Using Technology Acceptance Model to Explore Learning Satisfaction of e-Learning

楊惠合、陳建文

E-mail: 9314353@mail.dyu.edu.tw

ABSTRACT

Without the limitation of time-space, e-Learning has become a popular learning method due to the growth of the information technology and Internet. Not only e-Learning can provide a variety source of information quickly but also can provide a better educational quality with less expense. Furthermore, e-Learning improves the learning efficiency, which may help to lifelong learning. In today's studies about e-Learning, few of them are focused on both education theory and information technology. Therefore, in this research we start from the understanding and attitude of learners to explore the relation between e-Learning and its learners. By applying the theory of TAM (Technology Acceptance Model) and the education theory like learning motivation, we can realize the key factor which effects the learning satisfaction in e-Learning. In the analysis, we find that the external variables which influence e-Learning are the quality of the system, the feature of teaching materials, and the character of the learners. Moreover, by the path analysis and ANOVA, we have three conclusions: First, by combining TAM with the theory of learning motivation, we offer an assessed model which can find the key factor effecting learners' satisfaction in e-Learning; Secondly, the feature of teaching materials is the most significant factor effecting learners' attitude and satisfaction; Third, NSCU (National Sun Yat-Sen Cyber University) e-Learning system is deserving of many other systems to learning in the following items: the capability of interaction and communication of the system, the interaction of interpersonal relationship, the learning flexibility and the orientation of intrinsic motivation for learners' character.

Keywords: Technology Acceptance Model, e-Learning, Learning Motivation, Learning Attitude, Learning Satisfaction

Table of Contents

目錄 封面內頁 簽名頁 授權書 iii 中文摘要 v 英文摘要 vi 誌謝 viii 目錄 ix 圖目錄 xi 表目錄 xii 第一章 緒論 1 1.1 研究背景 1 1.2 研究動機 2 1.3 研究目的 4 1.4 研究範圍與研究限制 5 1.5 研究流程 6 第二章 文獻探討 8 2.1 數位學習 8 2.2 學習動機 13 2.3 科技接受模型理論 17 2.4 外部變數的推導 23 2.5 學習態度 35 2.6 學習滿意度 38 第三章 研究方法與假設 41 3.1 研究理論 與架構 41 3.2 統計分析方法 44 3.3 問卷設計 47 3.4 前測施行與結果分析 50 3.5 確立研究架構與研究假說 52 3.6 變數定義與 衡量 58 第四章 研究結果與分析 62 4.1 樣本基本資料分析 62 4.2 因素分析與信度分析 64 4.3 假說檢定之路徑分析 70 4.4 單因子變異數分析 79 第五章 結論與建議 84 5.1 研究發現與結論 84 5.2 建議與未來研究 86 參考文獻 89 附錄 103

REFERENCES

參考文獻中文文獻 [1] 中央社新聞稿(2004),全台6成人口上網使用寬頻者逾900萬人,

http://www.dajiyuan.com/b5/4/2/20/n470489.htm。

- [2] 王宗立(2002),個人沈浸體驗、任務/科技配適度及科技接受之實徵研究-以電子郵件使用為例,樹德科技大學資訊管理研究所碩士論文。
- [3] 王秋華(2001),網路教學之學生學習行為與學習滿度及學習績效的關係,大葉大學資訊管理研究所碩士論文。
- [4] 王福林(1990),新制師院學生與師專學生家庭社經地位及其學習行為、學業成就之分析調查,國立臺灣師範大學教育研究所碩士論文
- [5] 何祖鳳、陳俊榮和陳銘欽(1998),網路教學系統評估準則之研究,遠距教育,第7期,第20-29頁。
- [6] 吳明隆(2000), SPSS 統計應用實務,臺北:松崗電腦圖書。
- [7] 吳俊毅(1999), 科技接受模型之實徵研究-從動機角度, 國立中央大學資訊管理研究所碩士論文。
- [8] 吳肇銘(1999),影響網站使用意向之因素研究-以入門網站為例,國立中央大學資訊管理研究所博士論文。
- [9] 吳靜吉、程炳林(1992),激勵的學習策略量表之修訂,中國測驗學會測驗年刊,第39期,第59-78頁。
- [10] 李青蓉、魏丕信、施郁芬、邱昭彰(1998), 人機介面設計,臺北:空大。
- [11] 李建二、嚴伯良(1997),成長中的遠距教學、視訊會議與網路教學,遠距教育,第1期,第34-36頁。
- [12] 李美慧(2001),科技接受模式在非同步網路學習系統使用意向之應用,國立中正大學資訊管理學系。
- [13] 周甘逢、劉冠麟譯(2002),教育心理學,台北:華騰文化。
- [14] 周斯畏、孫思源、朱思明(2000),遠距教學的應用-進修推廣教育教師與學員的探索性研究,中華管理評論,第2期,第123-134頁。

- [15] 官淑如(1997),綜合高中學生學習態度及其相關因素之研究,國立台灣師範大學工業教育研究所碩士論文。
- [16] 岳修平(1999),網路教學於學校教育之應用,課程與教學季刊,第4期,第61-76頁。
- [17] 林永吉(1990),師鐸電腦輔助教學編輯系統CAITOOL,臺北:松崗。
- [18] 林家弘(2000), 我國大學生網路學習滿意度之研究, 國立政治大學教育研究所碩士論文。
- [19] 林珮怡(1997),二專餐飲管理科學生學習滿意度之研究,文化大學生活應用科學研究所碩士論文。
- [20] 林寶貴、錡寶香(1991),高職階段聽障學生學習態度成就動機及其學業成就之相關研究,台灣師範大學特殊教育研究所碩士論文。
- [21] 邱皓政(2003), 結構方程模式:LISREL的理論、技術與應用,台北:雙葉。
- [22] 洪寶蓮(1987),國中學生個人與環境因素對其學習行為之研究,國立台灣師範大學教育研究所碩士論文。
- [23] 唐璽惠(1988),高中生英語學習動機態度、師生互動、親子關係與英語科成就之相關研究,國立高學師範大學教育研究所碩士論文
- [24] 孫春在(2000),網路學習趨勢與原理,第一屆大學教學方法與網路課程研討會,第13-20頁。
- [25] 孫培真(2000),影響非同步網路學習系統接受度與滿意度之因素:一個以結構化理論為基礎之研究,國立中山大學資訊管理學系博士論文。
- [26] 袁之琦、遊恆山(1990),心理學名詞辭典,臺北:五南。
- [27] 馬芳婷(1989),社教機構短期研習班教師教學行為與學生學習滿意度之研究,國立台灣師範大學社會教育研究所碩士論文。
- [28] 張金鐘(2002),以科技接受模式探討教師與學生採用數位化教材的態度,中山大學資訊管理研究所碩士論文。
- [29] 張春興(1992), 現代心理學,臺北:五南。
- [30] 張春興(1994),教育心理學-三化取向的理論與實務,台北:東華。
- [31] 張春興(1997), 教育心理學, 台北:東華。
- [32] 張美玲(2000),以專題為基礎之教學與學習對國小學生自然科學習動機與學習成就之影響,屏東師範學院國民教育研究所碩士論文
- [33] 曹汝民(2001),非同步網路教學網站評鑑指標發展之研究,國立臺北科技大學技術及職業教育研究所碩士論文。
- [34] 梅發廣、方國定(2003), Web-Title使用意向之探討-TAM修正模型之驗證,中央警察大學資訊、科技與社會學報,第1期,第55-72頁
- [35] 郭達沂(2002),以科技接受模型探討失業勞工對公共職業訓練採用線上學習的使用意願,國立中正大學資訊管理研究所碩士論文。
- [36] 陳育民(2002),學習風格與學習模式對中學生電子化學習成效之影響,國立中正大學資資訊管理研究所碩士論文。
- [37] 陳佳賢(2001), 我國線上學習市場現況與未來展望, http://www.itis.org.tw/index.html。
- [38] 陳孟功(2003),校園無線區域網路(WLAN) 科技接受模式(TAM)之研究,國立高雄師範大學工業科技教育研究所碩士論文。
- [39] 陳焜元(1996), 行政管理資訊系統使用者參與效果之研究-技術接受性模式檢証,國立政治大學公共行政學系碩士論文。
- [40] 湯宗益、廖莉芬(2003), 遠距教學系統滿意度與接受度之研究:以適應性結構化理論為基礎,中央警察大學資訊、科技與社會學報, 第1期,第1-23頁。
- [41] 項必蒂(1991), 師院生學習教育心理學之動機與策略及其相關因素研究, 國立政治大學教育研究所碩士論文。
- [42] 黃慧美(2002), 國小二年級學童使用電腦輔助學習之學習態度分析研究, 國立嘉義大學幼兒教育學系碩士班。
- [43] 黃繼弘(2002),線上學習內容提供業者的經營風險與因應策略,元智大學資訊傳播研究所碩士論文。
- [44] 楊家興(2000), 航向新世紀的願景:網路上的開放教育環境,遠距教育,第16期,第75-84頁。
- [45] 楊淑斐(2002),線上學習市場使用意向模式建構與比較分析之研究,南台科技大學資訊管理研究所碩士論文。
- [46] 詹秉鈞(2002), 以電腦輔助教材進行交線與展開圖教學對學生學習表現之研究,國立臺灣師範大學工業教育研究所碩士論文。
- [47] 臺灣經建會人力規劃處(2001),電子學習(e-Learning)現況及未來展望, http://www.cepd.gov.tw/service/news/2001/1225.htm。
- [48] 潘明君(2003),全球線上學習市場將大幅成長到500億美元規模,
- http://www.find.org.tw/0105/news/0105_news_disp.asp?news_id=2768。
- [49] 蔡淑如(2004), 線上學習類型網站造訪趨勢觀察, http://www.find.org.tw/0105/news/0105_news_disp.asp?news_id=2969。
- [50] 盧正川(2002), 多媒體網路教材設計 以資訊豐富理論為基礎之研究, 國立高雄師範大學資訊教育研究所碩士論文。
- [51] 謝宜君、紀文章(2003),網路教學學習動機、學習傾向及學習滿意度相關性之研究,2003年電子商務與數位生活研討會,第1108-1125頁。
- [52] 謝芳紋(2000),應用Dick 與Carey 教學系統設計模式建構電腦網路課程之研究,國立中正大學教育研究所碩士論文。
- [53] 藍瑞霓(1990), 空軍軍官學校與屏東師範學院學生對學校態度問卷調查研究,測驗與輔導,第100期,第2005-2008頁。 英文文獻 [1] Agarwal, R. and Prasad, J. (1998), "The antecedents and consequents of user perceptions in information technology adoption", Decision Support Systems, Vol. 22, pp. 15-29.
- [2] Ajzen, I. (1988), "Attitudes, Personality and Behavior", Milton Keynes: Open University Press.
- [3] Arbaugh, J. B. (2000), "Virtual Classroom Characteristics and Student Satisfaction with Internet-Based MBA", Journal of Management Education, Vol. 24, pp. 32-54.
- [4] Bagozzi, R. P., and Yi, Y. (1988), "On the evaluation of structural equation models", Academy of Marking Science, Vol. 16, pp. 76-94.
- [5] Bagozzi, R. P., Davis, F. D., and Warshaw, P. R. (1992), "Development and test of a theory of technological learning and usage", Human

Relations, Vol. 45, pp.660-686.

- [6] Bailey, J. E. and Pearson, S. W. (1983), "Development of a Tool for Measuring and Analyzing Computer User Satisfaction", Management Science, Vol. 29, pp. 530-545.
- [7] Barua, A., Chellapa, R., and Whinston, A. B. (1995), "Collaboratory in Cyberspace: Theoretical Foundation and an Implementation", Journal of Organizational Computing, Vol.5, pp. 417-442.
- [8] Bergeron, F., Rivard, S., and Serre, L. D. (1990), "Investigating the Support Role of the Information Center", MIS Quarterly, Vol. 14, pp. 247-260.
- [9] Biner, P., Barone, N., Welsh, K., and Dean, R. (1997), "Relative academic performance and its relation to facet and overall satisfaction with interactive telecourses", Distance education, Vol. 18, pp.318-326.
- [10] Binner, P. M., Dean, R. S., and Millinger, A. E. (1994), "Factors underlying distance learner satisfaction", The American Journal of Distance Education, Vol. 4, pp. 232-238.
- [11] Brckler, S. J. (1984), "Empirical validation of affect, behavior, and cognition as distinct components of attitude", Journal of Personality and Social Psychology, Vol. 47, pp. 1191-1205.
- [12] Burns, J., Clift, J., and Duncan, J. (1990), "Understanding of Understanding: Implications for Learning and Teaching", British Journal of Educational Psychology, Vol. 61, pp. 276-289.
- [13] Carolyn M. G. and Tony W. (2001), "e-Learning for Industry: the Competitive Advantage", Paper presented on 2001 Vocational Education and Training Research Conference.
- [14] Casarotti, M., Filipponi, L., Pieti, L., and Sartori, R. (2002) "Educational Interaction in Distance Learning: Analysis of a One-Way Video and Two-Way Audio System", PsychNology Journal, Vol.1. http://www.psychnology.org/casarotti.pdf [15] Daft, R. L., and Lengel, IL, H. (1986), "Organizational information requirements: Media richness and structural design", Management Science, Vol. 32, pp. 554-571.
- [16] Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", Management Science, Vol. 35, pp. 982-1003.
- [17] Entwistle, H. (1979), "Antonio Gramsci:Conservative schooling for radical politics", London: Routledge and Kegan Paul.
- [18] Goodhue, D. L., and Thompson, R. L. (1995), "Task-Technology Fit and Individual Performance", MIS Quarterly, Vol. 19, pp. 213-236.
- [19] Hamby, C. S. (1986), "A study of the effects of computer assisted instruction the attitude and achievement of vocational nursing students", Computers in Nursing, Vol. 4, pp. 109-113.
- [20] Hilgard, E. R. (1980), "The trilogy of mind: Cognition, affection, and conation", Journal of the History of the Behavioral Sciences, Vol. 16, pp. 107-117.
- [21] Hiltz, S. R. (1997), "Impacts of College-Ilevel courses via Asynchronous Learning Networks: Some Preliminary Results", Asynchronous Learn Networks, Vol. 1,pp. 1-19.
- [22] Holmberg, B. (1983), "Guided didactic conversation in distance education", In Sewart, D. et al. (eds.): Distance Education. International Perspectives, London: Croom Helm.
- [23] Hubona, G. S., and Geitz, S. (1997), "External Variables, Beliefs, Attitudes and Information, Technology Usage Behavior", Proceeding of the Thirtieth Hwaii International Conference, Vol. 3, pp. 21-28.
- [24] Igbaria, M., Iivari, J., and Maragahh, H. (1995), "Why do individuals use computer technology? A Finnish case study", Information and Management, Vol. 29, pp. 227-238.
- [25] Ives, B., Olson, M. H., and Baroudi, J. J. (1983), "The measurement user information satisfaction", Communications of the ACM, Vol. 26, pp. 785-793.
- [26] Johnson, G. R., Eison, J. A., Abbott, R., Meiss, G. T., Moran, K., Gorgan, J. A., Pasternack, T. L., Zaremba, E., and McKeachie, W. J.
- (1991), "Teaching tips for users of the motivated strategies for learning questionnaire (MSLQ)", Ann Arbor, MI: National Center for Research to Improve Postsecondary Teaching and Learning.
- [27] Jones, C. M. (1998), "Evaluation of effective instructional web sites: A pilot study", University of Austin, Texas.
- [28] Justyna, R., and Gregory, R. M. (2001), "A Framework for Effective User Interface Design for Web-Based Electronic Commerce Applications", Proceedings of Information Science, pp. 462-470.
- [29] Kaiser, H. F. (1974), "An Index of Factorial Simplicity, Psychometrics", Vol. 39, pp. 31-36.
- [30] Kang, S. (1998), "Information technology acceptance:evolving with the changes in the nerwork environment", Proceedings of the 31 Hawaii International Conference on System Sciences, pp. 413-423.
- [31] Khan, B. (1997), "Web-based instruction (WBI): What is it and why is it?", In Khan BH (ed.), Web-based Instruction. Englewood Cliffs, NJ: Educational Technology Publications, pp.5-18.
- [32] King, F., Nelson, J. G., and Restauri, S. (2002), "Reaching the Distant Learner: The Evolutionary Process", Education, Vol. 122, pp. 667-370.
- [33] Lin, J. C., and Lu, H. (2000), "Towards an understanding of the behavioural intention to use a web site", International Journal of Information Managament, Vol. 20, pp. 197-208.
- [34] Mathieson, K. (1991), "Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior",

Information Systems Research, Vol. 2, pp. 173-191.

- [35] Mieczyslaw, L.O. and Leszek, A. M. (2001), "On Principles of Course Evaluation in Distance Learning Environment", Proceedings of Information Science, pp. 385-391.
- [36] Miller, S. M., and Miller, K. (2000), "Theoretical and practical considerations in the design of web-based instruction", In B. Abbey (ed.), Instructional and cognitive impacts of web-based education, Hershey, PA: Idea Group.
- [37] Mok, C. (1996), "Design Business: Multiple Media, Multiple Disciplines", Mountain View, CA.: Adobe Press, Adobe Systems Incorporated.
- [38] Moore, M. G. (1989), "Three types of interaction, A presentation of the NUCEA Forum: Issues in Instructional", Interactivity, National University Continuing Education Association Annual Meetings.
- [39] Moore, M. G., and Kearsley, G. (1996), "Distance education: A systems view", Belmont, CA: Wadsworth.Nielsen.
- [40] Pintrich, P. R. (1989), "The dynamic interplay of student motivation and cognition in the college classroom", In C. Ames and M. L. Maehr (Eds.), Advances in motivation and achievement: Motivation enhancing environments, Greenwich, CT: JAI, Vol. 6, pp. 117-160.
- [41] Pintrich, P. R., Smith, D. A. F., Garcia, T., and McKeachie, W. J. (1991), "A Manual for the Use of the Motivated Strategies for Learning Questionnaire (MSLQ)", National Center for Research to Improve Postsecondary Teaching and Learning.
- [42] Pintrich, P. R., and Schunk, D. H. (1996), "Motivation in education: Theory, research and applications", Englewood Cliffs, New Jersey: Prentice-Hall.
- [43] Porter, L. A. (1997), "Creating the virtual classroom: Distance learning with the Internet", New York: Wiley Computer Publishing.
- [44] Pujola, J. T. (1997), "Ewebuation", Edinburg Working Papers in Applied Linguistics, Vol. 9, pp. 104-115.
- [45] Rafaeli, S. (1998), "Interactivity: From new Media to Communication", In R.P. Hawkins, J.M. Wiemann & S. Pingree (Eds.), Advancing communication science: Merging mass and interpersonal process, Newbury Park, CA: Sage, Vol. 18, pp. 110-134.
- [46] Rich, C. (1999), "Creating Online Media: A Guide to Research, Writing and Design on the Internet", Quebecor Printing Book Group.
- [47] Robey, D. (1979), "User attitudes and management information system use", Academy of Management Journal, Vol. 22, pp. 527-538.
- [48] Sarapuu, T., and Adojaan, K. (1998), "Evaluation scale of educational web sites", Parper presented at the WebNet 98 World Conference of the WWW, Internet and Intranet, Vol.24, pp.192-204.
- [49] Simonson, M., Smaldino, S., Albright, M., and Zvacek, S. (1999), "Teaching and Learning at a Distance-Foundations of Distance", Education, New Jersey: Upper Saddle River.
- [50] Sipple, C. J., and Sipple, R. J. (1980), "Computer dictionary", Howard W. Sams and Co. Inc.
- [51] Small, R. V., and Gluck, M. (1994), "Educational technology research section-The relationship of motivational conditions to effective instructional attributes: A magnitude scaling approach", Educational technology, Vol. 34, pp. 33-40.
- [52] Swanson, E. B. (1982), "Measuring user attitudes in MIS research: a review", OMEGA, Vol. 10, pp. 157-165.
- [53] Szajna, B. (1996), "Empirical evaluation of the revised technology acceptance model", Management Science, Vol.42, No.1, pp. 85-92.
- [54] Taylor, J. C. (1996), "Perspectives on the Education Uses of Technology", Vol. 2, pp. 18-26.
- [55] Taylor, S., and Todd, P. A. (1995), "Assessing IT Usage: The Role of Prior Experience", MIS Quarterly, Vol. 19, pp. 561-570.
- [56] Trace, A. U., and Cornelia, C. W. (2000), "Corporate e-learning: exploring a new frontier", WR Hambrecht Co.
- [57] Venkatesh, V., and Davis, F. (1996), "A model of the antecedents of perceived ease of use: Development and test", Decision Sciences, Vol. 27, pp. 451-481.
- [58] Venkatesh, V., and Speier, C. (1999), "Computer technology training in the workplace: A longitudinal investigation of the effect of mood", Organizational Behavior and Human Decision Processes, Vol. 79, pp. 1-28.
- [59] Webster, J., and Hacklery, P. (1997), "Teaching Effectiveness in Technology Mediated Distance Learning", Academy of Management Journal, Vol. 40, pp. 1282-1309.
- [60] Webster, J., and Trevino, L. K. (1995), "Rational and Social Theories as Complementary Explanations of Communication Media Choices: Two Policy Capturing Studies", Academy of Management Journal, Vol. 38, pp. 1544-1572.
- [61] Webster's College Dictionary (1996), "Webster's College Dictionary", New York: Random House.
- [62] Weinstenin, C. E. (1982), "Training students to use elab- oration learning strategies", Contemporary Educ- ational Psychology, Vol. 7, pp. 301-311.
- [63] Woodrow, J. E. J. (1992), "The influence of programming training on the computer literacy and attitudes of preservice teachers", Journal of Educational Computing Research, Vol.25, pp.165-187.
- [64] Yellen, R. E. (1998), "Distance Learning Students: A Comparison with Traditional Students", Journal Educational Technology Systems, Vol. 26, pp. 215-224.
- [65] Zona Research (1999), "The Economic Impacts of Unacceptable Web-Site Download Speeds", Zona Research, Inc.