DESIDOC Journal of Library & Information Technology, Vol. 41, No. 2, March 2021, pp. 88-93, DOI : 10.14429/djlit.41.2.16009

Effective Factors in Adopting Electronic Books (E-books) by Students in Electronic Era

Malihe Nazari and Mohammadhiwa Abdekhoda*

School of Health Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran

**E-mail: abdekhodam@tbzmed.ac.ir*

ABSTRACT

The current study was conducted with the aim of identifying effective factors in students' utilise of e-books by combining the Expectancy Disconfirmation Theory and Technology Acceptance Model. The current study is a descriptive-analytical study using confirmatory factor analysis. The study population included students of Tabriz University of Medical Sciences. A randomised sampling method was used from the available population, including 140 participants selected as the study population, and the research instrument was a questionnaire constructed based on the Expectance Disconfirmation Theory (EDT) and Technology Acceptance Model (TAM). The findings indicate that factors of the TAM, that is, perceived usefulness (PU) (=β0.64) and perceived ease of use (PEOU) (=β 0.42) have a positive and significant effect on student's use of e-books. Other findings indicate that the suggested model is able to depict over 47 per cent of effective factors in using e-books by students. Thus, the combination of TAM and EDT models is appropriate for depicting students' behavior in using e-book. The results of this study clearly identified the effective factors in student's use of e-books, including PU, PEOU, confirmation, and user satisfaction. The results of current study can be beneficial for the implementation of e-books in libraries and educational settings.

Keywords: Electronic books; Technology acceptance model; Expectancy disconfirmation theory; EBook use

1. INTRODUCTION

With the ever-increasing progress of computers in everyday life, the world is quickly transforming into an electronic and digital world and creating fundamental changes in our lives[1]. According to Tafler, issues such as the extremely high speed of change and information explosion, extensive access to information resources, availability of computers, internet connection, access to reliable world libraries, journals, newspapers, scientific papers, people's widespread communication at any age, gender or language, in any social, cultural, political or economic situation, from the farthest part of the globe, are among the new features of this new global society[2].

As a result, awareness of public and technological devices has become a necessary and important means of the teaching and learning process at universities. Nowadays, not only are numerous journals published electronically in addition to the printed version, but countless books on various topics have also become available electronically. In fact, the main reason for the advent of the electronic book is overcoming issues and problems related to printed versions and the main feature of an e-book is its dynamic, interactive and flexible nature which can be accessed and supplied in various formats at any time or place. The greatest application of e-books is in the area of educational books because university students require having numerous books with them; however, the high cost and large load has always been a serious barrier[3].

Nowadays, most libraries such as university libraries use e-books in their collections and e-books have become an outstanding service in libraries. Numerous studies have evaluated people's level of awareness regarding e-books and these studies indicate that awareness motivates people's usage of e-books, which ultimately results in the priority of e-books among users[4].

Based on the EDT and TAM, the closer the capabilities of an information system to the experiences and expectations of users, the greater the acceptability and hence satisfaction and continuance intention of using that technology will be [5]. Dalcher and Shine(2011) found that confirmation is important for the acceptance of technology (e-books)[6]. A number of recent studies have focused on concepts such as perceived quality, mental norms, satisfaction and their relationship with using e-books.

The current study was conducted based on the combined Technology Acceptance Model (TAM) by Davis and Expectance Disconfirmation Theory (EDT) in order to recognise effective factors in using e-books by students of Tabriz University of Medical Sciences (TUoMS). Hence, by providing a clear and logical scenario of the current situation, effective factors of using e-books by students are identified. Thus, the major objectives of this study was to identify effective factors in using e-book by students and presenting conceptual model of e-book using.

Received : 10 June 2020, Revised : 23 November 2020
Accepted : 20 January 2021, Online published : 12 March 2021

Figure 1 provides a summary of hypotheses and proposed models.

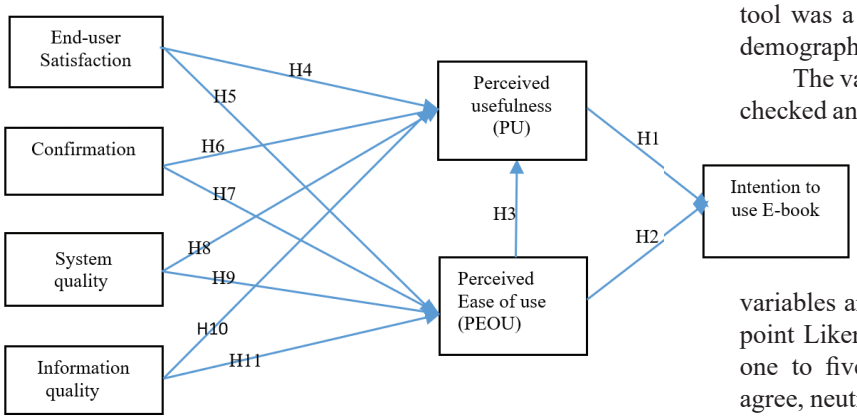

Figure 1. Model hypotheses based on TAM and EDT.

population. From 168 questionnaire distributed, 140 were returned completed (response rate=83 %). The data collection tool was a questionnaire structured into two general sectors; demographic data and research questions.

The validity of the data collection tool, questionnaire, was checked and approved. In order to evaluate the reliability of the study tool, Cronbach's α was applied. The total reliability coefficient for the questionnaire was obtained at (0.83), indicating the high reliability of the questionnaire.

To evaluate the correlation between model variables and quantitatively evaluate them (Annexure I) the 5 point Likert rate was utilised, with responses extending from one to five. That is, responses included completely agree, agree, neutral, disagree and completely disagree with values of 1, 2, 3, 4 and 5, respectively. SPSS Version 24 was applied for analysis of data. Annexure I presents the questionnaire items.

Table 1. Correlations between model research variables (TAM) and (EDT)

Constructs	Confirmation	User Satisfaction	System Quality	Information Quality	PU	PEOU	Continuance Intention
Confirmation	1						
User Satisfaction	0.752**	1					
System Quality	0.610**	0.554**	1				
Information Quality	0.517**	0.421**	0.524**	1			
PU	0.683**	0.715**	0.417**	0.431**	1		
PEOU	0.668**	0.664**	0.534**	0.408**	0.659**	1	
Continuance Intention	00725**	0.758**	0.546**	0.494**	0.686**	0.521**	1

** P-Value ≤0.01

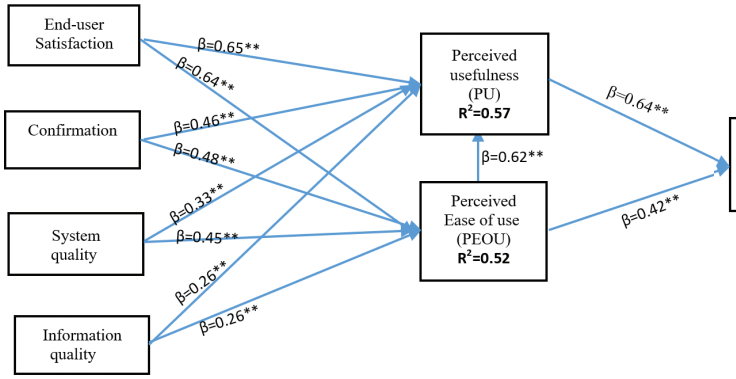

Figure 2. Model Results (EDT) & (TAM) (p-value<0.01).**

2. METHOD

This study was a descriptive-analytical study used confirmatory factor analysis. The research environment was TUoMS and the research population included graduate students of TUoMS. The sampling method was based on structural equation modeling and for each item 3-5 samples were considered using the simple randomised method and available samples, 168 participants were selected as the sample

3. RESULTS

One hundred forty graduate students at TUoMS participated in the current study, among which 114 (81.4 %) of the sample population were female and 26 (18.6 %) were male. Regarding their level of education, 75 participants (53.6 %) were Masters students, 52 participants (37.1 %) were General PhD students, and 13 (9.3 %) of the overall population were PhD students.

Table 1 appears the relationship between proposed model variables, dependent and independent of the ATM and EDT.

Figure 2 appears the outcomes of regression test analysis.

4. DISCUSSION

With respect to H1 (Fig. 1), the results reveal a positive association between PU and intention of use, with the highest correlation. The findings of Venkatesh and Guyal (2010) indicated that introducing the technology to staff members and holding training courses to teach them how to work with the technology had a highly positive effect on users tendency towards continuance intention of using new technologies in

an organisation[7]. When a technology is efficient for users, they continue using it and if it is not efficient they will reject it[8-9]. Thus, efficiency is critical factor in adoption the now technologies.

Regarding H2, we found a positive and considerable correlation between PEOU and continuance intention of use. Literature show that PEOU directly and indirectly effect continuance intention by means of PU[10-11].

Regarding H3, the findings show a positive and meaningful relationship between PU and PEOU. PU can also be useful both as an independent and dependent variable. When PU is under the influence of PEOU, it is the dependent variable and when it influences other variables it is considered the independent variable[12]. PU is a stronger factor than PEOU, that is, the more that technology enhances performance in an organisational setting, it is more efficient and thus used more[13]. Literature show that there's positive and powerful relationship between PU and PEOU[14-16]. So, PU and PEOU is effective factor when comprehensive adoption of e-book is considered.

Regarding H4, the study results reveal that there's positive and considerable association between PU and user satisfaction. There's a stronger association between PU and user satisfaction compared to PEOU and user satisfaction. Literature show that PU is a prerequisite for end-user satisfaction and has a noticeable effect on satisfaction, which is in agreement with the discoveries of this research[17-22].

Regarding H5, the study findings show that there's a direct relationship between PEOU and user satisfaction. Results of previous studies indicate that PEOU has a positive effect in students' satisfaction in using a technology, and these results are in agreement with the results of the current study[20,23]. Thus, user satisfaction should be considered a determinant factor when the successful adoption on new technology is in progress.

Regarding H6, the results demonstrate that there's a direct and considerable association between PU and confirmation. There have been numerous studies related to the two variables PU and confirmation. M-c. Lee (2010) and Stone & Baker-Eveleth (2013) came to the conclusion that PU of the electronic content stimulated the students confirmation[21,24]. The results of Thong *et al.* (2006) show that confirmation improved PU among users[25].

Regarding H7, the findings appear that there's a positive and considerable association between PEOU and confirmation. This relationship showed that ease of utilise of a new technology results in user confirmation[26] and the PEOU is much stronger and more effective compared to perceived usefulness. The results of Armstrong and Lonsdale (2005) verify the results of our study[27].

Regarding H8, the results show that there's a positive and considerable association between PU and SQ. The previous study results is in agreement with the results of our study[28-29].

Regarding H9, the results revealed that there's a positive and considerable association between PEOU and SQ. Liao and Cheung show that SQ has a positive effect on PEOU[28]. The literature approved that SQ has a direct and considerable effect on PEOU and these results are in agreement with our study[6,30].

Regarding H10, the results reveal that there's a positive and considerable correlation between PU and IQ. Literature reveled that IQ have a powerful impact on both PEOU and PU, and result in electronic book use[31-32].

Regarding H11, the results show a positive correlation between PEOU and IQ. Lederer *et al.* (2000) show that IQ has a positive impact on PEOU, which confirmed our finding[29].

All told, the finding of this study show that PU, PEOU, end user satisfaction, confirmation, system quality, and information quality are effective factors in adopting e-book by students. Also, the findings show that the integrated model of TAM and EDT is valuable framework to elucidate the student's behaviors in using e-book.

5. CONCLUSION

The results of this study acknowledged that TAM and EDT were adequate models to analyse the adoption of electronic books by graduate students. PU in using information technology is more effective on client satisfaction and continuance intention of e-book use, meaning that the efficiency of a technology can enhance its use and this can influence its real use and continuity of use. The variable PEOU in using information technology has a greater effect on confirmation and SQ. A comparison of the current research results with other related research shows that results and participants differ and in future studies this study can be repeated regarding other issues. The results of current study can be beneficial for the implementation of e-books in libraries and educational settings.

6. STUDY LIMITATIONS

Among the limitations of this study was the inappropriate cooperation level of some participants in completing the questionnaire; a number of participants did not state their true opinions due to various reasons.

7. ETHICAL APPROVAL

This study was approved by TUoMS ethics committee considering various ethical aspects with the ethical code (IR. TBZMED.REC.1398.496).

8. FUNDING

this study was funded by Tabriz University of Medical Sciences (IR. TBZMED.REC.1398.496)

REFERENCES

1. Yaqubi, J. Ebooks: Concepts, benefits and practices. *Libr. Inf. Sci.,* 2007, **9**(3), 132-40.
2. Toffler, A. Future shock, 1970. Sydney Pan., 1970.
3. Nasri, S ZZE.; Azmand, M. & Rezai, E. Designing and producing an e-textbook and examining its impact on students' learning and attitude. Research and writting of academic books*,* 2012, **16**(27), 82-98.
4. Tri, Agif I.; Noorhidawati, A. & Ghalebandi, S.G. Continuance intention of using ebook among higher education students. *Malays J. Libr. Inf. Sci*., 2016, **21**(1), 19-33.
5. Moghaddam, M.G. An Overview of information technology acceptance models with emphasis on

expectation-confirmation theory electronic journal of libraries. Museums and Astan Quds Razavi Documentation Centre. 2018, **10**(38-39), 1-16.
6. Dalcher, I. & Shine, J. Extending the new technology acceptance model to measure the end user information systems satisfaction in a mandatory environment: A bank's treasury. *Tech. Ana. Strat. Manage.,* 2003, **15**(4), 441-55.
7. Venkatesh, V., & Goyal, S. Expectation disconfirmation and technology adoption: polynomial modeling and response surface analysis. *MIS Q.*, 2010, 281-303.
8. Rezaei, M. Current theories about the adoption of information and communication technologies. *Q. J. Comms. Res.,* 2010, **16**(4), 63-93.
9. Premkumar, G. & Bhattacherjee, A. Explaining information technology usage: A test of competing models. *Omega.*, 2008, **36**(1), 64-75. doi: 10.1007/s11576-007-0099-1.
10. Mun, Y.Y. & Hwang, Y. Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *Int. J. Hum. Comput. Stud.,* 2003, **59**(4), 431-49. doi: 10.1016/s1071-5819(03)00114-9.
11. Pan, S. & Jordan-Marsh, M. Internet use intention and adoption among Chinese older adults: From the expanded technology acceptance model perspective. *Comput. Hum. Behav.*, 2010, **26**(5), 1111-9. doi: 10.1016/j.chb.2010.03.015.
12. Abdekhoda, M.; Ahmadi, M.; Hossini, AF.; Prikhani, E. & Farhadi, A. Factors affecting information technology acceptance by health information management (HIM) staff of Tehran university of medical sciences' hospitals based on the technology acceptance model (TAM) in 2011. *J. Payavard Salamat*., 2013, **7**(4), 287-98.
13. Malekinajafdar, A.; Rasoulishemirani, R. & Rousta, M. The impacts of factors involved in the taxpayers acceptance and application of IT on the provision of E-Tax services based upon davis model (case study of taxpayers at south of tehran province tax). *J. Tax Res*., 2012, **20**(14), 135-68.
14. Park, N. Adoption and use of computer-based voice over Internet protocol phone service: Toward an integrated model. *J. Comms.*, 2010, **60**(1), 40-72. doi: 10.1111/j.1460-2466.2009.01440.x.
15. Totolo, A. Information technology adoption by principals in Botswana secondary schools. 2007. doi: 10.1080/10572317.2011.10762882.
16. Doherty, N.F.; Ellis-Chadwick, F.; McKechnie, S.; Winklhofer, H. & Ennew, C. Applying the technology acceptance model to the online retailing of financial services. *Int. J. Retail Distribut. Manage.,* 2006. doi: 10.1108/09590550610660297.
17. Kim, B. An empirical investigation of mobile data service continuance: Incorporating the theory of planned behavior into the expectation–confirmation model. *Exp. Sys. Appl*., 2010, **37**(10), 7033-9. doi: 10.1016/j.eswa.2010.03.015.
18. Bøe, T.; Gulbrandsen, B. & Sørebø, Ø. How to stimulate the continued use of ICT in higher education: Integrating information systems continuance theory and agency theory. *Comput. Hum. Behav*., 2015, **50**, 375-84. doi: 10.1016/j.chb.2015.03.084.
19. Mouakket, S. Factors influencing continuance intention to use social network sites: The Facebook case. *Comput. Hum. Behav*., 2015, **53**, 102-10. doi: 10.1016/j.chb.2015.06.045 .
20. Mohammadi, H. Social and individual antecedents of m-learning adoption in Iran. *Comput. Hum. Behav*., 2015, 49, 191-207. doi: 10.1016/j.chb.2015.03.006.
21. Lee, M-C. Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model. *Comput. Edu.,* 2010, **54**(2), 506-16. doi: 10.1016/j.compedu.2009.09.002.
22. Ahad, Z.R.; Ashrafi, A. & Rabiiy Savoji, S. Investigating the factors affecting students' intention to continuously use learning management system. *Ir. J. Manage. Sci.,* 1395, **11**(43), 151-27.
23. Islam, A. The role of perceived system quality as educators' motivation to continue e-learning system use. *AIS Transact. Hum. Comput. Int.*, 2012, **4**(1), 25-43. doi: 10.17705/1thci.00037.
24. Stone, R.W. & Baker-Eveleth, L. Students' expectation, confirmation, and continuance intention to use electronic textbooks. *Comput. Hum. Behav.*, 2013, **29**(3), 984-90. doi: 10.1016/j.chb.2012.12.007.
25. Thong, J.Y.; Hong, S.J. & Tam, K.Y. The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *Int. J. Hum. Comput. Stud.*, 2006, **64**(9), 799-810. doi: 10.1016/j.ijhcs.2006.05.001.
26. Sattari, A.; Abdekhoda, M. & Zarea Gavgani, V. Determinant factors affecting the web–based training acceptance by health students, applying UTAUT model. 2017. doi: 10.3991/ijet.v12i10.7258.
27. Armstrong, C. & Lonsdale, R. The e-book mapping exercise. Draft report on phase 1. London, JISC e-Books Working Group, 2003.
28. Liao, Z. & Cheung, MT. Internet-based e-shopping and consumer attitudes: An empirical study. *Inf. Manage.*, 2001, **38**(5), 299-306. doi: 10.1016/s0378-7206(00)00072-0.
29. Lederer, A.L.; Maupin, D.J.; Sena, M.P. & Zhuang, Y. The technology acceptance model and the World Wide Web. *Decis. Sup. Sys.*, 2000, **29**(3), 269-82. doi: 10.1016/s0167-9236(00)00076-2.
30. Ahn, T.; Ryu, S. & Han, I. The impact of web quality and playfulness on user acceptance of online retailing. *Inf. Manage.*, 2007, **44**(3), 263-75.
31. Venkatesh, V. & Bala, H. Technology acceptance model 3 and a research agenda on interventions. *Decis. Sci*., 2008, **39**(2), 273-315. doi: 10.1111/j.1540-5915.2008.00192.x.
32. Ramkumar, M.; Schoenherr, T.; Wagner, S.M. & Jenamani,

M. Q-TAM: A quality technology acceptance model for predicting organisational buyers' continuance intentions for e-procurement services. *Int. J. Product. Econ*., 2019, **216**, 333-48.

CONTRIBUTORS

Mrs Malihe Nazari is pursuing her MSc (Medical library and information sciences) from School of Health Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran. Her research interest include: E-book adoption, research behaviour and medical information sciences.

Her contribution in the current study is in formation of idea, collection and synthesis of related data. She also performed experiments and wrote the whole manuscript.

Dr Mohammadhiwa Abdekhoda received his PhD in Health information sciences form Iran University of medical Sciences. Currently working as an Associate professor in Health Information Management, Department of Medical Library and Information Sciences, School of Health Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran. His research interest include: Health information systems, information systems adoption, scientomertic, medical library and information sciences.

He contributed the current study by acting as the corresponding author, supervisor and final reviewer of the manuscript.

Annexure I

Questionnaire for measuring variables (TAM) and (EDT)

Construct	Item number	Items
PU	1	Using e-books has improved my performance in studying.
	2	Using e-books has increased the effectiveness of my studying.
	3	Using e-books has resulted in reduced costs and saving time.
	4	By using e-books I am able to access more information.
PEOU	5	Learning how to utilize e-books is simple for me.
	6	Utilizing e-books is simple for me.
	7	Ease of use and easy portability are among desirable qualities of e-books.
	8	Use of e-book services can facilitate the learning process.
	9	Searching and retrieving information or part of information in e-books is easy.
Confirmation	10	I have gained good experiences in using e-books.
	11	Services provided through e-books were better than expected.
	12	Most of my expectations in using e-books are fulfilled.
	13	I feel at ease in a classroom where e-books are used.
	14	I endorse of the ease of utilize and accessibility of e-books.
	15	Accurate use of e-books can result in academic advancement.
User satisfaction	16	I am fulfilled with e-book effectiveness.
	17	Using e-books is a good experience for me.
	18	E-book features have been satisfactory.
	19	Reading e-books is interesting for me.
Continuance intention	20	I expected to utilize electronic books routinely within the future.
	21	I intend to utilize e-books frequently within the future.
	22	I will recommend others to utilize e-book.
System quality	23	There are numerous way to access information sources using e-books.
	24	The steps in accessing information sources in e-books is logical and clear.
	25	I become confused and waste time when using e-books.
	26	Organization of information is clear in the pages of an e-book system.
	27	An e-book has natural and predictable page changes.
	28	E-book access is often of high quality and easily possible.
Information quality	29	E-books provide me with related information I need to study.
	30	E-books provide information sources in an appropriate format.
	31	I have been able to access the information I need through e-books.
	32	E-books provide me with the information I need at any time.
	33	Information provided in e-books is updated according to my objectives.
	34	E-books provide information related to my field of academic study.