

Factors Affecting m-learning Continuance: From the Perspectives of flow Theory and Stimulus-Organism-Response Theory

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Abstract: With the continual impact and deterioration of the pandemic disease of COVID-19 around the world, teaching classes in person that was a key part of learning style now was unavailable to be utilised by universities' lecturers and it seemed that such situation would remain unavailable for some time to come. Fortunately, the good news is that there has been a trend over the past decades that the increasing number of universities has established and moved partly to online courses and most of the students have learned how information and communication technologies (ICTs) can help them study effectively. Previous research on E-learning has proven that the challenges of studying online can be even more daunting for both lecturers and students who have to suddenly change their learning patterns from the classrooms to the virtual ones. This is mainly because the suddenness of this change makes it difficult for lecturers to fully prepare to lecture in the virtual learning environment. In light of the above-mentioned facts, this research proposes a novel model and integrates flow theory into the theory of technology acceptance model (TAM), based on stimulus–organism–response (S-O-R) theory, the SOR model has been widely used in previous studies of online customer behaviour, and the model theory includes three components: stimulus, organism, and response. Assuming that stimuli contained in the external environment cause people to change, which in turn affects their behaviour. This research explores deeply what factors stimulate and affect learners mobile learning (M-learning) continuance (individual responses). Consequently, our research model provides a new lens for M-learning through the S-O-R theory and suggests that the TAM model affects students' flow experiences and satisfaction, which in turn, influences engagement and M-learning continuance.

Keywords: Mobile Learning (M-learning), Flow Theory, Technology Acceptance Model (TAM), Stimulus–Organism–Response (S-O-R)

1. Introduction

With the ever-accelerating development of Information and Communication Technologies (ICTs), relevant mobile applications' technologies have been gradually paid more attention to users for obtaining diversified services, such as mobile payment, mobile learning, mobile banking, etc. (Rafique et al., 2018). Mobile learning is regarded as a new way of education and has been widely used in various educational fields. Turning the perspective to the users of mobile learning, as people's demands for learning have increased, and they anticipate using mobile devices to learn at any spare time (such as commuting time) or any place (such as various public transportation). Having considered the importance of continuous education and learning as mentioned above, universities are trying their best to cultivate students in order to increase their competitive advantages (Sen and Bhattacharya, 2001; Al-Shihi et al., 2018; Ali and Arshad, 2016). At present, given the growing importance of mobile learning, educational institutes cannot ignore it and actively adopt it to maintain their competitive advantage.

With the spread of the COVID-19 pandemic by the end of 2020, e-learning has been regarded as an alternative education system which help students continue to learn in educational institutions (Roman and Plopeanu, 2021). In response to the spread of epidemic diseases, users and education providers have realized that mobile learning can not only acquire the knowledge they need, but also reduce the contact with the crowd. Therefore, the importance of mobile learning development cannot be ignored. In Taiwan, the majority of universities have shifted from offline courses to online ones. Yet, the results showed that students' participations in online courses are even lower degree of participation than offline courses. This is mainly because mobile smart devices are easier to make students lose their concentration in the classroom, which is a common problem faced by the Taiwanese education community. We believe that the mobile smart device can be deemed to a double-edged sword which can be used for reverse thinking and can also become a powerful tool for the development of educational mobile learning.

Hence, this research attempts to propose an integrative model through the S-O-R theory which combines TAM model with flow theory. The SOR model includes three components—stimulus, organism, and response. We posit that the stimulation of the information platform (using the TAM model as the antecedents) causes changes in users (including flow theory and user satisfaction) which in turn affects the user's behavioral responses (engagement and continuity of mobile learning). Finally, this research aims to improve students' interest and

continuity in mobile learning by proposing the S-O-R theoretical model. Hoping to help the education sector to provide reference for professors to design courses and to solve the difficulties encountered by students in learning.

2. Literature Review

2.1 TAM Model

The TAM (Davis et al., 1989) can explain users' behavior towards technology adoption (Chang et al., 2017). The TAM (see Figure 1) proposes two independent variables, perceived usefulness and perceived ease of use (Davis et al., 1989). These two variables affect the dependent variables: user attitudes toward technology, usage behavior intention, and actual usage behavior. Among these variables, Perceived Usefulness (PU) and Perceived Ease of Use (PEU) were considered to directly or indirectly explain the results (Marangunić and Granić, 2015).

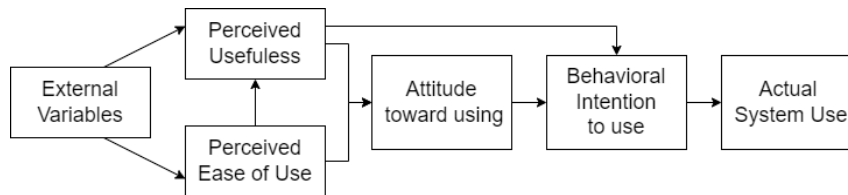


Figure 1: Original Technology Acceptance Model (Davis, 1986).

The TAM model has been widely used to explain individuals' technology acceptance behavior in many countries, such as the United States, Saudi Arabia, South Korea, China, etc. (Rafique et al., 2018 ; Zha et al., 2015 ; Yoon, 2016). Yet, Legris et al. (2003) found that the results of studies using TAM are not completely consistent, and more important factors have not been proposed and future studies may integrate TAM into a wider research model. Vijayasathy (2004) argues that TAM are more applicable to individuals' decisions making involving technology use choices (e.g. decisions made in the workplace) than situations involving voluntary user choices. This study believes that although the original TAM can discuss the attitude, intention and behavior of information technology users towards technology, it cannot fully demonstrate whether users (students) are willing to continue to use the technology platform for learning and the degree of their participation in learning. Therefore, the S-O-R model will be used in this study to supplement the shortcomings of TAM.

2.2 Stimulus-Organism-Response (S-O-R) model

Mehrabian and Russell (1974) proposed this model in the field of environmental psychology. The S-O-R model consists of three factors: stimulus, organism and response (See Figure 2). This model can view the behavioral consequences of the events. According to previous studies, stimulation is an external force that affects an individual's psychological state (Jacoby, 2002; Peng and Kim, 2014; Young, 2016), and Eroglu et al. (2001) define stimulation as an influence that stimulates an individual. This model conceptualizes behavior, point out that stimulus can affect the physical and psychological levels of individuals in an environment composed of stimulus, as well as affect consumers' cognitive and emotional processes, ultimately leading to behavioral responses (Mehrabian and Russell, 1974).

Organism and response refer to the user's emotional and cognitive states, as well as the entire process of intervening between stimuli and individual responses (Loureiro and Ribeiro, 2011). Xu et al. (2014) further stated that stimulus and behavior are not directly causal, including affective and cognitive variables.

The S-O-R model has been extended many other domains such as consumer behavior (Laato et al., 2020), social media brand engagement (Kamboj et al., 2018), and computer experience (Eroglu et al., 2003). This study will use the SOR model (see Figure. 2) and regard the TAM model as the stimulus for users to use mobile learning, and regard the users who use mobile learning as individuals, resulting in flow experience and satisfaction, which in turn influences the response of users to stimulate learning (the use of mobile learning and continuous learning).

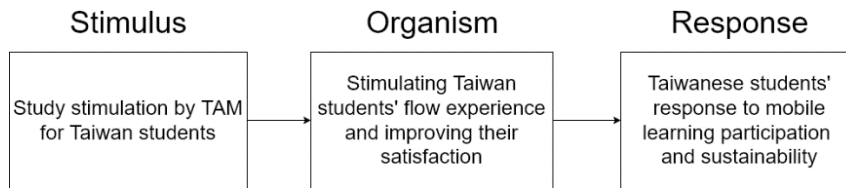


Figure 2: Theoretical framework of the study

Based on the above discussion, this research will delve into how TAM, flow experience, and satisfaction can lead to users' use of mobile learning and learning persistence.

2.3 Flow Experience

The flow theory was first proposed by Csikszentmihalyi (1989), and it is mainly defined as the overall experience of people when they are fully absorbed in action; it is composed of four factors, namely control, attention, curiosity and intrinsic interest. The concept is that when people are in a state of flow, they become so engrossed in the activity they are focusing on that they lose their sense of self, thinking they can manipulate their environment. In subsequent related studies, it was further proposed that the three main characteristics of flow are focused attention, full participation and the experience of inner pleasure (Csikszentmihalyi, 1975; Ghani and Deshpande, 1994; Privette and Bundrick, 1987). Flow theory is considered to be widely used in various fields. In their research, Hsu and Lu (2003) believe that the term "flow" describes the game user's full participation in certain activities, in addition to online, there is no other important thing. Also, this experience of engagement, focus and enjoyment does not only exist in online games. In another study, the researchers confirmed that "flow" is a useful tool not only to understand the user's experience when browsing a website, but also to motivate users to obtain better information interest can even influence positive attitudes and actions (Skadberg and Kimmel, 2004).

2.4 Engagement

"Engagement" can be seen as a person's active participation in a task or an activity (Reeve et al., 2004). Student engagement can be more often seen as a necessary prerequisite for student learning and engagement (Appleton et al., 2008). While academic performance is often seen as an important outcome of student engagement (Krause and Coates, 2008; Johnson and Sinatra, 2012), utility and achievement have also been shown to be related to student engagement. The research definitions according to Fredrick et al. (2004) and Jimerson et al. (2003), participation is divided into the following three types: (1.) Behavioural participation refers to the process by which students participate in the course homework; (2.) Cognitive engagement is the student's thinking and understanding of the topic of the class (e.g. self-regulation or learning goals); and (3.) Emotion or affective behavior is considered interest in learning, a positive attitude or a sense of belonging.

In this age of technological progress, mobile learning has become an emerging teaching model. Most research on technology and student engagement has affirmed the utility of computers and information technology to facilitate student engagement (Hu and Kuh, 2001; Nelson Laird and Kuh, 2005; Robinson and Hullinger, 2008). Robinson and Hullinger (2008) found a correlation between taking online courses and improving students' computer skills. Although most online courses do not require students to have a high level of computer skills to complete the course, students should be familiar with basic information skills such as the use of software such as email, participating in online chat, posting to discussion boards, word processing and forms...etc. When implemented through an active, inquiry-based learning pedagogy, online learning can also stimulate students to use higher-level skills such as problem solving, collaboration, and motivation (Duderstadt et al., 2002).

3. Research model & Proposition

3.1 Research model

In order to comprehensively understand factors that affect the mobile learning engagement and learning continuity, this study propose a novel model through the S-O-R theory (see Figure 3) which further increases emotional and cognitive variables (flow experience and satisfaction) as the critical variables. We hope the proposed model can advise to the education community to shape a positive and enjoyable virtual learning environment.

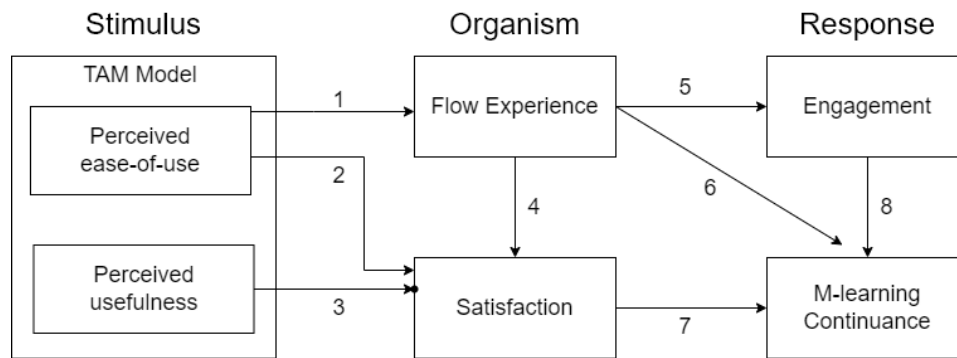


Figure 3: Research model

3.2 Proposition

3.2.1 TAM model

TAM is mainly composed of perceived ease of use and perceived usefulness. The two factors have the following meanings in this study : (1) Perceived ease of use means that mobile learning platforms can be easily operated by students. (2) Perceived usefulness means that the use of mobile learning platform helps improve the learning efficiency and quality of mobile learning students. According to Zhou (2013), flow experience can reflect the balance between challenges and skills. Rettie (2001) pointed out that there is a positive relationship between perceived ease of use and flow. Kiili (2005) also found that when the technology is easy to use, individuals may more easily fall into the state of flow. Thus, perceived ease of use increases the likelihood that mobile learning users will achieve a flow experience. According to Lin(2008) 's research on satisfaction and loyalty of virtual communities, it is pointed out that perceived ease of use has a significant impact on users' satisfaction with using websites. In this study, we hypothesise that there is a positive correlation between the perceived ease of use of mobile learning platform and the satisfaction of using mobile learning platform. On the other side, by exploring past studies, perceived usefulness has a significant impact on user satisfaction (Arbaugh 2000; Chiu et al. 2009). Students' perception of the usefulness of mobile learning platforms may improve e-learning efficiency and generate satisfaction. As mentioned above, this research concludes that:

Proposition 1. Perceiving the ease of use of the platform is positively related to flow experience of m-learning.

Proposition 2. Perceived ease-of-use of the platform is positively related to the satisfaction of using mobile learning platforms.

Proposition 3. Perceived usefulness of the platform is positively related to satisfaction of using mobile learning platforms.

3.2.2 Flow experience

When exploring the previous literature, we can find that the behavior of consumers in the virtual environment has many positive consequences, including satisfaction and behavioral intention (Novak et al., 2000). Consumer satisfaction is usually defined as the result of the realization, as opposed to the expected the actual experience (Hernon and Whitman, 2001). In the context of e-commerce, Szymanski and Hise (2000) conceptually defined satisfaction as the cumulative product of discrete experiences with service providers. In other words, media user satisfaction is a function of a set of discrete experiences in the media environment. Customers' positive emotional experiences (e.g. flow) affect their satisfaction with environmental features including virtual environments (Kim and Ko, 2019). Therefore, the following Proposition 4 is proposed.

Next, flow is a mental state characterized by focused attention and enhanced enjoyment (Shernoff et al., 2003). In flow experience, the individual ignores other thoughts and becomes absorbed in the activity. People believe that flow states are intrinsically beneficial because they have complete control over their behavior without distraction, and completely immersed in the process (Mollen and Wilson, 2010). The term participation is similar to flow experience, reflecting a state of complete concentration on a challenging activity, with no mental energy to distract attention and all attention focused on the relevant stimulus (Hamari et al., 2016). Thus, the following Proposition 5 is posited.

Then, the relationship between attitude and behavior has been explored in different studies on flow experience. In the study of MOOC (Massive open online courses), Zhao et al. (2020) confirmed that the higher the level of flow experience, the higher the continuous intention, reveal the importance of flow experience in influencing learners' behavior. Rodriguez-ardura and Meseguer-Artola (2016) proved that the cognitive state of flow of users is an important part of the m-learning experience, and this is mediated by attitude, leading to users' continued use. Hence, we propose Proposition 6.

Proposition 4. User's flow experience is positively influences satisfaction of using mobile learning platforms.

Proposition 5. User's flow experience is positively influences engagement with using mobile learning platforms.

Proposition 6. User's flow experience is positively influences M-learning continuance.

3.2.3 Satisfaction

Yan et al. (2021) showed that, in the continuous use study of health applications, if a user is satisfied with a health application, he/she is more likely to utilize it continually. According to Oliver's (1980) theory, satisfaction is positively correlated with future intention, directly or indirectly through its influence on attitude. Thus, we propose the following Proposition 7.

Proposition 7. Satisfaction is positively related to M-learning continuance.

3.2.4 Engagement

According to Expectation Value Theory (Eccles, 2005; Wigfield and Eccles, 2000), participation in a task is based on expectations of success, interest, achievement value, utility value, and relative cost. Among them, interest and relative cost may be closely related to whether people choose to participate or not (Eccles, 2005). Students who felt that the feedback they gave when they asked questions and talked to lecturers could help them increase their sense of engagement. This will increase their enjoyment in it and improve their desires to continue into the future (Guo et al.,2016). Therefore, as mentioned above, we propose the following Proposition 8.

Proposition 8. Engagement has a significant effect on M-learning continuance.

4. Ongoing research

Having considered that the limitation posed by the quantitative approach which is expected to be used in this research might be insufficient to permit a comprehensive understanding of all the complex and abstruse factors affecting students' M-learning continuous behaviour within Taiwanese universities, this research will then utilize thematic analysis to analyse the qualitative data. Finally, the full article containing the entire work is expected to be finished by July 2023.

References

- Ali, R.A., & Arshad, M. (2016) "Perspectives of students' behavior towards mobile learning (M-learning) in Egypt: an extension of the UTAUT model", *Engineering, Technology & Applied Science Research*, Vol 6, No.4, pp 1109-1114.
- Al-Shihi, H., Sharma, S.K. and Sarrab, M. (2018) "Neural network approach to predict mobile learning acceptance", *Education and Information Technologies*, Vol 23, pp 1805-1824.
- Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008) "Student engagement with school: critical conceptual and methodological issues of the construct", *Psychology in the Schools*, Vol 45, No.5, pp 369-386.
- Arbaugh, J.B. (2000) "Virtual classroom characteristics and student satisfaction with Internet-based MBA courses", *Journal of management education*, Vol 24, No.1, pp 32-54.
- Chang, C.-T., Hajiyev, J., & Su, C.-R. (2017) "Examining the students' behavioral intention to use e-learning in Azerbaijan? The general extended technology acceptance model for e-learning approach", *Computers & Education*, Vol.111, pp 128-143.
- Chang, S.H., Chih, W.H., Liou, D.K., and Hwang, L.R. (2014) "The influence of web aesthetics on customers' PAD", *Computers in Human Behavior*, Vol 36, pp 168-178.
- Chiu, C.M., Lin, H.Y., Sun, S.Y. and Hsu, M.H. (2009) "Understanding customers' loyalty intentions towards online shopping: an integration of technology acceptance model and fairness theory", *Behaviour & Information Technology*, Vol 28, No.4, pp 347-360.
- Csikszentmihalyi, M. (1975) *Beyond boredom and anxiety*, San Francisco, CA: Jossey-Bass.
- Csikszentmihalyi, M., LeFevre, J. (1989) "Optimal experience in work and leisure", *Journal of Personality and Social Psychology*, Vol 56, No.5, pp 815-822.
- Davis FD, Bagozzi RP, Warshaw PR. (1989) "User acceptance of computer technology: a comparison of 2 theoretical models", *Management Science*, Vol 35, pp 982-1003.

- Duderstadt, J., Atkins, D., & Houweling, D. (2002) *Higher education in the digital age: Technology issues and strategies for American colleges and universities*. Westport, CT: Praeger.
- Eccles, J. S. (2005) *Subjective task value and the Eccles et al. model of achievement-related choices*. In A. J. Eroglu, S. A., Machleit, K. A., and Davis, L. M. (2001) "Atmospheric qualities of online retailing", *Journal of Business Research*, Vol 54, No.2, pp 177–184.
- Eroglu, S.A., Machleit, K.A., Davis, L.M. (2003) "Empirical testing of a model of online store atmospherics and shopper responses", *Psychol. Marketing*, Vol 20, No.2, pp 139–150.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004) "School engagement: potential of the concept, state of evidence", *Review of Education Research*, Vol 74, No.1, 59-109.
- Ghani, J. A., and Deshpande, S. P. (1994) "Task characteristics and the experience of optimal flow in human–computer interaction", *Journal of Psychology*, Vol 128, No.4, pp 381–391.
- Guo, Z., Xiao, L., Van Toorn, C., Lai, Y. and Seo, C. (2016) "Promoting online learners' continuance intention: An integrated flow framework", *Information & Management*, Vol 53, No.2, pp 279–295.
- Hamari, J., Shernoff, D.J., Rowe, E., Coller, B., Asbell-Clarke, J. and Edwards, T. (2016). "Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning", *Computers in Human Behavior*, Vol 54, pp 170–179.
- Hernon, P., & Whitman, J. R. (2001) *Delivering satisfaction and service quality: A customerbased approach for libraries*, Chicago, IL: American Library Association.
- Hsieh, J.K., Hsieh, Y.C., Chiu, H.C., and Yang, Y.R. (2014) "Customer response to website atmospherics: task-relevant cues, situational involvement and PAD", *Journal of Interactive Marketing*, Vol 28, No.3, pp 225-236.
- Hsu, C.L. and Lu, H.P. (2003) "Why do people play on-line games? An extended TAM with social influences and flow experience", *Information and Management*, Vol 41, 2004, pp 853–868.
- Hu, S., & Kuh, G. D. (2001) "Computing experience and good practices in undergraduate education: Does the degree of campus "wiredness" matter?", *Education Policy Analysis Archives*, Vol 9, No.49.
- Jacoby, J. (2002) "Stimulus-organism-response reconsidered: An evolutionary step in modeling (consumer) behavior", *Journal of Consumer Psychology*, Vol 12, No.1, pp 51–57.
- Jimerson, S. R., Campos, E., & Greif, J. L. (2003) "Toward and understanding of definitions and measures of school engagement and related terms", *California School Psychologist*, Vol 8, No.1, pp 7– 27.
- Johnson, M., & Sinatra, G. M. (2012) "Use of task-value instructional inductions for facilitating engagement and conceptual change", *Contemporary Educational Psychology*, Vol 30, pp 51–63.
- Kamboj, S., Sarmah, B., Gupta, S., and Dwivedi, Y. (2018) "Examining branding co-creation in brand communities on social media: Applying the paradigm of Stimulus-organism-response", *International Journal of Information Management*, Vol 39, April, pp 169–185.
- Kiili, K. (2005) "Digital game-based learning: Towards an experiential gaming model", *Internet and Higher Education*, Vol.8, No.1, pp13–24.
- Kim, D., Ko, Y.J. (2019) "The impact of virtual reality (VR) technology on sport spectators' flow experience and satisfaction", *Computers in human behavior*, Vol 93, pp 346–356.
- Krause, K., & Coates, H. (2008) "Students' engagement in first-year university", *Assessment & Evaluation in Higher Education*, Vol 33, No.5, pp 493-505.
- Laato, S., Islam, N.A.K.M., Farooq, A., Dhir, A.(2020) "Unusual purchasing behavior during the early stages of the COVID-19 pandemic: the stimulus-organism-response approach", *J. Retailing Consum. Serv*, Vol 57, No. 102224, pp 1–12.
- Legris, P., Ingham, J., & Collette, P. (2003) "Why do people use information technology? A critical review of the technology acceptance model", *Information & management*, Vol. 40, No.3, pp 191-204.
- Lin, H.F. (2008) "Antecedents of virtual community satisfaction and loyalty: an empirical test of competing theories", *Cyberpsychology & behavior*, Vol 11, No.2, pp 138–144.
- Loureiro, S., and Ribeiro, L. (2011) *The effect of atmosphere on emotions and online shopping intention: Age differentiation*, Australian and New Zealand marketing academy conference.
- Marangunić, N., and Granić, A. (2015) "Technology acceptance model: A literature review from 1986 to 2013", *Universal Access in the Information Society*, Vol 14, No.1, pp 81–95.
- Mehrabian, A., and Russell, J. A. (1974) *An Approach to Environmental Psychology*, Cambridge, MA: MIT Press.
- Mehrabian, A., Russell, J.A. (1974) *An Approach to Environmental Psychology*, the MIT Press.
- Mollen, A., & Wilson, H. (2010) "Engagement, telepresence and interactivity in online consumer experience: Reconciling scholastic and managerial perspectives", *Journal of Business Research*, Vol 63, pp 919-925.
- Nelson Laird, T. F., & Kuh, G. D. (2005) "Student experiences with information technology and their relationship to other aspects of student engagement", *Research in Higher Education*, Vol 46, No.2, pp 211–233.
- Novak, T.P., Hoffman, D.L., and Yung, Y.F. (2000) "Measuring the customer experience in online environments: a structural modeling approach", *Marketing Science*, Vol. 19, No. 1, pp 22-42.
- Oliver, R.L., (1980) "A cognitive model for the antecedents and consequences of satisfaction", *Journal of Marketing Research*, Vol 17, pp 460–469.
- Parboteeah, D. V., Valacich, J. S., and Wells, J. D. (2009) "The influence of website characteristics on a Consumer's urge to buy impulsively", *Information Systems Research*, Vol 20, No.1, pp 60-78.
- Peng, C., and Kim, Y. G. (2014) "Application of the stimuli-organism-response (S-O-R) framework to online shopping behavior", *Journal of Internet Commerce*, Vol 13, No.3–4, pp 159–176.

- Privette, G., and Bundrick, C. M. (1987) "Measurement of experience: construct and content validity of the experience questionnaire", *Perceptual and Motor Skills*, Vol 65, pp 315–332.
- Rafique, H., Anwer, F., Shamim, A., & Minaei-bidgoli, B. (2018) "Factors affecting acceptance of mobile library Applications : Structural equation model", *Libri -International Journal of Libraries and Information Services*, Vol 68, No.2, pp 99–112.
- Rafique, H., Anwer, F., Shamim, A., and Minaei-bidgoli, B. (2018) "Factors affecting acceptance of mobile library Applications : Structural equation model", *Libri -International Journal of Libraries and Information Services*, Vol 68, No.2, pp 99–112.
- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004) "Enhancing students' engagement by increasing teachers' autonomy support", *Motivation and Emotion*, Vol 28, No.2, pp 147–169.
- Rettie, R. (2001) "An exploration of flow during Internet use", *Internet Research: Electronic Networking Application and Policy*, Vol 11, No.2 , pp. 103–113.
- Robinson, C. C., & Hullinger, H. (2008) "New benchmarks in higher education: Student engagement in online learning", *Journal of Education for Business*, Vol 84, No.2, pp 101–108.
- Rodríguez-Ardura, I. and Meseguer-Artola, A. (2016) "E-learning continuance: The impact of interactivity and the mediating role of imagery, presence and flow", *Information & Management*, Vol 53, No.4, pp 504–516.
- Roman, M. and Plopeanu, A.P. (2021) "The effectiveness of the emergency eLearning during COVID-19 pandemic. The case of higher education in economics in Romania", *International Review of Economics Education*, Vol 37, pp 100218.
- Sen, S., & Bhattacharya, C.B. (2001) "Does doing good always lead to doing better? Consumer reactions to corporate social responsibility", *Journal of Marketing Research*, Vol 38, No.2, pp 225–243.
- Sherhoff, D. J., Csikszentmihalyi, M., Schneider, B., & Sherhoff, E. S. (2003) "Student engagement in high school classrooms from the perspective of flow theory", *School Psychology Quarterly*, Vol 18, pp 158–176.
- Skadberg, Y. X., and Kimmel, J. R. (2004) "Visitors' flow experience while browsing a web site: its measurement, contributing factors, and consequences", *Computers in Human Behavior*, Vol 20, pp 403 – 422.
- Szymanski, D. M., & Hise, R. T. (2000) "E-satisfaction: An initial examination", *Journal of Retailing*, Vol 76, No.3, pp 309–322.
- Vijayasathya, L. R. (2004) "Predicting consumer intentions to use on-line shopping: The case for an augmented technology acceptance model", *Information and Management*, Vol 41, No.6, pp 747–762.
- Wigfield, A., & Eccles, J. S. (2000) "Expectancy–value theory of achievement motivation", *Contemporary Educational Psychology*, Vol 25, pp 68–81.
- Xu, J., Benbasat, I., Cenfetelli, R.T. (2014) "The nature and consequences of trade-off transparency in the context of recommendation agents", *MIS Q*, Vol 38, No.2, pp 379–406.
- Yan, M., Filieri, R., Raguseo, E. and Gorton, M. (2021) "Mobile apps for healthy living: Factors influencing continuance intention for health apps", *Technological Forecasting and Social Change*, Vol 166, pp 120644.
- Yoon, H. (2016). "User acceptance of mobile library applications in academic Libraries : An application of the technology acceptance model", *The Journal of Academic Librarianship*, Vol 42, No.6, pp 687–693.
- Young, G. (2016) "Stimulus–organism–response model: SORing to new heights", *Unifying causality and psychology*, pp 699–717.
- Zha, X., Zhang, J., and Yan, Y. (2015) "Comparing digital libraries in the web and mobile contexts from the perspective of the digital divide", *Journal of Librarianship and Information Science*, Vol 47, No.4, pp 330–340.
- Zhao, Y., Wang, A. and Sun, Y. (2020) "Technological environment, virtual experience, and MOOC continuance: A stimulus–organism–response perspective", *Computers & Education*, Vol 144, pp 103721–.
- Zhou, Tao. (2013) "The effect of flow experience on user adoption of mobile TV", *Behaviour & Information Technology*, Vol. 32, No.3, pp 263–272.