E-LEARNING IN MALAYSIAN PUBLIC UNIVERSITIES: CASE STUDIES OF UNIVERSITI KEBANGSAAN MALAYSIA AND UNIVERSITI TEKNOLOGI MALAYSIA[1]

Marlia Puteh, Ph.D
College of Science and Technology
Universiti Teknologi Malaysia
54100 Kuala Lumpur, Malaysia
marlia@citycampus.utm.my

ABSTRACT

This paper analyses the development of the e-learning strategies that have been introduced into Malaysian public universities since 1996. Using two case studies of Universiti Kebangsaan Malaysia (UKM) and Universiti Teknologi Malaysia (UTM), this paper examines how Malaysian public universities planned to introduce e-learning strategies into their undergraduate programs. This analysis uses some 25 interviews with the teaching and administrative staff at UKM and UTM. A critical view of the problems that these universities face in implementing their vision statements is also presented. However, testing the vision statements against the experience and opinions of teaching staff is a significant task, because ultimately it is the teachers who will drive the e-learning strategies. If teachers are not supportive of these programs, e-learning will struggle to become established.

INTRODUCTION

This paper analyses the development of the e-learning strategies that have been introduced into public universities since 1996. The 1990s were a period of considerable economic and educational change in Malaysia. The decade began with Vision 2020, the policy introduced by then Prime Minister Datuk Seri Dr. Mahathir bin Mohamad, and was followed in 1996 by the establishment of the Multimedia Super Corridor and the privatisation of tertiary education. All these initiatives were interconnected. The Malaysian educational sector appears to have been revolutionised during the decade beginning in 1996. The paper assesses this process by closely examining the emergence of e-learning strategies and by analysing the e-learning strategies that the universities have adopted. The factors that promoted or hindered this new approach to the delivery of lectures and tutorials are also reported.

After the commencement of the corporatisation policy in 1998, concepts such as strategic planning and aspects of corporate culture were introduced into Malaysian public universities. This paper evaluates the IT strategies that were incorporated in the planning of Universiti Kebangsaan Malaysia (UKM) and Universiti Teknologi Malaysia (UTM) and features the faculty perspectives of e-learning implementation.

LITERATURE REVIEW

The extent to which individual universities are willing to promote IT learning strategies has attracted academic discussion. Ward and Peppard (2002: 69) provide an important warning when discussing policy directions. According to them, strategic planning involves "a systematic, comprehensive analysis to develop a plan of action." Developing meaningful strategies requires an analysis of the organisational capacities of both universities and government departments. "All organisations have an IT capability,"[2] insist Ward and Peppard, and by bringing them together not only can the structure of an organisation be changed but so can the structure of the national economy.

Ismail (1993: 56) agreed that planning IT policies is not merely about compiling wish lists for future performance but it must include "a strategic response to change" because strategic planning establishes an institution's commitment to change. In a similar vein, Anderson, Johnson and Milligan (1999: 4) suggest that a university's strategic plans should specify its mission, core values, goals and broad objectives. Regardless of the time span of such plans, regular review was necessary to assess how circumstances are changing. Objectives, strategies and budgets need to be adjusted accordingly. The

---

[1] Paper presented at the 1st International Malaysian Educational Technology Convention, 2 – 5th November 2007, Sofitel Palm Resort, Senai, Johor Bahru, Malaysia

[2] For further information about organisation's IT strategies and capabilities, see Ward and Peppard (2002).

special duties of individual staff members also need to be specified, together with reporting structures to monitor the introduction of innovations. None of these conditions can, however, be met unless the strategic plans of universities are available and accessible to the public (Anderson et al., 1999: 13).

Mission statements are also needed to provide clear summaries and guidelines to facilitate the promotion of the strategic plans of universities. *Mission statements* are defined as the "intentions, aspirations, inspiration and general direction of educational purpose" (Kaufman & Herman, 1991: 125). Good mission statements are those, which specify precise objectives. A study conducted by Thompson and Strickland (2004: 34) listed three important elements that a mission statement needed to articulate: the *needs* of the organisation, the *identity* of the target group and the *mode* in which the organisation operates. The *mode* refers to the technology, the competencies and company activities that indicate the boundary of the organisation's operations. Thompson and Strickland were writing for a business-oriented organisation. This makes their work especially relevant to the post-1996 situation in Malaysia because universities from then onwards were expected to find at least 30% of their revenue from non-government sources. Kaufman and Herman (1991: 124) expanded the list to include the use of *performance indicators* as the basis for giving a mission statement substance. For them the following considerations needed to inform a mission statement:

1. The performance to be demonstrated;
2. The performance indicators (who or what);
3. The conditions of the performance; and
4. Specific criteria, which determine the performance achievement.

Cunningham et al. (2000: 84) noted that new educational providers, including corporate and for-profit universities, were more likely to stress the importance of mission statements and strategic plans. On the contrary, traditional universities continue to rely on history and reputation to ensure their place in the educational market.

THE ADOPTION OF IT BY UNIVERSITIES

Many factors drive the introduction of IT teaching and administrative methods in universities. According to Bates (2000: 8), these reasons include: increased student enrolments, the changing needs of learning and training; and the benefits of using new technologies in teaching and learning. The emergence of new universities with the specific task of providing electronic distance education or virtual university options has also pushed older teaching establishments to become more innovative. McCann, Christmass, Nicholson & Stuparich (1998: 2) noted that IT provides important opportunities for the more effective delivery of education and training throughout the educational system, including schools and technical training colleges. Likewise, in 1997, Yetton wrote an influential paper about the adoption of IT within 20 Australian universities. He observed that the reasons for using IT approaches varied between three kinds of universities but that in all cases the compulsion for continued innovation was irreversible (Yetton, 1997):

- the 'old' university used IT to boost the prestige of its privileged learning community;
- the 'divisional' university used IT to support the success of semi-autonomous faculties; and
- the 'new' universities harnessed the potential of IT as a central platform in their delivery of IT-based teaching and learning in both the classroom and beyond.

Despite the interest in using new technologies in universities, the technology by itself cannot drive change. According to McNaught et al. (2000: 71), clear policy direction was needed from institutional leaders. This needed to build on a culture in which teaching staff were motivated to be innovative through teaching rewards, recognition and internal collaboration. Academic staff could only be motivated if support structures existed to facilitate their adoption of new technologies, as they needed time, training, access to information and new technologies and other resources.

Much of the literature about e-learning in universities assumes that academic staff will embrace new technologies with enthusiasm (Bates & Poole, 2003). What is less well understood is the circumstances in which staff might be reluctant to adopt e-learning techniques and to resist change. Rogers (2003: 281) identified five kinds of adopters and stages of adoption. McNaught et al. revised this into the four stage S-shaped curve of Figure 1.
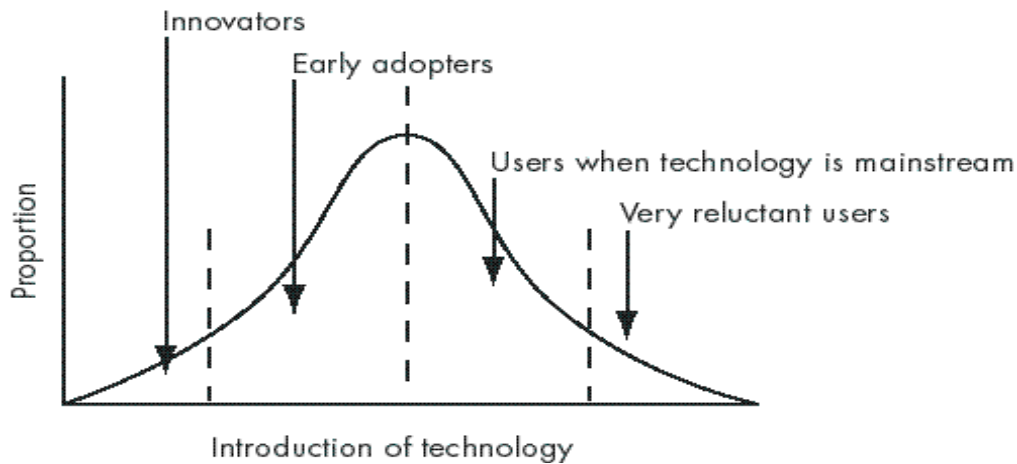
Source: McNaught et al., 1999: 106

FIGURE 1: Technology Adopters

Innovators are always risk takers and individuals obsessed with the technology. They can cope with the uncertainty that innovation brings. Early adopters, by contrast, are regarded as role models. They are not the risk takers when compared to the innovators and are therefore reference points for others who are likely to change their behaviour. For potential adopters, they become the "individual to check with" (Rogers, 2003: 283). McNaught et al. (1999: 106) formulated their third category, "users when technology is mainstream," from Rogers' "early majority" and "late majority" groups. These individuals adopt the technology because of different reasons: they are driven by economic necessity, they submit to peer pressure and they feel secure in taking to the new technology. Reluctant users are late adopters who are "suspicious of innovations and of change agents" (Rogers, 2003: 284).

Bates (2000: 181) warned that the main challenge for the management of educational technologies is to develop a system that promotes innovation and quick responses to accommodate the needs of students and teachers. Bates argued against the frequent practice of choosing a 'leader' who must be an expert in the use of new teaching and learning technologies. Instead, he asserted that effective leadership originated from a collective approach by senior administrators of an institution who shared the same vision but are allocated separate tasks in accomplishing the mission (Bates, 2000: 43).

METHODS OF DATA COLLECTION
The qualitative approach was applied through the prism of two case studies of particular Malaysian universities, and within those, more detailed case studies of the experiences and perceptions of particular university staff. Stake (1995: xi) defined a case study as "an analysis of the complexity of a single case." He argued that the great benefit of a case study was its capacity to penetrate into the particular details of a situation and how things actually worked (Stake, 1995: 8). This more than compensates for whatever criticisms might be made about the difficulties of generalising from a case study to a universal statement. Yin (2003: 33) noted that multiple case studies could to some degree rectify the limitations of a single case study. This is what this paper seeks to achieve. The two universities selected as the focus for the present work cover a range of situations within the Malaysian educational system. This paper also seeks to meet Creswell's suggestion that by collecting a wide range of data about individual cases, in-depth analysis is possible by looking at the interaction of the many variables that affect human decision-making (Creswell,1998). According to Yin (2003: 32, 47) if multiple case studies are used to analyse a problem then it is possible to generate "analytical generalisations."

A total of 25 face-to-face interviews were conducted over a six-month period. Three sets of interview questions were developed to cater for the three different groups of respondents: the Vice Chancellors, Deans or IT Managers and the lecturers. The anonymity of the participants had to be ensured and this has been done by allocating a code to each participant. Typically, each interview lasted between one and two hours, and most were conducted in Bahasa Melayu. The interviews were designed to be open-ended, in-depth, and semi-structured.

ANALYSIS OF THE CASE STUDIES

Table 1 shows that Universiti Kebangsaan Malaysia (UKM) plan to promote the values of the Malay language and culture. Since its establishment in 1970, it has been UKM's mission to offer tertiary education in the Malay language. This is only part of its Strategic Plan from 2000 to 2020 (PS2020). UKM has published this plan and its revised version on its website at http://pkukmweb.ukm.my/~ppa/strategik/kajiansemula/DokumenPS.pdf

Table 1: Missions and Visions of UKM and UTM

University	Vision	Mission
UKM	To be the leading university that pioneers innovations in creating a dynamic, knowledgeable, and ethical society.	To be the premier university that affirms and promotes the value of the Malay language while globalising knowledge within the framework of the national culture.
UTM	To be a world-class centre of academic and technological excellence through creativity.	To lead in the development of creative human resource and technology in line with the aspirations of the nation.

Sources: http://www.ukm.my; http://web.utm.my both accessed in November 2006

According to PS2020, UKM aspires to become a world-class university by 2020. Ten strategies were conceptualised in the initial plan, but the revised version of 2005 listed only six strategies and incorporated the remaining four into one strategy. Strategy No. 6 demonstrates the importance of IT in the university within management, services, teaching and research.

Each formulated strategy is supported by several activities and is given a particular time-frame. According to Hadi, Mohd Jelas, Mokhtar & Abdul Aziz (2002: 7), short-term plans commenced from 2000 to 2005, medium-term strategies will be conducted from 2006 to 2010 and the long-term plans are expected to begin between 2011 to 2020. The Strategic Plan was accompanied by a more detailed IT Master Plan of 2003 to 2005. The revised version of PS2020 stipulated the following short- and long-term objectives in order to achieve successful integration of IT:

1) Increase access to the campus networking, including wireless access

2) To increase the number of computers for UKM users (1:1 lecturer, 1:1 administrator, 1:4 students, 1:1 clubs)

3) To complete all main lecture halls with IT infrastructure (in phases)

4) To prepare the latest software based on demand

These projects were designed to boost the "dynamic and knowledgeable society," a mission of the University (Table 1) and the University's IT strategy.

The other case study, Universiti Teknologi Malaysia (UTM), is aiming to be a world-class university by 2010, ten years earlier than UKM. UTM's management claims that the current university rankings by the Times Higher Education Supplement or Business Weekly are not superior to the measure of "world-classness" by peer recognition, the recognition that comes from the academic world (Universiti Teknologi Malaysia, 2001: 4). However, a clear definition of "world-class" is not offered in any of UTM's official documents.

UTM's Plan of Action for the establishment of a World Class University (WCU) is also accessible on its website (http://www.utm.my/wcu/). However, this plan has never been reviewed. If any revision has occurred, the latest version has not been presented to the public. According to one participant (Participant H14), evaluation of UTM strategies is hardly ever performed, and corrective adjustments to the strategies are not formulated to respond to the current direction of the university. Hence, there is a possibility that the WCU Plan of Action will remain unchanged into the foreseeable future.

The first and third attributes in UTM's plan of action emphasise UTM's IT strategies, which include e-learning and the Cyber Campus Project. The commitment to technology-based teaching began in 1997 with the establishment of the Cyber Campus Project. This project involved several components: academic and administrative computing, IT infrastructure and services, and increased IT awareness and application. It was the responsibility of the Centre for Information Technology (CICT), which had a broad overview of all IT-related aspects of teaching, administration and infrastructure. Despite the plan, the Cyber Campus Project was not activated until four years later in 2001 when it was taken up by the Computing Unit, a subdivision of the Centre of Information and Communication Technology. Had the project commenced earlier, including the e-learning component, more benefits could have been garnered through this new technology.

Both UKM and UTM have developed strategic plans, and published them in print and on the web. It thus appears that they have realistic objectives for the implementation of IT learning strategies. Initial appearances, however, are misleading. A closer examination of these strategic plans reveals that the goals are not specific, do not have measurable timelines, and, crucially, do not incorporate any strategies for evaluating, reviewing or adjusting them in line with experience. These weaknesses in the IT vision are also reflected in other parts of the strategic plans. The following section analyses in detail the gap between the stated objectives of the IT strategic plans and the experience of the academic staff charged with their implementation.

Faculty Perspectives
This section explores the views of the academic staff at UKM and UTM, and offers their explanations as to why and how IT strategies are failing to meet the high expectations of both the university administration and the government. The case studies that follow consider the extent of the resistance to change, the weaknesses of the training programs, and the role of top management in pushing through IT reforms. Four case studies which explore the attitudes of academics towards e-learning in the case of UKM and UTM respectively are presented. For reasons of confidentiality, the names of all respondents have been changed.

Case Study G
Osman is a lecturer in one of the faculties at UKM. Ten years of teaching have made him very critical of the strategies of the university. He questioned the role of e-learning and criticised the lack of facilities:

> *Are the world-class universities using e-learning? Oxford? Cambridge? Do they become world-class universities because of e-learning? I personally feel that e-learning is not a measurement of WCU. The facilities in UKM cannot be regarded as world class; we still do not have enough computer labs. And what is the proportion of students and computers? Students have to queue a long time before being able to access the Internet, or, if they are able to use the computers, they are only given limited time to access the Internet. Is that world class? Though the system is available for use, accessibility is the question.*

Osman learned to use *LearningCare* (the e-learning platform in UKM) mostly on his own. He became the reference person in his faculty, together with the IT Manager. He was not only burdened with his own teaching activities and research agenda, but also helped to solve various technical problems:

> *The IT manager helps troubleshoot problems, if there are any. I help him sometimes. But, so far, none of the lecturers come to us for help … E-learning has not reached the objective, especially in my faculty. In my own department, out of 22 lecturers, I am the only person using e-learning.*

In applying the technology into his teaching, Osman admitted formulating his own strategy in getting his students to use the portal:

> *I have my own strategy in using the portal. There are three components of my teaching: lectures, photocopied notes and the learning portal. My exam questions are based on these three components. I am directly forcing my students to use e-learning if they want to excel in the exams.*

Osman was disappointed with the existing infrastructure in UKM. He planned to integrate IT into his teaching but his efforts have been hampered:

> *At present, I still bring the diskette to class. Why? I want to use the portal during my lecture, but sometimes there is no access to the Internet in the lecture hall. I want to teach my students to use the portal and I took the lecture hour to do that, but there is no Internet access. These accessibility problems affect my teaching in general.*

Osman also expressed a number of reservations, especially in the attitudes of the administrators:

> [Currently there is] *no acknowledgement in the form of reward or punishment from the top management to those who are using or not using e-learning. What is the difference between those who are engaged in e-learning than those who are not*?

Osman also questioned management's real involvement in e-learning, and expressed doubt that managers practise what they preach:

> *If we say that the lecturers will engage in e-learning only after directives from the top management are received, how sure are we that those in the top management are involved in e-learning themselves?*

Interpretation
Despite his reservations, Osman is clearly in favour of e-learning. However, his commitment to preparing lessons using e-learning technology was held back by the existing infrastructure, which he regarded as insufficient for e-learning. He was also frustrated with the lack of incentives to pursue e-learning, and he questioned the real commitment of the administration. Osman's comments are particularly helpful because it is very rare to find an academic who will question the operations of their university, especially in Malaysia. People like Osman, who is under the oath of the Pledge of Good Conduct required of all academic staff in Malaysian universities, are important in an organisation because despite the pledge they question the practicality and rationality of university policy.

Case Study I

Nadia's experience with e-learning has been completely different from Osman's. As a computer and educational technology lecturer, she was of the opinion that individual lecturers had to play a role in facilitating UKM's strategic planning by having course materials posted on the Internet. In a similar way to Osman, Nadia had studied the e-learning system at her own pace and in her own time. Recognising that facilities were lacking, especially in technical expertise, she described her successful attempt to prepare course materials:

The technical needs can be purchased if necessary, or one can always hire some student experts to fulfill the needs. No big deal in that matter. All the facilities are available through our computer centre, but do we really want to spend time for that? I just make full use of the text-based and still visuals and concentrate more on the computer-mediated communication using electronic forums to bring out student potentials.

Nadia did not expect to receive much assistance from technical experts. As she explained above, she exploited the discussion forum in the portal that did not need much preparation. In contrast to Osman, Nadia did rely on the new technology in delivering her teaching:

I have about ten minutes of PowerPoint presentation for every one-hour lecture. For my learning resources, I have collaborative effort with my students in building e-portfolios for the course. I am also engaged in discussion forums with my students. I conduct at least one forum topic for each theme covered in the lecture.

Despite her commitment to e-learning Nadia remained keen to use the traditional, face-to-face teaching method. She differentiated between the traditional and conventional teaching approaches as follows:

Both have its strengths. Face-to-face is very much needed for introducing new concept while relevant issues pertaining to its application or implementation may be discussed and elaborated more efficiently through timely reflected ideas on the electronic forums.

Nadia credited her closer relationship with her students to the e-learning technology she was using:

I have better relationships with students. I used to be very straightforward, very introverted and straight to the point. Now, I have time to relate to their problems and consequently able to help them in many ways. It has definitely made me feel better. My student-teacher relationship continues even after the semester is over and some even come back to present and write papers with me.

Interpretation
Despite the lack of expert facilities in UKM, Nadia was comfortable with the new technology and fully appreciated the benefits of e-learning. This was partly due to her background in educational technology and her overall teaching environment. She worked in a new building and almost all classrooms in her faculty are equipped with Internet facilities and related infrastructure to facilitate e-learning. By contrast, the faculty buildings where Osman was located dated back to the establishment of the university in 1971 and had poor facilities.

The case studies of Osman and Nadia demonstrate that not all teachers are supportive of e-learning strategies at UKM. Their experiences and views demonstrate that the environment in which they work must be understood to enable them to make teaching with new technologies both rewarding and interesting. By itself, the enthusiasm of the individual lecturer may not be sufficient to ensure that the strategic objectives of the university will be fulfilled. The following case studies, from UTM, also suggest that these are not isolated incidents.

Case Study J
Rose is a lecturer in her early forties. As one of the senior lecturers in her faculty, she wanted to set a good example for her other colleagues by using e-learning in her teaching. However, to her disappointment, she was delayed by UTM's frequent technical difficulties:

I have not used e-learning in my teaching yet but I plan to use it next semester. I believe that through my usage of e-learning it can lessen my workload, as I will be teaching the same subject every semester. I only have to do the work of uploading my materials once and later just update the contents. But I find it disappointing when even my first attempt is hampered by technology glitches. I could not upload my materials because there were a few technical problems every time I attempted to upload the notes into the system. I have the intention of uploading not only

the notes to my students but also using the discussion forum in my teaching, once I am more familiar with using the platform.

Rose was prepared to teach her courses by exploiting new technology. In this respect, she was a bit wary of issues relating to Intellectual Property (IP):

I personally feel that if I give all my notes to the students, the students will plagiarise my work. They might misuse the information they gathered from the resources I presented. Another problem is if I make my materials available for other lecturers to view, those lecturers will commercialise my materials into books and make money out of it.

Rose's concern about IP issues was typical, as she did not see any attempt by the university to protect lecturers by copyrighting their work. She was also critical of the lack of rewards given to academics, should they accomplish the e-learning mission of their faculties or their university:

I have not heard of any incentives given to the lecturers who have worked hard in using e-learning in their teaching. I personally feel that we lecturers should get some kind of reward for our hard work.

Interpretation

Rose's case shows that in addition to technical hitches in applying e-learning strategies to their teaching methods, lecturers at UTM are concerned about the lack of incentives or protection to IP. Rose clearly had a high view of her own academic standards and feared that other academics would use her work without due acknowledgement. She was also concerned about students doing the same thing. Such concerns reflect the wide gap in academic standards and performance in UTM. If academic staff were less differentiated in terms of their competence they would be less concerned about their colleagues taking their materials. University administration also needs to adopt strategies for soliciting and responding to negative experiences such as these.

Case Study K

Chong is a lecturer from the Faculty of Education. Chong has utilised the e-learning platform since e-learning was first introduced at UTM in 2001. He has applied both WebCT and Moodle (the e-learning platforms) in his teaching:

I made comparisons between Moodle and WebCT. We used WebCT as an introduction for UTM's first application of the e-learning platform … But WebCT was very complicated. Moodle originated from Australia. The person who created Moodle originally worked with WebCT. WebCT was so complicated and not user friendly, especially for non-technical people. Some people refer to Moodle as the Open Source Learning Management System. I find Moodle easy to use and that is why I put all my effort to use Moodle for my teaching.

Based on the UTM E-Learning Progress report for the 2004/2005 session, Chong taught one of the most active subjects at UTM as measured by the largest number of hits. He used a number of strategies to increase the popularity of e-learning. These included uploading weekly materials for his lectures, conducting asynchronous forums, chatting with students on academic issues, commenting on the students' weekly discussions and displaying the results for quizzes and assignments in e-learning modes.

So far, the only technical problem Chong reported was the initial difficulty with conducting the online quizzes:

I faced some problems when conducting the quiz online. During the trial period, the students could take the quiz anywhere and anytime from Monday, 9am to noon. Everything went smoothly and students could access the system. However, during the real quiz, which I conducted with the help of CICT in the CICT lab, the traffic was overloaded and students could not go in. The database was overloaded because the quiz was conducted for 10-15 minutes, synchronously.

Now, CICT has figured out to separate the students; 100 students will go for the exam, another 100 will be quarantined. It was successful. Currently, I conduct the quiz online by separating the students according to their sections [or classes]. Planning has to be made prior to conducting quizzes online so that the data is not overloaded.

Interpretation

As an 'innovator,' Chong did not let the IP or the incentive issues hinder him from using online methods for teaching his subjects. He seemed to enjoy what he was doing, even though he has not received any reward from UTM for his outstanding efforts (at the time this interview was conducted). Chong represents the innovators who are passionate about the new teaching technologies and who are more willing to take risks. There are very few people like Chong at UTM, and in the process of developing more imaginative teaching aids to stimulate student interest he has shown that e-learning is both possible and fun. It is innovators such as Chong that the university needs to elevate as role models. In this way e-learning might be adopted more widely.

These case studies from UKM and UTM indicate that to encourage the adoption of IT and e-learning approaches to teaching, staff development strategies need to be addressed and a reward system needs to be created. Most lecturers are reluctant to embrace e-learning due to time constraints and a lack of technical knowledge. Staff training and incentives are two ways that will accelerate the acceptance of IT culture and motivate academics to use e-learning. Furthermore, the role of administrative officers should not be taken lightly, as their participation is crucial.

CONCLUSION

Public universities have some fundamental problems when it comes to implementing e-learning and IT teaching strategies. Most of the difficulties in implementing e-learning strategies in the public universities are similar to that of other public universities attempting to adopt IT strategies university-wide. Malaysian public universities have not been successful at generating senior leadership capable of integrating the various university plans and strategies. These leadership issues are exacerbated by the working environments that are characterised by lack of encouragement, fear of intellectual piracy, inadequate technical training, insufficient equipment and no incentives for innovation. International comparisons can help and should be encouraged. Such benchmarking can provide Malaysian universities with a measure of how well they are doing and whether and what can be learnt from external examples.

REFERENCE

Anderson, D., Johnson, R., & Milligan, B. (1999). *Strategic Planning in Australian Universities.* Canberra: Department of Employment, Education, Training and Youth Affairs.

Bates, T. (2000). *Managing Technological Change: Strategies for College and University Leaders.* San Francisco: Jossey-Bass Publishers.

Bates, T., & Poole, G. (2003). *Effective Teaching with Technology in Higher Education.* San Francisco: Jossey-Bass.

Creswell, W. J. (1998). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions.* Thousand Oaks: SAGE Publications.

Cunningham, S., Ryan, Y., Stedman, L., Tapsall, S., Bagdon, K., Flew, T., & Coaldrake, P. (2000). *The Business of Borderless Education.* Canberra: Department of Education, Training and Youth Affairs.

Hadi, A. S., Mohd Jelas, Z., Mokhtar, M., & Yang Farina. (2002). *'Universiti Kebangsaan Malaysia, the National University with an International Reach: Opportunities and Challenges in the 21st Century'.* Paper presented at the 16th Australian International Education Conference, Hobart, Australia. 30 September - 5 October 2002.

Ismail, Z. (1993). Human Resource Development in Institutions of Higher Learning: Meeting the Challenges of the Future. In Nordin Muhamad & Arawati Agus (Eds.), *Challenges of Industralization and Globalization of Business Towards the Twenty First-Century.* Bangi: Penerbit Universiti Kebangsaan Malaysia.

Kaufman, R., & Herman, J. (1991). *Strategic Planning in Education: Rethinking, Restructuring, Revitalizing*. Lancaster: Technomic Publishing Co., Inc.

McCann, D., Christmass, J., Nicholson, P., & Stuparich, J. (1998). *Educational Technology in Higher Education*. Department of Employment, Education, Training and Youth Affairs.

McNaught, C., Philips, R., Rossiter, D., & Winn, J. (2000). *Developing a Framework for a Useable and Useful Inventory of Computer-facilitated Learning and Support Materials in Australian Universities*. Canberra: Department of Education, Training and Youth Affairs.

Rogers, E. M. (2003). *Diffusion of Innovations*. New York: Free Press.

Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks: SAGE Publications.

Thompson, A. A., & Strickland, A. J. (2004). *Strategic Management: Concepts and Cases*. Boston: McGraw-Hill.

Universiti Teknologi Malaysia. (2001). *Universiti Teknologi Malaysia Plan of Action for the Establishment of A World Class University (WCU) by 2010*.

Ward, J., & Peppard, J. (2002). *Strategic Planning for Information Systems*. London: John Wiley & Sons, LTD.

Yetton, P. (1997). *Managing the Introduction of Technology in the Delivery and Administration of Higher Education, Evaluations and Investigation Program*. Higher Education Division, Department of Employment, Education, Training and Youth Affairs.

Yin, R. K. (2003). *Case Study Research: Design and Methods - Third Edition*. Thousand Oaks: SAGE Publications.