

A VIRTUAL LEARNING ENVIRONMENT READINESS IN UNIVERSITI
TEKNOLOGI MALAYSIA (UTM)

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Dedicated to my beloved Family, Wife and Friends
To my respected supervisor.

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ABSTRACT

Many factors influence teaching nowadays, some universities in the worldwide offer web-based courses distributed by virtual learning environment. A virtual learning environment (VLE), which is an electronic system, provides various kinds of online interactions between students and lecturers, including online learning and assessment. Up till now, there are still many universities that did not fully establish a VLE in their educational institutions. This study investigates the students' point of view towards VLE readiness in Universiti Teknologi Malaysia (UTM), and presents an evaluation of VLE implementation in UTM. Data were collected from the questionnaire which completed by 140 UTM students. The questionnaire was developed based on Technology Readiness Index (TRI) Model by Parasuraman (2000). This study argues that the TRI is the most suitable model for this research. This study findings show that the VLE is ready to be applied in Universiti Teknologi Malaysia. Some of the VLE have been implementing in UTM context such as Moodle for its e-learning system. To sum up, this study shows that VLE implementation leads to better leaning performance

ABSTRAK

Banyak faktor yang mempengaruhi cara pembelajaran dan pengajaran pada masa kini. Kebanyakan universiti di seluruh dunia menggunakan kaedah pengajaran berasaskan Persekitaran Pembelajaran Maya (VLE). Interaksi dalam talian, VLE, menawarkan pelbagai kaedah pembelajaran di antara pelajar dan pensyarah tanpa mengira masa dan lokasi keberadaan mereka. Namun begitu, sehingga kini, masih terdapat sesetengah universiti yang tidak melaksanakan VLE sepenuhnya di dalam proses pembelajaran di institusi mereka. Oleh itu, kajian ini cuba mendalami tahap kesediaan pelaksanaan VLE sepenuhnya di Universiti Teknologi Malaysia (UTM) dengan mengambil kira pandangan para pelajarnya. Soal selidik bagi kajian ini dihasilkan daripada kerangka model Technology Readiness Index (TRI) yang dihasilkan oleh Parasuraman (2000). Hasil kajian yang dijalankan ke atas 140 pelajar UTM menunjukkan bahawa indeks kesediaan VLE di UTM adalah memberangsangkan di mana pelaksanaan VLE ini akan menjurus kepada hasil pembelajaran yang lebih berkesan.

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CHAPTER 1

RESEARCH OVERVIEW

1.1 Introduction

This chapter presents a general overview of the research such as the background of the study, problem background, problem statement, objectives, and purpose of the study, scope, and significance of the study. This study discusses Virtual Learning Environment readiness in Universiti Teknologi Malaysia (UTM), and presents a conceptual model for VLE readiness which is based on the research hypotheses. This chapter provides the reader a brief information about the whole research process and what it is all about. The details of the topic will be discussed in chapter two, the literature review.

1.2 Background of the Study

The growing of information and communication technology (ICT) changed many features of human life including the way they teach and learn. Education was once the advantage of rich people only but these days we are getting to the levels of new areas of education that is bridging the difference between the wealthy and poor, between different regions, religions, and races, this is one hand. The other hand traditional education came to be supported by the ICT to develop learning at the end of the 20th century. The new form of learning is known as E-learning; it was implemented after the educational institutions used some modes of distance learning called Blend Learning or sometimes known as Correspondence. But the time has shown that the lecturer's presence in the teaching process remains important.

The revaluation and development of technology are still in progress. Universities and other educational institutions now want to give the students high-quality product. The important thing that can be as responsive to this situation is the education in a virtual learning environment with all its advantages and drawbacks. The virtual learning environment has become an important part of teaching, and learning transforming the way people work and learn.

As technology allows more and more content to be virtual, so improves the possibility of better learner engagement. Virtual learning environment offers educational institutions the functionality to control the presentation; administration and assessment of coursework. Multi-user virtual environments (MUVE) can be used in the field of e-learning to simulate real situations and for lectures, exercises, virtual meeting, conferences, and so on (Michaela et al., 2010).

1.3 Problem Background

The domains of teaching and learning are experiencing changes as Higher Education Institutes (HEIs) rapidly accept the practices and concepts of Virtual Learning Environment. Many universities these days are starting to offer web-based courses that supplement and complement traditional classroom-based courses. Virtual Learning Environment provides students with different benefits such as flexibility, convenience, and the opportunity to work closely and collaboratively with lecturers and other learners from different universities or even across the world. (Hung et al., 2010). But is Universiti Teknologi Malaysia (UTM) ready to implement Virtual Learning Environment. Since VLE became popular in some educational institutions in the world, throughout this procedure, there has been and will be a need for university and students to re-examine the VLE readiness and re-develop and search a more comprehensive measure of learners' readiness (Hung et al., 2010).

This study presents an evaluation of VLE implementation in Universiti Teknologi Malaysia (UTM), and sets out to comprehend technology readiness in this context. The researcher distributes survey questionnaire to investigate VLE readiness in Universiti Teknologi Malaysia (UTM). The purpose of this questionnaire is to study the students' point of view of VLE implementing in UTM. This study reveals the level of VLE readiness in higher education, more specifically, in UTM. The research wants to apply Technology readiness index (TRI) model to know the VLE readiness in UTM and the way that higher education institutions can implement VLE in their institutions, especially how UTM is ready to develop VLE in its learning system.

1.4 Problem Statement

Virtual Learning Environment (VLE) is a new area of research, some higher educational institutions around the world used a virtual learning environment and there are many universities which did not establish VLE in their educational institutions. Virtual learning environment became an attractive alternative for improving more interesting user interface.

The universities which did not implement VLE system are facing some problems that may meet their day to day teaching environment. Face to face education increase the contact time with learners, this means that higher institutions spend the amount of contact time with the students which impact the student's experience and student working. It is difficult for the students in face to face learning to get more time to think about their discussion's response, this lead problem for student's contribution. The students who are far from the main campus of the university cannot get chance for learning, so placement is an important factor for learning because the students cannot get period for working at the time they are learning.

1.5 Research Questions

The researcher formulates the major questions of this study, research questions are the first steps to take when the researcher is trying to undertake a research. In this study the researcher intended to answer the following questions:

- i. What are the contributors of VLE readiness in Universiti Teknologi Malaysia (UTM)?
- ii. What are the inhibitors of VLE readiness in Universiti Teknologi Malaysia (UTM)?
- iii. What is the best theory to examine the Virtual learning environment readiness in Universiti Teknologi Malaysia (UTM)?

1.6 Purpose of the study

Virtual Learning Environment (VLE) can be used effectively, which is not only contributes to the student's learning and performance during their study but also raise the university's guidance with respect to the sharing teaching and learning resources among the learners and lectures and knowledge creation among the people. This study intended to attract the students and lecturers toward the benefits of using a VLE. This fact reduces teaching cost and the students will combine distance education. On a part –time schedule, to continue their jobs during the learning period.

1.7 Objectives of the Research

To gain useful and good results the researcher is going to follow a set of objectives which will be the central point of the research that controls all the finding and the ideas of the study. The study attempted:

- i. To identify the contributors of VLE readiness in Universiti Teknologi Malaysia (UTM).
- ii. To study the inhibitors of VLE readiness in Universiti Teknologi Malaysia (UTM).
- iii. To apply the suitable theory for evaluating the virtual learning environment readiness in Universiti Teknologi Malaysia (UTM).

1.8 Hypotheses

The study hypothesize the following sets of hypotheses based on TRI model in the context of Virtual learning Environment. The details of the hypotheses discussion will be explained in chapter four.

H1: Optimism has a positive significant effect on the VLE readiness in UTM.

H2: Innovativeness has a positive significant effect on the VLE readiness in UTM.

H3: Discomfort has no significant relation on the VLE readiness in UTM.

H4: Insecurity has no significant relation on the VLE readiness in UTM.

1.9 Significance of the Study

The virtual learning environment is an important element that needs to pay attention particularly the engagement of students in the virtual learning environment. This study helps the Universiti Teknologi Malaysia (UTM) to facilitate how they can implement the VLE system. This research helps the university to organize a strategy towards lecturers and learners effective using the virtual learning environment that motivates students to use virtual learning environment as supposed to be. One of the significance of this study is also to find out the average students who preferred VLE.

This study may be of value for a university implementing a VLE as it seeks to determine barriers VLE, and the findings of the research might assist a university in developing strategies and goals for successful implementation of a VLE. This research will inform the university with useful information for implementation of a VLE. It will give the useful data to notify technology integration at the university which is relevant particularly at this time.

1.10 Scope of the Research

The scope of this project is limited to the following:

- i. The analysis conducted mainly with the distance education process using networked virtual learning environment, the researcher is going to use a survey questionnaire to collect data.
- ii. This study targets only postgraduate students, in Universiti Teknologi Malaysia (UTM).
- iii. The applied focused on students' point of view to use the VLE in UTM, Johor campus.

1.11 Chapter Summary

This chapter provides an overview and brief description about VLE. The research problem background, problem statement was established followed by identification of research questions and the research objectives. The significance and the scope of the research were also identified. This chapter helps the reader to get rich information about this research.

REFERENCES

- Ben Salt, Clare Alkins & Blackall, L. 2008. Engaging With Second Life : Real Education In A Virtual World Literature Review. *Miscellaneous Papers, The Slenz Project For The New Zealand Tertiary Education*
- Berrueta, L. A., Alonso-Salces, R. M. & Héberger, K. 2007. Supervised Pattern Recognition In Food Analysis. *Journal Of Chromatography-A*, 1158, 196-214.
- Cheng, C. Y. Y. & Yen, J. Year. Virtual Learning Environment (Vle): A Web-Based Collaborative Learning System. *In: System Sciences, 1998., Proceedings Of The Thirty-First Hawaii International Conference On*, 1998. Ieee, 480-491.
- Ching-Tsorng, T., Hsien-Tang, L., Ming-Hung, H., Chia-Feng, L. & Shyan-Ming, Y. Year. Exchanging Course Content Mechanism For Moodle Lms. *In: Cyber-Enabled Distributed Computing And Knowledge Discovery (Cyberc), 2010 International Conference On*, 10-12 Oct. 2010 2010. 464-467.
- Chuttur, M. 2009. Overview Of The Technology Acceptance Model: Origins, Developments And Future Directions. *Working Papers On Information Systems*, 9(37).
- Davis, F. D., R. P. Bagozzi, et al. (1989). "User acceptance of computer technology: a comparison of two theoretical models." *Management science* 35(8): 982-1003.
- Dong, P., Ma, B. & Wang, F. 2010. Development And Evaluation Of An Experiential Learning Service In 3d Virtual World. *In: Service Sciences (Icss), 2010 International Conference On*, 13-14 May 2010. 374-378.
- Donnelly, U. & Turbitt, P. Year. Educating The Educators Online. *In: Mobile, Hybrid, And On-Line Learning, 2009. Elml '09. International Conference On*, 1-7 Feb. 2009 2009. 19-22.
- Ellaway, R. H. 2005. Evaluating A Virtual Learning Environment In Medical Education.

- F.Shortt, J. 2010. The Challenges Of Implementing A Virtual Learning Environment In Secondary School An Irish Case Study
- Garcia, E. (2010). A Tutorial on Standard Errors.
- Georgouli, K. 2011. Virtual Learning Environments - An Overview. *In: Informatics (Pci)*, 2011 15th Panhellenic Conference On, Sept. 30 2011-Oct. 2 2011. 63-67.
- Harper, K. C., Chen, K. & Yen, D. C. 2004. Distance Learning, Virtual Classrooms, And Teaching Pedagogy In The Internet Environment. *Technology In Society*, 26, 585-598.
- Heaton-Shrestha, C., Edirisingha, P., Burke, L. & Linsey, T. 2005. Introducing A Vle Into Campus-Based Undergraduate Teaching: Staff Perspectives On Its Impact On Teaching. *International Journal Of Educational Research*, 43, 370-386.
- House, S. M. 2010. Education In Multi-User Virtual Environments.
- Hung, M.-L., Chou, C., Chen, C.-H. & Own, Z.-Y. 2010. Learner Readiness For Online Learning: Scale Development And Student Perceptions. *Computers & Education*, 55, 1080-1090.
- Imadildayeva, A. Z. K. 2010. Developing E-Learning For Kazakh National University
- Jaligama, V. & Liarokapis, F. 2011. An Online Virtual Learning Environment For Higher Education. *In: Games And Virtual Worlds For Serious Applications (Vs-Games)*, 2011 Third International Conference On, 4-6 May 2011. 207-214.
- James, E. B., Joe, W. K. & Chadwick, C. H. 2001. Organizational Research: Determining Appropriate Sample Size In Survey Research. *Information Technology, Learning, And Performance Journal*.
- Jing, L., Hailong, M. & Jun, H. Year. Comparative Study Of Open-Source E-Learning Management Platform. *In: Computational Intelligence And Software Engineering*, 2009. Cise 2009. International Conference On, 11-13 Dec. 2009 2009. 1-4.
- Keller, C. 2005. Virtual Learning Environments: Three Implementation Perspectives. *Learning, Media And Technology*, 30, 299-311.
- Kurilovas, E. 2005. Several Aspects Of Technical And Pedagogical Evaluation Of Virtual Learning Environments. Vol. 4, No. 2, 215-252.

- Landge, P. S., Kamble, V. A. & Dange, A. S. 2010. A Virtual Learning Community For Teacher Education. *In: Computer Science And Information Technology (Iccsit), 2010 3rd Ieee International Conference On*, 9-11 July 2010. 457-460.
- Lipeikien'e, J. 2003. Virtual Learning Environments As A Supplement To Traditional Teaching. Vol. 2, No. 1, 53–64.
- Lombardi, J. & Mccahill, M. P. 2004. Enabling Social Dimensions Of Learning Through A Persistent, Unified, Massively Multi-User, And Self-Organizing Virtual Environment. *In: Creating, Connecting And Collaborating Through Computing, 2004. Proceedings. Second International Conference On*, 29-30 Jan. 2004. 166-172.
- Malaya Kumar Nayak & Suesaowaluk, P. 2007. Advantages And Disadvantages Of Elearning Management System
- Masrom, M., Zainon, O. & Rahiman, R. 2008. Exploring The Key Factors In Institutional E-Learning Implementation.
- Mary C Dyson & Campello, S. B. 2003. Evaluating Virtual Learning Environments: What Are We Measuring? *Electronic Journal Of E-Learning*, Volume 1 Issue 1 (2003) 11-20.
- Mayoux, L. 2006. Quantitative, Qualitative Or Participatory? Which Method, For What And When? *Doing Development Research*, 115-129.
- Meng, J., Elliott, K. M. & Hall, M. C. 2009. Technology Readiness Index (Stricker Et Al.): Assessing Cross-Cultural Validity. *Journal Of International Consumer Marketing*, 22, 19-31.
- Michaela Gajňáková , Juraj Vaculík & Vaško, M. 2010. The Use Of Multi-User Virtual Environments In The Field Of Education. The 10th International Conference “Reliability And Statistics In Transportation And Communication, P. 335-341. Isbn 978-9984-818-34-4.
- Mj.Callaghan, K. M., J.Lopez Losada, Jg.Harkin And S.Wilson 2009. Integrating Virtual Worlds & Virtual Learning Environments For Online Education.
- Moron-Garcia, S. 2002. Using Virtual Learning Environments: Lecturers' Conceptions Of Teaching And The Move To Student-Centred Learning. *In: Computers In Education, 2002. Proceedings. International Conference On*, 3-6 Dec. 2002. 1494-1495 Vol.2.

- Nielsen, D., White, A. S. & Zhou, L. 2011. The Vle As The Converging Platform. *In: Electrical Engineering And Informatics (Iceei), 2011 International Conference On, 17-19 July 2011. 1-6.*
- Pamela B. Lawhead, Elizabeth Alpert, Bland., C. G., Linda Carswell, Dawn Cizmar, Jean Dewitt, Mihaela Dumitru, Eva R. Fahraeus & Scott, K. 1997. *The Web And Distance Learning: What Is Appropriate And What Is Not.*
- Parasuraman, A. (2000). "Technology readiness index (TRI) a multiple-item scale to measure readiness to embrace new technologies." *Journal of Service Research* 2(4): 307-320.
- Pierre Dillenbourg, Daniel Schneider & Synteta, P. 2002. *Virtual Learning Environments.*
- Rashty, D. 1995. *Traditional Learning Vs. Elearning. Mount St. Mary's College.*[Online].(Url [Http://Www. Msmc. La. Edu/Include/Learning_Resources/](http://www.msmc.edu/include/Learning_Resources/)).(Accessed August 2010).
- Rikke Duus & Cooray, M. 2009. *Do Virtual Learning Environments Help Deliver A Consistent Learning Experience? Exploring The International Delivery Of Uk Marketing Degrees.*
- Shurden, M. 2007. *Academy Of Educational Leadership Journal* Volume 11, Number 2, 2007.
- Stefan, H. 2008. *Asynchronous & Synchronous E-Learning” A Study Of Asynchronous & Synchronous E-Learning Methods Discovered That Each Supports Different Purpose.*
- Stiles, M. 2007. *Death Of The Vle?: A Challenge To A New Orthodoxy.*
- Stonebraker, P. W. & Hazeltine, J. E. 2004. *Virtual Learning Effectiveness: An Examination Of The Process. The Learning Organization, 11, 209-225.*
- Stricker, D., Weibel, D. & Wissmath, B. 2011. *Efficient Learning Using A Virtual Learning Environment In A University Class. Computers & Education, 56, 495-504.*
- The Challenges Of Implementing A Virtual Learning Environment In Secondary School An Irish Case Study*
- Totkov, G. 2003. *Virtual Learning Environments: Towards New Generation*
- Van Raaij, E. M. & Schepers, J. J. L. 2008. *The Acceptance And Use Of A Virtual Learning Environment In China. Computers & Education, 50, 838-852.*

Walczuch, R., Lemmink, J. & Streukens, S. 2007. The Effect Of Service Employees' Technology Readiness On Technology Acceptance. *Information & Management*, 44, 206-215.

<http://www.utm.my/about/facts-and-figures/>