Volume: 3 Issues: 11 [September, 2018] pp.14-24]
Journal of Tourism, Hospitality and Environment Management
eISSN: 0128-178X
Journal Website: www.jthem.com

EXAMINING THE MUSEUM VISITORS USE OF MOBILE TECHNOLOGY THROUGH TECHNOLOGY ACCEPTANCE MODEL (TAM)

Nur Nabihah Mohamad Nizar[1]
Mohd Khairezan Rahmat[2]

[1]Faculty of Education, Universiti Teknologi MARA, nurnabihahnizar91@gmail.com
[2]Faculty of Education, Universiti Teknologi MARA, khairezan@yahoo.com

Accepted date: 03 December 2017 **Published date**: 13 September 2018

To cite this document: Nizar, N. N. M., & Rahmat, M. K. (2018). Examining the Museum Visitors Use of Mobile Technology Through Technology Acceptance Model (TAM). *Journal of Tourism, Hospitality and Environment Management*, *3*(11), 14-24.

Abstract: *Museum is one of the educational centre for people to gain knowledge. Varieties of communication modes have been used to deliver the information to museum visitors. The advent of technology has brought to the usage of mobile technology in museum, thus ensure visitor's meaningful experiences. Further, the integration of mobile technology in museum has facilitated visitor's understanding of information about artefacts in the museum. In addressing this issue, the present study focused on factors that might influence museum visitors' usage of mobile application based on the Technology Acceptance Model (TAM). Data for the study were collected through fifty-five responses from a survey questionnaire. All the museum visitors were asked to use their own mobile devices in order to access digital information provided in the museum. Findings show that perceived usefulness and perceived ease of use have directly influenced towards the actual use of mobile technology. The relationship between constructs is stronger mediated by attitude. Thus, museum visitors' attitude has played an important role in determining the actual use of the mobile application.*

Keywords: *Museum Visitors, Mobile Application, Mobile Technology, Technology Acceptance Model (TAM)*

Background of the study

Initially, museum is an institution that conserves a collection of cultural and historical artefacts. Museum functions were then expended as an environment for the purposes of education, research, study and enjoyment (Chung, 2009). In essence, museum education was introduced as a specialized field devoted to developing and strengthening the education through non-formal education spaces and institutions, such as museum. Its main objective is to engage visitors in learning experiences to enhance their curiosity and interest on objects and collections exhibited at the museum (Chang, 2006). The shifting of museum as a centre of education for society (Taber, 2014) has urged museum authorities to change their focuses from the object to the subject that presented. Numerous media were used in presenting the information to maintain

museum as an institution that offers educational experiences (Hooper-Greenhill & Dodd, 2002).

The challenge in ensuring effective and creative presentation of information is wider through the advanced of digital technologies. Many scholars' beliefs (i.e. Roger, 2002; Roland, 2006) that the advent of technology has dramatically changed the process of transferring information. Currently the teaching and learning process are not only restricted to classroom context, and students' independent learning has become the core for them to construct their own learning. In accordance to this scenario, the Malaysian government have introduced the Malaysia Education Blueprint, urging the Malaysian higher education institutions to enhance the student's learning experience by leveraging the use of technology in a more personalized learning (Ministry of Education Malaysia, 2015).

Hence, museums are expected to maximize the full potentials of technology in creating meaningful experiences and improving ways in conveying the information. Underline this statement, a number of museum have started integrating technological peripherals such as, liquid crystal display (LCD), cathode ray tube (CRT), television, interactive multimedia kiosk and audio tours as media to transmit the information (Allen, 2012). These ideas have also been brought to Malaysia where the National Museum has used a concept of touch screen through numbers of interactive kiosks in presenting the information. Throughout these kiosks, different sort of applications such as games, multimedia presentation, and interactive books are offered. The museum also has introduced a quick response (QR) code for visitor to assess digital information, easily and effectively through their own mobile devices at their own pace. Previous studies (i.e. Liyana, 2008; Othman, Petrie & Power, 2011) have reported that this idea will ensure that visitors are not bored with the objects display, the layout of the exhibits, and the old notch approaches.

Undoubtedly there are numbers of factors that influence individual's usage of technology. These factors can be referred through introduction of various educational technology adoption models. Although the are similarities among those models, each of it have identified specific factors, known as predictors that might influence individual's decision to use technology for their specific usage. In regards to this understanding, the present study aimed to examined three factors, namely museum visitor's attitude, perceived usefulness, and perceived ease of use as predictors towards their usage of mobile technology in museum. Findings of this study are hoped to outline strategies and ideas to the museum authorities, educators, and the government in the effort of establishing museum as one of the information source will be realized.

The Usage of Technology in Museum

The dynamic evolution of mobile technology has undoubtedly changed human's life. Mobile technology usage, through its peripherals has become a trend, especially among youngsters. This scenario has demand educational institution to fully utilize mobile technology potentials. In agreement of this statement, museum authorities across the globe have started to make use of technology as their medium to transmit information among visitors (Taber, 2014). For instance, previously museum has introduced the usage of Personal Digital Assistant (PDA) and iPod as a medium to excess information in the museum environment. This effort is hope to meet the expectation of museum visitors that greed for knowledge based on their needs and interests (Walker, 2008). This statement is in accordance with suggestion made by Lehn & Heath (2005) who suggested that PDA can be a good device for museum visitors as they able to access to different types of information delivered to them, such as images, video, animation or audio.

The year 2003 has highlighted the golden age of mobile technology, through the introduction of smart phone. Apart of being a medium of communication, smart phone users have expended its usage. Smart phone has now become one of the sources of information gaining, especially among teenagers. The increasing popularity of smart phone has given an opportunity among museum authorities to introduced different methods of interaction with their visitors. It is also believed that the usage of mobile applications in museum will increase visitors' engagement and usable in delivering information to museum visitors (Taber, 2014). Mobile devices have been well received and become an important medium in the lives of people in Western country (Raento et al., 2009) and even in Malaysia (Osman, Talib, Sanusi, Shiang-Yen & Alwi, 2012). The acceptance and demand of mobile devices are rapidly increased without any sign of deterioration. Mobile applications incorporate all previous types of mobile technology that allows text, audio, and video to communicate with user into one. Mobile devices have also provided a platform for user to download usable application that they need in their lives. It included an educational, social, and others application needed by the users.

Actually, the United States of America has become the first country that introduced the used of mobile technology in museum, which started in the year 2011. Although not all museums use mobile devices as a medium of communication, it clearly has offered valuable experience and became an important component for museum (Taber, 2014).

Considering all mentioned potentials of smart phone usage among museum visitors, the present study aimed to determine Malaysia museum visitors' use of technology in gaining information. The study also aimed to determine factors that might influence Malaysia museum visitors' decision to use smart phone during their visit to the museum. Although few local museum has started introducing these idea, comprehensive study in testing its effect is very limited, thus inform the needs to conduct this study. Further, to date there is very few published studies that venture into the same research area. In Malaysia, few museums have taken up this idea of communicating with their visitors through mobile devices. The National Museum, Heritage Museum, Cultural Museum and Folk Art Museum are among museum that already started to implement the use of mobile technology in delivering information about the artefacts on displayed. However, it is believed that there are factors that might influence the usage of mobile technology in museum, especially in the Malaysian context, thus highlight the important of conducting this study.

Research Model

The robustness of technology integration has offered to the presence of various definitions and concepts of technology. In a research field, researchers have introduced various models and theories (i.e. TAM, Davis, 1989; Venkatesh, 2001) in their efforts to determine individual's acceptance towards technology usage. Despite of all models, the Technology Acceptance Model (TAM) has been chosen as the basic framework of the study. The TAM has extensively used by many studies in explaining individual's acceptance of technology (i.e. Rahmat & Wu, 2013; Fathema, Shannon & Ross, 2015; Li, Chung & Fiore, 2017). Figure 1 shows the basic TAM model that has been introduced by Davis (1989).

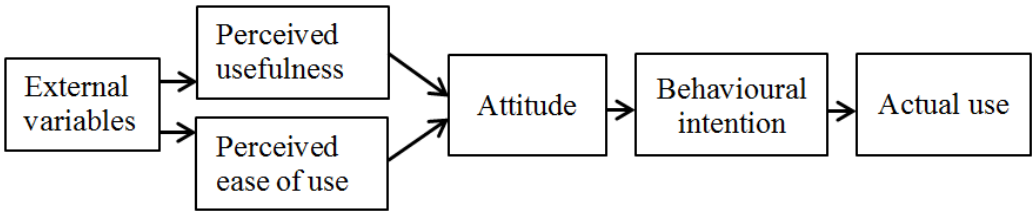

Figure 1: Technology Acceptance Model (TAM)

In the TAM model, actual use of a proposed technology is represented by intention to use, which is determined by the user's attitude toward using the proposed technology. Base on TAM, users' perceived usefulness (PU) and perceived ease of use (PEoU) are the predictors towards users' attitude (ATT) in using (AU) proposed technology. Additionally, PU and PEoU also can be affected by numerous external variables.

Although there are five variables that been proposed by TAM, for the purpose of this study behaviour intention was excluded. Past studies have shown a direct relationship between attitude and actual use without passes through behavioural intention (Ducey, 2103; Gao, Waechter & Bai, 2015 and Shang & Wu, 2017). A part from that, behaviour intention is much suitable to predict user's intention to use the proposed technology, which does not reflect to their actual usage. In contrast to this study, all the respondents are giving a chance to use the smart phones in museum before they answered the questionnaire. It is conclude that, the behavioural intention is not relevance to be part of the variables in predicting the actual use of mobile application.

Perceived usefulness (PU) and Attitude (ATT)

Davis (1989) has defined Perceived usefulness (PU) as a belief of an individual that using a particular information technology will enhance his or her performance. Hence, this study indicates that museum visitors' interest to use or not to use mobile application depends on to what extent they belief that the application can help to increase their learning performance. Previous study by Cheon et. al. (2012) has indicated that PU as one of the major factors that influences students' attitude to adopt mobile learning in their learning process. In addition, study conducted by Thomas, Singh & Gaffar (2013) found that PU has a significant effect on attitude in determining the mobile learning adoption among students in higher education. In other words, students who believe that using mobile technology will increase their performance in learning process will have a more positive attitude to integrated mobile learning. These findings are consistence with other studies by Wojciechowski and Cellary (2013); Isaias et al (2017). Based on those consistent findings, the present study therefore tested the following hypothesis:

H_1: The museum visitors' PU has a significant influence on their ATT towards the actual use of mobile technology in presenting information of artefacts in the museum.

Perceived Usefulness (PU) and Actual Use (AU)

Although TAM did not show a direct relationship between PU and AU of technology, but a number of studies revealed that there is a relationship between PU and AU of proposed technology. In the same contexts of study, Taber's (2014) study found that PU is reliable to the usage of MAGart 2.0 application in delivering information and as a guide for the Memorial Art Gallery visitors in their tour. In addition, data gathered by Khayati (2013) indicated that the perceived usefulness of information communication technology (ICT) have a good significant

towards the use of ICT among the contractors in Tunisia. The results also in line with study carried out by Zarmpou et al (2013) whereas they also found the same result. Thus, the next hypothesis is formulated as:

H_2: The museum visitors' PU has a significant influence towards the usage of mobile technology in presenting information of artefacts in the museum.

Perceived Ease of Use (PEoU) And Attitude (ATT)

Perceive Ease of Use (PEoU) considered as individual's belief that individual that free of effort when using a particular information technology (Davis, 1989). For the purpose of this study, museum visitors are expected to use a mobile application when the application minimizes their effort in order to get information. As suggested by TAM, an individual PEoU has a positive relationship towards their ATT in technology usage. Individual would have a positive ATT towards technology usage if the technology is effortlessness. This statement has been confirmed by finding from numbers of previous studies (i.e. Wojciechowski & Cellary, 2013; Briz-Ponce, et. al., 2016; Li et al., 2017; Isaais et al., 2017). Therefore, this study carries on further investigation with the following hypothesis as:

H_3: The museum visitors' PEoU has a significant influence on their ATT towards the usage of mobile technology in presenting information of artefacts in the museum.

Perceived Ease of Use (PEoU) and Actual Use (AU)

Numerous literatures have acknowledged the relationship between PEoU and an individual's technology usage (AU). For instance, a study by Taber (2014) has found that the museum visitors' PE of MAGart 2.0 application positively affected it usage. His study indicated that, the effortlessness in using MAGart 2.0 application has increased the museum visitors to keep using the application. On the other hand, Shang and Wu (2017) divulge PE as one of the best predictor in determining user's satisfaction toward mobile shopping. They found that when consumers feel the services is easy to handle and gaining benefits, the percentage of to use mobile online shopping services in purchasing selling item will be increase. In essence, the trustworthy in this construct is high due to its consumption in some previous studies to foresee the technology usage in diversity field. Thus, this present study proposed the subsequent hypothesis:

H_4: The museum visitors' PEoU has a significant influence towards the AU of mobile technology in presenting information of artefacts in the museum.

Attitude (ATT) and Actual Use (AU)

Attitude construct was used to predict a museum visitor's behaviour toward the usage of mobile application. It has been reported that attitude is one of the variables that have a positive correlation towards the usage of technology (Ducey, 2013). In addition, responses from 330 social networking sites (SNS) from a study by Ha et al (2015) found that the user's ATT towards mobile SNS significantly affects it usage. Although both studies found a positive relationship between ATT and AU of technology but study conducted by Myrczik (2014) did not found the same result. Given the inconsistence research findings, further investigation needs to be conducted. Therefore, this present study will test the following hypothesis:

H_5: The museum visitors' ATT has a significant influence towards the AU of mobile technology in presenting information of artefacts in the museum.

The research model for examining the factors that influence museum visitors' decision in using mobile technology is presented in Figure 2. In summary, the present study is aimed to determine factors that might influence museum visitor's usage of smart phone, as shown in Figure 2.

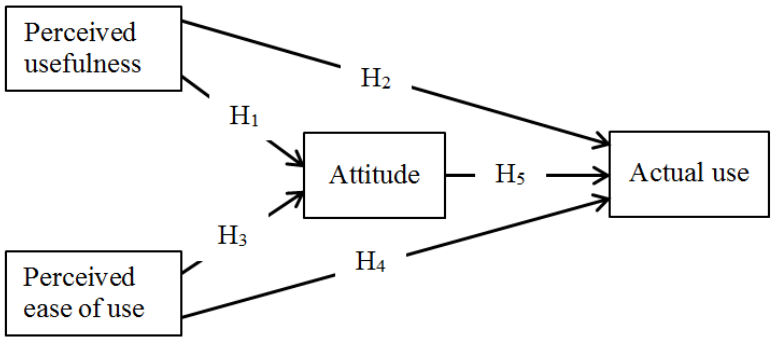

Figure 2: Research Model of the Study

Research Methodology

This study attempted to determine the contributing factors that might influence museum visitors' usage of mobile technology. This study deployed a quantitative methodology through a survey questionnaire. Decision to choose the questionnaire is due to the fact that it can facilitate the data collection process within a short period of time. The study was carried out from a group of 55 museum visitors that visited a public museum in Malaysia. Firstly, the respondents were asked to access the digital information provided in the museum before they answered 20 items questionnaire that have been adapted from TAM. A four-point Likert scale format was employed ranging from "Strongly disagree" as one, to "Strongly Agree" as four. All the 20 items from four variables are mixed together and arranged randomly to get truthfully answer from respondents without favouring a particular data. In analysing the data, the study employed statistical analysis to address all hypotheses. Apart from descriptive analysis, through mean score and standard deviation, the study has also embarked into inferential statistical, through regression analysis.

Research Findings

The Cronbach's alpha was used in determining the consistency correlation among each item for each construct. As suggested by Singh, Ghani and Hoon (2009), Cronbach's alpha is the most frequent form of internal consistency reliability coefficient and it is primarily used for questionnaires constructed items. It has been suggested that the value of alpha is acceptable if its 0.5, while if the value of alpha is more than 0.7 it thus indicates as high reliability (White et. al., 2012; Felder and Spurlin, 2005). Table 1 shows output of the reliability test for each construct, which indicate it's highly reliable.

Table 1: Cronbach's Alpha

Construct	Number of items	Cronbach's Alpha
Perceived usefulness	5	0.706
Perceived ease of use	5	0.738
Attitude	5	0.710
Actual use	5	0.788

In addressing the study hypotheses, the relationships between two constructs were determined through regression analyses. The result of regression analysis is presented in Table 2.

Table 2: The regression analysis

Independent variable	Dependent variable	Hypotheses	R	R^2	p-value
Perceived usefulness	Attitude	H_1	0.584	0.341	<0.001
Perceived usefulness	Actual use	H_2	0.518	0.269	<0.001
Perceived ease of use	Attitude	H_3	0.678	0.460	<0.001
Perceived ease of use	Actual use	H_4	0.487	0.237	<0.001
Attitude	Actual use	H_5	0.677	0.458	<0.001

As presented in Table 2, both PU and PEoU have significantly influence museum visitor's ATT towards the use of mobile application. These findings seem to suggest that information provided is beneficial and useful for the visitors, which lead to their positive attitude toward the mobile application. At the same time, the effortlessness in using the mobile technology has increased visitor's attitude towards the usage of mobile application. In the effort of comparing the strength of relationship between the two constructs, the finding indicates that PEoU has stronger effect as compared to PU in determining museum visitors' ATT.

Similar findings were suggested when both PU and PEoU found to have significant effect toward museum visitors' actual use of mobile technology. Based on the empirical study, data appears to suggest that museum PU and PEoU had a similar effect on actual use of mobile technology. However, with regard to the actual use of mobile technology in museum, ATT was much more significant factor than PU and PEoU. A regression analysis between PU and ATT suggest the value for R2 = 0.341. This value indicates that 34.1% of the variance in ATT score can be predicted from the value of PU. Due to the significant of *p*-value, it can be concluded that the PU reliably predict ATT. Thus, the hypothesis for H1 is supported.

Data gathered in this study also suggested that AU of mobile technology can be predicted to a similar extent on PU (R2=0.269) and PEoU (R2=0.237). The data yielded by this regression values provide strong evidence that the hypotheses H2 and H4 were supported. Further, the data indicates that 26.9% of the variance in ATT scores can be predicted from the PEoU scores. The coefficient *p*-value shows that PEoU reliably predicts ATT since the value was less than typical significant level 0.05. Therefore, the regression values were sufficient to accept the hypothesis H3. As *p*-value of ATT and AU variable was statistically significant, it reveal that ATT variable reliably predict the AU variable. The R2 value indicates that 45.8% of the variance in AU can be predicted from the value of ATT. Hence, hypothesis H5 was accepted.

Conclusion and Discussion

Data obtained from this study suggests that museum visitors' PU and PEoU have a significant direct effect on their AU of mobile technology. On the other hand, museum visitors' ATT was

found to be a stronger predictor to their AU of mobile technology in museum, as compared to other factors, namely PU and PEoU. These findings thus suggested that museum visitors had a strong positive attitude towards the mobile technology, which leads them to use the technology. Technology provided in museum indirectly has meet visitors' desire and criteria in line with the advent of the 21st century technology. A possible explanation to why visitors easily can adapt the use of technology in museum might be due to because it deals with device that so deeply ingrained to then and already be part of their life.

Further, there are two more factors that found to have positive impact toward museum visitors' decision to integrate mobile devises. Museum visitors' PU was used to determine a belief of museum visitors to enhance their knowledge through the application. The study thus suggested that, museum visitors' belief that mobile technology can enhance their knowledge about displayed artefacts and lead them to use the technology. This finding is in line with past researches by Zarmpou et al. (2012), Khayati (2013); Taber (2014). This may be due to the information provided was fit with their requirements to gained knowledge about particular artefacts. In fact, information provided in mobile technology was presented in details with the presence of visual. The used of proper visuals, illustration and texts have allowed museum visitors to easily understand the explanation about displayed artefacts. In point of fact, people easily to adapt and remember presented information through visual compare with the text only.

Findings from the present study also indicate that museum visitor's PEoU has influence museum visitor's decision to use the mobile technology. Numbers of researchers (i.e. Suki & Suki, 2011; Taber, 2014) have also found the same finding. PEoU was used to determine museum visitor's belief that using the mobile application will be free from effort in gaining information. Undeniably the use of mobile technology would ensure museum visitors are free of effort as they can get information by only scanning the QR Code. It clearly easier and time saver as compared conventional approach of presenting information.

Basically, findings drive from the present study might be due to the fact that mobile application is still new and novel among museum visitors. It can also be assumed that the positive attitude of visitors to seek for extra information at their own pace and time have been addressed by the advancement of technology, especially mobile application. In maintaining museum visitors' interest in assessing information through mobile technology, continuous provision of engaging learning content is crucial. Besides, continuance intention also can be one of influencing factor to be tested. It is to determine the intention of users to keep on continuing use the technology (Bhattacherjee,2001). This factor also helps to ascertain the ssuccessful of technology use. Apart from that, the dissemination of mobile technology in museum has greatly depended on the availability and quality of learning content for museum environment. Therefore, it is suggested that research on technology in museum should focus primarily on the development of advent technology to fit the need in 21st century learning environments.

In addition, learning process in museum through mobile technology has a great potential for non-formal educations because it gains meaningful experiences among visitors. Visitors can gain their learning experiences when museum able to provide a realistic artefacts, while at the same time able to access extra information through their own mobile devices. The realistic presented artefacts considerably facilitate visitor to comprehend the information received. It is because learning with realistic object is much better as it giving a chance to viewers to look at every corner of artefacts in details.

Based on discussed findings, the present study concludes that receiving digital information through mobile technology could be particularly attractive and evocative for younger generations, especially to those interested on edutainment than conventional learning approach. Further, this is the right time to expand the use of technology on a large scale for the purpose of education. In similar vein, several researchers (i.e. Tussyadiah, Jung, Dieck, 2017; Salinas & Gonzalez-Mendivil, 2017; Solano, Ugalde, Gomez & Sanchez, 2017; Yilmaz, 2016) have started to explore the importance of augmented reality (AR) in learning process. Their study suggested that AR could be one of the technologies that wise to be implemented in museum. In recent years, extensive availability of 3D computer games and movies, based on 3D interactive graphics also has led to widespread familiarity of individuals with the 3D technologies. This statement was supported by Wojciechowski & Cellary (2013) that suggested the exposure of 3D technologies due to the facts that the young generations accustomed to 3D games and movies demand similar experiences to be implemented in education. Thus, these approaches may offer a great help to educational institutions in increasing learning interest as well as motivation among learners.

References

Allen, J. (2012). Technology. In J. Allen, & E. Lupo, *Representing Museum Technologies* (pp. 19-26). Italy: Politecnico di Milano.

Bhattacherjee, A. (2001). Understanding Information Systems Continuance : An Expectation-Comfirmation Model. *MIS Quarterly*, 351-370.

Briz-Ponce, L., Pereira, A., Carvalho, L., Juanes-Mendez, J. A., & Garcia-Penalvo, F. J. (2016). Learning with mobile technologies-students behaviour. *Computers in Human Behavior*, 1-9.

Chang, C.-C., Yan, C.-F., & Tseng, J.-S. (2012). Perceived convenience in an extended technology acceptance model : Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 809-826.

Chang, E. (2006). Interactive Experiences and Contextual Learning in Museums. *Interactive Experiences and Contextual Learning in Museums*, 170-184.

Chen, S.-C., Li, S.-H., & Li, C.-Y. (2011). Recent Related Research in Technology Aceptance Model : A Literature Review. *Australian Journal of Business and Management Research*, 124-127.

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behaviour. *Computer & Education*, 1054-1064.

Chung, S. K. (2009). Presenting Cultural Artifacts in the Art Museum : A University - Museum Collaboration. *Art Education*, 33-39.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Management Information Systems Research Center,*, 319-340.

Ducey, A. J. (2013). Predicting Tablet Computer Use: An Extended Technology Acceptance Model. *Graduate Theses and Dissertations*, 45-71.

Falk, J. H., & Dierking, L. D. (2013). *The Museum Experience Revisited.* Walnut Creek, CA: Left Coast Press.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the technology acceptance model (TAM) to examine faculty use of learning management systems (LMSs) in higher education institutions. *MERLOT Journal of Online Learning and Teaching*, 210-231.

Felder, R. M., & Spurlin, J. (2005). Applications, Reliability and Validity of the Index of Learning Styles. *International Journal of Engineering Education*, 103-112.

Gao, L., Waechter, K. A., & Bai, X. (2015). Understanding consumers' continuance intention towards mobile purchase : A theoretical framework and empirical study - A case of China. *Computer in Human Behaviour*, 249-262.

Ha, Y. W., Kim, J., Libaque-Saenz, C. F., Chang, Y., & Park, M.-C. (2015). Use and gratifications of mobile SNSs : Facebook and KakaoTalk in Korea. *Telematics and Informatics*, 425-438.

Hooper-Greenhill, E., & Dodd, J. (2002). *Seeing The Museum Through The Visitor's Eyes : The Evaluation Of The Eduction Challenge Fund.* Leicester: RCMG.

Isaias, P., Reis, F., Coutinho, C., & Lencastre, J. A. (2017). Empathic technologies for distance/mobile learning : An emperical research based on UTAUT. *Interactive technology and Smart Education*, 1-20.

Khayati, S. (2013). Perceived Usefulness and Use of Information Technology: the Moderating Influences of the Dependence of a Subcontractor towards His Contractor. *Journal of Knowledge Management, Economics and Information Technology*, 1-28.

Lehn, D. V., & Heath, C. (2005). Accounting for New Technology in Museum Exhibitions. *International Journal of Arts and Management*, 11-19.

Li, R., Chung, T.-L., & Fiore, A. M. (2017). Factors affecting current users' attitude towards e-auctions in China: An extended TAM study. *Journal of Retailing and Consumer Services*, 19-29.

Liyana, I. (2008, May 5). *Kurang sambutan belia*. Retrieved from Kosmo Online: http://www.kosmo.com.my

Malaysian Communications and Multimedia Commision. (2015). *Komunikasi & Multimedia: Buku Maklumat Statistik*. Selangor: Malaysian Communications and Multimedia Commision (MCMC).

Ministry of Education Malaysia (2015). *Malaysia Education Blueprint (Higher Education).* Putrajaya: Ministry of Education Malaysia.

Myrczik, E. P. (2014). Satisfying personal needs at the museum : The role of digital technologies. *Journal of media and communication research*, 176-196.

Osman, M. A., Talib, A. Z., Sanusi, Z. A., Shiang-Yen, T., & Alwi, A. S. (2012). A Study of the Trend of Smartphone and its Usage Behavior in Malaysia. *A Study of the Trend of Smartphone and its Usage Behavior in Malaysia*, 273-285.

Othman, M. K., Petrie, H., & Power, C. (2011). Engaging Visitors in Museums with technology. *Scales for the measurement of visitor and multimedia guide experience*, 1-9.

Raento, M., Oulasvirta, A., & Eagle, N. (2009). Smartphones: An Emerging Tool for Social Scientists. *Sociological Methods & Ressearch*, 426-450.

Rahmat, M. K., & Au, W. K. (2013). Visual Art Education Teachers' Continuance Intention to Integrate ICT : A Model Development. *Procedia Social and Behavioral Sciences*, 356-364.

Salinas, P., & Gonzalez-Mendivil, E. (2017). Augmented reality and solids of revolution. *International Journal on Interactive Design and Manufacturing*, 1-9.

Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*, 213-227.

Solano, A., Ugalde, F., Gomez, J., & Sanchez, L. (2017). An augmented reality application to enhance the children's engagement in an early development method for mathematics literacy. *Advances in Intelligent Systems and Computing* , 405-414.

Suki, N. M., & Suki, N. M. (2011). Exploring the relationship between perceived usefulness, perceived ease of use, perceived enjoyment, attitude and subscribers' intention towards using 3G mobile services. *Journal of Information Technology Management*, 1-7.

Surendran, P. (2012). Technology Acceptance Model: A Survey of Literature. *International Journal of Business and Social Research*, 175-178.

Taber, M. M. (2014). Use of Mobile Technology Among Museum Visitors: A Case Study. *Use of Mobile Technology Among Museum Visitors*, 1-50.

Thomas, T. D., Singh, L., & Gaffar, K. (2013). The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 71-85.

Tussyadiah, I., Jung, T. H., & Dieck, M. T. (2017). Embodient of wearable augmeted reality technology in tourism experiences. *Journal of Travel Research*, 1-15.

Walker, K. (2008). Structuring Visitor Participation. In L. Tallon, & K. Walker, *Digital Technology and the Museum Experience* (pp. 109-124). Lanham: AltaMira Press.

White, G., Cordato, D., O'Rourke, F., Mendis, R., Ghia, D., & Chan, D. (2012). Validation of the Stroke Rehabilitation Motivation Scale: a pilot study. *Asian Journal of Gerontology & Geriatrics* , 80-87.

Wojciechowski, R., & Cellary, W. (2013). Evaluation of learners' attitude toward learning in ARIES augmented reality environments. *Computers & Educations*, 570-585.

Yilmaz, R. M. (2016). Educational magic toys developed with augmented reality technology for early childhood education. *Computer in Human Behaviour*, 240-247.

Zarmpou, T., Saprikis, V., Markos, A., & Vlachopoulou, M. (2012). Modeling users' acceptance of mobile services. *Springer Science+Business Media*, 226-247.