The Study on the Path of Using Educational Applications-Focusing on the Technology Acceptance Model

Sahoon H. Kim

College of Education, Hankuk University of Foreign Studies, Seoul, Korea

Abstract: The aim of this study was on understanding what factors have influence on students' acceptance of educational applications on the smartphone. Specifically, this study focused on to illuminate influential prompts on learner's acceptance as well as on to launch a theory-based model related to the prompts. For data analysis, we used skills from grounded theory methodology. The data was gathered through interviews with high school students in South Korea. As a result, we found core prompts in terms of use of smartphones for educational purpose. Then we laid on the prompts on the extended Technology Acceptance Model (TAM). We found that self-directed learning readiness was an influential factor in the acceptance of educational applications.

Key words: Smartphone, educational application, acceptance model, TAM, technology acceptance

INTRODUCTION

The purpose of this study is to illuminate the path of using Educational Applications (Edu-Apps) on a portable computing technology, the smartphone. To date, we have seen a large number of students bringing their portable computing technologies such as iPhones everywhere in their pockets (Walker *et al.*, 2004). Even though, educational researchers have studied the potential educational benefits of these technologies (Robinson *et al.*, 2013), schools have always fallen behind in implementing these buzzing technologies.

However, smartphones are carrying an irresistible paradigm shift toward a digital culture and even a digital education. In some countries, especially in South Korea, the government is encouraging students to use Edu-Apps by designing educational contents on smartphones. Students in South Korea now can bring their virtual teachers into their homes, libraries, buses and their pockets.

Previous studies in terms of technology implementation have shown a gap between beliefs and expectations of policymakers/administrators about the potential of computer technology (Cuban, 1986). In addition, prior researches have illuminated how new technologies encounter challenges in the educational context (Christensen, 1997). However, we are in the very beginning stages of this research, especially in focusing on learners' needs in using smartphones for their learning. Therefore, this study was begun with the purpose of illuminating factors which make learners use educational applications on their smartphones. Specifically, the purposes of this study are:

- To illuminate what factors influence learner's usage of educational applications on smartphones
- To establish a theory-based model for usage of educational applications on smartphones

Theoretical background: This study used the Technology Acceptance Model (TAM) to shed light on the issues that emerge when learners hope to use educational apps. The Technology Acceptance Model (TAM) is the information system theory that models how users come to accept and use the technology (Davis *et al.*, 1989). The model suggests that when users are presented with the new technology, many factors influence their decisions about how and when they will use it.

According to the study, people's action of using new technology is dependent on various factors, including attitudes, intentions, perceived usefulness and perceived ease of use. The perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance. The perceived ease of use is the degree to which a person believes that using a particular system would be effortless (Davis *et al.*, 1989).

Several previous studies have tested the robustness and validity of the model (Hendrickson *et al.*, 1993; Robinson *et al.*, 2013; Segars and Grover, 1993). Consequently, the model has been extended to bring in external factors for illuminating the technology's acceptance according to context, called the extended TAM model. Usually, external factors are categorized into individual aspects and features of technologies. For this study, we employed the extended TAM model to trace the

use of educational applications on smartphones. It helps not only to illuminate the path of new technology acceptance but also extends to the demonstration of new factors related to the use of educational applications on smartphones.

MATERIALS AND METHODS

This study employs three different methodologies to address each aim of this study. First, to illuminate what factors influence learner's usage of educational applications on smartphones, this study uses methods of Grounded Theory. Grounded theory aims to theorize the data by identifying latent patterns in the data and conceptualizing them rather than just depending on previous studies. The interviews were analyzed based on the methods of Grounded Theory; for example, the specific methods of open coding, axial coding, theoretical coding and selective coding were employed to analyze interviews and field notes which served as the data for this study (Glaser and Strauss, 2009; Glasser, 1978; Strauss and Corbin, 1998). Specifically, transcripts of recorded interviews were used as the data for this study. Since the interviews were conducted in Korean language, the transcripts were translated into English. Eventually, core categories emerged from the analysis and these were employed in this study.

Second, to establish a theory-based model for the usage of the educational application of smartphones, deductive coding based on the results of the first step was conducted. The grounded theory method at this step allowed the researcher to generate a substantive theory. Such a data based model has great potential in explaining the role of social context in their results as well as in developing a class of theories reflecting local contexts (Barab and Squire, 2004).

To identify what factors influence learners' usage of educational applications on smartphones, we conducted interviews with five high school students in South Korea. These subjects were randomly selected from five general high schools in Seoul which were promoting the use of applications on smartphones to students when they study.

As material for the study, we focused on learners who use EBS (Educational Broadcasting System) (http://itunes.apple.com/us/app/ebs-on-air/id429375686? mt = 8), educational application for both IOS and android based smartphones in South Korea. It offers 5 on-air channels, recorded channels, educational news, English contents and so on. Begun in 1951, EBS broadcasts through radio and TV for educational purposes. From 1997, the government has encouraged students to watch

the EBS channels to decrease private education. Recently, with the increasing use of smartphones, EBS channels have begun to broadcast their service through EBSI, an application for both iPhones and android-based phones.

RESULTS AND DISCUSSION

Results and/or substantiated conclusions or warrants for arguments/point of view
What external factors show up through open coding?: Based on interview description, we could find core categories through the node function of Nvivo 9. Results showed that influential properties were 'open minded', 'effective learning', 'accessing easily', 'independence', 'willingness', 'fun', 'challenging', 'problem solving', 'usage of peers', 'usefulness', 'test score', 'money', 'teachers' suggestion', 'experience of online learning' and 'carrying out'. Then, we could categorize them into four: attitudes on learning, social influences, usefulness and ease of use. Table 1 shows the results of the first step.

Established theory-based Model: Based on the influential properties shown above, we compared these with previous theories. As aforementioned, the Technology Acceptance Model (TAM) explains that usefulness and ease of use influence technology acceptance. In addition, we have found 'attitudes on learning' and 'social influence' in the acceptance of educational applications on smartphones. Especially, after finding the properties of attitudes on learning, we agreed that those properties can be explained by Self-Directed Learning Readiness (SDLR) (Gibbons, 2003). For the better generality of the theory, we constantly compared factors of SDLR with our findings and concluded that SDLR is an influential external factor in the usage of education applications of smartphones. In parallel with the external TAM model, we could establish the model explaining the path of usage on smartphones Fig. 1.

This study is influential in that it demonstrates how new tools such as iPhones could be used as educational tools. By the increased use of the portable computing technology called the smartphone, the educational context is rapidly changing. Even though existing.

Table 1: The influential properties

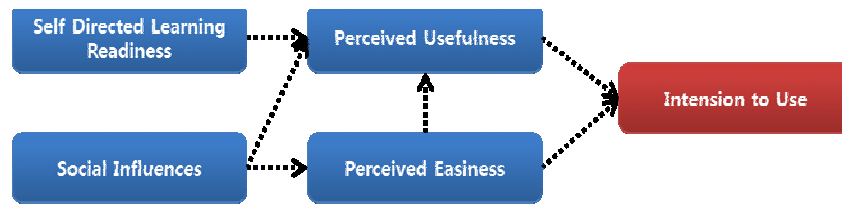| Tree nodes	Free nodes
Attitude to learning	Open minded, willingness, problem solving, independence, test score, fun
Social influences	Usage of peers, money, teacher's suggestions
Usefulness	Effective learning, carrying out
Ease of use	Accessing easily, experience of online learning

Fig. 1: Theoretical model of the study (extended TAM)

e-Learning approaches have not been sufficiently successful, it is important to know what factors influence the acceptance of new technologies

This study demonstrated what factors are related to the acceptance of smartphones for future education. Alongside the Technology Acceptance Model (TAM), it was important for students to have learner-centered learning and the improvement of interaction among learners (Kim, 2015; Steinkuehler, 2007). Based on this conclusion, this study suggests the follow-up researches on the statistical verification of the model as shown in the previous studies

CONCLUSION

This study conceptualized and provided the peculiarities of factors based on the TAM theory. The suggested model was conceptualized by analyzing the potential changes brought about by smartphones as a new environment. It can have remarkable educational significance and can serve as a cornerstone for future use. Future research needs to critically analyze the suggested model so that it can be refined and applied appropriately in more generalized contexts.

ACKNOWLEDGEMENT

REFERENCES

Barab, S. and K. Squire, 2004. Design-based research: Putting a stake in the ground. J. Learn. Sci., 13: 1-14.

Christensen, C.M., 1997. The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Harvard Business School Press, Boston, USA., ISBN-13: 9780875845852, Pages: 225.

Cuban, L., 1986. Teachers and Machines: The Classroom use of Technology Since 1920. Teachers College Press, New York, USA., ISBN: 0-8077-2792-X, Pages: 137.

Davis, F.D., R.P. Bagozzi and P.R. Warshaw, 1989. User acceptance of computer technology: A comparison of two theoretical models. Manage. Sci., 35: 982-1003.

Gibbons, M., 2003. The Self-Directed Learning Handbook: Challenging Adolescent Students to Excel. John Wiley & Sons, New York, USA.,.

Glaser, B.G. and A.L. Strauss, 2009. The Discovery of Grounded Theory: Strategies for Qualitative Research. Transaction Publishers, New Jersey.

Glaser, B.G., 1978. Theoretical Sensitivity: Advances in the Methodology of Grounded Theory. Sociology Press, New York, USA.,.

Hendrickson, A., P. Massey and T. Cronan, 1993. On the Test-retest reliability of perceived usefulness and perceived ease of use scales. MIS Q., 17: 227-230.

Kim, S.H., 2015. Communicative language learning and curriculum development in the digital environment. Asian Soc. Sci., 11: 337-352.

Robinson, T., T. Cronin, H. Ibrahim, M. Jinks and T. Molitor *et al.*, 2013. Smartphone use and acceptability among clinical medical students: A questionnaire-based study. J. Med. Syst., 37: 1-7.

Segars, A.H. and V. Grover, 1993. Re-Examining perceived ease of use and usefulness: A confirmatory factor analysis. MIS Q., 17: 517-525.

Steinkuehler, C., 2007. Massively multiplayer online gaming as a constellation of literacy practices. E Learn. Digital Media, 4: 297-318.

Strauss, A.L. and J.M. Corbin, 1998. Basics of Qualitative Research:Techniques and Procedures for Developing Grounded Theory. 2nd Edn., Sage, Thousands Oak, CA.

Walker, A., M.M. Recker, K. Lawless and D. Wiley, 2004. Collaborative information filtering: A review and an educational application. Int. J. Artifi. Intell. Educ., 14: 3-28.