

Toward Serving MOOC Learners Globally: Focusing on Intent to Continue Using K-MOOCs

Hannah Kim¹ and Jeongmin Lee^{2,*}

¹ Sungkyul University; Visiting Professor; edux021@gmail.com

² Ewha Womans University; Associate Professor; jeongmin@ewha.ac.kr

* Correspondence

<https://doi.org/10.5392/IJoC.2020.16.1.065>

Manuscript Received 24 October 2019; Received 16 December 2019; Accepted 6 January 2020

Abstract: *The purpose of the study was to explore the structural relationships between the intent to continue using Massive Open Online Courses (MOOCs) and its determinants based on the information systems continuance expectation-confirmation model. A total of 156 students from five different universities in Korea completed an online survey. An analysis by structural equation modeling revealed that college students' intent to continue using K-MOOC is partially supported by the model. Although perceived usefulness and confirmation are strong determinants of satisfaction and intent to continue using information systems in general, confirmation was the only significant predictor of satisfaction, the only significant predictor of intent to continue to use K-MOOC. Written responses on the survey were used to interpret the results. Findings indicate significant effects of confirmation on perceived usefulness, of confirmation on satisfaction, and of satisfaction on intent and insignificant effects of perceived usefulness on satisfaction and perceived usefulness on intent to continue. Substantial implications for future research and practices are discussed.*

Keywords: MOOCs; K-MOOCs; expectation-confirmation model; intent to continue; undergraduates

1. Introduction

Massive Open Online Courses (MOOCs) are online classes that are large, free, and open to all. The first MOOC was an artificial-intelligence course offered by Stanford University in 2011. The course was delivered in English and attracted 160,000 online registrants. Since then, this educational innovation has rapidly gained popularity worldwide and been delivered to learners of multiple cultures and through diverse languages.

As audiences of MOOCs are expanding worldwide, issues about local pedagogical and cultural considerations have risen [1]. MOOC learners across various countries present distinct patterns of behavior [2]. Students from different countries may have dissimilar motivations and needs [3]. Interaction between participants from different culture or who speak different languages may result in miscommunication or conflict [1]. Although MOOCs share the vision of being open and massive, in reality, many online courses that claim to be MOOCs fail to become open and appropriate for diverse learner groups [1].

A study suggested that differences in educational culture may lead to distinct learner behavior [2]. For example, Asian countries are historically more test-centric or employers in Asian countries place higher values on MOOC certificates. Given that culture, language, and country play into MOOC learner behavior and quality of experience, better understanding of learners from various cultures and designing courses that are targeted to specific learners is essential to ensure effective and engaging learning experiences. This line of research is clearly fundamental to the design and delivery of MOOCs, yet is very recent and needs to be advanced.

The current study aims to improve the understanding of learning experience in MOOCs, especially in K-MOOCs, delivered in Korean language mainly targeting Korean learners. The current study takes continued usage intention as a learning outcome variable and investigates on influential factors, in order to potentially inform the customization or localization of MOOC design and delivery.

1.1 Intent to continue to use MOOCs

Despite tremendous promise for overcoming the challenges of higher education by the openness and reputation of MOOCs [4], MOOCs continue to have a lower completion rate than does traditional online education, ranging from 0.7% to 52.1%, median 12.6% [5]. Although the interest in and hopes for MOOCs are increasing, the low completion rate challenges their validity and effectiveness and has become a huge issue for their design and delivery [6]. Initial enrollment and first use is a necessary step toward success in online learning [7, 8]. However, the long-term viability of online learning highly depends on its continued use rather than on its initial use [9].

Intent to continue plays an important role in whether users choose to return and repeat the similar behavior. Based on the expectation-confirmation model, pre-behavior and post-behavior influence confirmation, which then influences satisfaction and intent to repurchase [10]. For information systems, confirmation and perceived usefulness jointly establish satisfaction, which determines the intent to continue or discontinue the use of information systems in the future [9].

The information-systems continuance expectancy-confirmation model by [9] has been widely tested and validated. [11] examined an extended information-systems continuance expectancy-confirmation model incorporating perceived quality and perceived value with 183 e-learning users in Taiwan. The results confirmed its adaptability to e-learning among Taiwanese undergraduates. Another extended information-systems continuance expectancy-confirmation model including perceived enjoyment, openness, and reputation was tested with 316 MOOCs users from 74 countries [6]. The results confirmed the applicability of the information-systems continuance expectancy-confirmation model except for the effects of perceived usefulness on satisfaction and effects of perceived openness on satisfaction in MOOCs. Nevertheless, existing studies have rarely investigated the intent to continue using country-specific MOOCs in a language other than English.

1.2 MOOCs in Korea

In 2015, The Ministry of Education of Korea launched K-MOOCs (Korean Massive Open Online Course) and developed a partnership with outstanding universities in Korea. Starting with 27 courses and 10 universities in 2015, the number of courses has increased ten-fold, resulting in 268 courses from 30 universities in 2017, with ten of them taught in English. K-MOOCs reached the million-viewer mark in 2016 [12]. However, despite the growing interest in teaching and learning in K-MOOCs, not a sufficient number of studies have investigated the learning experience and process in K-MOOCs, particularly in terms of the learning effectiveness or learning outcome. Several Korean researchers have studied the learning experience of Korean students enrolled in MOOCs delivered in English [13, 14]. Although the results are very meaningful and worthwhile, there is a significant gap to directly apply the findings in courses run in Korean language. This calls for a research study addressing the distinctive features of the learning experience in K-MOOCs, looking at the delivery through the Korean language and the design reflecting Korean culture, and exploring systematic strategies to design and manage the learning process of K-MOOCs.

Therefore, this study aims to investigate learner experience and effectiveness in K-MOOCs with a strong focus on intent to continue to use K-MOOCs. The study takes intent to continue using K-MOOCs to mean the extent to which learners are likely to return to K-MOOCs for another course, using that as the learning outcome or learning effectiveness variable instead of using initial enrollment in MOOCs. To guide the understanding of intent to continue, this study takes the information-systems continuance expectancy-confirmation model as its theoretical framework and examines its applicability in K-MOOCs. Specifically, this study investigates the potentially influential variables – confirmation, perceived usefulness, and satisfaction – that affect learners' intent to continue using K-MOOCs and the interplay between the variables. Confirmation refers to an individual's expectation that is established based on a combination of pre and post behavior. Perceived usefulness indicates the instrumentality of the system and is found to make a strong and consistent impact on attitude. Satisfaction means affect or evaluation of emotion about the experience.

In the current diffusion stage of K-MOOCs, a better understanding of K-MOOCs users' intent to continue using them may provide a path to consider the sustainability of K-MOOCs and their affecting elements [15] and additionally provide the basis for better design and management of K-MOOCs. To effectively corroborate the study, we employ structural equation modeling to investigate the structural relationships between the variables of interest. Written responses on the learner survey and related literature help to articulate the relationships. The followings are the five research hypotheses presented in Figure 1.

Hypothesis 1. Confirmation has a significant, positive effect on satisfaction.

Hypothesis 2. Confirmation has a significant, positive effect on perceived usefulness.

- Hypothesis 3. Perceived usefulness has a significant, positive effect on satisfaction.
 Hypothesis 4. Perceived usefulness has a significant, positive effect on intent to continue.
 Hypothesis 5. Satisfaction has a significant, positive effect on intent to continue.

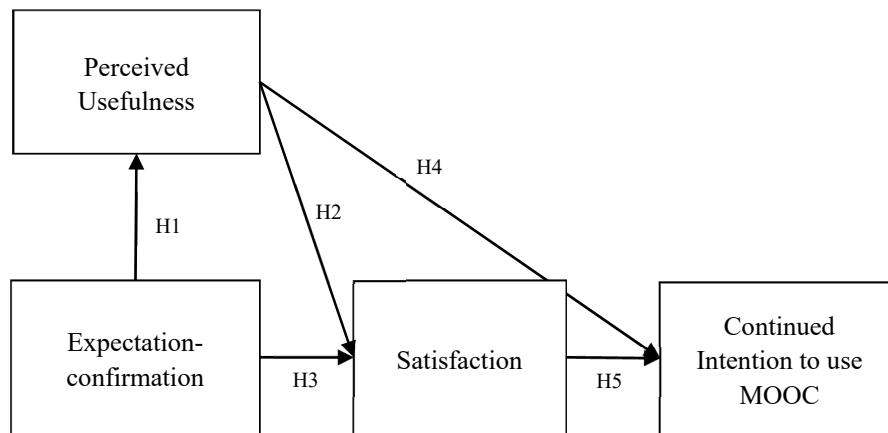


Figure 1. Hypothesized model (adjusted from Bhattacharjee, 2001).

2. Research Methods

2.1 Data collection and participants

Data in the current study were drawn from undergraduate students at five different universities in South Korea. An online survey link was posted on student forums of the five universities. Students who had the prior experience of taking a K-MOOC course were asked to voluntarily participate in the online survey. A gift card for a drink was sent to survey completers afterward.

A total of 156 respondents completed the survey. Of the participants, 91 percent were female. Their ages ranged from 19 to 30, the average age being 22. Over 70 percent of the participants were between 20 and 23 years of age. All of them had completed at least one K-MOOC course. The academic majors of the participants were distributed as follows: Management 7.1%, Engineering 12.8%, International Relations 3.2%, Law 1.3%, Education 19.9%, Social Science 21.8%, Liberal Arts 1.3%, Music 5.8%, Medicine 1.3%, Humanities 12.8%, Science 8.3%, Arts 2.6, and others 1.9%.

2.2 Measures

The survey included several demographic questions about gender, age, major, and the number of prior MOOC courses taken. The rest of the survey items related to the variables of interest: Expectation-confirmation, Perceived usefulness, satisfaction, and intent to continue using. Each item was on five-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). All items were drawn from existing literature, translated into Korean and revised for the K-MOOC setting. The followings are details of the scales used to measure the variables of interest in this study:

Confirmation. Items developed by [9] were revised for the K-MOOC setting and used to measure confirmation-expectation in this study. The scale consists of three items, such as ‘The service level provided by K-MOOCs was better than what I expected’. Cronbach’s alpha in the current study was 0.87.

Perceived usefulness. Four items in [16] was revised to measure perceived usefulness in the current study. An example was “The MOOC course was critical to my job”. Cronbach’s alpha in the study was 0.89.

Satisfaction. Items from [9] were edited to measure satisfaction. Three items such as ‘I am contented with the experience of using K-MOOCs’ were included in the scale. Cronbach’s alpha in the current study was 0.93.

Intent to continue. Items developed by [6] were edited and used to measure intent to continue to use MOOCs in this study. The scale consisted of four items such as ‘I will continue using K-MOOCs in the future.’ Cronbach’s alpha in this study was 0.95.

2.3 Data Analysis

Because the current study attempted to elucidate the conceptual relationship between latent variables [17] based on the expectancy-confirmation model in MOOCs setting, structural equation modeling was performed for data analysis, using IBM SPSS 23.0 and AMOS. Given that the general consensus on sample size for structural equation modeling is 10 per estimated parameter [18], we have an acceptable ratio.

3. Results

3.1 Descriptive Statistics and Correlations

As preliminary analysis, descriptive statistics, such as average, standard deviation, skewness, and kurtosis, were examined and confirmed the normalization of multivariate distribution of data, as shown in Table 1. In addition, correlations were examined to check the possibility of multicollinearity. Our data analysis was guided by [19]'s two-step procedure. First, convergent and discriminant validity was examined using the measurement model. Then, the strength and direction of the relationship of the constructs of interest were tested using the structure model.

Table 1. Descriptive Statistics and Correlations

Variables	1	2	3	4
Number of Items	4	3	3	4
Average	3.48	3.57	3.78	3.88
S.D.	.96	.91	1.01	1.05
Skewness	-.62	-.51	-.96	-1.02
Kurtosis	-.06	.14	.56	.57
Correlations				
1. Perceived Usefulness	1			
2. Expectation-Confirmation	.76**	1		
3. Satisfaction	.70**	.79**	1	
4. Continued Intention	.62**	.73**	.86**	1

** p<.01, * p<.05.

3.2 Analysis of Measurement Model

Construct validity refers to the accuracy of measurement and is represented by convergent validity and discriminate validity. Convergent validity was assessed using the three criteria suggested by [20]:

- (1) all factor loadings were significant and exceeded 0.7;
- (2) construct reliability was more than 0.8;
- (3) average variance extracted (AVE) by each construct exceeded the variance caused by measurement error for the construct (i.e., AVE should exceed 0.5).

As shown in Table 2, the Cronbach's alpha confirmed strong internal reliability of each construct. Factor loadings in confirmatory factor analysis of the measurement model ranged from 0.75 to 0.92 and were significant with a confidence level of 0.05. Composite reliability ranged from 0.87 to 0.94, and the AVE ranged from 0.62 to 0.80, which was greater than the variance caused by the measurement error. Hence, all three conditions were met and confirmed the convergent validity of the measurement model.

Table 2. Construct Reliability and Convergent Validity

Construct	Items	Item loading	t-Value	Composite reliability	AVE	Cronbach's alpha
Perceived Usefulness (PU)	PU1	.82	11.13*	.89	.62	.87
	PU2	.81	10.90*			
	PU3	.85	11.63*			
	PU4	.79				

Expectancy-Confirmation (EC)	EC1	.85	14.05*	.867	.68	.87
	EC2	.75	11.48*			
	EC3	.88				
Satisfaction (S)	S1	.91	17.80*	.938	.79	.92
	S2	.90	17.57*			
	S3	.90				
Continued Intention (CI)	CI1	.92	19.02*	.952	.80	.94
	CI2	.91	18.45*			
	CI3	.92	18.63*			
	CI4	.90				

** p<.01, * p<.05.

Discriminant validity was assessed using the criterion in [21]: the square root of average variance extracted (AVE) for each construct is greater than the correlation between all constructs. As shown in Table 3, values of the square root of AVE of each construct exceeded the correlations between constructs, and thus the test of discriminant validity is satisfactory

Table 3. Correlation Matrices and Discriminant Validity

Variables	Perceived Usefulness	Expectation -Confirmation	Satisfaction	Continued Intention
Perceived Usefulness	0.62			
Expectation-Confirmation	0.76	0.68		
Satisfaction	0.70	0.79	0.79	
Continued Intention	0.62	0.73	0.86	0.80

3.3 Analysis of the Structural Model and Hypotheses Testing

The hypothesized structural model was examined using the structural equation modeling analysis. As shown in Table 4, the results indicate that the model fits well with the data, having its fit indices as $\chi^2 = 153.44$, $CMIN = 2.13$, $CFI = .96$, $TLI = .95$, and $RMSEA = .085$. Table 5 and Figure 2 show the standardized path coefficients and the relationships of the variables in the model. Each line connecting variables on Figure 2 indicates the corresponding hypothesis From H1 to H5 in Table 5. The dotted line represents non-significant relationships, and the regular line indicates significant relationships at the 0.05 significance level. As shown, two hypotheses were not supported: hypothesis 2 and hypothesis 4.

Table 4. Fit Measures for the Structural Model

	χ^2	<i>Df</i>	<i>CMIN/df</i>	<i>CFI</i>	<i>TLI</i>	<i>RMSEA</i>
Model	153.44	72	2.13	.96	.95	.085
Acceptable range				>.90	>.90	<.1

Table 5. Parameter Estimates of the Structural Equational Model

Relationship of variables	B	β	<i>t</i>	<i>p</i>
H1: Expectancy-Confirmation \rightarrow Perceived Usefulness	.86	.87	11.19*	.00
H2: Perceived Usefulness \rightarrow Satisfaction	.03	.03	.17	.87
H3: Expectancy Confirmation \rightarrow Satisfaction	.90	.87	5.51*	.00
H4: Perceived Usefulness \rightarrow Continued Intention	-.10	-.09	-1.05	.29
H5: Satisfaction \rightarrow Continued Intention	1.10	.98	10.51*	.00

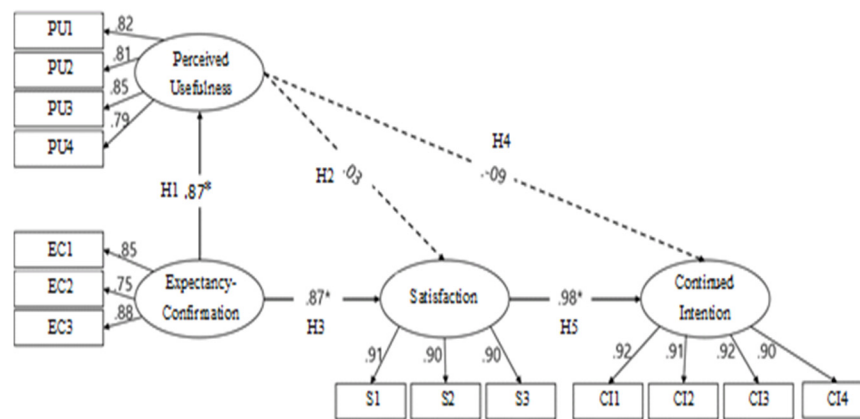


Figure 2. Analysis of research model

4. DISCUSSION

4.1 Key Findings

This study attempts to identify factors influencing intent to continue in K-MOOCs. The findings report that hypothesis 1 is supported indicating a significant effect of confirmation on perceived usefulness). Hypothesis 3 is supported meaning a significant effect on confirmation on satisfaction. Lastly, hypothesis 5 is supported referring a significant effect of satisfaction on intent to continue. The findings are in line with [9] and [6] and successfully corroborated in K-MOOC. In other words, the results of the current study revealed that satisfaction ($\beta = .98, p = .00$) is a stronger predictor of intent to continue in K-MOOCs than is perceived usefulness ($\beta = -.09, p = .29$). Satisfaction is significantly predicted by confirmation ($\beta = .87, p = .00$) but not by perceived usefulness ($\beta = .03, p = .87$). Although confirmation had a strong effect on perceived usefulness ($\beta = .86, p = .00$), perceived usefulness had an insignificant effect on satisfaction ($\beta = .03, p = .87$). The information-systems continuance expectancy-confirmation model was supported by numerous instances, to name a few: repurchase intention in information systems setting [9] and e-learning setting targeting Taiwanese college students [11, 22], but it was only partially supported in this study.

Hypothesis 2 is not supported indicating an insignificant effect of perceived usefulness on satisfaction, which is consistent with [6]. The insignificant influence of perceived usefulness on satisfaction is in conflict with the findings for 295 Taiwanese college students in e-learning courses in [26] and the finding on 313 undergraduates of e-learning courses in [23]. Meanwhile, this finding parallels [6], a study of 316 MOOC users from 74 countries. This finding is partially consistent to [27], in that mixed findings in the comparisons of traditional e-learning platform and MOOCs were reported concerning continuance intention and relationships between variables from technology acceptance and social support theory.

It is notable that the results in MOOC studies were incompatible with the ones in e-learning studies. The written responses on the survey of this study reported that the reasons of satisfaction on MOOC courses include (1) learning at own pace, (2) flexible in time, (3) self-monitoring of own learning progress, (4) easy communication with other enrollees, (5) taking courses with students from other universities, and (6) taking high-quality courses for free. Meanwhile, reasons for dissatisfaction list (1) lack of interaction with the instructor, (2) linear structure of the course, (3) lack of feedback, (4) slow bandwidth, (5) difficulty in sustaining learning intention, and (6) last-minute study. Several reasons of satisfaction or dissatisfaction - for example, being able to take courses from other schools for free and at own pace or experiencing a difficulty in maintaining initial learning intention - are strongly linked to the original distinguishable attributes of MOOCs. Thus the written responses indicate that students are well acknowledged of the unique characteristics of MOOCs, those are apparently different from the ones in traditional e-learning settings. Although it needs further investigation, the specific characteristics of MOOCs may construct different learner experience from traditional e-learning setting.

Several studies have affirmed a strong and positive effect of perceived usefulness on satisfaction or intent to continue of Korean students in e-learning settings [28]. Thus our inconsistent finding does not seem to be drawn from cultural variance. A study of mobile banking in Korea has reported that perceived usefulness

presented significant, yet weaker, influence on the adoption of mobile banking compared to how it was shown in traditional setting [29]. In the same vein, the unexpected finding may have resulted from the unique setting of MOOCs in contrast to that of traditional e-learning setting.

It is also noteworthy that there was a consistent finding of the insignificant effect of perceived usefulness on satisfaction in a study of MOOC users from multiple countries – 24% from the USA, 14% from India, 10% from Greece, 10% from Azerbaijan, and 42% from others [6] – communicating in English and in this study of MOOC users communicating in Korean. Furthermore, the insignificant effect of perceived usefulness on satisfaction, along with the significant effects of confirmation on perceived usefulness, confirmation on satisfaction, and satisfaction on intent to continue, was found from both traditionally designed MOOCs in [6] and localized MOOCs in the current study. In terms of delivery language, it is also prominent that a similar finding was reported from MOOC courses delivered in English and in Korean.

Hypothesis 4 is also not supported reporting an insignificant effect of perceived usefulness on intent to continue, which is not consistent with [6]. Perceived usefulness is known as a significant predictor of intent to continue and attitude, which is one of the most salient predictors of intent to continue, based on the widely tested and applied Technology Acceptance Model [16]. The role of perceived usefulness in intent to continue is well acknowledged in the information-systems continuance expectancy-confirmation model as well [9]. In e-learning, a study of 313 undergraduate students with e-learning experience confirmed the role of perceived usefulness in the model [23]. Similarly, for MOOC, a study of Chinese learners with prior MOOC experience reported that perceived usefulness has a significant effect on intent to continue [24], as well as a study of students from numerous countries [6]. However, the result of this study about its effect of perceived usefulness on intent to continue is not consistent with the Technology Acceptance Model nor with the information-systems continuance expectancy-confirmation model.

Because perceived usefulness helps to evaluate the instrumentality of the information systems and serves as a primary motivator of information-systems acceptance [9], the insignificant effects of perceived usefulness on satisfaction and intent to continue call for more consideration of the motivations of MOOC learners. Given that motivation is a critical predictor of performance in MOOCs [25], this can be an important design issue dealing with MOOC localization or personalization.

4.2 Implications

The findings of this study suggest some implications for both researchers and practitioners. First, given its theoretical model, the expectancy-confirmation model [10] and the information-systems continuance expectancy-confirmation model [9] are well cited and widely validated, as indicated by 14228 and 5087 citations, respectively in Google Scholar at the time of 2018. Thus, the unexpected findings – insignificant effect of perceived usefulness on satisfaction and of perceived usefulness on intent to continue use MOOCs - in this study are intriguing. It is noteworthy that some results in MOOCs studies were not compatible with the ones in e-learning studies. The findings articulate a more comprehensive understanding of learner behaviors in MOOCs, which are distinct from traditional e-learning courses, by suggesting that confirmation and satisfaction are significant factors that affect learners' intent to continue to revisit and learn in MOOCs.

Second, it is conspicuous that a consistent finding of an insignificant effect of perceived usefulness on satisfaction, and the significant effects of confirmation on perceived usefulness, of confirmation on satisfaction, and of satisfaction on intent to continue were found in a study of MOOCs users from multiple countries communicating in English [6] and in this study of MOOC users of Korea communicating in Korean. There are popular debates on customized vs. universal design of MOOCs (e.g., [30, 31]), recently growing movements for MOOC localization and an increasing effort to understand cross-cultural learner characteristics in MOOCs (e.g., [2, 3, 32]). Hence, findings of this study are worthwhile in that the information-systems continuance expectancy-confirmation model was tested for MOOCs, particularly, MOOCs designed to serve learners in one specific country and delivered in a language other than English. The findings of this study add to the growing body of literature on MOOCs localization and provoke interesting and meaningful considerations for the design and delivery of future MOOCs.

4.3 Limitations and Future Research

This study has several limitations. First, all participants of this study were undergraduate students, mostly female (91%) having varying majors and from five schools. No separate analyses were performed comparing gender, major, or school differences. Thus, the findings may not accurately reflect age, gender, or occupation

differences and may not be applicable for generalization. This is an important consideration, given that one critical advantage of MOOC is that they can improve access to good-quality higher education to all learner groups [33]. To confirm generalizability of the findings, future studies may choose learners with a wide range of ages, occupations, genders, and so on. However, gender-specific research studies on MOOCs are rarely performed, and the unique characteristics of female MOOCs users are hardly known. Thus, the findings add to the literature and contribute to the understanding of learner groups with a high portion of female students. MOOC courses in subject areas that historically have a large number of female students, such as child education or nursing, or specific courses that target female undergraduates, like self-defense, may benefit from the findings.

Second, research on learner behaviors in MOOCs is relatively new. The findings presented in this study must be generalized for external validity, including the generalizability to learner groups outside of Korea.

Last, the intent to continue may not be the best measure for evaluating learning in MOOCs, given the differences between conventional online college courses and open online registration courses [34]. Future studies may explore alternative measures that better represent learning in MOOC environments, such as number of logins or time spent on the course.

5. Conclusion

MOOCs have gained a great deal of attention from both learners and researchers worldwide [35]. Recent research studies focusing on a single country (i.e., [24]) indicate that MOOCs are evolving and being adjusted for various cultures, languages, and countries to become accessible to broader learner groups. MOOCs are also being evolved to better accommodate learners who may have difficulty learning in traditional English-based MOOC courses or feel uncomfortable with traditional western-oriented MOOC culture.

The current study examined determinants of the intent to continue using K-MOOCs based on information-systems literature. The information-systems continuance expectancy-confirmation model was tested in a MOOC setting. The findings suggest that the intent to continue using K-MOOCs is contingent on satisfaction and insignificantly associated with perceived usefulness. Confirmation was a stronger predictor of satisfaction and perceived usefulness, but perceived usefulness had an insignificant effect on satisfaction. The results contribute to the literature by demonstrating the expectancy-confirmation model partially applies to K-MOOCs in terms of the role of confirmation and satisfaction, particularly for learner groups with high enrollments of female undergraduate students. Future studies may examine the model in western-oriented MOOC courses or other country/language-specific MOOCs.

Conflicts of Interest: The authors declare no conflict of interest.

References

- [1] R. Godwin-Jones, "Emerging Technologies Global Reach and Local Practice: The Promise of MOOCs," *Language Learning & Technology*, vol. 18, no. 3, pp. 5-15, 2014.
- [2] Z. Liu, R. Brown, C. Lynch, T. Barnes, R. S. Baker, Y. Bergner, and D. S. McNamara, "MOOC learner behaviors by country and culture; an exploratory analysis," *Proc. EDM'16*, pp. 127-134, 2016.
- [3] S. Lee, M. Lee, S. Lee, T. Kang, and G. Gim, "A Comparative Analysis of Korea and Vietnam on Usage Intention of Massive Open Online Course," *Information*, vol. 20, no. 1B, pp. 411-416, 2017.
- [4] G. L. Mehaffy, "Challenge and Change," *EDUCAUSE Review*, vol. 47, no. 5, 2012. Retrieved from http://online.tarleton.edu/fdi/Documents/EDUCAUSE_Mehaffy.pdf.
- [5] K. Jordan, "Massive Open Online Course Completion Rates Revisited: Assessment, Length and Attrition," *The International Review of Research in Open and Distributed Learning*, vol. 16, no. 3, pp. 341-358, 2015, doi: <https://doi.org/10.19173/irrodl.v16i3.2112>.
- [6] K. M. Alraimi, H. Zo, and A. P. Ciganek, "Understanding the MOOCs Continuance: The Role of Openness and Reputation," *Computers & Education*, vol. 80, pp. 28-38, 2015, doi: <https://doi.org/10.1016/j.compedu.2014.08.006>.
- [7] Y. S. Wang, M. C. Wu, and H. Y. Wang, "Investigating the Determinants and Age and Gender Differences in the Acceptance of Mobile Learning," *British Journal of Educational Technology*, vol. 40, no. 1, pp. 92-118, 2019, doi: <https://doi.org/10.1111/j.1467-8535.2007.00809.x>.
- [8] Y. Liu, H. Li, and C. Carlsson, "Factors Driving the Adoption of M-Learning: An Empirical Study," *Computers & Education*, vol. 55, no. 3, pp. 1211-1219, 2010, doi: <https://doi.org/10.1016/j.compedu.2010.05.018>.

- [9] A. Bhattacharjee, "Understanding Information Systems Continuance: An Expectation-Confirmation Model," *MIS quarterly*, vol. 25, no. 3, pp. 351-370, 2001, doi: <https://doi.org/10.2307/3250921>.
- [10] R. L. Oliver, "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions," *Journal of Marketing Research*, vol. 17, no. 4, pp. 460-469, 1980, doi: <https://doi.org/10.1177/002224378001700405>.
- [11] C. M. Chiu, M. H. Hsu, S. Y. Sun, T. C. Lin, and P. C. Sun, "Usability, Quality, Value and E-Learning Continuance Decisions," *Computers & education*, vol. 45, no. 4, pp. 399-416, 2005, doi: <https://doi.org/10.1016/j.compedu.2004.06.001>.
- [12] Y. H. Ki, J. H. Lim, K. C. Yu, D. J. Choi, J. E. Hong, T. K. Park, J. H. Cho, H. J. Seo, C. H. Oh, and H. M. Lee, Research report on ways to use K-MOOC, National Institute For Lifelong Education of Korea, 2017.
- [13] S. J. Cho, "Factors Influencing the Acceptance of Massive Open Online Courses: An Explanatory Study based on Technology Acceptance Model II," *Journal of Learner-Centered Curriculum and Instruction*, vol. 15, no. 9, pp. 601-619, 2015.
- [14] M. H. Cho and M. K. Byun, "College Students' Motivation and Learning Patterns in Massive Open Online Courses (MOOCs)," *Korean Journal of Educational Research*, vol. 53, pp. 193-223, 2015.
- [15] S. Barnes, "Understanding Use Continuance in Virtual Worlds: Empirical Test of a Research Model," *Information & Management*, vol. 48, no. 8, pp. 313-319, 2011, doi: <https://doi.org/10.1016/j.im.2011.08.004>.
- [16] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319-340, 1989, doi: <https://doi.org/10.2307/249008>.
- [17] R. B. Kline, "Convergence of Structural Equation Modeling and Multilevel Modeling," In M. Williams and W. P. Vogt (Eds.), *Handbook of Methodological Innovation in Social Research Methods*, Sage, London, pp. 562-589, 2011.
- [18] J. B. Schreiber, A. Nora, F. K. Stage, E. A. Barlow, and J. King, "Reporting Structural Equation Modeling and Confirmatory Factor Analysis Results: A Review," *The Journal of Educational Research*, vol. 99, no. 6, pp. 323-338, 2006, doi: <https://doi.org/10.3200/JOER.99.6.323-338>.
- [19] J. C. Anderson and D. W. Gerbing, "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin*, vol. 103, no. 3, pp. 411-423, 1988, doi: <https://doi.org/10.1037/0033-2909.103.3.411>.
- [20] C. Fornell and D. F. Larcker, "Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics," *Journal of Marketing Research*, vol. 18, no. 3, pp. 382-388, 1981, doi: <https://doi.org/10.2307/3150980>.
- [21] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, *Multivariate Data Analysis 6th ed*, Pearson Prentice Hall, Upper Saddle River, 2006.
- [22] M. C. Lee, "Explaining and Predicting Users' Continuance Intention toward E-Learning: An Extension of the Expectation-Confirmation Model," *Computers & Education*, vol. 54, no. 2, pp. 506-516, 2010, doi: <https://doi.org/10.1016/j.compedu.2009.09.002>.
- [23] M. Limayem and C. M. Cheung, "Understanding Information Systems Continuance: The Case of Internet-Based Learning Technologies," *Information & management*, vol. 45, no. 4, pp. 227-232, 2008, doi: <https://doi.org/10.1016/j.im.2008.02.005>.
- [24] B. Wu and X. Chen, "Continuance Intention to Use MOOCs: Integrating the Technology Acceptance Model (TAM) and Task Technology Fit (TTF) Model," *Computers in Human Behavior*, vol. 67, pp. 221-232, 2017, doi: <https://doi.org/10.1016/j.chb.2016.10.028>.
- [25] P. D. Barba, G. E. Kennedy, and M. D. Ainley, "The Role of Students' Motivation and Participation in Predicting Performance in a MOOC," *Journal of Computer Assisted Learning*, vol. 32, no. 3, pp. 218-231, 2016, doi: <https://doi.org/10.1111/jcal.12130>.
- [26] P. C. Sun, R. J. Tsai, G. Finger, Y. Y. Chen, and D. Yeh, "What Drives a Successful E-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction," *Computers & Education*, vol. 50, no. 4, pp. 1183-1202, 2008, doi: <https://doi.org/10.1016/j.compedu.2006.11.007>.
- [27] J. Y. Hsu, C. C. Chen, and P. F. Ting, "Understanding MOOC Continuance: An Empirical Examination of Social Support Theory," *Interactive Learning Environments*, vol. 26, no. 8, pp. 1100-1119, 2018, doi: [10.1080/10494820.2018.1446990](https://doi.org/10.1080/10494820.2018.1446990).
- [28] B. C. Lee, J. O. Yoon, and I. Lee, "Learners' Acceptance of E-Learning in South Korea: Theories and Results," *Computers & Education*, vol. 53, no. 4, pp. 1320-1329, 2009, doi: <https://doi.org/10.1016/j.compedu.2009.06.014>.
- [29] K. S. Lee, H. S. Lee, and S. Y. Kim, "Factors Influencing the Adoption Behavior of Mobile Banking: A South Korean Perspective," *The Journal of Internet Banking and Commerce*, vol. 12, no. 2, pp. 1-9, 2007.

- [30] T. M. Reeves, M. Lee, Y. Ziaee, and T. Bonk, "Multimedia in MOOCs: Best Practices for Cultural Inclusion," In B. Lockee (Chair), Presidential Session, *Symposium conducted at the meeting of the Association for Educational Communications and Technology (AECT)*, Indianapolis, IN., 2015.
- [31] C. J. Bonk, M. M. Lee, T. C. Reeves, and T. H. Reynolds, *MOOCs and Open Education around the World*, Routledge, 2015.
- [32] C. H. Aydin and B. K. Kayabaş, Designing Culturally Sensitive Massive Open Online Courses: Learning Culture and MOOCs in Turkey, In *Supporting Multiculturalism in Open and Distance Learning Spaces*, IGI Global, pp. 208-221, 2018, doi: <https://doi.org/10.4018/978-1-5225-3076-3.ch011>.
- [33] M. Patru and V. Balaji, *Making Sense of MOOCs: A Guide for Policy-Makers in Developing Countries*, Paris, UNESCO, pp. 17-24, 2016.
- [34] A. D. Ho, J. Reich, S. Nesterko, D. T. Seaton, T. Mullaney, J. Waldo, and I. Chuang, *HarvardX and MITx: The first year of open online courses (HarvardX and MITx Working Paper No. 1)*. Retrieved from: <https://dspace.mit.edu/bitstream/handle/1721.1/96649/SSRN-id2381263.pdf?sequence=1>.
- [35] A. Bozkurt, N. O. Keskin, and I. de Waard, "Research Trends in Massive Open Online Course (MOOC) Theses and Dissertations: Surfing the Tsunami Wave," *Open Praxis*, vol. 8, no. 3, pp. 203-221, 2016, doi: <https://doi.org/10.5944/openpraxis.8.3.287>.



© 2020 by the authors. Copyrights of all published papers are owned by the IJOC. They also follow the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.