

The causal Model of effective factors on Intention to use of information technology among payam noor and Traditional universities students

Hossien Zare and Sedigheh Yazdanparast

Payame Noor University, Islamic Republic of Iran, Iran

Email: S.yazdanparast6@yahoo.com

Abstract: The objective of this study is presenting the causal modeling of intention to use technology among university student. Correlation is used as the method of research. Instrument of this study is standard questionnaire. The collected data is analyzed with AMOS software. The result indicate that facilitative condition, cognitive absorption, perceived enjoyment, perceived ease of use, and perceived usefulness have significant and direct effect on intention to use technology. Also, facilitative condition, cognitive absorption, perceived enjoyment, perceived ease of use and computer playfulness have significant and direct of effect on perceived usefulness. Facilitative condition, cognitive absorption, perceived enjoyment, and playfulness have significant and direct effect on perceived ease of use.

[Hossien Zare, Sedigheh Yazdanparast. **The causal Model of effective factors on Intention to use of information technology among payam noor and Traditional universities students.** *Life Sci J* 2013;10(2):46-50]. (ISSN:1097-8135). <http://www.lifesciencesite.com>. 8

Keywords: Intention to use information technology, cognitive absorption, perceived ease of use, perceived enjoyment, perceived usefulness, facilitative condition and Computer playfulness

Introduction

Advances in technology, especially information technology are quickly swept the world and has a significant effect on many dimensions of human life, like education (Rehman and Saba, 2012a,b). Application of Information and Communication Technology (ICT) in education include: computer-assisted learning, computer-assisted research and distance education which is facilitated by using computer. When the students use ICT, their learning coupled with motivation and they are more confident in doing their tasks. Information and Communication Technology increase the efficiency of classrooms achievements and facilitate teaching and learning process (Rehman and Saba, 2011). Higher education's systems encounter a huge wave of developments in which the traditional university teaching methods, students, teachers must be reconsidered. To promote the use of ICT in higher education, it requires some changes in the role of teachers and students. Since the students have a fundamental role in the application of information technology in education, adoption of ICT and its use by them must be considered as a key factor in the evolution of teaching - learning process. Therefore, this study aims to investigate the effective factors on intention to use ICT by utilizing causal modeling among students of payamnoor university and medical university (Rehman and Saba, 2011). This study is benefited from variables such as computer playfulness from the Webster & Martoque's (1992) study and cognitive absorption from the theory of cognitive absorption (agarwal &

Karahana 2000), perceived enjoyment from the acceptance personal computer model and facilitative condition which is adopted from effective factors in using computer by Thompson. These variables are added to technology acceptance model of Davis which is including three variables called: perceived usefulness, perceived ease of use and intention to use technology. The result of previous researches (Agarwal & Karahanna 2000, Bekhti et al., 2011; Saba et al., 2012; Kurniawan et al., 2009; Tselios et al 2011; Rehman et al., 2013) shows that intention to use technology is not under the effects of one factor, but several factors are influencing on it. As the above mentioned researches indicate, there is a meaningful and significant relationship between intention to use technology and two cognitive elements (perceived ease of use and perceived usefulness). Chen et al (2006) reported that perceived ease of use and perceived usefulness are the most important predictor of intention to use technology, Sun and Zhang (2006 and 2008), found that perceived ease of use has a direct effect on intention to use technology.

According to Serenko et al (2007) the relationship between perceived usefulness and intention to use technology is meaningful but, perceived ease of use has not significant effect on intention to use technology. Also, Shen et al (2009) found that perceived ease of use has not a meaningful relationship with intention to use technology. The research result of Jong et al (2009) showed that in addition to the direct effect of perceived ease of use and perceived usefulness

on intention to use technology, facilitative condition also has a direct effect on intention to use technology.

Gunther et al (2009) in his published article titled "Modeling Micro blogging Adoption in the Enterprise" in 15th American conference on information system at San Francisco reported that there is a meaningful relationship between facilitative condition and intention to use technology.

In addition Mazman et al (2009) showed that facilitating conditions has a positive effect on perceived ease of use and perceived usefulness. The result of a study by Raleting et al (2011) indicate that facilitative condition has a direct effect on perceived ease of use but the effect of this variable on perceived usefulness is not significant.

Various researches such as Teo et al 2007, Tselios et al 2011, Porter et al 2006, yang2007, Mazman et al 2009, Raleting 2011, Zhang et al 2006, sun et al 2008, Chandra et al 2009, Shen et al 2009; Saba and Rehman,2012a,b indicate that the relationship between perceived ease of use and perceived usefulness are meaningful. Although the relationship between cognitive absorption and perceived usefulness takes its theoretical foundation from cognitive theory of Berm (1972, cited in Tan 2007) but empirical researches such as Agarwal & Karahanna 2000, Zhang 2006 et al, Chandra et al 2009 and Tan 2007 showed that there is a significant relationship between cognitive absorption, perceived ease of use and usefulness.

Chandra et al (2009) in an article titled "Role of cognitive absorption and trust for collaboration in virtual world" showed that cognitive absorption has a direct effect on intention to use technology. They also in another article titled "Examining the Role of Cognitive Absorption for Information Sharing in Virtual Worlds" indicated that cognitive absorption has direct effect on both perceived ease of use and perceived usefulness.

Saade and Bahli (2005) in their article titled "The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: an extension of the technology acceptance model" and Agrawal & Karahanna (2000) in their studies found that there is a meaningful relationship between cognitive absorption and perceived ease of use and perceived usefulness. They also indicated that perceived ease of use is one the most important predictor of perceived usefulness. Also, these two variables (perceived ease of use and perceived usefulness) have a significant and direct effect on intention to use technology.

Enjoyment, defined by Davis, Bagozzi, and Warshaw (1992) as "the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences

that may be anticipated". They have indicated that perceived enjoyment significantly affects intention to use computers. Serenko et al (2007) expressed that perceived enjoyment and perceived usefulness have direct and meaningful effect on intention to use technology.

Also Liao et al 2008 and Heerink 2008 perceived enjoyment will have a positive effect on behavioural intention and intention to use. Sun and Zhang (2006 and 2008) in articles titled "Causal Relationships between Perceived Enjoyment and Perceived Ease of Use: An Alternative Approach" and "An Exploration of Affect Factors and Their Role in User Technology Acceptance: Mediation and Causality" found that there is a meaningful relationship between two cognitive elements of TAM (perceived ease of use and perceived usefulness) and perceived enjoyment. But the relationship between perceived enjoyment and intention to use technology is not significant.

Venkatesh 2000 in his article titled "Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation and Emotion into the Technology Acceptance Model" found that there is not a meaningful relationship between computer playfulness and perceived ease of use. According to Shen et al (2009) found that the relationship between computer playfulness and intention to use technology are significant and meaningful.

Research Methodology

Research method in this study is correlation and 379 Fars PayameNoor University students and medical university students were selected by stratified sampling. In this research standardized questionnaires of intention to use information technology (Agarwal & Karahanna, 2000), cognitive absorption (Tan, 2007), facilitative condition (Raleting & Nel, 2011), perceived enjoyment (lung, 2007), computer playfulness (Sun & Zhang, 2008) and perceived ease of use and perceived usefulness are evaluated by the questioner that development by Teo et al 2007 are used and AMOS software was used in data analysis.

Results

Considering that the correlation matrix is the basis for analysis in casual modeling, correlation matrix of variables with correlation coefficients and their significance levels are presented in Table1.

According to Table 1, correlation between perceived enjoyment, perceived usefulness and computer playfulness is insignificant; correlation between cognitive absorption and facilitative condition is insignificant too.

Correlation between perceived ease of use and intention is significant at 0.05 levels, also correlation between computer playfulness and perceived enjoyment with Facilitative condition is significant at 0.05, but the correlation between other variables is significant in 0.01 levels. Direct, indirect and total effects of variables are presented in Table 2.

Table 1: Correlation matrix of variables

Variables	1	2	3	4	5	6	7
Computer playfulness	1						
perceived enjoyment	.061	1					
Facilitative condition	.144*	.120*	1				
Perceived Usefulness	.022	.272**	.413**	1			
Perceived Ease of use	.212*	.349**	.212**	.406**	1		
Cognitive Absorption	.318**	.141*	.014	.310**	.308**	1	
Intention to use information technology	.188**	.257**	.498**	.309**	.106*	.180**	1

*. Correlation is significant at the 0.05 level (2-tailed).
 **. Correlation is significant at the 0.01 level (2-tailed).

According to Table 2, facilitative condition ($\beta=0.352$, $t=5.329$, $P=0.01$), cognitive absorption ($\beta=0.209$, $t=3.707$, $P=0.01$), perceived enjoyment ($\beta=0.233$, $t=4.019$, $P=0.01$), perceived ease of use ($\beta=0.132$, $t=2.180$, $P=0.05$), and perceived usefulness ($\beta=0.345$, $t=5.329$, $P=0.01$) have significant and direct effect on intention to use technology. Facilitative condition ($\beta=0.168$, $t=2.786$, $P=0.01$), cognitive absorption ($\beta=0.232$, $t=4.216$, $P=0.01$), perceived enjoyment ($\beta=0.230$, $t=4.040$, $P=0.01$), and perceived ease of use ($\beta=0.168$, $t=2.786$, $P=0.01$) have significant and direct effect on perceived usefulness. Facilitative condition ($\beta=0.280$, $t=4.925$, $P=0.01$), cognitive absorption ($\beta=0.212$, $t=3.567$, $P=0.01$), perceived enjoyment ($\beta=0.343$, $t=6.041$, $P=0.01$), and playfulness ($\beta=0.164$, $t=2.758$, $P=0.01$) have significant and direct effect on perceived ease of use. It must be noted that perceived enjoyment (0.124), perceived ease of use (0.057), facilitative condition (0.176) and cognitive absorption (0.107) have an indirect effect on intention to use technology. Also Facilitative condition (0.047), perceived enjoyment (0.057) and cognitive absorption (0.035) have an indirect effect on perceived usefulness.

The amount of Explained total variance related to intention to use technology, perceived usefulness and perceived ease of use are equal to (0.39), (0.37) and (0.27).

Table 2: Direct, Indirect and Total Effect of Variables.

Effect	Direct effect	Indirect effect	Total effect	T-Value
Criterion: information and communication technology Intention	-----	-----	-----	-----
Predictors: perceived enjoyment	0.233	0.124	0.357	4.019
perceived ease of use	0.132	0.057	0.189	2.180
perceived usefulness	0.345	-----	0.345	5.329
cognitive absorption	0.209	0.107	0.316	3.707
Facilitative condition	0.352	0.176	0.528	5.329
Criterion: perceived usefulness	-----	-----	-----	-----
Predictors: perceived enjoyment	0.230	0.057	0.287	4.040
cognitive absorption	0.232	0.035	0.267	4.216
Facilitative condition	0.408	0.047	0.455	7.471
perceived ease of use	0.168	-----	0.168	2.786
Criterion: perceived ease of use	-----	-----	-----	-----
Predictors: perceived enjoyment	0.343	-----	0.343	6.041
cognitive absorption	0.212	-----	0.212	3.567
Playfulness	0.164	-----	0.164	2.758
Facilitative condition	0.280	-----	0.280	4.925

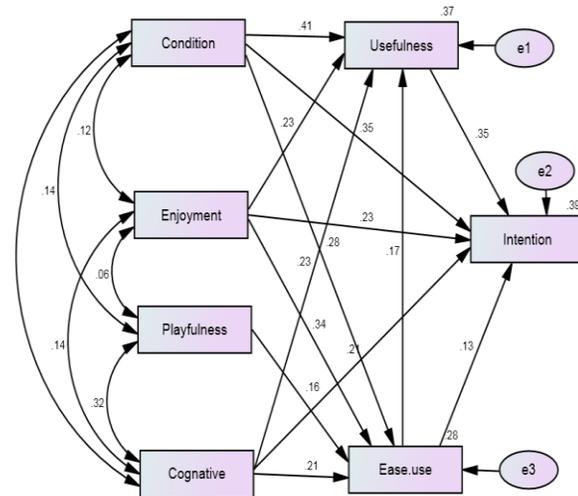


Figure 1: AMOS analysis results of the research model

Fitted indices (GFI), (AGFI) and (CFI), respectively (0.998), (0.976) and (1) indicate that the fitness of model is very high. The RMSEA value is equal to 0.000 so characteristic of reported fitness indicate that model has a good fitness with the data.

Discussion

This study examined the effective factors on intention to use technology. Results indicate that perceived ease of use and perceived usefulness are the significant predictors of intention to use technology. This finding is aligned with the result of the study by Agarwal et al 2000 & Tselios et al., 2011.

The above mentioned research confirmed the effect of perceived ease of use and perceived usefulness on intention to use technology but this finding is inconsistent with Zhang et al (2006) and Shen et al (2009) who say that the relationship between perceived ease of use and intention to use technology is not meaningful. Research result indicates that facilitative condition has a direct effect on intention to use technology. Gunther et al 2009, Jong et.al 2009, also confirmed this finding.

In this study the effect of facilitative condition on perceived ease of use and perceived usefulness confirmed. This is consistent with the Mazman et.al (2009) research. Although, Raleting et al (2011) indicate that facilitative condition only has the effect on perceived ease of use, but it has not a significant effect on perceived usefulness. This study proved the effect of perceived ease of use on perceived usefulness. This finding is aliened with the findings of Teo et al 2007, Tselios et al 2011, Porter et al 2006, yang 2007, Mazman et al 2009, Raleting 2011, Zhang et al 2006, sun et al 2008, Chandra et al 2009, Shen et al 2009.

Of the other result of this study is the effect of cognitive absorption on perceived ease of use and perceived usefulness. This is aliened with the findings of Agarwal et al 2000, Zhang et al 2006, Saade and Bahli (2005) and Tan 2007. In this study the effect of cognitive absorption on intention to use technology is direct and significant, that is consistent with the findings of Chandra et al (2009) and Agarwal et al (2000).

There is a meaningful relationship between computer playfulness and perceived ease of use. This statement is consistent with the findings of Shen (2009), Sun & Zhung (2008) but it is inconsistent with the findings of Vankatesh (2000). Also, there is a meaningful relationship between perceived enjoyment and two cognitive elements of TAM (perceived ease of use and perceived usefulness). This study finds a direct effect of perceived enjoyment on perceived ease of use. This is consistent with the findings of Sun and Zhang (2006 and 2008). Also the relationship between perceived enjoyment and perceived usefulness is confirmed. This finding is aliened with the findings of, Serenko et al 2007, Chen et al (2006), Sun and Zhang (2006 and 2008). And finally, there is a direct relationship between perceived enjoyment and intention

to use technology. This is supported by the findings of Liao et al 2008, Heerink 2008, Serenko et al 2007, Shen et al 2009. And it is inconsistent with the result of the studies that is done by Sun and Zhang (2006 and 2008). Among the variable of this study, facilitative condition has the most effect on intention to use technology. Therefore, it is recommended that university environment become equipped with technology related facility. Also, it is proposed that future researchers consider other variables such as computer experience, computer anxiety, and subjective norm.

Corresponding author:

Sedigheh Yazdanparast,
Master's Degree,
Payame Noor University, (Islamic Republic of Iran),
E-mail address: S.yazdanparast6@yahoo.com

References

- [1] Agarwal, R., & Karahanna, E. (2000). Time flies whit you re having fun: cognitive absorption and beliefs about information technology usage. *MIS quarterly*, 24 (4), 665.
- [2] Chandra, S., Theng, Y.L., O'Lwin, M., & Foo, S. (2009). Examining the Role of Cognitive Absorption for Information Sharing in Virtual Worlds, *Proc. 59th Annual Conference of the International Communication Association*
- [3] Chen, C & Cheng, Y & Chen, R (2006). Predicting College Student' Use of E Learning Systems: an Attempt to Extend Technology Acceptance Model.
- [4] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R (1989). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, vol. 22, 1992, pp. 1111-1132.
- [5] Gunther, D., Krasnova, H., Riehle, D., Schondienst, V. (2009). Modeling Micro blogging Adoption in the Enterprise, 15th American conference on information system, San Francisco, California august 6th-9th, 1-10.
- [6] Heerink, M & Kröse, B & Evers, V & Wielinga, B (2008). The Influence of Social Presence on Enjoyment and Intention to Use of a Robot and Screen Agent by Elderly User, *Proceedings of the 17th IEEE International Symposium on Robot and Human Interactive Communication*, August 1-3.
- [7] Jong, D., Wang, T. S. (2009). Student Acceptance of Web-Based Learning System, *International Symposium on web information and Application (WISA'09)*, China, May 22-24, 533-536.
- [8] Rehman, A. and Saba, T. (2011) Document skew estimation and correction: analysis of techniques, common problems and possible solutions, *Applied Artificial Intelligence* 25 (9), 769-787, 2011.

- [9] Mazman, S. G., Usluel, Y. K. (2009). The Usage of Social Network in Educational Context, *Word Academy of science, Engineering and Technology*, 49, 404-408.
- [10] Porter, C & Donthu, N (2006), Using the technology acceptance model to explain how attitudes determine Internet usage: The role of perceived access barriers and demographics, *Journal of Business Research* 59.
- [11] Raleting, T., Nel, J. (2011). Department of Low-income non-users, attitude towards WIB mobile phone banking: Evidence from South Africa, *African Journal of Business Management*, 5(1), 212-223. Available from <http://www.academicjournal.org>.
- [12] Rehman, A. & Saba, T. (2012) "Neural Network for Document Image Preprocessing" *Artificial Intelligence Review*, DOI: 10.1007/s10462-012-9337-z.
- [13] Rehman, A. & Saba, T. (2012). "Evaluation of Artificial Intelligent Techniques to Secure Information in Enterprises". *Artificial Intelligence Review*, DOI. 10.1007/s10462-012-9372-9.
- [14] Rehman, A. & Saba, T. (2011). "Performance Analysis of Segmentation Approach for Cursive Handwritten Word Recognition on Benchmark Database". *Digital Signal Processing*, vol. 21(3), pp. 486-490.
- [15] Rehman, A. Alqahtani, S. Altameem, A. Saba, T. (2013) Virtual Machine Security Challenges: Case Studies, *International Journal of Machine Learning and Cybernetics*, DOI 10.1007/s13042-013-0166-4.
- [16] Bekhti, S. Rehman, A. Al-Harbi, M. & Saba, T. (2011) AQuASys an Arabic question-answering system based on extensive question analysis and answer relevance scoring *International Journal of Academic Research*, vol. 3(4), 45-54.
- [17] Saba, T. Alzorani, S. & Rehman, A. (2012) Expert System for Offline Clinical Guidelines and Treatment, *Life Science Journal*, vol. 9(4):pp. 2639 -2658.
- [18] Saba, T. & Rehman, A. (2012a), *Machine Learning and Script Recognition*, Lambert Academic Publisher, ISBN-10: 3659111708, pp: 98-105.
- [19] Saba, T. & Rehman, A. (2012). Effects of Artificially Intelligent Tools on Pattern Recognition, *International Journal of Machine Learning and Cybernetics*, vol. 4(2), pp. 155-162.
- [20] Saade, 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 & Management*, 42(2), 261-386.
- [21] Serenko, A & Bontis, N & Detlor, B (2007), End-user adoption of animated interface agents in everyday work applications, *Behavior & Information Technology*, Vol. 26, No. 2
- [22] Shen, J & Lauren, B. (2009). Exploring Intentions to Use Virtual Worlds for Business, *Journal of Electronic Commerce Research*.
- [23] F Kurniawan, A.R. Khan, D Mohamad (2009). "Contour Vs Non-Contour based Word Segmentation from Handwritten Text Lines. An Experimental Analysis". *International Journal of Digital Content Technology and its Applications*, vol. 3(2), pp. 127-131.
- [24] Sun, H & Zhang, P (2006). Causal Relationships between Perceived Enjoyment and Perceived Ease of Use: An Alternative Approach, *Journal of the Association for Information Systems* Vol. 7 No. 9, pp. 618- 645
- [25] Sun, H and Zhang, P (2008), An Exploration of Affect Factors and Their Role in User Technology Acceptance: Mediation and Causality, *Journal of the American Society for Information Science and Technology*.
- [26] Tan, W. (2007). An integrated view of cognitive absorption in a technology mediated learning Environment, Unpublished Doctoral Dissertation.
- [27] Teo, T., Lee, C.B., Chai, C.S. (2007). Understanding per-service teachers' computer attitudes: applying and extending the technology acceptance model, *Journal of computer assisted learning*, 24, 128-143. Doi:10.1111/j.1365-2729.2007.0024.x.
- [28] Tselios, N., Daskalakis, S., and Papadopoulou, M. (2011). Assessing the Acceptance of a Blended Learning University Course. *Educational Technology and Society*, 14 (2), 224–235.
- [29] Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, Intrinsic Motivation and emotion in to the technology acceptance model. *Information Systems Research*. 11(4), 340-365.
- [30] Webster, J., and Martocchio, J. (1992) .Microcomputer Playfulness: Development of a Measure with Workplace Implications,. *MIS Quarterly* (16:2), 1992, pp. 201-226.
- [31] Yang, H (2007). The Effect of Technology Acceptance on Undergraduate Students' Usage of WEBCT as a Collaborative Tool, Unpublished Doctoral Dissertation.
- [32] Zhang, P & Li, N and Sun, H (2006), Affective Quality and Cognitive Absorption: Extending Technology Acceptance Research *Proceedings of the Hawaii International Conference on System Sciences*.