bangert-Downs, Kulik, Kulik, and Morgan (1991) assert that:

> ...any theory that depicts learning as a process of mutual influence between learners and their environments must involve feedback implicitly or explicitly because, without feedback, mutual influence is by definition impossible (p. 214).

Feedback compares actual performance to set standards. It informs learners of the accuracy of their responses to instructional questions (Cohen, 1985; Kulhavy, 1977) and may be used to (a) increase response rate or accuracy, (b) reinforce correct responses to prior stimuli, or (c) change erroneous responses (Kulhavy & Wager, 1993). In networked environments, telecommunication technologies are expanding feedback options. Immediate and delayed feedback may provide learning guidance, lesson sequence advisement, motivational messages, critical comparisons and information about answer correctness and timeliness (Hoska, 1993). At minimum, feedback is essential during e-learning for closing message loops (Yacci, 2000; Northrup & Rasmussen, 2000), informing learners that communications are complete (Berge, 1999; Liaw & Huang, 2000; and Weller, 1988, as cited by Northrup, 2001).

Learner-Learner Interactions. Learner-learner interactions occur "between one learner and another learner, alone or in group settings, with or without the real-time presence of an instructor" (Moore, 1989, p. 4). Typically, such interactions ask learners to work together to analyze and interpret data, solve problems and share information, opinions and insights. They are designed to help groups and individuals construct and apply targeted skills and knowledge.

Assigning individuals to groups does not mean that they will work collaboratively (Johnson & Johnson, 1994). Considerations for effective learner-learner interactions are similar

in traditional classroom environments and e-learning environments (e.g., group size, group goals, individual roles and responsibilities, group and individual accountability, contact information, communications, grading). The challenge lies in planning and coordinating such interactions during e-learning.

Learner-Other Human Interactions. Learner-other human interactions utilize the potential for telecommunication technologies to break down the barrier of classroom walls and enable learners to search for, access, acquire and apply a wealth of information from a variety of external resources. Increasing numbers of online courses ask learners to review external web-sites, as well as to communicate with others outside of class to promote knowledge construction and social discourse (e.g., Bonk & King, 1998). Such interactions include exchanges with teaching assistants, mentors, and subject matter experts as well as student and academic support staff.

Some argue that certain attitudes and behaviors must be modeled during face-to-face interactions with real people in real-time and thus, e-learning is not appropriate. In such cases, it is essential to keep in mind that just because a course or training program is put online, not all interactions must occur online. Distance learners may be asked to visit a designated facility and work with subjects and certified personnel. Suitable interactions may be arranged between learners and other experts as a required component of counseling, humanities and education programs for example. The key lies in distilling the nature of and designing such experiences.

Learner-other human interactions may occur online or face-to-face depending on the location and configuration of the learners and the other human resources. They may be planned as an integral part of a lesson or learners may be given random access from within or outside of the e-learning program. The key is to provide ready access to the expertise, supports and services necessary to enter, navigate and complete the educational or training system in a user-friendly fashion.

Learner-Content Interactions. Learners–content interactions occur when learners' access audio, video, text and graphic representations of the subject matter under study. While it seems only logical to assume that media matters (e.g., what I hear, I forget; what I see, I remember; what I do, I understand), research suggests otherwise. Media selection guides, such as those proposed by Reiser and Gagné (1983) indicate that video and graphics (or more specifically, interactions with simulations or real objects) are critical when teaching psychomotor skills and may have a significant impact when trying to affect learner attitudes (e.g., modeling). Furthermore, if sensory discriminations (visual, tactile, auditory) are a required part of learning (e.g., music education), specific medium or a combination of media is required during instruction. However, comprehensive reviews of media comparison research conclude that use of media, in general, has minimal effects on student learning (Clark, 1994a, 1094b). Research reviews, focusing on distance learners, yield similar results (Russell, 1993, 1999). It appears that instructional design has a greater impact on student achievement than the media used to deliver the content.

There are some practical criteria to consider when designing learner-content interactions. First, are the plug-ins and other software applications necessary to read various multimedia file formats readily available to learners? The use of Flash, Java, RealAudio, RealVideo and other specialized multimedia programs require updated Web browsers that may be difficult for novice computer users to configure. Second, is the expertise necessary to generate the desired multimedia resources available on staff or are funds available to outsource such development requirements? Third, how durable are the multimedia resources? If multimedia is used to communicate content information that is highly volatile, it may not be practical to continuously update and revise the files. Finally, what is the return on investment for creating such files? Creating and maintaining multimedia content costs a lot more than text. Is the resulting affect on student attitudes, learning or performance worth the price?

Learner-Interface Interactions. When a computer acts as the primary delivery mechanism, its interface serves as the principal point or means of interaction with the content, instructor, learners and the larger community. Attention must be place on how the interface enables learners to manipulate electronic tools, access information, interpret visual elements and complete goal oriented tasks. Hillman, Willis and Gunawardena (1994) suggest that the extent to which a learner is proficient with a specific medium correlates positively with the success the learner has in extracting information from the medium. Poor interface design can place high cognitive demands upon the learner that may take their attention away from the subject matter at hand. Learners cannot deal with content information if they are unable to use the interface. Learners' must possess the skills necessary to operate the delivery system before they can be expected to successfully interact with human and non-human resources.

Norman (1988) suggests that mental models form as users' interpret the interface's perceived action and its visible structure. Then, as the model develops, it serves as the basis for understanding the interface, predicting its future behavior, and controlling its actions. The development of an effective mental model may be facilitated by instructional activities or tools that help the learner become familiar with the interface (e.g., in-class exercises, orientation sessions, technology credit courses, help screens or job aides).

In short, key factors include (a) learners' mental model that enable him or her to become proficient in interacting with the mediating technology, (b) learners' understanding of specific communication protocol associated with the delivery system to transmit and receive information, and (c) learners' potential fear of (or anxiety with) working with the technology. Gillani and Relan (1997), Jones and Farquhar (1997) among others (c.f., Neilsen, 1993) posit additional guidelines for Web interface design.

Learner-Environment Interactions. Learner-environment interactions occur when learners manipulate tools, equipment or other objects outside of the computer interface during e-learning. As noted earlier, not all e-learning interactions have to occur online. Learners may be sent a package of manipulatives, field equipment or laboratory instruments and asked to use them as an integral part of e-learning. Learners may also be required to seek or travel to specific locations to gather, observe and otherwise inspect materials, complete activities or participate in planned events to achieve specified learning objectives.

For example, gaining technical or problem-solving skills by interacting with highly specialized and sophisticated equipment may be necessary aspects of science, aerospace and engineering courses or training programs. In such instances, distance learners may be asked to go to a remote facility and work with an experienced scientist or engineer. Albeit, such interactions may be difficult to manage at a distance, but when necessary, they can be arranged.

Like planning complex learner-other human interactions, the keys are to: (a) clearly define the required learning outcomes and identify when such experiences are essential for the achievement of those outcomes; (b) careful plan and coordinate the interactions so that learners readily understand what is expected of them and why it is important for them to interact with their environment; and (c) integrate the event with other interactions and embed them within a sound instructional strategy to optimize the experience and ensure learners reach the specified objectives and achieve the greatest return from time and effort invested on arranging such learner-environment interactions.

Learner-Instruction Interactions: Learner-instruction interactions consist of a series of events (or e-learning strategy) that are necessary to achieve a defined set of objectives. Interactions involve a deliberate arrangement of events to promote learning and facilitate goal achievement. Learner-instruction interactions illustrate how theoretically grounded instructional strategies may be used to help distance educators design and sequence planned e-learning interactions.

Educators often fail to ground their designs in research and theory (Bonk & King, 1998; Bonk & Cunningham, 1998; Bednar, Cunningham, Duffy, and Perry, 1995). While there is no substitution for practical experience, difficulties occur when e-learning strategies are based solely on past practices. Without sufficient time, training or support, educators have little choice but to rely on what they know best (i.e., teacher–directed methods). The problem is that key interactions are not often planned as an integral part of traditional classroom teaching materials because instructors typically facilitate such interactions in real-time based on their expertise and intuition. As a result, key interactions necessary to stimulate e-learning are frequently missing when traditional classroom materials are posted online to promote e-learning.

A common concern expressed by educators is that it takes far more time and effort to manage the communications that occur during e-learning than during traditional classes. Two potential causes for such overload are (a) too many planned learner-instructor interactions, and (b) poorly designed interactions that require considerable clarification, explanation and elaboration.

Too few, too many or poorly designed interactions can result in both learner and instructor dissatisfaction, inadequate learning and insufficient performance, requiring additional time, effort and expertise to revise instruction; resources that could have been spent on other projects. Improved interface design and the evolution of better Web course authoring and delivery tools may eventually make the technical aspects of online interactions transparent to learners. However, until such improvements are realized, educators must keep in mind that frequency does not equal quality (Northrup, 2001). Analysis of planned e-learning interactions

specified in initial drafts of instructional treatment plans can help educators correct potential problems prior to programming as well as identify key factors to consider during development and implementation. Planned interaction analysis of prototypes and existing coursework may also be conducted to increase the overall effectiveness of e-learning materials.

Key interactions that can affect student attitudes and performance must be carefully designed and delivered as an integral part of e-learning. While various taxonomies reveal a plethora of interactions that may be used to facilitate e-learning, relatively little has been done to synthesize related literature on, delimit the relationships between and provide practical guidelines for planning and managing e-learning interactions.

The creation of modern e-learning programs requires research and the development of new design methods that fully utilize the capabilities of telecommunication technologies and the potential they afford collaborative and independent learning (Bates, 1990; Mason & Kaye, 1990; Soby, 1990).

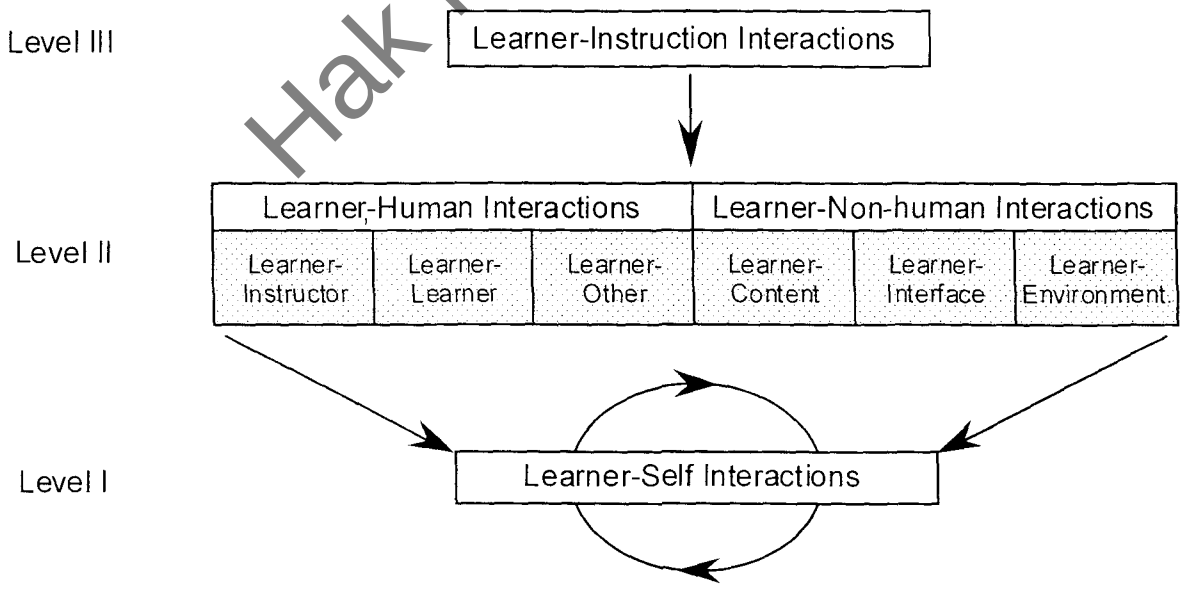


Figure 4. Three levels of planned e-learning interactions

Step 1 –	Identify essential experiences that are necessary for learners to achieve specified goals and objectives (optional);
Step 2 –	Select a grounded instructional strategy (Level III interaction) based on specified objectives, learner characteristics, context and epistemological beliefs;
Step 3 –	Operationalize each event, embedding experiences identified in Step 1 and describing how the selected strategy will be applied during instruction;
Step 4 –	Define the type of Level II interaction(s) that will be used to facilitate each event and analyze the quantity and quality of planned interactions; and
Step 5 –	Select the telecommunication tool(s) (e.g., chat, email, bulletin board system) that will be used to facilitate each event based on the nature of the interaction.
Step 6 –	Analyze materials to determine frequency and quality of planned e-learning interactions and revise as necessary.

Six step process for designing and sequencing e-learning interactions

Online Learning Pedagogy

Do we need a new pedagogy for online learning? There are many claims being made for the effectiveness of online learning, and these need to be subject to critical scrutiny. Some of these claims refer to advantages over classroom-base teaching that can result from the use of learning technology. On the validity of some of the claimed advantages for online learning will rest the future of new forms of educational provision.

The evidence from the past is clear: new technologies, however effective in other fields, don't inevitably lead to major change in education. It is arguable that real change in the way education is provided need not be driven by technologies at all, not even by new pedagogies. Rather it depends on developing novel forms of organizational processes and structures while carefully maintaining and enhancing the pedagogical principles that remain fundamental to almost all forms of learning, This still leaves opportunity for large-scale change in the way education and training are organized- where and when learning occurs, how resources can be accessed, how learning can be assessed – but at the center there are some activities that still must

occur. By this view it is not new pedagogies that we need, but new ways for providing existing pedagogy efficiently and flexibly. This may provide the real challenge for online learning. It is the challenge of how to offer the pedagogical sympathetic and well-equipped teacher to large numbers of learners in geographically dispersed and socially diverse settings.

Mason(1998), Salmon (2000), Massy (2000) provide a view of the component parts of e-pedagogy and it suggests that the e-learning pedagogue needs;

- Conventional pedagogy – a knowledge of how different people learn, what works in teaching them and why;
- Online awareness – how different people learn online, what works in teaching them and why;
- To plan and manage online events and places;
- The ability to explore and extend the potential of technology and solve technical problems without support;
- The ability to interweave technology into the design – learning with rather than from technology.

Hence e-learning pedagogue is a hybrid creature with multiple skills and a passion for learning (Martin Good,2001).

Online learning is a highly technical activity and requires specialist skills. Much of the early running has been made by the commercial sector and small-scale multi-media companies have

flourished. In the absence of pedagogical advice from those commissioning the products, these small companies exercise their own judgement about what is appropriate.

e-learning has crystallized an intractable issue that affected open and distance learning for many years- the question of product versus process. Because of communications technology we now have a much higher level of process pedagogy to work alongside and provide a context for learning materials. In conventional distance learning, materials and support were separate. The term 'support' now seems inadequate. The skills and processes of face-to-face teaching, extended to include communication technologies, have finally been integrated into the open learning. Integrating learning design in CDROM and Multimedia focused on the role of pedagogy in developing multimedia. It identified, but did not resolve, the problem of process. Application of pedagogy is important to materials design and development with the rich processes that e-learning allows. Pedagogy provides the context and the theoretical surround for the learning activity in a particular learning environment (how designer envisage that the material will be used). This drives many decisions – look and feel, control, assumptions about the level of support. Diverse contexts and varying degrees of support create dilemmas, for example is this for the 'average' learners or for the 'lowest common denominator'? The e-learning environment offers far more possibilities and allows many of these problems to be addressed online by skilled tutors.

Learner-managed Learning

Many authors argue that online learning is simply another, albeit sophisticated, medium for doing what we have always done. Rather than look for something new, it is argued, we should

first concentrate on using the right methodology for the educational purposes we have in mind, and then look at ways in which online learning can be structured to ensure effective learning takes place. As more people begin to exploit the full range of facilities that the medium can offer, online learning needs re-balancing in that learners are taking more responsibility for managing their own learning.

With the medium for online learning still evolving, it is unsure that online learning encourages learners to become more responsible for more aspects of their learning. The hardware and software necessary to take advantage of online learning are increasingly available outside the formal educational system, beyond the control of teachers. Tools such as software 'agents' are being developed that will further reduce learners' dependence upon tutors to mediate what they learn. Intuitive or 'intelligent; agents can give access to complex and multi-level data sources and present material in a format appropriate to learner's requirements. Some agents can learn about their users' learning styles, interests and intentions intuitively from the learners themselves, and automatically gather information, monitor the learner's progress and assist in the planning of further learning.

External pressures and technical innovations are likely to push the next generation of online teaching and learning more towards learner-managed learning. The challenge facing teachers/instructors is not whether to give their online students responsibility for their own learning, but how much responsibility they are going to deny or facilitate, and how they are going to do it (John Stephenson,2001).

Features of Online Learning

Online learning has much more to offer than easier text exchange between student and teacher. The features of online learning are summarized below:

- Easy access to high volumes of diverse learning resources
- Dialogue in real time (synchronous) or over a period (asynchronous), one-to-one, one-to-many or many-to-many
- Threads of discussions and development of argument, frequently asked questions
- Access to a range of personal support by e-mail
- Ease of navigation to sources within and outside the package materials, allowing multiple levels of engagement via navigation buttons
- Feedback loops through progress checking, quizzes and online assessment
- Access multimedia
- Access to live collaboration

Each of the above features can be controlled by learners in their own learning place, such as at home or at the work place. If all of the features of online learning are to be exploited to best effect there need to be significant changes in the roles of the teacher and the development of the skills to carry out those roles. These require a rethink of the idea of the course to be the main organizing structure for learning.

e-Learning seamlessly extends the reach of content, as materials can now include links to relevant Web sites and access to places where you 'meet' other people. The balance shifts from product to process, and interaction becomes as important as content.

e-learning brings us a new set of characters and associated metaphors. Perhaps the most important is the idea that the machine is a 'place' where you find other people doing things – conferences, dialogues, lectures, etc. This range of models forms a 'learning environment' that feels physical even if it is virtual.

e-Learning on the Internet allows learners to do what they like and go where they like. Learners do not respond to efforts to control too much of the environment: if they want to skip things, they do; if they want greater depth, they expect it to be there.

Making technology part of the process of learning is a key issue for pedagogy. How can it be woven in? The simple fact of asynchronous and synchronous conferencing dramatically changes what matters in the design of distance learning. Every page of text can now generate a conversation, a dialogue, a collaboration, and adventure. It is now standard practice to build an online area in all learning materials. Much of the interactivity that was formerly put into boxes on the page or quizzes on the screen is now located in the online conference. To make that work, teachers need a high level of skill in moderation and virtual classroom management in addition to their subject knowledge.

Learning Media/Internet Tools

Jonathan L.Lim (2002) stressed that Institutions of Higher Learning offering e-Learning programmes should also focus on instructional outcomes, and not only the technology of delivery. It is without doubt that technology plays a key role in the delivery of the e-Learning. However, the key to effective e-Learning is focusing on the needs of the learners or the

knowledge-thirsty, the requirements of the content and the constraints faced by the system. Appropriate technology can only be selected once these elements are assessed in details.

Using the integrated approach, the task of the Institutions of Higher Learning is to carefully evaluate and select the technological option. The ultimate aim is to build a mix of instructional media meeting the needs of the learners in a manner that is instructionally effective and economically prudent.

Selecting a delivery system for a typical e-Learning programme, a systematic approach will result in a mix of media, each serving a specific purpose.

The www - In many respects the Web can be considered as an enormous CD-ROM. At any instant a snapshot of the Web appears as an extensive and rich resource of information. This analogy has been exploited by developers who produce CD-ROM/Web applications, using the same browser for each medium. The concept can be extended further, by linking these media and having dynamic data transmitted via the Web and relatively static data made available on the CD-ROM. This integrated approach offers many interesting possibilities as well as overcoming limitations imposed by the bandwidth of networks.

The web is used for access for communication and learning. There are two approaches to accessibility. First, well designed pages (clear layout, contrasting colours, simple structures, etc.) can make a considerable difference to many users, A high standard of design should be a target to all users – good design benefits everyone. Second, by following certain guidelines, compatibility with enabling technologies can be considerably enhanced.

Accessibility to courseware is an issue for all learners. For example, consider interface design where factors such as screen layout, navigation methods and typography all have important parts to play. With the advent of graphical user interfaces (GUIs), user interactions have moved away from typing in lengthy commands towards direct manipulation that involves clicking on or moving graphical objects, which is usually performed with a mouse. This requires courseware designers to take into consideration the size, shape, color, and positioning of objects. Accessibility can be improved by keystroke alternatives to actions performed by pointing devices. This is just one facet of design, which can be drawn from a detailed consideration of accessibility issues. These issues have implications for all learners.

Internet Tools are summarized as follows:

Asynchronous Communication

- Electronic mail – mailing lists, newsgroups, multimedia for email, MIME, Video mail
- World Wide Web

Real time conferencing tools

- Text base conferencing tools – Internet Relay Chat (IRC), Multi user dimensions(MUD), MUD object oriented(MOO)
- Audio Conferencing Tools
- Video –conferencing

The Economics of Internet-based e-Learning

It is not difficult to see why governments, educational administrators and companies are enthusiastic about exploiting the potential of the Internet and Web-based online learning. Online learning offers the prospect of direct delivery of learning to existing learners, and to groups traditionally excluded by personal circumstances from institutional learning, coupled with assumed economies of scale. There is also the bonus – especially for governments and companies- that the use of online learning will generally promote greater proficiency in IT skills with assumed spinoffs in personal employability and corporate competitiveness.

The value Internet technology brings to distance education lies not in direct translation from other media but in transformation of support mechanisms to exploit its potential range. Taking care over the integration of the electronic tools into the existing administrative infrastructure paid off. Administration is faster and more efficient with electronic assignments. Turnaround time is reduced; less paper is consumed access to assignments and records is facilitated and automatic logging increases accountability, But, for a large number of students, there is still real concern about managing demands on communications and about consequences of system breakdowns.

Supported Internet presentation is not a cheap option, but it may be one that can provide greater flexibility and can shift effort from mundane tasks (administrative details) to teaching.

Costs

More technical support: Supported Internet presentation demands suitable technical support from a dedicated resource; in addition to existing computing support services. Effective electronic administration requires an unwavering commitment to technical support to maintain key systems continuously.

Tutor expense: The highest costs in the initial year will be borne by the tutors, who had to master new tools and new skills, evolve a new culture, devise new strategies, prepare new tutorial materials and adjust to new types of impoverished feedback (ie no body language, no eye contact) from students.

Student expense: Internet presentation also requires new skills, new strategies, and greater responsibility from students. Some of the presentation costs (eg. Connect time, printing) are off-loaded onto students.

Equipment upgrades for tutors: When the quality of equipment the tutors use has such an impact on the time required to do their work, then upgrading equipment must be a priority.

Loss of social interaction for some: Except for those who do not seek interaction or for whom conventional face–to-face sessions were never an option. With limited resources, this is a difficult medium in which to establish a 'community of learning'.

Less satisfactory tutorials are no substitute for face-to-face interaction, although they clearly have value and tremendous potential. And yet the potential must be realized at this sort of level- where technology is inexpensive and available so that technology makes education accessible rather than exclusive.

Gains

More rapid feedback for students: Feedback on assignments is a crucial part of teaching; the faster the feedback, the more likely it is to assist learning.

Increased tutor collaboration and communication: Re-use and sharing are two crucial means for improving productivity, exploiting expertise and reducing the load on any one tutor, The increased loads experienced in the early years may well be off-set in subsequent years by the advantages gained in materials collection re-distributed load, and so on.

Greater access for students: The potential exists for global access.

Increased administrative efficiency: The electronic assignment handling with its automatic checks and record keeping, can substantially reduce the costs of mundane administration, including photocopying costs, while potentially improving the retention and handling of student data.

Reduction in administrative errors: The electronic assignment handling system is known to substantially reduce (if not eliminate) minor administrative

Potential for flexibility: Students potentially have access to more tutors, more problem sessions, and more different supporting materials as archives and dialogues accumulate on the Web. Tutors can use the breadth of material to address individual needs.

Reduction of time and place constraints: Just as students have access to tutors outside their regions, tutors are able to collaborate with remote colleagues and have more control over the time and manner of their interaction with students, Tutorial structures no longer need to be organized geographically they can be structured to take advantage of tutors' interests and expertise.

Current Internet-based T/L Implementation – Malaysian Scenario

Yang Berhomat Datuk Amar Leo Moggie, Malaysian Minister of Energy, Communications and Multimedia, in the opening of the "International Conference on e-Learning, 2002", held in Kuala Lumpur, stated "Malaysia is aggressively transforming its economy from a production-based to a knowledge-based one. This necessitates the active role of higher education to generate the critical mass of knowledge workers with the ability to compete in an increasingly technological world. The role of **e-education** becomes imperative because it makes learning more equitable and accessible to the general public.' In Malaysia, most if not all, public and private universities are moving fast into the e-learning market.

Venturing into the 21 st Century poses a great challenge to all especially developing countries like Malaysia. As the nation moves towards information-based economy in the era of ICT, there is a need to produce more skilled workers and more radically, the knowledge-workers

(KW). There is a steady increase of knowledge-workers since the turn of the century. By the year 2005, the nation is targeted to have 35% knowledge-workers among its workforce.

Abu Daud Silong, Daing Zaidah Ibrahim and Bahaman Abu Samah in their Models of Online leaning Delivery System (2001)– observed three approaches in the development of online learning in Malaysian universities. "These are the lone ranger approach, the island approach and the integrated approach". The lone ranger and the island approaches are said to be common in Malaysian universities. In the lone ranger approach, development of online learning is initiated by very interested individuals who often sacrificed their time and resources to develop their own courses online. These online courses are usually used to supplement their campus courses. Most often they include course information online, course materials and useful links for the courses. Online interactions are also conducted. An island approach on the other hand develop online learning through the support of Departments or Faculties and usually develop for distance education courses. The integrated approach is the most advanced approach, which can be observed in virtual university like UNITAR. In this approach, the technology is fully integrated into the curriculum and teaching-learning process. The network is the main environment for learning. The online delivery is the main method of teaching-learning and supported by face-to face meetings.

In line with the market demand for workers with IT skills, UiTM introduced the electronic distance Education Program or also known as the Flexible Learning Program (FLP) in January 1998. UiTM uses the web as an adjunct mode of online learning. Learning materials are in the form of printed text or better known as the Self Instructional Material (SIM). The SIM are

written by a team of lecturers and are edited by content editors who are experts in their respective fields of specialization. The team that developed SIM also comprise of language editors and instructional designers.

Current Online Learning in Institute Kemahiran Tinggi MARA (IKTM)

British Malaysian Institute (BMI)

BMI offers BTEC Programmes at the Higher National Diploma level in Electrical Engineering, Electronic Engineering, Medical Electronic Engineering, Telecommunication Engineering, Computer Systems Engineering and Information Technology. Courses are taught using the British Technician Education Council methodology/education philosophy.

BMI has a very integrated intranet system build using the open system software. To date BMI intranet supports the administrative, academics and students management. The system known as the ICMS (Integrated Campus Management System), is maintained by a unit called QCE (Quality Control and Evaluation) which comprised of hardware, software and networking experts, who are also the teaching staffs of BMI. This unit is responsible for the ICMS development and provides services to academic staff, non-academic and students. Internet-based e-learning is at its early stage in BMI. Though the intranet provides a good foundation in stimulating e-learning, not many lecturers are making effort to deploy its advantages.

Most teaching and learning materials are still given to students through printed notes. Nevertheless there are individuals who made the effort to make use of the e-learning environment provided by the intranet. It is observed that these individuals are knowledgeable in

the hardware and software and have the enthusiasm to test and use the technology and to prove that it is an effective method for teaching and learning. QCE unit in their effort to encourage e-learning environment, asked lecturers to submit their teaching materials to be converted into electronic form and place it in the ICMS for students to access. Students interact with electronic form of the lecture materials where they are able to download or print directly from the intranet.

Some lecturers developed their learning modules online such as, besides lecture notes, tutorial questions, quizzes, tests and further references for the students. As noted above these instructors are individuals who have the necessary skill to use the technology in the e-learning environment. Students enrolled in subjects taught by these instructors, communicate with the instructors with regard to lecture notes, tutorial, quizzes, tests and notices is via the intranet. Nevertheless, face-to-face communication is still required to monitor and evaluate hands-on or practical learning and final examination.

The ICMS which resides on the intranet is also accessible via the Internet. QCE unit ensure that all levels of security on the ICMS are taken. Students are able to access to their lecture notes, email, quizzes, tutorials, available on the campus intranet from home or own computer network using user password issued to them by QCE unit, together with an open source software which they can download from the Internet. Conferencing also form part of e-learning in BMI but the conferencing tools available are limited and most of the time via the intranet system. Students' group discussions on the Internet take place on free Internet sites which do not involve instructors and the BMI intranet.

QCE unit is observed to be the driving force for e-learning in BMI. Main problems faced by QCE are with instructors complaining of not enough time to produce teaching materials for e-learning, low bandwidth and interface for the intranet is not user-friendly. Towards improving BMI's e-learning environment and solving the said problems, QCE has taken steps to design a one-stop web portal for the institution that provides total e-learning and also administrative and education system that is highly integrated. With this, the institute, specifically QCE hope to encourage students and instructors to fully utilize the e-learning environment, extend education to distant learners (partimers) and can efficiently execute their administrative and management tasks.

Malaysia France Institute

Malaysia France Institute is a co-operation project between France and Malaysia. It is an advanced technical training center in the field of engineering specializing in automation, electrical, mechanical and maintenance. The institute insists on the importance of work related training.

By design, the training approach is to encourage active student participation in the learning process or activities, strengthening theoretical knowledge with high degree of practical work and usage of machinery or equipment similar to those found in real life work place or industry, usage of industrial catalogue and wide usage of audiovisuals as teaching aid.

Though MFI encourages the use of computer and Internet technology in their teaching and learning, they are still faced with the problem of insufficient bandwidth.. Access to the

Internet is available to instructors and students. This enable instructors and students to take advantage of some free Internet tools available to experience teaching and learning. The main Internet tools being used is the email. The existing intranet is to support some administrative tasks and students management but not the learning itself.

In their effort to provide e-learning environment, the IT unit which responsible for the IT hardware and software requirement and the design of the institute IT infrastructure, collaborated with students to build IT infrastructure that supports the integration of their intranet systems. More recent development is subscribing to bigger bandwidth to enable instructors and learners to take advantage of distant learning. The collaboration between students and institute is in the form of hardware funding and guided design of the upgraded infrastructure by instructors. As part of their coursework, the collaboration contributes to their project grades for their practical assessment. This collaborative work sets invaluable benefit of first hand experience for students and cost savings for the institute.

Recent e-learning development in MFI is the planning of total e-learning environment through student web-portal. This is also a collaborative effort between MFI and Sisco Systems. With improved infrastructure, the implementation of e-learning should be made possible and thus provides a rich learning and teaching environment for both learners and instructors.

German Malaysian Institute (GMI)

The German-Malaysian Institute is a centre for advanced skills training in the fields of Production Technology and Industrial Electronics with specializations in the field of Mould,

Tool & Die, Mechatronics, Process Instrumentation & Control and Electronics & Information Technology.

The main objective of GMI is to support Malaysia's industry by qualifying highly skilled manpower capable of combining theoretical know-why with practical know-how in design, manufacture, maintenance, fault analysis, repair of complex production plant, machinery, equipment, tools, product and efficiently use modern technology notable in the manufacturing and engineering industries.

GMI training will thus produce competent technologist. This competency involves three basic elements that are inculcated during the training programs, namely; Technical Competence: Which includes the ability to perform work in a technically competent manner and to monitor it in an independent and critical manner; Learning Competence: Which includes the methodological skills and energy to continue learning independently after training at GMI and to always be up to date on current issues in their area of specialization; Social Competence: Which includes the ability to work together with other employees as a team, monitor their work independently and to take ecological and safety considerations into account.

To instill these competencies, GMI's training emphasize on:- hands-on practical learning (60-70%) to acquire skills supported with theoretical classes to acquire knowledge (40-30%). Practical and theoretical learning classes are conducted concurrently in labs/workshops, skills and knowledge learning are supported through experimentation and project work throughout the training period, broad based training in foundation year and allows diversification into

specialised areas in year two and three, multi-skill training in various enabling technologies related to field of specialization, promotes teamwork through group learning and industry based projects, enabling trainees to establish themselves in the manufacturing sector, extensive use of modern teachware, uses realistic machinery and equipment, provides planned, guided and supervised industrial exposure.

The institute's IT department is responsible for the hardware and software requirement for the institute. For the past one year, this department has made effort to stimulate e-learning in the institute by subscribing RM3000 per annum to a Singapore based company to provide e-learning space for GMI. On top of that, each students were charged RM1 per month access fee. Though teams were formed to ensure that e-learning materials are developed by instructors, the effort failed simply because instructors were too busy with the traditional teaching and learning that they complained of not enough time to produce what was required. The effort was found to be ineffective and thus abandoned. The IT department then decided to appoint a webmaster and a graphic designer to develop a student web portal for the institute. A collaborative effort between the institute and industry in developing multimedia self-learning module is also taking place. In this collaboration, GMI acts as the content expert and provider, the industry provides the funding while a third party is appointed as a multimedia production expert. Undeniably the Internet provides a rich e-learning environment, nevertheless the institute until this time failed to inculcate the use of Internet tools other than email to take advantage of the anywhere and anytime learning experience.

Despite problems faced by each institution, there are still instructors and students that are attracted by the use of the Internet technology. These group of people take advantage of the free

tools available on the Internet to use for their teaching and learning and testing the limit and effectiveness of the technology.

Chapter 3

Methodology

Introduction

Many aspects and problems of e-learning reported above, in the literature review and the current scenario found in MARA Higher Institution, may very well exist in any implementation of e-learning environment in universities and higher institution. e-Learning requirements for each institution varies according to the nature of the courses offered and the extent to which learners and instructors can benefit from it. It is beyond doubt that e-learning is excellent environment for distant learning but distant learning can also be viewed as a good method to be applied as a fraction or a mixture for education system where time and space are not the major problems (also known as blended learning). In this perspective, e-learning environment is considered to enrich and enhance the learning environment that enable learners and instructors to better communicate with each other and have more opportunity to understand the course better. In this education system, face-to-face teaching and learning is the major method to deliver education while the presence of e-learning provides the opportunity for a rich learning environment.

The education systems exist in IKTM as explained in earlier chapter portrays the scenario discussed above. Face-to-face lectures are being carried out through out the semester with assessment via assignments and attendance required for test, quizzes and final examinations. All three institutions have full-time students enrolment maximizing the use of classrooms and other facilities. 70%-80% of students are staying in students accommodation provided by the institute

which are just minutes away from lecture halls, classrooms and laboratory. The only difference between these institutes is the nature of the courses offered, where they are unique to each one of them.

This paper presents a theoretical model of an e-learning environment via the Internet for IKTM by presenting a strategic framework that takes into consideration the education system and courses offered by the institutes and the factors and predicaments as discussed above. The systematic approach presented in the theoretical model is hypothesized to enable the production of Internet-based e-learning that is effective, meaningful and beneficial to the instructors, learners and the institutions. These models are presented in Chapter 4.

In the second part, complementary to the theoretical model presented, is the identification of e-learning tools required by the institutions supported by results of a survey, which evaluates the use of the Internet tools for the teaching and learning.

The survey included 10 short answer questions and 5 questions, which requested respondents to write short answers about their personal opinions with regards to using the Internet for online learning and existing management of the online teaching and learning. The survey produced 40 responses.

Internet Use for Distance Learning

Interestingly, nearly all the respondents, 91%, were already using the Internet in one form or another for online learning. The 5 respondents who did not yet integrate the Internet in their teaching, are planning to use it during the following year.

Reasons for Using The Internet

By asking this question, the survey wanted to know the reasons that have encouraged online learning practitioners to integrate the Internet in their courses.

Based on the information obtained while searching about online learning via the Internet, some of the main reasons of using the Internet for delivering the educational material include:

- Making communication easier between students and instructors
- Allowing students with different needs to learn in the convenience of their home, without wasting time in traveling to campuses
- Allowing students to take courses and earn diplomas on a flexible schedule that is most appropriate and convenient for them.
- Allowing instructors and students to interact remotely with remote experts, and to work with other students from different parts around the world.
- Providing students with a powerful research tool, with extensive amount of valuable information, resulting in better quality and more up-to-date information.

The asynchronous communication nature of various Internet tools, such as the electronic mail, mailing lists, newsgroups and bulletin boards, is a powerful feature in providing this service.

Moreover, the ability to post, send and access huge information resources at very cheap prices makes the use of the Internet more cost effective than the traditional way of delivering educational and training material.

Survey Results

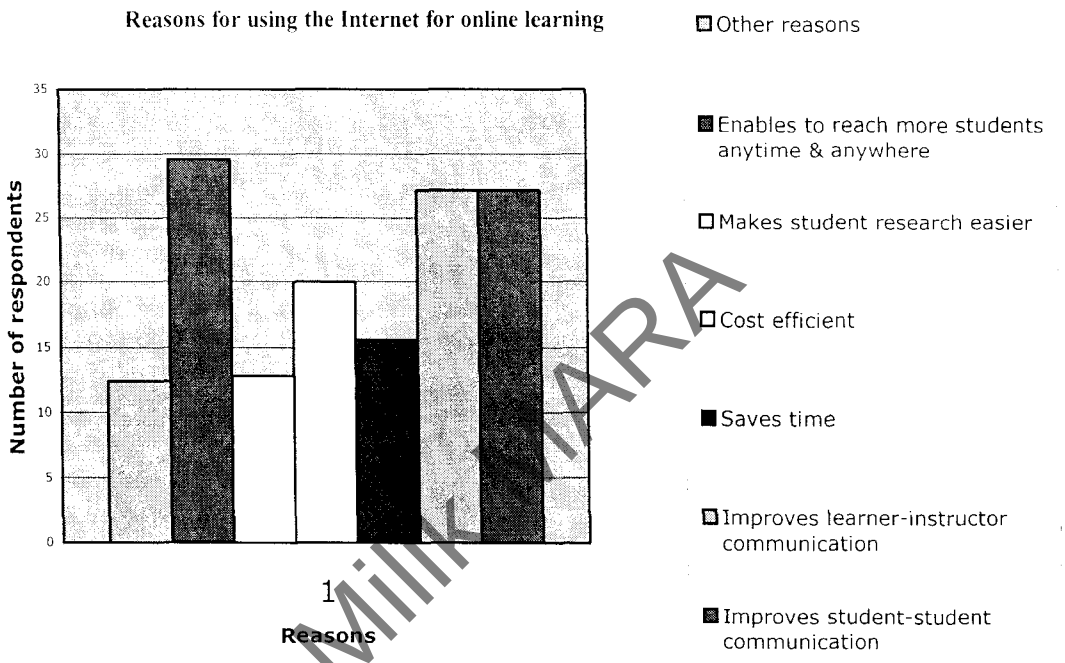
In order to answer this question, respondents were given seven suggestions, including another option where they can add any extra reasons. The following results were obtained: 74% of respondents agreed that their main reason for using the Internet is the ability to access and to reach students anywhere and anytime at the convenience of every participant. Another major reason is that the Internet improves communication between the different class members, which results in further advantages.

In addition to the above mention reasons, answers included other reasons such as:

- It allows cooperative team learning and creates a more active learning environment
- It is cost effective since most of the material is online
- It is fun and entertaining
- It helps students become familiar with Internet tools and technologies
- It helps students to develop many necessary skills
- It is flexible
- It provides a wealth of information
- It provides students and instructors with up to date information

A general comment about these answers is that most respondents agreed on most of the suggested reasons for using the Internet.

Graph 1 illustrates the responses to each suggested reasons



Graph 1

Internet Tools and Technologies Used

The Internet offers several tools, some are very widely used such as email and newsgroups, others are less popular such Web conferencing, while others are still at the trial stage. Because of all these options, this survey wanted to know what tools respondents were using during 2000-2002 year, and what tools they were planning to use this year.

Tools such as e-mail, mailing lists and newsgroups are widely used by Internet users, especially for instructor/student and student/student asynchronous communication, They are relatively low cost, demand only modest bandwidth on the part of the user. Moreover, most institutions having an Internet access are providing these services to their students, and many instructors are finding it very convenient to flexibly communicate with students.

Such tools also allow students to read postings from the instructor or other students at leisure and respond at convenient pace and communicate directly and privately by e-mail with the instructor or any other student. Moreover, newsgroups and mailing lists are in many cases valuable information resources for students when working on research projects. Private mailing lists, restricted only to class members allow instructors to post their material for students use, saving consequently on paper and other delivery media costs.

Based on these facts, the following hypothesis was formulated for validation later with the respondents' replies:

Hypothesis 1:

E-mail and its applications are the most widely used for online delivery of lectures and class discussions.

The Internet provides two important low bandwidth tools, which allow real time text based communication. The first tool is the IRC and the second includes a variety of environments depending on the programming language used for interaction. The two commonly used environments are MUDs (Multi User Dimensions) and MOOs (MUD Object Oriented)

When researching the topic through the Internet, real time conferencing tools, such as IRC seemed to be increasing in popularity among the educational community. Several institutions have been already using these tools for online course delivery. Moreover, the increased developments in this technology are providing users with easier user interfaces and more flexible virtual environments. These two factors can, to a large extent, encourage more institutions and instructors to integrate these tools in their online lectures. By comparison, many educators have been using the Web for some time so that there is less opportunity for a growth in Web usage.

Based on the above background information, the following two hypotheses can be formulated:

Hypothesis 2:

The growth rate of adoption of the Internet text based conferencing tools, IRC, is higher than that of the WWW and e-mail applications.

In the case of multimedia conferencing tools, the quality of audio and video available over regular modems is limited. These tools are in their infancy with regard to online applications. We can expect to see their usage grow as low cost higher speed modems such as ADSL, become more widely available. Therefore the following hypothesis is formulated:

Hypothesis 3:

The use of multimedia conferencing for online learning is:

a) growing but
b) has a lower acceptance rate than text based conferencing tools.

Survey Results

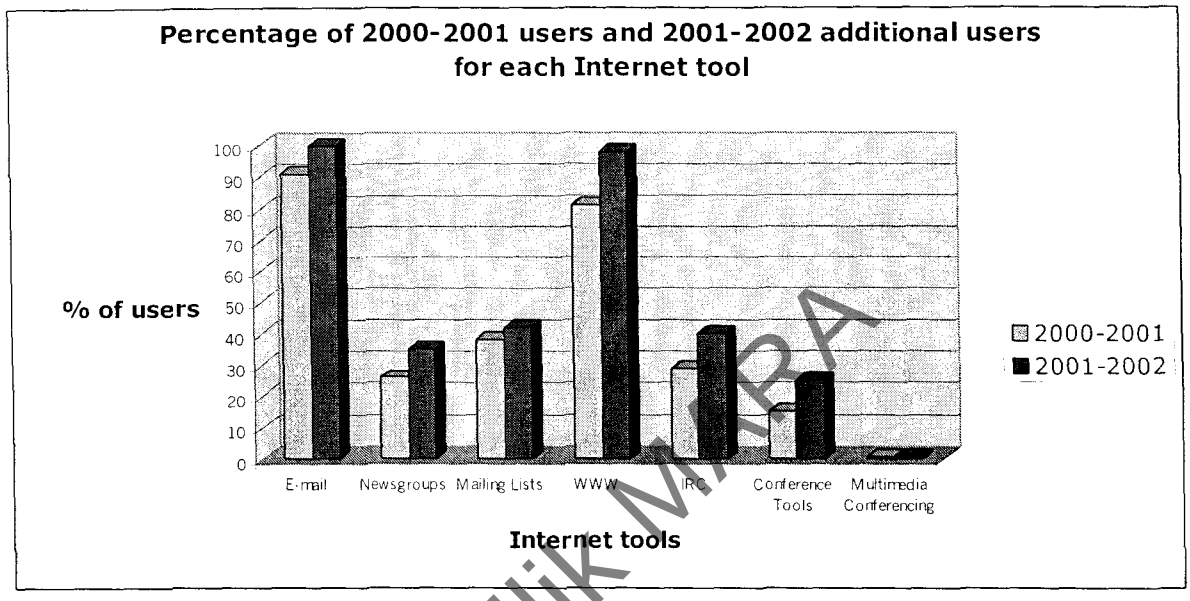
As shown in the graph below, compared with other tools, e-mail is the most popular tool and is used by nearly all the respondents (95%), while the remaining 5% were planning to integrate it during the following academic year. This confirms the fact it is the tool's affordable costs, in addition to its asynchronous feature and the related benefits, which promoted the quick adoption of the tool within the online community. Since it is almost universally used, its growth rate is lower than any other Internet tool.

E-mail applications, such as newsgroups and mailing lists, are less prevalent than the elementary e-mail application. Their use however is expanding, with the newgroups having the highest growth rate. This is presumably, due to the new trend of conferring openly with the larger Internet community, primarily, other students, and experts.

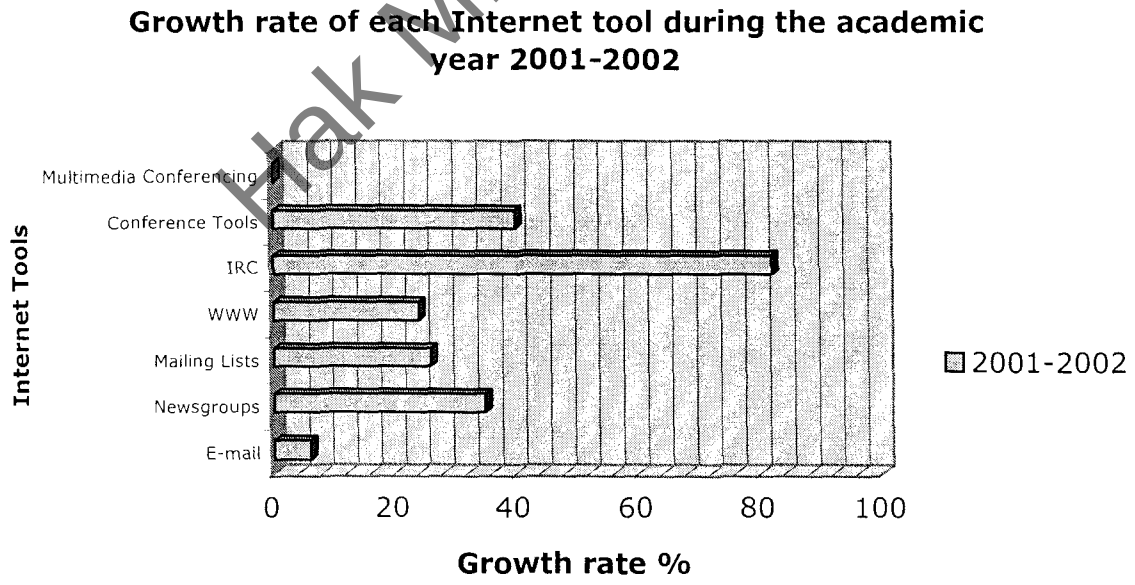
The second most used tool is the World Wide Web, which is already used by 81% of the respondents. The remaining 19% were planning to integrate it in 2000-2002. For this reason the WWW growth is the second lowest after, e-mail.

Many of the Web's benefits and capabilities, such as its accessibility, its considerable information resources, and its flexible hyperlinked environment, are definitely the main justifications behind its wide acceptance. This rationale is also confirmed by the answers of question "Reasons for using the Internet", where 50% of the respondents consider using the Internet as cost effective, and 32% are of the opinion that that it makes student research easier.

These results partially confirm hypothesis one, since e-mail is indeed the most common tool in online learning environment, except that it is the WWW and not the other e-mail applications, which is nearly a predominant as e-mail within the online environment, as illustrated in the chart in Graph 2.



Graph 2



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Graph 3.

As anticipated, the multimedia conferencing tool is not used by any of our respondents, and many of them though aware of its presence, did not know much about the existing technology. These findings prove hypothesis 3.

Audio and Video Used

Most of the audio and video delivered over the net is on demand. Multimedia clips are downloaded by instructors and students and can be used in class discussions or as further references for student research and assignments.

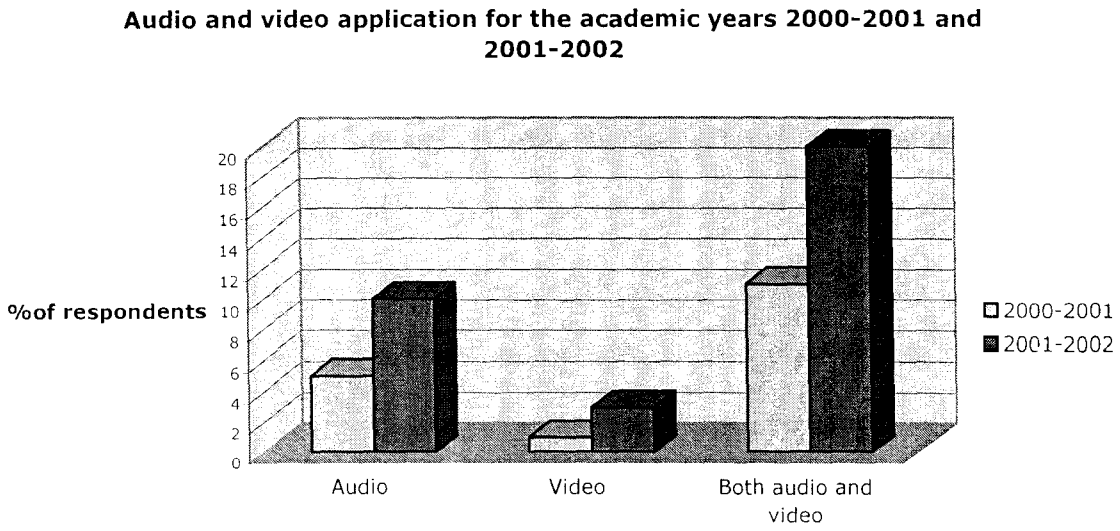
Because of its lower requirements of bandwidth and low cost compared with real time video, real time audio is more popular than real time video. The fact that most audio tools are proprietary, however, and due to the lack of standards, only a small portion of respondents is anticipated to be integrating the tool within their educational environment.

Real time video on the other hand, is still limited to experimental applications and many users are experiencing many technical problems with them. Based on these information, the following hypothesis is established:

Hypothesis 4:

Audio tools are:

a) more deployed than video and
c) they are expanding faster



Graph 4

Survey Results

As depicted in the bar chart above, only 1% of the respondents are using video while 5% are using audio. The rate of growth for audio tools is also higher than that for video tools 5% for audio versus 3% for video. These findings confirm hypothesis 4.

Advantages of using the Internet for teaching/learning

The last two questions required users to give short answers about their opinions with regards to using the Internet within an intenet based learning environment, either as a complementary and integral tool or as the only fundamental system for online knowledge transfer.

e-learning offers a wealth of benefits to the teaching and online learning community. The following are some of its main valuable services:

- It improves access to a wide, universal community of students; The Internet service today is more popular today than two years ago. Also the number of commercial service providers has grown, giving rise to competition, bringing down service costs, and resulting in opportunities for more people to access the technology. Moreover, because the Internet is based on standard communication protocols, and because much of its software can be down-loaded directly, students and instructors around the world can be sure of compatibility regardless of the platforms they are using.
- It is a cost and time effective solution for delivering education and for accessing learning material, First, costs of the required equipment for online learning via the Internet are, in most of the cases, a one-time investment and are continuously dropping in price. Also, many of the applications used can be downloaded for free directly from the Internet. Moreover, online learning via the Internet saves the travel time and costs to go to class, as well as the extra buildings, and faculty costs. Compared with other distance learning methods, online learning practitioners save the costs of courier services and traditional video-conferencing equipment.
- The relatively low cost electronic publishing and Internet access, combined with online flexible support services, enable individual instructors wishing to teach without instructional support, to compete for students by giving stand alone online courses.
- Extended class discussions beyond lecture time, and the ability to review previous sessions provide students with more time for reflection, analyzing and writing neat responses. It also encourages active involvement of the whole group in the discussion.. Further, it stimulates increased student-instructor interaction, which provides more support and help for student.

- As students are learning advanced tools and technologies, they are using most of the tools and developing the skills that will be an essential part of their work later.
- It is highly convenient: Teaching and learning via the Internet is highly flexible. Neither instructors nor students are confined by time or space, as they can access the Internet anytime from anywhere. Further, it permits students with special needs such as physically disabled people or those with certain life and work conditions, to benefit from educational program and upgrade their skills.
- It is easy to use. Internet software smoothly integrates different resources, providing users with a simple and user-friendly interface, which is quickly and easily mastered
- It improves learning resources. The Internet allows access to a readily available world-wide information resource, ideal for education and research. The ability of creating links to relevant resources, such as simulation software and multimedia documents, considerably supports teachers in their preparation of the course material and provides students with high quality learning resources.
- The ability to incorporate hypermedia, simulation software and real time multimedia applications provides considerable support for online learning environments. It permits the delivery of sophisticated instructional material to students anywhere. At the same time, using such tools improves the technological capabilities of students and instructors and helps them to get acquainted with the different features of the continuously developing Internet technologies.
- Internet material development is relatively easy, quick and low cost: can be done very quickly. The HTML language used to do so is very easy to learn and provides several capabilities and options for presenting information in different formats. Further, unlike

printed resources, the Internet presents a powerful tool for publishing and updating Internet information at low time and money costs.

Survey Results

The following is a list of the benefits the survey respondents believe the Internet provides for online learning environment.

- It provides global access to a large audience
- It is flexible
- It permits the easy processing of a large number of students tasks and provides self paced learning
- It allows for more open discussions with people from all over the world
- It allows any one to access and learn any time they wish to learn about nearly any subject
- It allows for a global and fairly inexpensive education
- It is time efficient, faster and more convenient communication between students, instructors and administration
- It allows for a more efficient use of class time
- It helps students develop new skills, such as :discussion, writing, thinking, collaboration, computer literacy, etc.
- It facilitates one-on-one tutoring, therefore allowing and encouraging students who might be reluctant to participate in class, but have equally valid points to make
- It increases student motivation and involvement in the learning process
- It provides a wealth of information resources for students and instructors

- Allows for a rapid generation of custom course materials in place of a standard textbook authored by the instructor
- It provides up-to-date material and allows for frequent adjustments to course syllabus

Disadvantages of using the Internet for teaching/learning

Despite the long list of the Internet benefits for online learning via the Internet, this medium also has some disadvantages and issues, which should be taken into consideration before implementing an online class via the Internet. Some of the main issues are economics, security, accreditation and copyright

Survey Results

Respondents had several comments about the shortcomings and problem areas of the medium, which need attention in order to provide a problem free online environment. The main remark is that respondents were experiencing, such as security matters and technical problems like bandwidth and technical problems and technical support, have been either solved or are being addressed

The following are the main criticisms of the survey respondents;

- Much of the information available on the WWW is irrelevant, therefore students can easily have an information overload and can lead to a loss of time searching.
- Many technical problems including: connection access to material, delays and cut off, slow downloading of multimedia files, low bandwidth
- Time consuming technical problems

- Lack of students and instructors computer literacy
- Continuous need for technical support
- Technical problems quickly lead to student frustration therefore affecting their concentration during the class session
- Searching can be cumbersome and clumsy
- Some sites are not easy to access or disappear and change address
- Lack of security
- Increased workload for instructors
- Current Internet tools are not fully adequate to student
- Paying for access is a problem for students
- High risk of flaming and inappropriate behavior during discussions
- Academic resistance to this new way of teaching

Conclusion

Based on the survey's outcomes, the main conclusions can be summarized as follows:

- The Internet's ubiquity and easy access, coupled with the increased developments and proliferation of its tools are opening up new opportunities for learning students and institutions, who have already started deploying the medium as a flexible learning environment
- This concept is confirmed by the fact that in the academic year 2001-2002 almost all the respondents were using the Internet as an integral tool of their course delivery.

- The main powerful aspect of the Internet, which strongly encouraged the respondents to adopt the different Internet tools, is the easy reach to class members any time and anywhere, which resulted in improved communication between them. Furthermore, cost efficiency was also among the main reasons which invited users to use the Internet, in addition to the previously mentioned ones.
- Given the current network limitations, and the high cost of broadband access, low bandwidth modules which mainly involved e-mail applications were the most prevalent tools used for online distribution of learning material. Real time text based tools, which provide flexible cyber environments and live interactions on the other hand, are increasing in popularity among the educational community. The real time video conferencing software is also being promoted along with the continuous upgrades in its technology. User education about the best ways of deploying these tools would grant users higher quality environments and an increased efficiency. Not until high speed connections become affordable and network issues are solved, would the majority of Internet learning community start adopting high bandwidth technologies.
- Taking into account the network issues stated earlier and the scarcity of bandwidth, multimedia applications are limited to downloads of multimedia web files, to supplement presentations and research projects. The lack of standards is a significant discouraging factor for the widespread of learning community to adopt these tools for online delivery of educational material. In the case of real time multimedia applications, network improvements would considerably promote the integration of these media
- Despite the fact that any of the respondents still consider the Internet as being insecure, upgrades in the network security field, have been motivating other learning practitioners

to use the medium for giving or taking online exams. Furthermore, the unsolved electronic material copyright issues did not really hinder many of the respondents from providing their students with online hypertext manuals

- Despite the various advantages of using the Internet within an e-learning environment, several issues such as network security, bandwidth insufficiency and costly high speed connections are still presenting obstacles for a higher quality online educational environment and more efficient and smooth interactions. Hardware and software developers are currently working on solving these issues and on upgrading the medium and making it more convenient for the Internet user community including learning practitioners.

Other issues such as, online class material preparation time and effort investments, training needs and technical support required are temporary issues which are solved soon as the users get more familiar with the tool and become able to use it smoothly.

Chapter 4

Suggestions

A Theoretical Framework for The Integration of Internet-based e-learning

Strategic Management Model

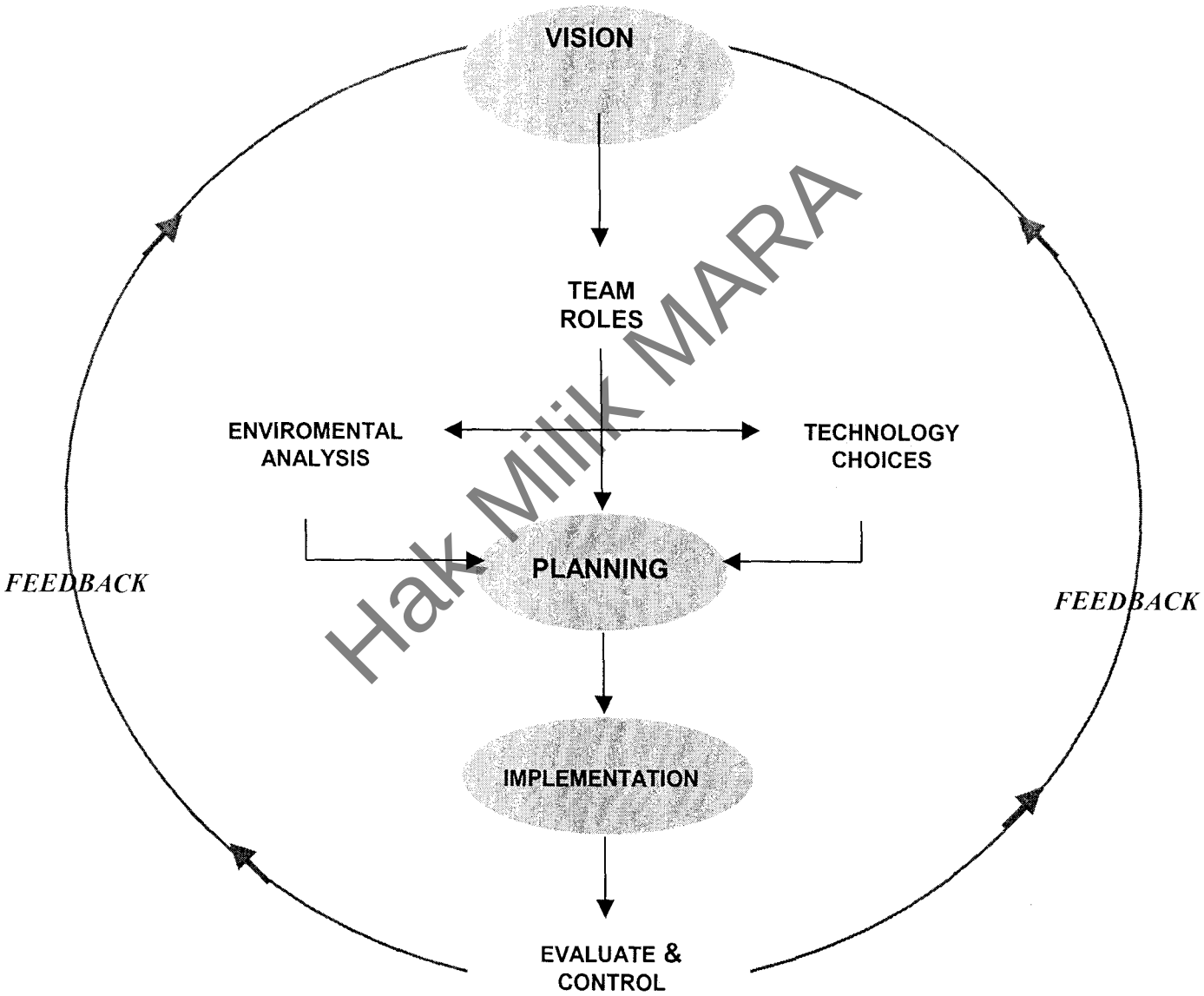


Figure 5

Strategic Management Model For IKTM's Internet–based e-Learning

Strategic Manangement is a process by which top management determines the long-run direction and performance of an organization by ensuring that careful formulation, proper implementation and continous evaluation of the strategy takes place

Organizational strategy is concerned with envisioning a future for the organization's business, creating value in the eyes of customers, and building and sustaining a strong position in the marketplace.

For IKTM, a strategic management of the Internet-based e-learning is very important to ensure that its implementation will be well supported by top management and concerned parties in the institute. What was observed is that e-learning in general has not been receiving strong support from top management, staffs and lecturers. It can be said that the management of e-learning in these institutes is not integrated and hence results in more of a lone ranger approach (Abu Daud Silong, Daing Zaidah Ibrahim and Bahaman Abu Samah, 2001). Based on this current management scenario, the author would like to propose a strategic management model that will help guide the institutions in managing their Internet-based e-learning.

An integrated organizational strategy is devised to help develop an Internet-based e-learning that strives towards a dynamic and more competent institution. The following detail will demonstrate the effectiveness of this Strategic Management Model by evaluating each elements of the framework presented in figure 5.

Visioning

Defines what the institutes stand for and why they exist. It provides the glue that holds the institute together as it grows, decentralizes, diversifies, expands globally and develops workplace diversity. These include the institutes' core values, core purpose and envisioned future. The envisioned future is what the institute aspire to become, to achieve, to create – something that will require significant change and progress to attain.

In line with its vision, the institute should submit its mission to establish an Internet-based e-learning that commits to the advancement and success of the teaching and learning and to the education as a whole.

Environmental Analysis

Environmental Analysis process is critical for scenario building through the assessment of the organization's internal and external environments. Through this, we can identify the opportunities that can be exploited and threats to be thwarted before planning can take place.

External analysis covers issues on internationalism, k-economy, effective government and venture partners funding, institute's competency and difference, ICT in teaching/learning and current and advance technology.

Internal Analysis to be carried out with regard to, institutions' reputation and prestige, teaching/learning environment, research and development and quality management.

For the integration of Internet-based e-learning, the institutes need to analyse externally the use of ICT in teaching and learning in other institution and internally analyse their current teaching and learning environment.

Leadership Roles

The difference between low performance organizations and high performance organizations could rest in the quality of leaderships and its ability to respond quickly to external changes and internal organizational dynamics.

Role type can change dynamically based on the tasks assigned to the leaders. In the organization, one leader may play many roles or many leaders may share the same role type but at a different level. It is important here for the leaders to realize their roles in order to carry out their responsibilities efficiently and to provide quality leadership.

In the context of IKTM and its Internet-based e-learning planning and implementation, it is vital that team leaders identify their roles and determine the tasks they need to carry out. This should be strongly back by supporting roles of leaders in top management.

Technological Choices

Technology is playing an increased role in organizations. New and improved technologies such as computer-integrated teaching and learning enable organizations to produce superior products, in context of institutions, better qualified graduates, and to customize services more easily, and to quickly alter their processes as the market dictates. However, continuing innovation with computer technologies means faster obsolescence of products, shorter life cycles, and increasing quality standards. These factors should be carefully studied by IKTM's Strategic Planning Committee for the implementation of Internet-based e-learning, before devising strategic plans, specifically which involves the acquisition of hardware and software.

Planning

Organizations that use the concepts of strategic planning in the management process will go through several stages in the planning framework. These stages, involve the definition of a mission statement, determination of goals and objectives that aid in completing the mission, and development of the strategies and tactical plans by which the goals and objectives can be achieved.

Implementation

A brilliant strategy that can't be implemented creates no real value. Effective implementation begins during strategy formulation when questions of "how to do it?" should be considered in parallel with "what to do?" Effective implementation results when organization, resources and actions are tied to strategic priorities, and when key success factors are identified and performance measures and reporting are aligned.

Evaluate and Control

This process is critical to ensure that, the implementation process provides a comprehensive approach to the system development. This involves activities of data collection and analysis, facilitation from the management team, and feedback to accomplish strategic alignment.

Soft Systems Methodology

This project work developed the strategic planning for the Internet-based e-learning environment using the Soft System Methodology approach. The soft system methodology (SSM) is a methodology based upon the system theory, which provide an antidote to conventional reductionist scientific inquiry, with the tendency to reduce phenomena into smaller and smaller components in order to study and understand them better (Peter Checkland,1989). Soft Systems Methodology, SSM, uses models of purposeful activity systems to set up a debate about change and learns its way to changes, which would be both systematically desirable and culturally feasible for the people in the problem situation.

SSM originates from the failure of hard systems methodology towards problem solving, which Peter Checkland refered to as hard Systems Engineering (SE). How different is the systems thinking in 'soft' Systems Methodology from that in 'hard' Systems Engineering? In brief, SSM is a learning systems, where learning means participating while SE is an optimizing system. SSM is a general case tool while SE is a special case (when ends are agreed or can be imposed). SSM answers the questions of 'what to do?' and 'how to do?' but SE only answers the question of 'how to do?'. The crucial distinction between the hard and soft systems

approaches is that the former takes the world to consist of systems, whereas the latter shifts systemicity from the world to the process inquiry into the world: in SSM 'the system' is not something out there in the situation but is the process of inquiry, a process which happens to make use of pure systems models.

The system theory is also holistic, which means it attempts to study the whole picture and the relation of the components, parts to each other and to the wider picture. Some systems like biology and environmental science is using principles widely but SSM is not, it's rather a general problem-solving tool. This methodology (SSM) has been made to incorporate it into the system design work.

Also SSM helps formulate and structure thinking about problems in a complex human situations, its core is the construction of the conceptual models and the comparison of these models with the real world. This process can greatly clarify all the hard problems with many potential solutions. And one more thing about SSM is that it's not about analyzing systems found in the world but it's about applying systems principles to the structure thinking about things that happen in the world. People involved in the problem situation, with expert help and guide, can usefully carry out SSM.

This report discussed about the related SSM stages in developing the strategic planning. In fast, the problem situation is often expressed as the **rich picture**, then the **root definitions** are then derived, after that textual statements which describes potential relevant system to be considered and this is what we call **conceptual model of systems described in root definitions.**

Of course the root definition and the conceptual model are only two expressions, one should always explain and justify each other so then we will **compare these two models** with the what's actually happening in the real world. This comparison will lead to suggestion for improvements, which must be feasible in the culture of the organization, considered and finally suggestions for the actions.

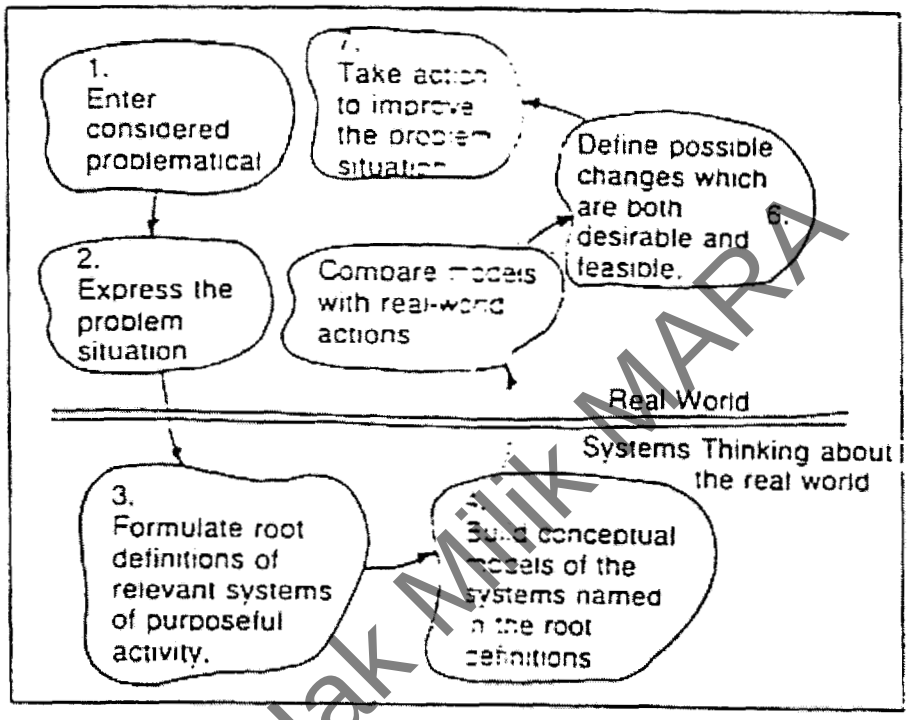
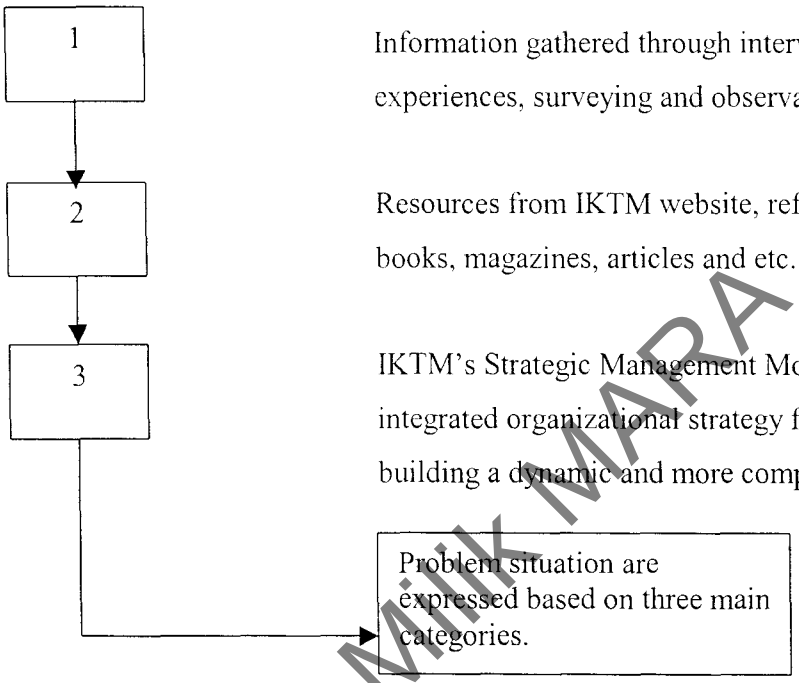


Fig. 6 The learning cycle of Soft Systems Methodology.

Rich Picture Analysis

The rich picture expresses the problems that are faced by the IKTM.

The problem situation are expressed based on the following enquiry methods:



Information gathered through interviews, personal experiences, surveying and observations.

Resources from IKTM website, references from literature: books, magazines, articles and etc.

IKTM's Strategic Management Model that devises an integrated organizational strategy framework towards building a dynamic and more competent organization.

Problem Situation 1: Teaching & Learning

1. Students are not self-directed/learner-managed towards learning
2. Instructors and learners confidence in the technology
3. The need to change roles and degree of responsibility
4. Confusion – methodology? Or delivery tool?
5. Crisis of confidence in methodology
6. Adapting to new method/technology(h/w and s/w)

Problem Situation 2: Designing and Producing

1. Key interactions
2. "online anything" syndrome
3. Different online modes
4. Hardware and software
5. Instructional design
6. Integration of other educational activities
7. Cost effective?
8. Accessibility, usability and availability
9. Pedagogue - meta-cognitive capability, pedagogical implications, ability to assimilate knowledge learned

Problem Situation 3: Funding

1. h/w and s/w and applications development
2. Training

The Conceptual Model

The conceptual model is designed in a way that would demonstrate the potential activities that will be undertaken for Internet-based e-learning and their logical dependencies.

To ensure the success of the implementation of the Internet-based e-learning, it is very important to educate the instructors, learners, other staffs and management adequately on the its concept and especially on the benefits that it would bring to education in the institution and the type of graduates produced. It is very important to highlight on the benefits and usage that the Internet-based e-learning will provide during the educating process since it will help to attract

interest to the concept and eventually lead them to support and back the implementation of the system. As they further able to identify and appreciate the Internet tools used for the Internet-based e-learning, such as the e-mail, newsgroups, conferencing, etcetera, it is very likely they would give full support to the concept. Supports from these people are extremely important to ensure the success of the Internet-based e-learning because they play a big role as the producer, users and customers of the system.

These people also need to be trained and educate to ensure that they are well versed and familiar with the system, able to manage and maintain the system required within their specified needs, as well as assisting each other in carrying out their tasks.

It is also necessary to recruit skillful and experienced people from various fields especially from IT fields to assist in the process. They should not only assist in the training process of the staff, but also during the development stage of the system. With adequate help from experts, it would ensure that the Internet-based e-learning system stays on track and achieve its goals.

In higher education, a needs assessment is necessary to determine which programs or courses are best suited for Internet delivery and which Internet tool will be most advantage for the learning. Such assessments may include: a market analysis; an examination of faculty skills, knowledge, attitudes and beliefs; and an assessment of available resources.

Instructors together with team of designers and producers for the Internet-based e-learning system should work collaboratively to identify the need for existing T/L to be online(Internet). Careful and detail analysis will help ensure that the Internet tools are being appropriately and optimally deploy to the advantage of learners and course delivered.

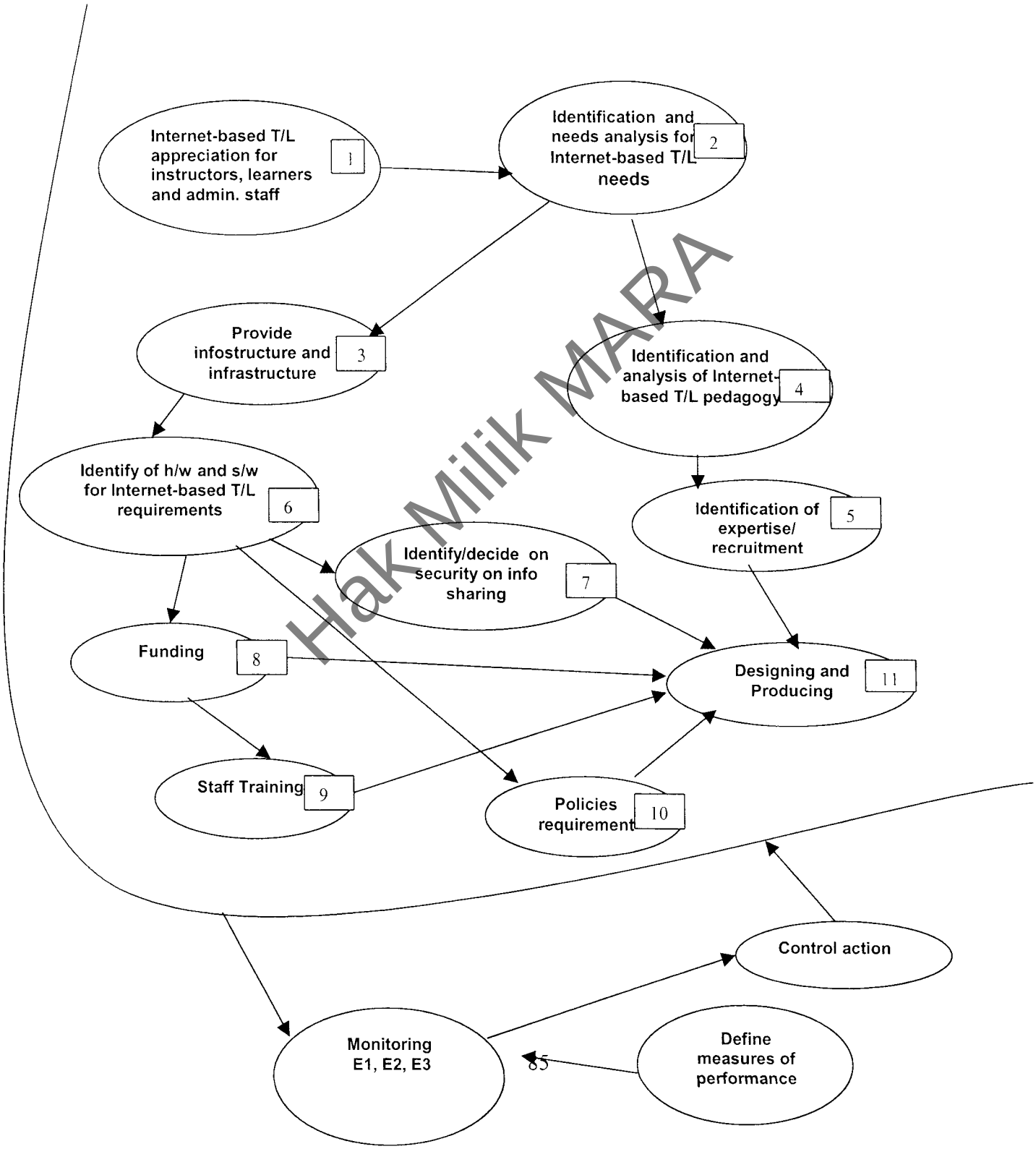
The results of the activity mentioned above, facilitate the design and selection of infostructure and infrastructure. The design of infostructure and infrastructure produced will enable the identification of hardware and software required for the Internet-based e-learning which should take into consideration of cost and performance efficiency, funding, security, policies and the ability of the infrastructure to support future needs/expansion.

The selected T/L activity to be on online will undergo pedagogical analysis to ensure that knowledge to be learned by learners is achieved. These will also include the identification of complementary activities.

Instructors will undergo training that will equip them with skills to use, adapt, integrate and manipulate the different Internet technology use for T/L. If they form part of the design team, further training required for skills in developing online materials. Skills training for instructors will depend on recruitments of expertise made. Instructors can also be trained as experts for the Internet-based e-learning, but they should be selected base on their keenness in the Internet technology for education and their ability to apportion their time to design and produce materials online and also to carry out in-house training when there's a need.

CONCEPTUAL MODEL – Strategic Planning of Internet-based e-Learning for IKTM

Figure 7



Monitor and Control

The monitor and control mechanisms are incorporated in the conceptual model of the Internet-based e-learning system because they act as measures of performance, since they evaluate the performance and regulate themselves when and where the desired performance is not being achieved.

Based on SSM, the Internet-based e-learning monitor and control mechanisms developed are as follows:

Efficacy	-	will the Internet-based e-learning able to catalyze the teaching and learning?
Efficiency	-	what are the benefits that the Internet-based e-learning provide for the resources consumed (ROI)?
Effectiveness	-	do the instructors/learners and the institution as a whole, benefit from the services provided by the Internet-based e-learning and improve education?

Comparison

After all the above steps are done, the problem situation in the Internet-based e-learning is looked again. The aim here is to compare defensible conceptual version of what might happen with what really happen in the situation. The activities in the Internet-based e-learning that are done poorly or not done at all are spotted and recommendations for improvements are made.

Figure 8

Activity	Is it done in real situation? How is it done?	Comments, recommendations
1. Educate Internet-based T/L appreciation for instructors, learners and administrative staff	The education system in IKTM do not place emphasis on the use of Internet specifically in their teaching and learning.	• Instructors/learners and related staffs of the institution should undergo an awareness on the use of Internet in education. Several sessions and stages of awareness on Internet-based education can take place.
2. Identification and analysis of Internet-based T/L activities	'online anything', electronic page turning. only act as delivery tool for lecture notes	• Instructors as content provider together with designers and producer of Internet-based education analyse the need to online the necessary activities for T/L, which will facilitate the T/L. • This activity will help in the knowledge management of the course.
3. Provide infostructure and infrastructure	Duplication of information due to unorganized infostructure. A non-holistic approach to infrastructure. Low bandwidth.	• A team to organized the institute infostructure. • Hardware and software expert to advise on the current and future needs of the institutions' infrastructure. • Identify bandwidth requirement for T/L activities to be online.
4. Identification and analysis of Internet-based	Converting existing T/L material into electronic form for students to access.	• Though the emphasis of training is 70% hands-on industrial plant and

T/L pedagogy	Limited T/L activities on the Internet, face-to-face remain the main methodology, ie. classroom-based.	equipment, institution like MFI and GMI can still consider using the Internet to provide a rich learning environment for students by having Internet discussions with experts, encourage students to explore the vast knowledge available on the Internet related to their studies which students can bring to class for discussions.
5. Identification of expertise	It is observed that h/w and s/w literate personnel, like those in the IT departments are the able people to explore and use the Internet technology. Most instructors find that they are deskill to use the technology and that it will only take more of their time to switch their T/L activities online.	• Identify various expertise relating to the implementation of Internet-based e-learning. • Based on information gathered, the institution can identify expertise that is lacking and decide to acquire the expertise through new recruitment or train existing personnel.
6. Identification of H/w and S/w for Internet Technology	The numbers of computers are sufficient and for some IKTM, the computers are fully network into the intranet. Nevertheless, access to Internet are limited and slow due to low bandwidth Not many students own computers to enable them to take advantage of iInternet use when they are not in the institution or when time is a factor	• Seriously upgrade the current bandwidth. • Ensure efficient use of bandwidth through selection of h/w and s/w and the most appropriate use of Internet tool for T/L • Analyse the feasibility of providing term loan to students for purchase of computers.

		• Collaborate with student sponsors, banks or finance institution to help students obtain loan for purchase of computers for their studies.
7. Identify/decide on security on info sharing	Some instructors are skeptical about sharing their T/L materials on the Internet.	• Assurance on security of intellectual rights should be made aware to the instructors. • Employ h/w and s/w security.
8. Funding	Limited to one time government endowment fund and students' fees	• Active collaboration with industry that relates to the training in the designing and producing of Internet T/L, eg. T/L materials, expert discussions, online training. • Actively collaborate with students in modularised projects in terms of practical/hands-on experience that form part of students' coursework.
9. Staff training	Limited training was carried out for the T/L on the Internet. Mostly delivered by h/w and s/w personnel who are the keen user of Internet tools.	• Instructors train on Internet tools usage and on related Internet h/w and s/w used for T/L. • Training in instructional design for Internet-based e-learning is desirable.
10. Policies requirement	Existing policy loosely cater for the usage of h/w and s/w	• Emphasis on copyright and security. • Revised policies on h/w and s/w with focus on practicality and advantage for T/L

11. Designing and Producing	Minimal training, and mainly for IT literate staffs. Some design work was outsourced	• Proper training in instructional design. • Ensure understanding of key interactions, integration of other T/L activities, flexibility for learners, encourage self-directed, self-regulated and self-managed attitude and responsible towards own learning, focus on T/L pedagogy and learners meta-cognitive ability. • Consider factors on usability, accessibility, availability .assessment, evaluation and feedback.

Choice of Internet Tools for T/L Activities

Figure 9

Use of an Internet-based e-learning	Examples	Types of student activity
Administration - online support for learning	Unit outline Calendar Maiiling Lists Notices Class management Assessment submission	Access to administrative resources and details through the Internet.
Communication	Email Discussion/bulletin boards	Projects with other students (on-campus, off-campus or remote/international).

	Newsgroups IRC-Chat rooms E-conferencing/web-conferencing Multimedia conferencing Frequently Asked Questions (FAQs)	Interaction with course coordinator/tutor. Interaction with discipline experts from other institutions etc. Special event contact with tutor and other students. Online socialisation. Information exchange.
Delivery of content	Lectures Handouts PowerPoint slides	Access to learning resources through the Internet.
Assessment	Formative e.g., quizzes Summative e.g., modified essay questions, assignments	Access to feedback and self-checking resources through the Internet.
Resources	Support material e.g., movies, images Links to other relevant sites Library resources e.g., journals, databases	Access to learning resources through the Internet. Students contributing resources and material to the institute's website
Interactive learning activities	Multimedia Simulations Computer Assisted Learning (CAL) e.g., programs that profile the learner, assesses the students knowledge and then tailors the program to the student's needs	Interaction with learning materials. Projects.

Chapter 5

Conclusion

In implementing the Internet-based e-learning plan through SSM, several strategic thrusts have been identified to close the gap between the conceptual model and the real world situation.

Firstly, the need to provide awareness of the use and benefits of Internet technology for T/L for IKTMs' instructors, learners and management, in order to ensure the successfulness of the integration of Internet-based e-learning plan. The involved parties need to understand the concept of the Internet-based e-learning and related technology so that the Internet technology can be deployed effectively and efficiently and most of all for the instructors and learners to take full advantage of the new environment for teaching and learning which provides a rich T/L environment.

Preparation of mindset shift is important too. Awareness of the benefits of Internet-based e-learning mentioned above is one of the main factors for the successfulness of the mindset shift. Instructors and learners should have correct mindset about the restructure of the teaching and learning with the integration of Internet technology so that they are able to embrace the new technology. Failure in shifting mindset would cause instructors resistance to change, as experienced by teams or individuals responsible to encourage e-learning in IKTM.

Skillful people are very much needed in the Internet-based e-learning plan especially in encouraging the instructors, learners and management to use the Internet technology in the T/L.

There fore, it is vital for IKTM to recruit some skillful and experience key personnel for the Internet-based e-learning to join the existing team rather than to fully train existing time constraint instructors to carry out the task. It is best to consider the instructors as content expert and help and encourage them to integrate Internet technology in their teaching. In the case of instructors who are keen to not only use but also keen to develop Internet applications and manage the technology, they can be trained as experts. Development support for instructors is desirable, this will provide the instructors with a place to go to have questions answered, to receive development help. Availability of resources for those instructors wanting to 'play" with technology and learning are also vital.

In the case of students, they should be guided into the new learning environment ensuring secure feeling using the Internet technology to manage their learning and able to clearly see how they could take advantage of the new environment to experience an enrich learning. Also students require support on resources to help them succeed.

The smart partnership idea can also be considered for the Internet-based e-learning plan. The institutions need to build strategic relationships with more related industries with extensive experience that would be able to provide not only funding for Internet applications development for the T/L but also an up-to-date information content related to the course.

For all the above to thrive, commitment from the top is highly needed. Their support and encouragement will be a major driving force for students, staff and management to the new learning environment. The support should also cater for environment that encourages

experimentation and accepts failure. It would be wise for institution to think of a change management strategy to ensure Internet-based e-learning is adoptend with "minimal discomfort".

More case studies should be done on existing implementation of Internet-based e-learning which provide not only on insight to factors discussed in this report but also on the cultural aspects. The Internet new presence in the T/L approach enable institution to take the advantage to explore its limits so that institution will be more appreciative of its benefits and be aware of its disadvantages.

Finally, it is important to remember that instructing is not teaching, and teaching is not learning. Instructing involves conveying information, while teaching involves imparting knowledge. All the knowledge in the world is worthless if it is not taught in a manner that enables the student to learn. This is true whether the classroom is in a light green schoolhouse or on a vast network linked by electrons. These days, finding the best way to teach may be the most important lesson we can learn.

BIBLIOGRAPHY

Abu Daud Silong, Daing Zaidah Ibrahim, Bahaman Abu Samah, (2001), 'Models of Online Learning Delivery Systems',

Adamson-Macedo, C (1996) 'PC's, the bandwidth revolution and engineering curricula,' IEEE Computing and Control Engineering Journal, 7,3, pp 129-35

Alexander and McKenzie, J(1998) An Education of information Technology Projects for University Learning, Committee for University Teaching and Staff Development and The Department of Employment, Education, Training and Youth Affairs, Canberra

Alrajeh, Nabil & Janco,B., (1998). A Model for Asynchronous Learning Networks in Media Education. ALN Magazine 2(2).

Bangert-Downs, R. L. Kulik, C. C., Kulik, J. A., & Morgan, M. T. (1991). The instructional effect of feedback in test-like events. Review of Educational Research, 61(2), 213-38.

Bates, A. W. (1990). Third generation distance education: The challenge of new technology. Paper presented at the XV World Conference on Distance Education, Caracas, Venezuela. (ERIC Document Reproduction Service No. 332 688).

Bednar, A., Cunningham, D. J., Duffy, T., & Perry, D. (1995). Theory in practice: How do we link? In G. Anglin (Ed.), Instructional technology: Past, present, and future (2nd ed., pp. 100-112). Englewood, CO: Libraries Unlimited

Bligh, D A(2000) What's the Use of Lectures?, Josey-Bass, San Francisco.

Bonk, C. J. & King, K. (1998). Computer conferencing and collaborative writing tools: Starting a dialogue about student dialogue. In C. J. Bonk & K. King (Eds.), Electronic Collaborators: Learner-Centered Technologies for Literacy, Apprenticeship, and Discourse (pp. 3-23). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Bonk, J. C. & Cunningham, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In C. J. Bonk & K. S. King (Eds.), Electronic Collaborators: Learning-Centered Technologies for Literacy, Apprenticeship, and Discourse (pp. 25-50). Mahwah, NJ: Lawrence Erlbaum Associates

Bulter, D. L., & Winnie, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. Review of Educational Research, 65(3), 245-81.

Centre for the Advancement of Teaching and Learning, Towards a Definition of Online Learning at UWA, (Academic Council Resolution 39/2001)

Clark, R.E. (1994a). Media and method. Educational Technology Research and Development, 42, 7-10.

Clark, R.E. (1994b). Media will never influence learning. Educational Technology

Research and Development, 42, 21-29.

Cohen, V. B. (1985). A reexamination of feedback in computer-based instruction: Implications for instructional design. Educational Technology, 25(1), 33-37

Corno, L. (1994). Student volition and education: Outcomes, influences, and practices. In D. H. Schunk & B. J. Zimmerman (Eds.), Self regulation of leaning and performance: Issues and educational applications (pp. 229-254). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Corno, L. & Randi, J. (1999). A design theory for classroom instruction in self-regulated learning? In C. M. Reigeluth (Ed.). Instructional design theories and models: A new paradigm of instructional theory (Vol. II) (pp. 293-318), Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Gary Bartlett, (2001), Systemic Thinking: A simple thinking technique for gaining systemic focus.

Gillani, B. B. & Relan, A. (1997). Incorporating interactivity and multimedia into Web-based instruction. In B. Khan (Ed.). Web-based instruction (pp. 231-237). Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Hagen, A. S. and Weinstein, C. E. (1995). Achievement goals, self-regulated learning and the role of classroom context. In P. R. Pintrich (Ed.), Understanding self-regulated learning (pp. 43-56). San Francisco: CA: Jossey Bass.

Harasim, L,Hiltz,S R, Teles, L and Turoff,M (1995) Learning Networks: A field guide to teaching and learning online, The MIT Press, Cambridge MA.

Haughey, M & Anderson, T., 1998, Networked Learning: The Pedagogy of the Internet, Montreal, Canada: McGraw-Hill.

Hillman, D. C., Willis, D. J. & Gunawardena, C. N. (1994). Learner-interface Interaction in distance education: an extension of contemporary models and strategies for practitioners. The American Journal of Distance Education, 8(2), 30-42.

Hoska, D. M. (1993). Motivating learners through CBI feedback: Developing a positive learner perspective. In J. V. Dempsey & G. C. Sales (Eds.), Interactive Instruction and Feedback (pp. 105-32). Englewood Cliffs, NJ: Educational Technology.

Iran-Nejad, A. (1990). Active and dynamic self-regulation of learning processes. Review of Educational Research, 60, 573-602.

John Stephenson, 'Learner-managed Learning – An Emerging Pedagogy for Learning Online), Middlesex University, 2001

Jonassen, D.H. (1994). Thinking technology: Toward a constructivist design model. Educational Technology, 34(4), 34-37

Jonathan L.Lim (2002) 'E-Learning a New Frontier in Education', Multimedia Resource And Development Centre.

Jones, M. G. & Farquhar, J. D. (1997). User interface design for Web-base

Khan, B. H. (2001). A framework for Web-based learning. In B. H. Khan (Ed.), Web-based training. Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. H.(Ed.). (1997). Web-based instruction. Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. H.(Ed.). (in progress). Web-based learning. Englewood Cliffs, NJ: Educational Technology Publications

Kulhavy, R. W. (1977). Feedback in written instruction. Review of Educational Research, 47(1), 211-32.

Kulhavy, R. W. & Wager, W. (1993). Feedback in programmed instruction: Historical context and implications for practice. In J. V. Dempsey & G. C. Sales (Eds.), Interactive Instruction and Feedback (pp. 2-20). Englewood Cliffs, NJ: Educational Technology

L. M. Harasim (Ed.), Online education: Perspectives on a new environment (pp. 15-30). New York: Praeger

Laurillard, D (1993) Rethingking University Teaching: A framework for the effective use of educational technology, Kogan Page, London.

Ley, K., & Young, D. B. (2001). Instructional principles for self regulation. Educational Technology Research and Development, 49(2), 93-105

Mason, R (1998) Models of online courses, ALN Magazine, 2(2), http://www.aln.org/alnweb/magazine/vol2/issue2/Masonfinal.htm

Mason, R., & Kaye, T. (1990). Toward a new paradigm for distance education. In L. M. Harasim (Ed.), Online education: Perspectives on a new environment (pp. 15-30). New York: Praeer.

Massy, J (2000), Manager of theCEDEFOP Training Village e-learning sites, http://www.trainingvillage.gr/

Martin Good, 'On The Way to Online Pedagogy', (2001), Cambridge Training and Development Ltd, UK,

Moore, M. G. (1989). Editorial: Three types of interaction. The American Journal of Distance Education, 3(2), 1-6.

Neilson, J. (1993). Usability engineering. Boston: AP Professional.

Norman (1988). The Psychology of Everyday Things. New York, NY: Basic books, Inc., pp. 151-158.

Northrup, P. T. & Rasmussen, K. L. (2000). Designing a web-based program: Theory to Design. Paper presented at the annual conference of the Association for Educational Communications and Technology, Long Beach, CA: February 2000.

Northrup, P. (2001). A framework for designing interactivity in Web-based instruction. Educational Technology, 41(2), 31-39.

Paulsen,m F (1995) The Online Report on Pedagogical Techniques for Computer-Mediated Communication, http://www.hs.nki.no/morten/cmcped.htm

Peter Checkland, Soft Systems Methodology, (1989), Human Systems Management (pg 273-289),.

Pilgrim, C J, and Leung, Y K (1996) ' Appropriate use of the Internet in Computer Science courses', ACM SIGCSE Bulletin, 28 (Special Issue: proceedings of ITiCSE '96 – SIGCSE/SIGCUE Conference on Introducing Technology into Computer Science Education), pp 81-6.

Ramsden,P(1992) Learning to Teach in Higher Education, Routledge, London.

Reiser, R. A. and Gagné, R. M. (1993). Selecting media for instruction. Englewood Cliffs, NJ: Educational Technology Publications.

Riva, A and Bellazzi, R (1996) ' Current AI Technologies for Distributed Patient Management', in Proceddings of the AAAI Spring Symposium on Artificial Intelligence in Medicine, Stanford, CA.

Roger, Carl (1969) Freedom to Learn, Charles Merill, Ohio.

Russell, T. L. (1999). The "no significant difference" phenomenon: A comparative research annotated bibliography on technology for distance education. Raleigh: North Carolina State University Office of Instructional Telecommunications.

Russell, T. L. (1993). The "no significant difference" phenomenon as reported in research reports, summaries and papers. Raleigh: North Carolina State University Office of Instructional Telecommunications.

Soby, M. (1990). Traversing distances in education: The PortaCOM Experiment. In A. W. Bates (Ed.), Media and technology in European distance education. Proceedings of the EADTU workshop on media, methods and technology (pp. 241-247). Milton Keynes, England: The Open University for EADTU.

Salmon, G (2000) E-Moderating: The key to teaching and learning online, Kogan Page, London.

Steeples, C et al. (1996) 'Technological support for teaching and learning: computer mediated communications in higher education (CMC in HE)', Computers and Education, 26, 1-3, pp 71-80

Thach, E. C. & Murphy, K. L. (1995). Competencies for Distance Education Professionals. Educational Technology Research and Development, 43(1), 57-79.American Psychological

Urdan.T.& Weggen,C., Corporate e-Learning: Exploring a New Frontier(2000), A Research Paper from WR Hambrecht & Company, available on line at http://www.wrhambrecht.com/research/coverage/elearning/

Yacci, M. (2000). Interactivity demystified: A structural definition for distance Education and intelligent computer-based instruction. Educational Technology, 40(4), 5-16.

Zimmerman, B. J. & Martinez-Pons, M. (1995). Self-monitoring during collegiate studying: An invaluable tool for academic self-regulation.

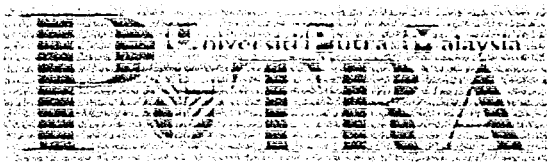
Zimmerman, B. J. & Martinez-Pons, M. (1988). Construct validation of a strategy model of student self-regulated learning. Journal of Educational Psychology, 80, 284-290.

Zimmerman, B. J. & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. American Educational Research Journal, 23, 614-628.

Zimmermen, B. J. & Paulsen, A. S. (1995). Self-monitoring during collegiate studying: An invaluable tool for academic self-regulation. In P. R. Pintrich (Ed.), Understanding self-regulated learning (pp. 13-28). San Francisco: Jossey Bass.

APPENDIX

Questionnaire



A Collaborative Effort Framework For The Production of Elearning Program :Internet/Web-based Education (IbEd.) for MARA Higher Institution

This survey comprise of 13 questions which include short answer questions, questions with short multiple choice answers, and questions which requested respondents to write short answers about their personal opinions with regards to using the Internet for online learning.

Internet Use for Distance Learning

1. Name of institution:.....

2. Type of institution

   Public university ☐
   Private university ☐
   MARA Higher Institution ☐
   Private College ☐

3. What year was your institution founded?

   50's ☐ 60's ☐ 70's ☐ 80's ☐
   90's ☐ year 2000 and above ☐

4. How long have you served this institution?

more than one year ☐
more than two years ☐
more than three years ☐
more than four years ☐
five years and above ☐

5. What is your function in this institution?

Instructor/Lecturer/Tutor ☐
Administrator ☐
Others ☐

6. Age group

21 - 25 ☐ 25 - 30 ☐ 31 - 35 ☐ 35 - 40 ☐
41- 45 ☐ more than 45 ☐

7. Do you use any of the internet tools in your teaching/admin.work?

Yes ☐ No ☐

8. If you answer 'yes' for question (7) above, what internet tools do you use?
(give ranking according to degree of usage, 1 – none, 2 - sometimes,
3 – frequent, 4 – highly frequent)

email ☐ web-conferencing ☐ video conferencing ☐
IRC ☐ Audio conferencing ☐ learning portal ☐

Reasons For Using the Internet

9. What are the reasons for using the Internet for delivering your educational material?

It improves student-student communication ☐

It improves teacher-student communication ☐

It saves time ☐

It is cost efficient ☐

It makes student research easier ☐

It enables to reach more students anytime & anywhere ☐

Other reasons (Please write your response to this question in the space given below)

i .....

ii.....

iii.....

iv.....

v.....

vi.....

Audio and Video Use for the academic year 2000 -2002

10. Please indicate your application of audio and video during the academic year

	2000 – 2001	2001 – 2002
Real time audio	☐	☐
Real time video	☐	☐
Both real time audio and video	☐	☐

11. Please indicate if you used the Internet for the following functions during the academic year 2000 – 2002.

Functions	*2000 – 2001*	*2001 – 2002*
Uni/college.com	☐	☐
Class discussions	☐	☐

Real time lecture	☐	☐
Lecture	☐	☐
Posting lectures outline	☐	☐
Hypertext manual	☐	☐
Receiving assignments	☐	☐
Providing feedback	☐	☐
Cooperative assignments	☐	☐
Exams	☐	☐

Advantages of using the Internet for Teaching/Learning

12. Within an online environment, what are the advantages (list) of using the Internet for teaching/learning?

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13. What are the disadvantages(list) of using the Internet for teaching /learning?

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Managing online teaching/learning

14. Are there teams formed in your institution to oversee the implementation and running of the online teaching/learning? If yes, please name your team and their functions.

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15. What kind of help/expertise and services the institution engaged in implementing online teaching/learning?

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Deebben Subramaniam,
Liaisons Director,
Ins. Of Engineering Malaysia,
Multimedia University,
Cyberjaya Campus.

Dr. Mohamad Yusoff Alias,
Associate Dean,
Student Affairs and Lab Management,
Multimedia University,
Cyberjaya Campus. 10 SEPTEMBER 2008

To Book Lab for C-Language Workshop

Sir,

Referring to the subject above, I, Deebben Subramaniam, as a representative for the Institutions of Engineering Malaysia, Multimedia University (Cyberjaya Campus) would like to request for the lab R3007 in the FOE building to be booked on Tuesday, the 16th of September 2008 to host a C-language workshop between 8.00p.m and 10.00p.m.

2. We are expecting around 50 students to participate in this workshop and have also prepared food and beverages for the participant. We are collecting a small sum form the participants to compensate for the food and drinks. This event is based on a first-come-first-serve basis.

3. Mr. Low Chong Hoe would be conducting this workshop and it would be solely for the benefit of the students. We assure you that this event is not to attain profits for the society.

4. Your cooperation is wholly welcomed as this is the first event we are organising for this trimester and we hope it turns out an outstanding success.

5. We look forward to your approval and hope that you oblige to this noble request.

Thank you.

(DEEBBEN SUBRAMANIAM)
Liaisons Director,
Institutions Of Engineering Malaysia,
Multimedia University,
Cyberjaya Campus.