

Network Technology and Online Learning: Towards the Creation of World-class University

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ABSTRACT

Global concept has developed as fast as the computer technology itself and ICT nowadays is not meant for business purposes only, but also for other IT dependent industries which include "Education". Online-learning is a result of fast evolving networking technology. As networking technology evolved and more communication tools were developed, the online-learning becomes more practical. Collaborative technologies and groupware backed up by a great networking technology are very important in order to realize the aspiration towards a world-class university and be in the mainstream.

Keywords: *Online-learning, network technology, world-class university.*

Introduction

ICT helps us in our daily transactions, from simple home chores to highly risked decision making. This is due to the continuous development of computer and communication technology that have merged to our advantages. The development of technology further changes our daily routine or how companies run their businesses. ICT has become an important asset and a business strategy of today's business organizations to improve business processes, productivity and efficiency. Global concept has developed and has been easily comprehended as fast as the computer technology itself. In the US alone, it was reported that IT industry is one of the largest in the economy. All these are direct results of the widespread use of the internet. This is evidence that ICT nowadays is not meant for business purposes only, but also for other IT dependent industries such as healthcare, insurance, banking, government and not

forgetting the emerging important industry in our country that is, “Education”.

Nowadays Malaysians, no matter in what age group they are in, what walk of life they come from, seem to be seriously trying to upgrade their paper qualifications, whether to ensure a better and more promising future, or for self-satisfaction. Whatever their reasons are, with the help of technology, all Malaysians have an equal chance to further their studies. If it is impossible for them to be there in the lecture hall, an online-learning is certainly a great option. It is a flexible mode of learning and has become popular. According to a research in the United States by Lewis et al. (1999), in the 1997-98 academic year, around one third of 2-year and 4-year post-secondary education institutions offered distance education courses while one fifth of them had planned to offer distance education courses within the next years. This is an evidence to support the statement that online learning is getting popular. According to Phipps and Merisotis (1999), due to the demand, distance education is predicted to continue to grow exponentially for a predictable future.

The key factor behind this encouraging scenario is the “Networking Technology”. Networking Technology has evolved tremendously over the years. It makes everything seem possible. From ARPANET and the concept of interconnected network or Internet today that makes way to many other beneficial technologies that bring to where we are now. Those technologies combined with advanced network technology from wire to wireless platform has further encouraged the development of “online-learning” facilities and tools to make distance learning possible and more meaningful.

Distance Learning to Online-learning

Online-learning is a result of the fine networking technology that has evolved over the years. As networking technology evolved and more communication tools were developed, online-learning has become more practical and viable. Forms of distance education have been available for 150 years (Palmer, Collins & Roy 1996). According to Holcomb et al. (2004), only within the last quarter century that distance education has really exploded. Modern technologies like video conferencing, affordable PCs and the World Wide Web (WWW) have given rise to this expansion. The so-called distance learning term is fading and

subsequently replaced by the term online-learning or online-education due to the fact that distance learning is always associated with online-learning that takes full advantage of today's available Networking Technology.

To further support the positive statement over the current online-learning scenario, there are a variety of reasons why online-learning is getting popular. According to Olsen (2002) and Merisotis (1999) distance learning provides some access to courses when they would not have been able to otherwise participate. Another reason as according to Chorp (2000) is restricted learner availability during scheduled course hours; more convenience in obtaining a degree or certificate and greater means to advance one's knowledge in one's own areas of interest, whether or not a degree or certificate is involved.

According to Zieger and Pulichino (2004) while distance learning can emancipate students in distant and remote locations from geographic, economic and social constraints, it can isolate students from their community and, thus, offer an educational experience inferior to that of the traditional classroom. According to Kahl and Cropley (1986) distance learners differed from face-to-face learners in that they felt more isolated and experienced lower level of self-confidence.

It is therefore essential for Networking Technology developers and online learning tools and software developers to work together to support the current needs to resolve problems associated as per discussed in quite lengthy notes quoted from previous studies. Developing new tools and technology to enhance the success of online-learning is meaningless unless they are made known to all and ensure that they are user friendly. A study by Pauleen and Yoong (2001) stated that the effectiveness and selection of communication technologies is strongly impacted by infrastructures. Another possibility is that the participants did not have an understanding of the newer communication tools.

On the local perspective, online-learning is progressing as fast as in the western countries, thanks to the continuous supports from the government. Local universities like UPM is very popular with its IDEAL (Institute of Distant Learning) where online learning is part of its learning process, while UiTM is well known for its FLP (Flexible Learning Program) to cater the increasing demands of students to acquire UiTM certifications. The management of UiTM is on the right track. In its "Restructuring Plan 2001-2010" stated that one of its core academic qualities is on education resources where ICT technologies which include networking facilities will be strengthened.

Network Technology

Computer technology and telecommunication technology were previously developed separately. Only when modem was invented then the capability of computer was enhanced and provided a means for computer to communicate with one another using the standard copper-wire telephone line. From a stand-alone microcomputer, telecommunication enables microcomputer to extend its capability and uses, whereby information can be shared and exchanged among two or more microcomputers. This is what we call as “Computer Network”.

According to a book written by O’Leary (2005) Computer Network can be defined as “a communication system that connects two or more computers so that they can exchange information and share resources”. Starting from this point, telecommunication technology has evolved significantly to work side by side together with the computer technology. Many telecommunications applications and devices were invented since then to cater the needs of users and business societies that changes through time. This leads to the concept of “Connectivity” that is a concept related to using computer networks to link people and resources. “Connectivity” that merges computer and telecommunication technologies has made “Internet” possible.

There are so many activities that can be accomplished with the current telecommunication applications that help business societies improve their business. While for those who seek knowledge or education purposes, the dynamically growth network technology whether wired or wireless media based is such a great help. In the late 1990s we could see an explosive Internet growth. Networking technology that is responsible for such trend has evolved with new network technologies developed but quickly faded over time. Some technologies that have stood the test of time and are the top movers and shakers in computer networking are the Home Broadband, Napster and Peer to Peer, Cisco systems, Apache, Ipv6 and Carnivore.

According to Eric Jao (2005) the networking which is single computing concept has so significantly revolutionized the way we work and live. A business world without networking and the Internet is almost unimaginable today. He also said that new trends are emerging that spell greater possibilities for businesses eyeing that competitive edge. Three key networking related trends spreading across the enterprise scene are; increased mobility and productivity via wireless networking, faster information flow via Gigabit Ethernet connections and better data access

and storage via networked storage innovations. This statement is in fact not only relevant to enterprise scene, but also could be closely associated with the current education scene especially online-education that has become very popular recently.

World-class University

Aspiration towards World Class University is one of the ultimate goals of all universities around the globe. It is somehow very relevant to associate closely the new educational horizon and the aspiration to be a world-class university. Being a world-class university means, a university has to grow in parallel with the current technology related to education that includes the online-education infrastructures. It is very important for universities to place themselves in the list of World Class Universities to ensure their survivals and maintain international recognitions. University of Illinois at Urbana California claims that they are World Class University. Among reasons provided are; it has been committed to excellence in research, teaching and public engagement. It also has most significant resources like talented and highly respected faculty. Its students receive some of the world's most elite scholarships. Its alumni are Nobel Laureates and Pulitzer Prize winners. Its academic resources are among the finest in the world, a world leader in Supercomputing design and applications and many others. Another university, University of Leicester in UK, also claims that it is a World Class University. University of Leicester is among 17 UK universities to be ranked among the elite universities of the world in a survey of the world's top 500 universities. In fact, there are also universities that hire consultants to upgrade them into a World Class University. For instance, the Institute of Communication Technologies in Islamabad, Pakistan. This shows that it is important to be recognized as a World Class University.

In the case of UiTM, Institute of Leadership and Quality Management (iLQaM) is striving hard in order to place UiTM among the above mentioned universities as a World Class University. It is all started from the "21 Strategi Pengukuhan UiTM Abad 21" initiated by the Vice Chancellor of University Teknologi MARA (UiTM) himself. Based on the "21 Strategi Pengukuhan UiTM Abad 21" the management of UiTM laid out some comprehensive plans for the restructuring of UiTM started in January 2001. The so called "UiTM Restructure Plan 2001-2010" is towards the recognition of UiTM as a World Class University by 2010.

The management stated that this plan is vital to fulfill the current requirements of the Ministry of Education, the challenges of globalization era and ICT explosion.

UiTM has its own definition of World Class University criteria. They are as the following:

- i. Internationally recognized excellent academic achievement, the best student selection method based on meritocracy, lecturers with internationally recognized qualifications and expertise, professional bodies recognized university academic programs, industries and employers recognized graduates
- ii. Human and finance resources that are more than enough to support academic excellence
- iii. Perform efficient governance
- iv. Conducive educational environment including library, ICT technology and excellent research facilities
- v. Continuous policy, procedures and mechanism of evaluation to assure academic quality, governance structure and study programs so that it's always at its best
- vi. Excellent academic activities of staff and students overseas
- vii. Academic interaction networks with industries, universities locally and overseas

To further enrich the discussion over this topic, a statement from one of UiTM's PhD holder scholars who did not want his name to be revealed is raised. According to him, UiTM at present is nowhere close to World Class University. He said, the students themselves have to think like one and behave like one. Students should be well prepared before classes and always ready for argument on issues with paradigm and no "spoon feeding". The Malay attitudes such as "spoon feeding" and afraid of challenges he said, could be due to the culture of the Malay themselves that always uphold the culture of being "too humble", "too polite" and are always taught not to "talk back" or argue to the elders. Adding to that, according to him another huge problem to UiTM students is their inability to converse well in English. He emphasized that English is not to be learnt, but to be acquired.

Personal readings shows that the above statements are inline with the extract of a dialogue held between the leaders of Peking University and Yale University (are cognized World Class University) regarding World Class University in 2001 that focuses on teaching ideal. The representatives of Yale University were quoted:

We hope the students think critically to form their own viewpoints. Only by that can they grow creative and become leadership.”

(Yale University Representative 2001)

According to Feng Jiao (2001), Peking University is regarded as the most promising Chinese university to be a World Class University. He quoted that some people say that World Class University professors are lacking in Peking University, while some people say that the physical conditions for scientific research are obviously worse than that of World Class Universities. But the most important of all is the lack of well-defined teaching ideal, based on self-confidence and with its own characteristics. He also claims that “independency”, “creativity” and “leadership” are important aims of a World Class University.

If we closely examine all the characteristics and criteria required or desired as per quoted and discussed above, we will find that most scholars and universities share some common expectations and criteria. Some of the common criteria are as follows:

- i. Excellence academic achievement
- ii. Excellence in research
- iii. Excellence in teaching
- iv. Excellence in public engagement
- v. Finest academic resources
- vi. Excellent students
- vii. Best students selection method
- viii. Conducive educational environment
- ix. Academic quality
- x. Excellence academic activities
- xi. Academic interaction networks with industries and universities
- xii. Students with World Class University attitudes
- xiii. Critical thinking students
- xiv. Creative
- xv. Independence
- xvi. Leadership
- xvii. Teaching ideal

These are the criteria to be met in order to be recognized as a World Class University. We also have discussed in length on online-learning which is becoming very popular and is in demands. This means universities have to be prepared with all the infrastructure and requirements to meet

these demands. Not only to fulfill the demands but also to comply with the criteria as per listed above on the effort to become a World Class University. This is where Networking Technology comes in to aid to the process of becoming a World Class University.

The Roles of Network Technology

In the new education horizon as discussed above, we can conclude that the key towards a world-class university is the ability of students to think critically to form their own viewpoints (Yale University Representative 2001) and also the ability of the education provider like the universities to support and provide the best IT infrastructure especially in the area of networking technology that makes online-learning possible. In view of this, one personally believes that collaborative technologies and groupware backed up by a great networking technology is very important in order to realize such aspiration toward a world-class university and be in the mainstream of new education horizon. According to Bonk (2002), there is no mistake in the shift of society's focus from thriving on competition to the need for collaboration. Communication and conversation are among the keys to learning. Therefore, it is important to understand that internet can be used as communication tools in online learning whereby it allows collaboration among peers not only locally but also across the continents.

Workgroup Computing

This type of telecommunication application is also called "Collaborative computing". With workgroup computing, teams of co-workers use networks of microcomputers to share information and to cooperate on projects. Workgroup computing is possible because of the network technology, microcomputer technology and an application called groupware. With groupware, two or more people on a network can work together on the same information at the same time. Examples of groupware are such as the Lotus Notes and MS Netmeeting. Workgroup computing enables students to collaborate among peers and lecturers or teachers. With workgroup computing, if students or peers have problems in understanding matters related to studies, they can communicate and collaborate with others who are using the groupware. This can be used as a platform to gain new knowledge or exchange their thoughts and ideas with others who are experts around the world.

FTP (File Transfer Protocol)

FPT or the File Transfer Protocol is no longer a mysterious and difficult concept. FTP is used to transfer file of any format along the inter-connected network (Internet) from one computer to another. This is very useful for online learning students and lecturers or teachers to send a set of document such as notes or files to every students or peers immediately. This paperless concept is truly economical and time saving.

Search Engines

Search Engines are very important tool of Internet. Without search engines, it would be very difficult to get or search for desired information from the abundance and millions of resources or web pages from different networks and servers. Students and peers can make use of search engines to look out for latest information whether for knowledge enrichment or in the effort to complete assignments. There are plenty of resources on the internet available ready to be tapped.

Discussion Groups

Discussion groups consist of few systems such as the Mailing List, Newsgroups and Chat Groups. With Mailing List and Newsgroups, students and peers can communicate and send messages to members. Ideas can be exchanged for the good use. This is very beneficial and a good strategy to develop knowledge and therefore produce a world-class university students. A better understanding on educational matters can also be gained through comments and advices of members. Students' knowledge would not confined to local matters only, but also internationally as Discussion Groups enable students and peers to discuss across continents.

Web Logs

Electronic discussion groups are very popular and mostly known to Internet users – they have been around for a while and used in many types of education settings. According to Hernandez-Ramos of Santa Clara University, web logs (also known as “blogs”) are relatively a new phenomenon; their uses in education are also still being explored and developed. Carlson (2003) stated that, “blogs” are used by scores of

memoirists, editorialists, exhibitionists, and navel gazers, who post their daily thoughts on Web sites for all to read”. According to Jonassen (2000) the most common use of blogs in teaching is to encourage writing, but in a public space, which usually motivates students to spend more effort in the process since the audience is more “authentic”.

E-Mail

E-Mail can also be used as a tool for communication with students, peers, lecturers and teachers locally or overseas. This is very cost effective for eliminating international calls, expensive stamps and paper. E-Mail enables students to collaborate across the department and also across the globe. It can be used to exchange ideas or knowledge, and also to exchange notes through attachments.

Video Conferencing

Video conferencing is one of telecommunication technologies that is capable to assist students to collaborate online. This telecommunication application is also called “Teleconferencing”. With “video conferencing” people from different locations are able to communicate with each other. They can see, hear and talk with each other as though communication is face to face. Video conferencing used to be very expensive and uneconomical, as people need to go to conference rooms or booths that have been set up with television camera and special devices and applications. But nowadays video conferencing equipment can be set up on people’s desks, with a camera (webcams) and microphone to capture the person speaking and a monitor and speakers for the person being spoken to, and they are inexpensive. This telecommunication application is very useful for the online-learning students to communicate with their lecturers, teachers and peers around the world to exchange ideas and thoughts to enrich their knowledge or put to better understanding on any subjects. In term of cost, this telecommunication application offers local calls and Internet rates, as compared to having to pay international calls or expensive cell phones calls charges.

Video Phones

Another alternative for Video Conferencing is Video Phones. In terms of flexibility as compared to Video Conferencing, this telecommunication

application is not that flexible. This is because video phones are meant for making calls only and we are unable to use it for information search. Video phones are actually telephones with TV-like screen and a built-in camera that allows you to see the person you are calling and vice versa. This telecommunication application is mostly useful for students who are more comfortable to have a face to face discussion with their lecturers or teachers and also among peers. Again, since Video Phones uses the telephone line, the charges is so limited that is local calls.

Internet Telephony

Internet Telephony is another telecommunication application that could help to cut down on communication costs, thus, reduces the education cost. Internet Telephony will allow students and peers, especially those who want to communicate with others from other part of the continents or experts from overseas or other universities to make calls at local call charges. Even though communications with peers or experts from overseas take place, charges are still at local rate. They can use Internet Telephony either for one-to-one or for audio conferencing which means discussion or meeting can take place without having to gather all members at one place. Evidently, Internet Telephony is a good option to minimize the communication and travelling expenses.

Multimedia on the Web

Multimedia has become a very interesting part in Internet technology. It is undeniable that multimedia is the reason why Internet becomes so popular nowadays. The use of multimedia in Online Learning will put in more interest to users to use the Internet as a medium to gain or develop their knowledge. The most popular multimedia publishing is graphics. Adding graphics and images will enhance understanding other than putting in interests on students. Macromedia Flash is an example of programmes that can be used to create animations for the web for online learning. Sound or audio is another type of multimedia that can be used on the web that will put in enhancement to a web page. Video is also another means of enhancement to a web. It naturally motivates and excites students about learning. However, even though multimedia is seen be very useful, using multimedia such as sound and movies inappropriately will only lead to irritating encounters.

Conclusion

Generally, we are so much aware of the importance of Network Technology in online-learning. Everything seems to support the development; however, there are also barriers that hinder the online-learning from being successful. A research done by Mayben et al. (2003) concluded that the study found similar results as in other research on virtual teams, distance collaborations, and communication technologies. In order for collaborative research via distance to progress and grow in effectiveness, perhaps institutions must support the continued modernization of technology infrastructures which include the networking infrastructure. The study also suggests continuous staff development to ensure they have adequate training and knowledge to use distance communication tools effectively, thus, will promote to the success of online-learning. In the same research, it was found that technical infrastructure constraints the extend to which technologies are seen as resources that can usefully support collaborative relationships and the functional aspects of their work. In the context of UiTM, the same phenomenon exists. Flexible Learning Program or FLP is a program that caters the demands for courses carried out online or in another word, online-learning. What impacts do networking technology and the FLP programs pose to UiTM in its effort to become a World Class University? The question of how to become a World Class University has been a key question to almost all universities around the world. Having to know that the demands for online-learning has risen and the quality factors need to be considered as criteria of being a World Class University, it is so vital for the Management of UiTM and other universities to be aware of the important network technologies behind the implementation of a successful online-learning program. I wish to highlight a quotation by Bonk (2002) which says 'education needs become lifelong, advances in collaborative learning tools will impact everyone'. However, it is not necessarily the tools for collaboration that will be the most important or interesting, but the types of interactions made possible by these technologies. Given the collaborations that are now possible with peers, trainers, expert mentors and even artificially intelligent agents, there certainly is no shortage of collaborative tools and associated learning opportunities.

References

- Bonk, C. J. (2002). *Online training in an online world*. [online]. Available: <http://courseshare.com/reports.php>.
- Carlson, S. (2003). *Weblogs come to the classroom*. The Chronicle of Higher Education.
- Charp, S. (2000). *Distance education*. The Journal, 27(9).
- Eric, Jao (2005). *Networking: Network Trends that will reshape the way You Do Business*. Available: http://www.magazine.jaring.my/2003/july/ind_technology.htmlid=73&month=july&year=2003
- Feng Jiao (2001). *What Do We lack for a World Class University*. Available: <http://pkunews.pku.edu.cn/news/110/distance>.
- Hernandez-Ramos (2004). *Web Logs and Online Discussions As Tools to Promote Reflective Practice*. Journal of Interactive Online Learning 3(1). Available: <http://www.ncolr.org/jiol/archives/2004/summer/04/index.htm>
- Holcomb, L.B., King, F.B. and Brown, S.W. (2004). *Student Traits and Attributes Contributing to Success in Online Courses: Evaluation of University Online Courses*. Journal of Interactive online learning 2(3). Available: <http://www.ncolr.org/jiol/archives/2004/winter/04>
- Jonassen, D.H. (2000). *Computers as mind tools for schools: Engaging critical thinking*. Upper Saddle River, NJ: Merrill/Prentice Hall.
- Kahl, T.N., and Cropley, A. J. (1986). *Face-to-face versus distance learning: Psychological consequences and practical implications*. Distance Education, 7(1).
- Lewis, L., Parsad, B., Carey, N., Bartfai, N., Farris, E., Smerdon, B., & Green, B. (1999). *Teacher quality: A report on the preparation and qualifications of public school teachers* (NCES 1999-080). Available: <http://nces.ed.gov/pubs99/199080.pdf>.

- Mayben, R. (2003). *Distance technologies in collaborative research: Analyzing the successes and barriers*. Journal of Interactive Online Learning, 2 (2). Available: <http://www.ncolr.org/jiol/archives/2003/fall/02/index.html>.
- O'Leary, T.J., L.I. O'Leary (2005). *Computing Essentials*. Complete Ed. Irwin/McGraw-Hill Publishing: New York.
- Olsen, Alan (2002). *E-learning in Asia: Supply and Demand*. The Observatory on Higher Education Report, June 2002. Available: <http://www.brookes.ac.uk/virtual/NewTF/51/roberts51.pdf>.
- Pauleen, D. & Yoong, P. (2001). *Facilitating virtual team relationships via Internet and conventional communication channels*. Internet research: Electronic networking applications and policies, 11(3).
- Phipps, R. & Merisotis, J. (1999). *What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education*. A Report from The Institute for Higher Education Policy, April 1999. Available: <http://www.ihep.com/PUB.htm>
- Zieger, L., & Pulichino, J. (2004). *Establishing a community of learners: A case study of a university graduate orientation program for online learners*. The Journal of Interactive Online Learning, 2(4), Available: <http://www.ncolr.org/jiol/archives/2004/spring/04/index.html>
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