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**THE DETERMINANTS OF VIRTUAL LEARNING ENVIRONMENT (VLE)
SYSTEM ADOPTION ATTITUDE AMONG TEACHERS IN NATIONAL
SECONDARY SCHOOLS IN KUALA LUMPUR**



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Thesis Submitted to

**Othman Yeop Abdullah Graduate School of Business
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Master of Sciences (Management)**

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ABSTRACT

Virtual Learning Environment System (VLE) is one the current trending technology in education globally. The Virtual Learning Environment (VLE) system has enable to bridge teacher-student-parent communication through its various advantageous functionalities. In Malaysia, the Ministry of Education has joined the global leap of adapting the Virtual Learning Environment (VLE) technology via the introduction of Frog Virtual Learning Environment (VLE) system in 2012. This initiative under the project, 1BestariNet was coupled with high speed broadband access that bridges the digital divide of all schools in the Nation. However, the utilization of the Frog Virtual Learning Environment (VLE) system has seen a low uptake by its stakeholders. Hence, this study aims to investigate the determinants of Virtual Learning Environment (VLE) system adoption attitude among teachers, specifically secondary school teachers in Kuala Lumpur. This study administered the survey methodology for data collection from 89 secondary schools located in three zones in Kuala Lumpur namely zone Bangsar/Pudu, zone Sentul and zone whereby 366 secondary school teachers were chosen as the sample for this study. A disproportionate stratified sampling procedure was used to select respondents from the respective schools within the zone. Five hypotheses were proposed in regards to the determinants of Frog Virtual Learning Environment (VLE) system adoption attitude. A structured questionnaires consisting 35 questions were adopted from previous scholars for this study in order to measure five variables namely Frog Virtual Learning Environment (VLE) System adoption attitude, perceived usefulness, and perceived ease of use, organizational culture and self-efficacy. As of from the 800 questionnaires handed out, only 336 were usable after the outlier assessment thus yielding a response rate of 42.0%. The research was analyzed using descriptive as well as inferential statistics in order to measure the relationship of the variables and draw the inferences between the independent variables and the dependent variable. The research result indicated that there are relationships which exist between the determinants and Frog Virtual Learning Environment (VLE) System adoption attitude. In concluding the research, the academic and managerial implications as well as suggestion for future research was discussed.

Keywords: Virtual Learning Environment (VLE), Technology Adoption, Perceived Usefulness, Perceived Ease of Use, Organizational Culture, Self-Efficacy and Adoption Attitude

ABSTRAK

Persekitaran Pembelajaran Maya (VLE) adalah salah satu trend teknologi semasa dalam bidang pendidikan di peringkat global. Teknologi Persekitaran Pembelajaran Maya (VLE) telah membolehkan komunikasi guru, murid serta ibu-bapa dirapatkan melalui pelbagai fungsi berfaedah yang terdapat dalam sistem Persekitaran Pembelajaran Maya (VLE). Di Malaysia, Kementerian Pendidikan telah menyertai lonjakan global dalam pengadaptasian teknologi Persekitaran Pembelajaran Maya (VLE) melalui pengenalan sistem *Frog Virtual Learning Environment* (VLE) pada tahun 2012. Inisiatif ini diterapkan di bawah projek 1BestariNet, dimana sistem Persekitaran Pembelajaran Maya (VLE) ini digabungkan dengan penyediaan akses jalur lebar berkelajuan tinggi yang di inispirasikan dapat merapatkan jurang digital semua sekolah di Malaysia. Walau bagaimanapun, penggunaan sistem *Frog Virtual Learning Environment* (VLE) telah menyaksikan penggunaan dan pengadaptasian yang rendah dikalangan pihak-pihak berkepentingan dalam sektor sekolah. Oleh yang demikian, matlamat kajian ini dijalankan adalah untuk mengkaji faktor yang mempengaruhi pengadaptasian sistem *Frog Virtual Learning Environment* (VLE) di kalangan guru-guru, khususnya guru sekolah menengah kebangsaan di Kuala Lumpur. Satu metodologi kaji seldik telah digunakan untuk pengumpulan data dari 89 sekolah menengah kebangsaan yang terletak di tiga zon Kuala Lumpur iaitu zon Bangsar/ Pudu, zon Sentul dan zon Keramat di mana 366 guru sekolah menengah kebangsaan telah dipilih sebagai sampel kajian ini. Prosedur persampelan berstrata yang tidak seimbang telah digunakan dalam proses pemilihan responden daripada sekolah dari tiga zon tersebut. Lima hipotesis dicadangkan mengenai penentu penggunaan teknologi *Frog Virtual Learning Environment* (VLE). Satu soal selidik berstruktur yang terdiri daripada 35 soalan telah digunakan untuk kajian ini bagi mengukur lima pembolehubah iaitu sikap penggunaan sistem *Frog Virtual Learning Environment* (VLE), tanggapan kegunaan, tanggapan penggunaan yang mudah, budaya organisasi dan efikasi sendiri. Sebanyak 800 soal selidik telah diedarkan, dimana hanya 336 boleh digunakan yang menghasilkan kadar tindak balas 42.0%. Kajian ini dianalisis menggunakan statistik deskriptif dan inferensi untuk membuat kesimpulan terhadap hubungan antara pembolehubah-pembolehubah. Dapatan kajian menunjukkan bahawa hubungan signifikan wujud di antara pembolehubah dengan sikap penggunaan sistem *Frog Virtual Learning Environment* (VLE). Kertas kajian ini diakhiri dengan perbincangan mengenai implikasi akademik dan pengurusan teori dan praktikal serta cadangan untuk kajian akan datang.

Kata kunci: Persekitaran Pembelajaran Maya (VLE), Penggunaan Teknologi, Tanggapan Kegunaan, Tanggapan Penggunaan yang Mudah, Budaya Organisasi dan Efikasi Kendiri.

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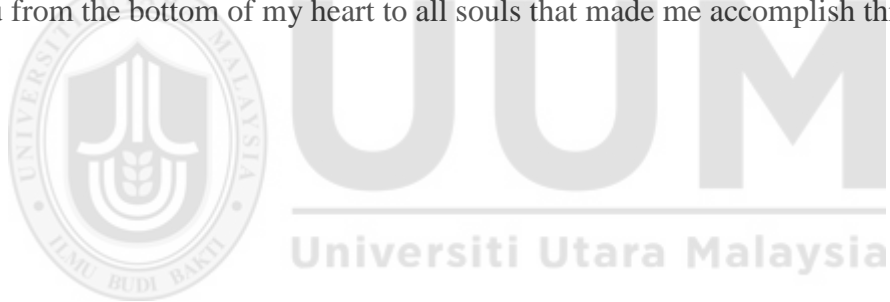


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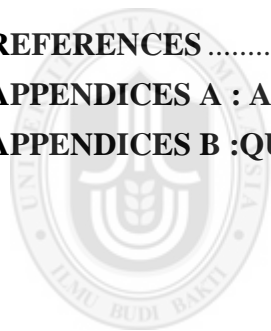
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LIST OF ABBREVIATION/NOTATIONS/ GLOSSARY OF TERMS

JPWKL	<i>Jabatan Pendidikan Wilayah Kuala Lumpur</i>
MOE	Ministry of Education, Malaysia
OC	Organizational Culture
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SE	Self-Efficacy
SMK	<i>Sekolah Menengah Kebangsaan</i>
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
VLE	Virtual Learning Environment



CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

The advancement in technology has taken over world in the past decade and is being a huge part of a societies' daily need. Thus, this has ignite global educational institutions to continuously harness the potentials of technology that overcome geographic barriers, enhance service delivery and streamline business processes (Zhao et al., 2009). According to Johannesen (2013), Virtual Learning Environment (VLE) is among the top technologies that being adapted by many education institution. The Virtual Learning Environment (VLE) is demarcated as an internet based system which compliments the traditional face-to-face teaching in where the physical presents of a teacher is not required, the teachers may be in a different geographical setting from their students and it also helps teachers in preparation and managing the learning resources for their students (Jackson & Fearon, 2014).

The Virtual Learning Environment (VLE) system is also defined as an advanced e-learning tool that is accessible by teachers, students as well as parents (McGill & Klobas, 2009) and can be accessed via the world wide web through computers, smart phones and other technological devices (Mbengo, 2014). Furthermore, many research has distinguished that e-learning systems are now being an important tool in the process of the school's education management system (Pituch & Lee, 2006). Essentially, Virtual Learning Environment (VLE) refers to the utilization of multiple technological devices combined with the advancement of Internet in order to enhance the quality of learning. Thus, the Virtual Learning

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REFERENCES

- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888–918.
- Al-Alak, B. A., & Alnawas, I. A. M. (2011). Measuring the acceptance and adoption of e-learning by academic staff. *Knowledge Management and E-Learning*, 3(2), 201–221.
- Alharbi, S., & Drew, S. (2014). Using the Technology Acceptance Model in Understanding Academics' Behavioural Intention to Use Learning Management Systems. *International Journal of Advanced Computer Science and Applications*, 5(1), 143–155.
- Amin, H. (2009). An analysis of online banking usage intentions: An extension of the technology acceptance model. *International Journal of Business and Society*, 10(1), 27–40.
- Arbaugh, J. B., & Duray, R. (2001). Class Section Size, Perceived Classroom Characteristics, Instructor Experience, and Student Learning and Satisfaction With Web-Based Courses: a Study and Comparison of Two on-Line Mba Programs. *Academy of Management Proceedings & Membership Directory*.
- Awang, K. (2015). *Pelaksanaan Penggunaan Pelantar Persekitaran Pembelajaran Maya (VLE-FROG) IBestarinet Kementerian Pendidikan Malaysia (KPM)*.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. (R. F. Baumeister, Ed.) *Psychological Review*, 84(2), 191–215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147.
- Bandura, A. (1989). Human agency in social cognitive theory. *The American Psychologist*, 44(9), 1175–1184.
- Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W.H. Freeman and Company. *American Psychological Association*, 23, 604.
- Bandura, A. (2000). Cultivate self-efficacy for personal and organizational effectiveness. *Handbook of Principles of Organizational Behavior: Indispensable Knowledge for Evidence*, 179–200.
- Barclay, C. (2012). An Analysis of Students' Perceptions and Attitudes to Online Learning Use in Higher Education in Jamaica : An Extension of TAM [Research in progress], 1–16.
- Baruch, Y., & Holtom, B. (2008). Survey response rate levels and trends in organizational research. *Human Relations*.
- Benson, R., & Palaskas, T. (2006). Introducing a New Learning Management System: An Institutional Case Study. *Australasian Journal of Educational Technology*, 22(4), 548–567.

- Birch, D., & Burnett, B. (2009). Bringing academics on board : Encouraging institution- wide diffusion of e-learning environments Institutional context for the research. *Australasian Journal of Educational Technology*, 25(1), 117–134.
- Boettcher, J. V., & Conrad, R.-M. (2010). The Online Teaching Survival Guide: Simple and Practical Pedagogical Tips, 15(2), 322.
- Bradburn, N., Sudman, S., Blair, E., & Locander, W. (1992). Improving interview method and questionnaire design: *Response effects to threatening questions in survey research*.
- Broadhurst, K., Holt, K., & Doherty, P. (2012). Accomplishing parental engagement in child protection practice: A qualitative analysis of parent-professional interaction in pre-proceedings work under the Public Law Outline. *Qualitative Social Work*, 11(5), 517–534.
- Bryman, A. (2012). *Social Research Methods. Social Research Methods*.
- Bryman, A., & Bell, E. (2011). *Business Research Methods. Social Research*.
- Calisir, F., Gumussoy, C. A., & Bayram, A. (2009). Predicting the behavioral intention to use enterprise resource planning systems: An exploratory extension of the technology acceptance model. *Management Research News*, 32(7), 597–613.
- Chau, P., & Hu, P. (2001). Information technology acceptance by individual professionals: A model comparison approach*. *Decision Sciences*.
- Cho, V., Cheng, T. C. E., & Lai, W. M. J. (2009). The role of perceived user-interface design in continued usage intention of self-paced e-learning tools. *Computers and Education*, 53(2), 216–227.
- Choudrie, J., & Dwivedi, Y. (2005). Investigating the research approaches for examining technology adoption issues. *Journal of Research Practice*.
- Coakes, S. J., & Ong, C. (2011). SPSS : analysis without anguish; version 18.0 for Windows. *John Wiley & Sons Australia*.
- Coakes, S. J., Steed, L., & Price, J. (2008). SPSS: Analysis Without Anguish; version 15.0 for Windows. *SPSS for Windows*.
- Cohen, J., & Cohen, P. (1983). Applied multiple regression/correlation for the behavioral sciences. *Hillsdale, NJ: Lawrence Earlbaum*.
- Collis, J., & Hussey, R. (2013). Business Research. *Nature*, 142, 410–411.
- Collis, J., & Hussey, R. (2014). Business research: a practical guide for undergraduate and postgraduate students. *Palgrave Macmillan*.
- Compeau, D. R., & Higgins, C. A. (2011). Computer self-efficacy: Development of a Measure and Initial Test. *Management Information Systems*, 19(2), 189–211.
- Cook, S. D. N., & Yanow, D. (1993). Culture and Organizational Learning. *Journal of Management Inquiry*, 2(4), 373–390.

- Cooper, D. R., & Schindler, P. S. (2003). *Business research methods*. Business.
- Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning*, 22(5), 320–334.
- Creswell, J. W. (2009). *Research Design*. SAGE Publications.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334.
- Cronk, B. C. (2016). *How to use SPSS statistics : a step-by-step guide to analysis and interpretation*. Pyrczak Publishing.
- Dasgupta, S., & Agarwal, D. (1999). Determinants of information technology adoption: An extension of existing models to firms in a developing country. *Journal of Global*.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319.
- Davis, J. (1971). *Elementary Survey analysis*. Eaglewood, New Jersey: Prentice Hall.
- Diamantopoulos, A., & Schlegelmilch, B. B. (1998). Taking the Fear out of Data Analysis. *Journal of the Operational Research Society*.
- Edwards, Y. V. (2004). Factors that motivate and deter rehabilitation educators from participating in distance education. *Assistive Technology*, 16(2), 94–103.
- Eom, S. B., Wen, H. J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education*, 4(2), 215–235.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53(4), 25–39.
- Eteokleous-Grigoriou, N. (2009). Instilling a new learning, work and communication culture through systemically integrated technology in education. *Systems Research and Behavioral Science*, 26(6), 707–716.
- Fadzleen, N., & Sa, B. (2013). 3rd International Conference on Research and Innovation in Information Systems. *Derivation for Design of Virtual Learning Environment (VLE) Framework for Malaysian Schools*, 1, 570–575.
- Fathema, N., Shannon, D., & Ross, M. (2015). Expanding The Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) In Higher Education Institutions. *MERLOT Journal of Online Learning and Teaching*, 11(2), 210–232.
- Field, A. (2009). *Discovering Statistics Using SPSS*. In *Discovering Statistics Using SPSS* (pp. 166–181).

- Gibson, S. G., Harris, M. L., & Colaric, S. M. (2008). Technology Acceptance in an Academic Context: Faculty Acceptance of Online Education. *Journal of Education for Business*, 83(6), 355–359.
- Gilbert, N. (2008). *Researching social life*.
- Greener, S., & Wakefield, C. (2015). Developing Confidence in the Use of Digital Tools in Teaching. *Electronic Journal of E-Learning*, 13(4), 260–267.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate Data Analysis. *Vectors*.
- Hammersley, M. (1987). Some notes on the terms “validity” and “reliability.”
- Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2004). The Role of Social Presence and Moderating Role of Computer Self Efficacy in Predicting the Continuance Usage of E-Learning Systems. *Journal of Information Systems Education*, 15(2), 139–154.
- Heinrich, E., Milne, J., & Moore, M. (2009). An investigation into E-tool use for formative assignment assessment - status and recommendations. *Educational Technology and Society*, 12(4), 176–192.
- Hess, T., McNab, A. L., & Basoglu, K. A. (2007). Reliability Generalization of Perceived Ease of Use, Perceived Usefulness and Behavioral Intentions. *MIS Quarterly*, 38(1), 1–28.
- Hill, T., Smith, N. D., & Mann, M. F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology*, 72(2), 307–313.
- Hitchcock, A., & Porter, K. (2004). The Likert Scale. *Methodology*, 7–10.
- Hlapanis, G., & Dimitracopoulou, A. (2007). The School-Teacher’s Learning Community: matters of communication analysis. *Technology, Pedagogy and Education*, 16, 133–151.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53–60.
- Huertas, A. (2007). Teaching and learning logic in a virtual learning environment. *Logic Journal of the IGPL*, 15(4), 321–331.
- Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. L. M. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Model. *MISQ*, 21(3), 279.
- Israel, G. D. (2012). Sampling the Evidence of Extension Program Impact. *Program Evaluation and Organizational Development (PEOD-5), IFAS Extension, University of Florida.*, 1–9.
- Jabatan Pendidikan WP Kuala Lumpur. (2012). *Jumlah 97 sekolah menengah di WP Kuala Lumpur sepanjang 2012*.

- Jackson, S. (2011). Organizational culture and information systems adoption: A three-perspective approach. *Information and Organization*, 21(2), 57–83.
- Jackson, S., & Fearon, C. (2014). Exploring the role and influence of expectations in achieving VLE benefit success. *British Journal of Educational Technology*, 45(2), 245–259.
- Jeyaraj, A., Rottman, J. W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1–23.
- Johannesen, M. (2013). The role of virtual learning environments in a primary school context: An analysis of inscription of assessment practices. *British Journal of Educational Technology*, 44(2), 302–313.
- Johnson, R. D., & Florida, S. (2007). When Technology Does Not Support Learning : Conflicts Between Epistemological Beliefs and. *Group*, 19(6), 23–46.
- Kim, J., & Mueller, C. W. (1978). Review of factor analysis basics. In *Factor analysis statistical methods and practical issues*, 8–87.
- King, R. C., & Gribbins, M. L. (2002). Internet technology adoption as an organizational event: An exploratory study across industries. In *Proceedings of the Annual Hawaii International Conference on System Sciences* pp. 2683–2692.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. *Structural Equation Modeling*, 156.
- Krejcie, R., & Morgan, D. (1970). Determining sample size for research activities. *Educ Psychol Meas.*
- Kroenung, J., & Eckhardt, A. (2015). The attitude cube - A three-dimensional model of situational factors in IS adoption and their impact on the attitude-behavior relationship. *Information and Management*, 52(6), 611–627.
- Kurilovas, E., & Dagiene, V. (2009). Learning Objects and Virtual Learning Environments Technical Evaluation Criteria. *Journal of E-Learning*, 7(2), 127–136.
- Lederach, J. P. (1995). Preparing for peace: Conflict transformation across cultures. *Syracuse studies on peace and conflict resolution*.
- Lee, B. C., Yoon, J. O., & Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. *Computers and Education*, 53(4), 1320–1329.
- Lee, E. A., Wai, K., & Che, C. (2009). Learning Effectiveness in a Desktop Virtual Reality-Based Learning Environment. *Proceedings of the 17th International Conference on Computers in Educations*, 832–839.
- Lee, M. C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model. *Computers and Education*, 54(2), 506–516.

- Lee, Y. C. (2008). The role of perceived resources in online learning adoption. *Computers and Education, 50*(4), 1423–1438.
- Lee, Y. H., Hsieh, Y. C., & Ma, C. Y. (2011). A model of organizational employees' e-learning systems acceptance. *Knowledge-Based Systems, 24*(3), 355–366.
- Lehner, P. N. (1979). *Handbook of ethological methods*. Cambridge University Press.
- Lewis, W., Agarwal, R., & Sambamurthy, V. (2003). Sources of influence on beliefs about information technology use: An empirical study of knowledge. *MIS Quarterly, 27*(4), 657–678.
- Lim, K., & Kim, M. H. (2015). A case study of the experiences of instructors and students in a virtual learning environment (VLE) with different cultural backgrounds. *Asia Pacific Education Review, 16*(4), 613–626.
- Lisewski, B. (2004). Implementing a learning technology strategy: top–down strategy meets bottom–up culture. *Alt-J, 12*(2), 175–188.
- Littlejohn, A., & Cameron, S. (1999). Supporting strategic cultural change: The Strathclyde learning technology initiative as a model. *AltJ, 7*(3), 64–74.
- Liu, I. F., Chen, M. C., Sun, Y. S., Wible, D., & Kuo, C. H. (2010). Extending the TAM model to explore the factors that affect Intention to Use an Online Learning Community. *Computers and Education, 54*(2), 600–610.
- Liu, Y. C., Huang, Y.-A., & Lin, C. (2012). Organizational factors' effects on the success of e-learning systems and organizational benefits: An empirical study in Taiwan. *The International Review of Research in Open and Distributed Learning, 13*(4), 130–151.
- Lumpe, A. T., & Chambers, E. (2001). Assessing Teachers' Context Beliefs about Technology Use. *Journal of Research on Technology in Education, 34*(1), 93–107.
- Lunenburg, F. C. (2011a). Organizational Culture-Performance Relationships: Views of Excellence and Theory Z. *National Forum of Educational Administration and Supervision Journal, 29*(4), 1–10.
- Lunenburg, F. C. (2011b). Understanding Organizational Culture : A Key Leadership Asset. *National Forum of Educational Administration and Supervision Journal, 29*(4), 1–12.
- Lynham, S. a. (2002). The General Method of Theory-Building Research in Applied Disciplines. *Advances in Developing Human Resources, 4*(3), 221–241.
- Ma, W. W., Andersson, R., & Streith, K.-O. (2005). Examining user acceptance of computer technology : an empirical study of student teachers. *Journal of Computer Assisted Learning, 21*, 387–395.
- Martins, L. L., & Kellermanns, F. W. (2004). A Model of Business School Students' Acceptance of a Web-Based Course Management System. *Academy of Management Learning & Education, 3*(1), 7–26.

- Maxwell, J. A. (2011). Conceptual Framework. *Qualitative Research Design: An Interactive Approach*, 141–151.
- Mbengo, P. (2014). E-learning Adoption by Lecturers in Selected Zimbabwe State Universities : An Application of Technology Acceptance Model, *6*(1), 15–33.
- McGill, T. J., & Klobas, J. E. (2009). A task–technology fit view of learning management system impact. *Computers & Education*, *52*(2), 496–508.
- Moghadam, A. H., & Bairamzadeh, S. (2009). Extending the Technology Acceptance Model for E-learning: A Case Study of Iran. *Sixth International Conference on Information Technology New Generations*, 1659–1660.
- Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, *2*, 192–220.
- Motaghian, H., Hassanzadeh, A., & Moghadam, D. K. (2013). Factors affecting university instructors' adoption of web-based learning systems: Case study of Iran. *Computers & Education*, *61*, 158–167.
- Naismith, L., Lee, B. H., & Pilkington, R. M. (2011). Collaborative learning with a wiki: Differences in perceived usefulness in two contexts of use. *Journal of Computer Assisted Learning*, *27*(3), 228–242.
- National Audit Department Malaysia. (2013). Auditor General's Report, 100.
- Netemeyer, R., Ryn, M. Van, & Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179–211.
- Nevo, D., & Chan, Y. E. (2007). A temporal approach to expectations and desires from knowledge management systems. *Decision Support Systems*, *44*(1), 298–312.
- Norusis, M. J. (2010). Cluster Analysis. In *SPSS Statistical 17.0 Statistical Procedures Companion 20*, 361–392.
- Oliveira, T., & Martins, M. (2011). Literature review of Information Technology Adoption Models at Firm Level. *Electronic Journal of Information*, *14*(1), 110–121.
- Ong, C. S., Lai, J. Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information and Management*, *41*(6), 795–804.
- Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools*, *9*(1), 73–90.
- Osika, E. R. (2004). The Concentric Support Model: A model for the planning and evaluation of distance learning programs, 234.
- Pallant, J. (2013). SPSS survival manual: a step by step guide to data analysis using SPSS. *McGraw-Hill Education*.

- Parker, A. (2003). Motivation and Incentives for Distance Faculty. *Online Journal of Distance Learning Administration*, VI(III), 1–6.
- Peluchette, J. V., & Rust, K. A. (2005). Technology use in the classroom: Preferences of management faculty members. *The Journal of Education for Business*, 80(4), 200–205.
- Pituch, K. A., & Lee, Y. kwei. (2006). The influence of system characteristics on e-learning use. *Computers and Education*, 47(2), 222–244.
- Pynoo, B., Devolder, P., Tondeur, J., Van Braak, J., Duyck, W., & Duyck, P. (2011). Predicting secondary school teachers' acceptance and use of a digital learning environment: A cross-sectional study. *Computers in Human Behavior*, 27(1), 568–575.
- Qureshi, I. A., Ilyas, K., Yasmin, R., & Whitty, M. (2012). Challenges of implementing e-learning in a Pakistani university. *Knowledge Management and E-Learning*, 4(3), 310–324.
- Radner, R., & Rothschild, M. (1975). On the allocation of effort. *Journal of Economic Theory*, 10(3), 358–376.
- Robson, C., & McCartan, K. (2016). *Real World Research*. Wiley.
- Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. *International Journal of Human Computer Studies*, 64(8), 683–696.
- Rogers, E. M. (1995). *Diffusion of innovations*. Newyork Free Press.
- Saadé, R., & Bahli, B. (2005). The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: An extension of the technology acceptance model. *Information and Management*, 42(2), 317–327.
- Saadé, R. G., & Kira, D. (2009). Computer Anxiety in E-Learning : The Effect of Computer Self-Efficacy Development of Research Hypotheses. *Journal of Information Technology Education*, 8, 177–191.
- Salmon, G. (2005). Flying not flapping : a strategic framework for e-learning and pedagogical innovation in higher.
- Sánchez-Franco, M. J., Martínez-López, F. J., & Martín-Velicia, F. A. (2009). Exploring the impact of individualism and uncertainty avoidance in Web-based electronic learning: An empirical analysis in European higher education. *Computers and Education*, 52(3), 588–598.
- Sapsford, R., & Jupp, V. (2006). *Data collection and analysis*.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students*. Business (Vol. 5th).
- Sauro, J., & Lewis, J. R. (2011). When designing usability questionnaires, does it hurt to be positive? *Proceedings of the 29th SIGCHI Conference on Human Factors in Computing Systems*, 2215–2223.

- Sawang, S., Newton, C., & Jamieson, K. (2013). Increasing learners' satisfaction/intention to adopt more e-learning. *Education + Training*, 55(1), 83–105.
- Schein, E. H. (1990). Organizational culture. *American Psychologist*, 45(2), 109–119.
- Schunk, D. (1991). Self-Efficacy and Academic Motivation. *Educational Psychologist*, 26(3), 207–231.
- Sekaran, U. (2003). Item Analysis. In *Research Methods for Business: A Skill Building Approach*, 203.
- Sekaran, U. (2006). *Research method of business: A skill-building approach. Writing.*
- Sekaran, U., & Bougie, J. R. G. (2009). *Research Methods for Business : A Skill Building Approach (5th Edition).*
- Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill-building approach. Fourth edition. John Wiley and Sons, New York.*
- Selim, H. M. (2003). An empirical investigation of student acceptance of course websites. *Computers and Education*, 40(4), 343–360.
- Shih, H. P. (2004). Extended technology acceptance model of Internet utilization behavior. *Information and Management.*
- Silverman, S., & Solmon, M. (1998). The Unit of Analysis in Field Research : Issues and Approaches to Design and Data Analysis. *Journal of Teaching in Physical Education*, 17, 270–284.
- Smith, A. (2012). *Research Methodology: A Step-by-step Guide for Beginners.*
- Straub, D., Keil, M., & Brenner, W. (1997). Testing the technology acceptance model across cultures: A three country study. *Information & Management*, 33(1), 1–11.
- Straub, D. W., Boudreau, M.-C., & Gefen, D. (2004). Validation Guidelines for Is Positivist Research. *Communications of the Association for Information Systems*, 13(1), 380–427.
- Surry, D. W., Ensminger, D. C., & Haab, M. (2005). A model for integrating instructional technology into higher education. *British Journal of Educational Technology*, 36(2), 327–329.
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics (6th ed.). New York: Harper and Row.*
- Taylor, S., & Todd, P. (1995). Assessing IT usage: The role of prior experience. *Management Information Systems Quarterly*, 19(4), 561–570.
- Termit, K., & Noorma, H. (2015). Teachers' Readiness to Utilize Frog VLE: A Case Study of a Malaysian Secondary School. *British Journal of Education, Society & Behavioural Science*, 5(1), 20–29.

- Tornatzky, L., & Klein, K. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on Engineering Management*.
- U.S. Department of Education, O. of E. T. (2010). Transforming American education : learning powered by technology : National Education Technology Plan 2010. *Learning*, 000, 87.
- van Raaij, E. M., & Schepers, J. J. L. (2008). The acceptance and use of a virtual learning environment in China. *Computers and Education*, 50(3), 838–852.
- Venkatesh, V., & Davis, F. (2000). Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- Venkatesh, V., G. Morris, M., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology : Toward a Unified View. *MIS Quarterly*, 27(3),
- Wang, W. T., & Wang, C. C. (2009). An empirical study of instructor adoption of web-based learning systems. *Computers and Education*, 53(3), 761–774.
- Williams, M., & Williams, J. (2010). Evaluating a model of business school students' acceptance of web-based course management systems. *The International Journal of Management Education*, 8(3), 59–70.
- Zakaria, M. H., Watson, J., & Edwards, S. L. (2010). Investigating the use of Web 2.0 technology by Malaysian students. *Multicultural Education & Technology Journal*, 4(1), 17–29.
- Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker, J. F. (2004). Can e-learning replace classroom learning? *Communications of the ACM*, 47(5), 75–79.
- Zhao, J. J., Alexander, M. W., Perreault, H., Waldman, L., & Truell, A. D. (2009). Faculty and Student Use of Technologies, User Productivity, and User Preference in Distance Education. *Journal of Education for Business*, 84(4), 206–212. <http://doi.org/10.3200/JOEB.84.4.206-212>
- Zikmund, W. G., Babin, B. J., Editorial, V. P., Calhoun, J. W., Thomas, J., Assistant, E. Fuller-Jacobsen, B. (2010). Exploring Marketing Research. *Sout Western Pub*.