

Application of On-line Facilities in Producing Human Capital for Malaysian New Economic Model

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Abstract: - Malaysia launched New Economic Model in Mac 2010 to drive Malaysia's transformation into a high income economy by 2020. The foundation of this economy is innovative entrepreneurship. This new model was introduced in response to the current world situation where job market is constantly changing at a very fast rate and stiff competition between countries and between individuals. As Malaysia moves to innovation and entrepreneurship based economy, universities must produce graduates who are very independent, innovative and highly entrepreneurial. In addition, more and more digital-native students whose learning habits are very much different from before are enrolling into universities. This is a convergence of education needs and the new student learning habits that require immersive-collaborative environment, more student initiative, experience-led, and project based instead of course based. To facilitate this learning requirement, on-line facilities are required to enable the students to gain new knowledge as much as possible, to collaborate globally, to synthesis new knowledge or to engage in computer simulations that replicate the real situation.

Key-Words: M-learning, serious game, on-line global collaboration, Expert System

1 Introduction

Malaysia launched New Economic Model (NEM) in 2010 to propel Malaysians to an advanced nation. The NEM is to be achieved through an Economic Transformation Program. The old model has provided outstanding growth for the past 30 years. But the growth is slowing down and Malaysia now is now caught in a middle income trap [1].

The NEM has five characteristics, namely market led, well-governed, regionally integrated, entrepreneurial and innovative. Naturally the NEM requires a different kind of human capitals than what we have now. In line with this, higher education provider must produce graduates who are innovative, entrepreneurial, globally collaborative, independent and fast learners to cope with the fast changing world.

On the student part, more and more digital native and generation f (facebook) students are enrolling in to universities. They are very skillful in digital environment, knowledgeable in the area of they like, fast learner and they have friends in almost every part of the world. These skills must be capitalized to propel their learning.

2 Learning Outcomes

Competition between nations, between companies and between individual graduates are very much challenging than ever due to the rapid advancement in knowledge, fast dissemination of knowledge through the internet and collapse of walls between nations since the collapse of Berlin Wall. At the same time a number of giant companies have fell down, mostly because of unethical practices among the managers. The competition is not going to subside, but will be tougher. If Malaysian graduates are not prepared for this competition, they will lose out and subsequently a lost to the nation. For the survival of the graduates and the nation, they must have the followings attributes upon graduation:

- Complex problem solver
- Knowledge producing graduates
- Share, remix and capitalise on new ideas
- Embrace change rather than fighting change
- Innovative
- Entrepreneurial
- Global collaboration and global perspective
- Leverage-collaboration
- Strong ethics
- Have practical reasoning
- Lifelong and fast learner

- International communication skill

3 Achieving the Learning Outcomes

Achieving the required learning outcomes is almost impossible if traditional classroom instructions are only used; especially the ability of the student to look into global perspectives and ability to have global collaborations. The knowledge producing graduates, international communication skills as well as lifelong and being fast learners are also almost impossible to achieve in a traditional classroom. Other than that digital natives entering higher education, growing abundance of free and open educational resources, including reusable content and software, the emergence of the programmable web (distributed learning environments) and the growth of social networking and the blur of the distinction between work and play; require changes in the mind set of professors, recognition of collaborative learning and university policies [2].

The above mentioned scenario requires to look into online facilities, either as addition or to replace part of the traditional instructions. In fact sitting inside a four wall classroom leads to students being bored, impedes their learning and limit the learning resources available in the classroom.

To some professors, online learning is not as effective as traditional format. However, studies show that if the online facilities are designed innovatively, more learning occurs at a lower cost [3]. In a large scale study, it is reported that nearly 40% cost reduction and 20% increase in students' scores [4].

When we allow the student to find new knowledge through online facilities, their learning may not be aligned to the learning outcomes. To ensure the alignment, a good assessment plan is required for every program. The plan must be calibrated and validated to ensure all stated learning outcomes are achieved by the students [5]. The plan is not only for a comprehensive assessment but also to align all student learning activities toward achieving the learning outcomes [6].

4 Manifestation of online Learning

For the digital natives, online learning is a must because they are so used to it everywhere. The online learning can take in many forms, depending on the level of learning and the level of infrastructure. For Malaysia, the internet is relatively good and the broadband facilities are available almost everywhere at an affordable price. WiFi is available in almost all higher education

campuses and schools. The advancement of student literacy in internet either for academic projects or for their own interest is very fast, much faster than teachers and lectures. Without formal training the students can master and apply the knowledge together with their peers in their learning. For instance, use of Facebook, Twitter, mailing list for collaboration, Google facilities such as Google Documents, Google Scholar, Google Earth and Google 3D Tours in writing their project reports, Slideshare and Scribd for sharing and getting new knowledge. They also use Survey Monkey to administer questionnaire survey, making use of available video editor such as Windows Movie Maker and upload their video production to YouTube and other facilities online which are free to use. Again, they can master all these facilities without formal training; they learn on their own.

Tablets such as iPad and Galaxy accelerate the use of online facilities among students. The students use Zite to get the latest information from all over the world in the area of their interest. Udemy is another application that is famous among the students. They can learn from international experts by watching structured lectures in video format. Besides Udemy, Khan Academy is also very famous to the students. The academy offers various kinds of lectures ranging from sciences, mathematics and engineering. We can enrich and accelerate student learning by capitalising these skills by creating new applications, making use of existing contents or integrating existing new contents.

Creating new applications for students learning may take more time and energy but it is rewarding because it can be customised to suit the students' requirements. Using available online applications is also rewarding because the choice is wide open and can be adopted immediately.

Some examples of adopted applications in teaching-learning in Malaysian universities are as follows:

4.1 Expert System

Expert systems are traditionally developed to help new staff in an organization to perform expert duties. Recently it is used in learning and teaching. If the Expert System can help the novice to do expert duties, students can use it to learn expert knowledge and skills. Some of the expert systems that are developed and are being used now in Universiti Kebangsaan Malaysia are:

- Urban Traffic Control
- Transport Demand Management

- Solid Waste Management
- Highway Design
- Road Maintenance

Using expert system can open up a wider range of expert knowledge in solving real complex problems to the students. Compared to traditional class room instruction, the expert system provides contextual learning and allows student flexibility in learning.

4.2 Just in Time Training to You (JiT2U)

JiT2U (Pronounced as Jitzu) is taking advantage of the students situation when they are desperately in need of extra knowledge to solve certain problems. Obviously they become more motivated and learn faster in this situation. Therefore JiT2U is a very powerful tool when used parallel with Problem Based Learning (PBL). The PBL itself is a powerful learning method that motivates student to find new knowledge and skills. A JiT2U has been developed and used in University Kebangsaan for application of Web 2.0. The Jit2U was designed in a mobile learning format that can be accessed using a smart phone as well as a computer or a tablet.

The concept of JiT2U is also used to prepare PhD students to understand basic knowledge before they start their research. Udemy (<http://www.udemy.com/>) platform is used for at least 10 courses for engineering students.

4.3 Computer Game and Simulation

Computer game and simulations, if properly designed, are very good means of to learn using the media. Among the criteria of a good designed computer game and simulation are given knowledge-construction process that allow students to construct their own knowledge effectively, provide multi perspective view to broaden student view, provide realistic and relevant contexts, embed social experience such as multi player experience, give ownership of learning to the players, give awareness of knowledge construction process and represent the learning in process in multiple mode [7].

There are many applications available online either free of charge or can be obtained with reasonable fees. In Universiti Kebangsaan Malaysia, the computer game and simulations are utilised extensively in entrepreneurship programs and engineering programs.

4.4 e-Portfolios

The digital native students like to be empowered in their learning. They learn much faster if they learn by themselves and the instructor act as the facilitator. They will immerse in their learning if given a project or a problem. They find new knowledge and skills online that are necessary to complete the project or to solve the problem. As lecturers we can set the learning outcomes and design the project to cover all the learning outcomes. The achievement of the learning outcomes must be assessed authentically. E-Portfolio can be effectively adopted as evidence for assessment [8].

In Universiti Kebangsaan Malaysia, e-Portfolio is integrated in the Learning Management System. Students can design their own portfolio to exhibit their achievement of each learning outcome.

5 Student Achievement

In early 2011, the Student Centered Learning Policy was introduced in Universiti Kebangsaan Malaysia. Along this policy, internet facilities were improved and all the above mentioned facilities were introduced. Students' perceptions on their soft skills achievement were compared before and after the policy during their graduation day. In 2010, 5083 students and in 2011, 5112 students participated in a perception survey. The scores are given in Table 1.

The minimum score is 1 and maximum is 5 where the score 5 is the best. The score in all areas are improved significantly after the implementation of the policy which indicates much of student dependency on the use of internet facilities. The improvement is not only in the cognitive domain, but also in the affective and psychomotor domains.

The Faculty of Information Science & Technology emerged as the faculty that most extensively utilized online facilities in the implementation of the student centered policy. In 2010, their graduate employment within 3 months upon graduation was only 37.9%. In 2011, the rate was 69.9%.

The entrepreneurship simulation game had also helped students to become real entrepreneurs [9]. In 2010, there was no traceable student who had start-up companies upon their graduation. In 2011, 40 out of 5112 students managed to register their start-up companies.

Table 1 Students' Perception of their soft skills achievement

	Perception	2010	2011
1	Self Confident	4.20	4.36
2	Improving self maturity	4.29	4.43
3	Developing identity	4.23	4.37
4	Knowledgeable	4.34	4.48
5	Eagerness to learn	4.19	4.34
6	Sensitive to current development	4.16	4.30
7	Independent	4.35	4.50
8	Critical and creative	4.20	4.34
9	Readiness to face real world and job environment	4.15	4.34
10	Problem solving and decision making	4.22	4.37
11	Teamwork	4.31	4.48
12	Communication skill	4.20	4.39
	Average	4.24	4.39

5 Conclusion

Online facilities are very important to support student centered learning. They enable, accelerate and enrich learning. In this study, students achievement towards important employability attributes improved significantly hence the employment. Besides improvement in employment, entrepreneurship is also improved. The importance of the online facilities is shown in Fig. 1 as the foundation of the innovative learning-teaching in order to achieve the formulated learning outcomes that are suitable for required human capital.

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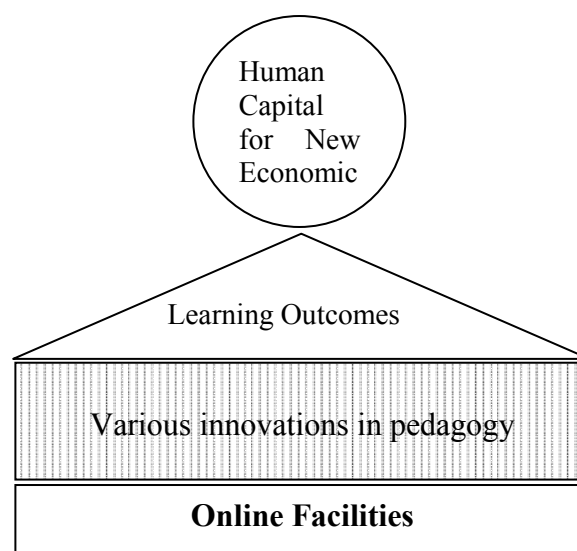


Fig.1 Online Facilities as the Foundation to produce Human Capital for NEM

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