

Factors Impacting Perceived Learning and Continuation Intention of Art and Design Major Undergraduates Towards M-Learning in Chengdu

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Abstract: *This research examined the essential factors that significantly impact the perceived learning and continuance intention of M-Learning among art and design major undergraduate students from one private university in Chengdu of China. The factors studied in conceptual framework included self-efficacy, engagement, perceived ease of use, perceived usefulness, satisfaction, perceived learning, as well as continuance intention. This research was the Quantitative methods. It was used to distribute questionnaires to 500 target respondents online, and 476 valid questionnaires were finally recovered. Purposive sampling and quota sampling were used in the sampling procedures. Before the data gathering, the content validity and reliability of questionnaire was tested by Item-Objective Congruence (IOC) and pilot test (n=30). After the data collection, the Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) was employed to validate the goodness-of-fit of model and confirm hypotheses. This study had been shown to achieve the research objectives and showed that all variables have significant effects in their pairings, with engagement having the greatest impact on perceived learning. Furthermore, PU had the strongest significant impact on CI. For M-Learning designer, they are supposed to pay attention to enhance PU, PEOU, meanwhile raising students' SA to improve CI of M-Learning. For academic practitioners, attention should be paid to building the classroom atmosphere of M-Learning and creating high-quality online courses, so as to enhance students' EN and enhance students' PL are supposed to.*

Keywords: *M-Learning; Engagement; Perceived usefulness; Perceived learning; Continuance intention*

1. Introduction

Mobile learning (M-Learning) referred to learning that uses a variety of equipment, for example, smartphones as well as iPad to store messages in different places and times (Oberer & Erkollar, 2013)^[3]. Of course, there were other M-Learning advocates who define M-Learning as wireless networks and digital devices and technologies that are often produced for the public and used by learners as they participate in higher education. When comparing M-Learning to the traditional learning, some of researcher rated M-Learning as more effective than traditional learning. However, there were also some people who reject it due to the low social interaction, high investment cost, technical problems with exchanging and calculating technology. M-Learning had the potential to improve student achievement and efficiency, but for it to be used effectively in the art and design profession, it was necessary for both teachers and students to use relevant research to guide the learning of the application of new technologies.

In this study, M-Learning mainly referred to the studying by iPad. The development of mobile techniques and the need for movement of the educational technology to a new direction had revealed the new concept of M-Learning. Learners were able to inject their studying accumulation into the common cooperative atmosphere of M-Learning. Mobile technology played a crucial role in higher education. Advances in wireless technology and mobile had had an impact on the educational environment. Mobile technology could provide teachers with new opportunities to go beyond the traditional classroom scenario. The most important advantage of M-Learning over traditional learning was that students can obtain the information they need independently of time and space. Today, M-Learning had been an important part of educational techniques in institution of higher learning. The majority of higher education institutions all over the world had carried out M-Learning to provide studying no matter when and where with various approaches.

2. Literature Review

2.1. Self-efficacy (SE)

SE referred to the specific range of abilities to evaluate an individual's ability to achieve the desired goal in a specific field (Bandura, 1986)^[1]. According to Igarria & Iivari, SE first influences a person's system anxiety, and then influences a person's PEOU as well as PU to the system. Similarly, in the study of Hasan. Thus, the direct effect of SE on PU and PEOU was also evaluated. Preacher and Hayes also proved that a higher sense of SE enhances the PU of an individual to a specific technical system.

H1: SE exerted crucial effect on students' EN towards using M-Learning.

H2: SE exerted crucial effect on students' PU towards employing M-Learning.

H3: SE exerted crucial effect on students' PEOU towards using M-Learning.

2.2. Perceived Ease of Use (PEOU)

The connection of PEOU and PU had been researched by many academic studies. In the TAM model, a strong direct correlation was existed between PEOU and PU. Assuming that, all other things being equal, if students think a technology is easier to use, they will naturally think it is more useful. PEOU may influence the CI of e-learning systems directly or indirectly through PU (Li et al., 2012; Roca & Gagne, 2008)^[4].

H4: PEOU exerted crucial effect on students' PU towards using M-Learning.

2.3. Perceived Usefulness (PU)

The definition of PU was the degree to which students believe that their performance can be improved through the employment of the technique (Davis et al., 1989)^[2]. The outcome of the research showed the students' SA was affected by the PU of wireless internet in a straight way.

H5: PU exerted crucial effect on students' SA towards using M-Learning.

H6: PU exerted crucial effect on students' CI towards using M-Learning.

2.4. Satisfaction (SA)

Rust and Oliver interpreted SA as the extent to which an individual holds that positive feelings can be gained from using a service. If students were not satisfied with M-Learning, they will decisively refuse to use it. Previous research had shown that SA exerts an active influence on the students' CI towards M-Learning. The connection among SA and CI had been investigated by many academics. In the M-Learning environment, SA was the prerequisite for CI, it was able to be predicted that when students feel content with M-Learning, they are more likely to keep on employing M-Learning in years to come.

H7: SA exerted crucial effect on CI to using M-Learning.

2.5. Engagement (EN)

A definition of EN stated that it is a meta-structure containing behavioral, affective, and cognitive EN. EN was referred to the time and energy that students spend on learning and activities related to educational significance. The relation of both EN together with PL had been researched by several experts. The relation of both EN together with PL had been researched by several experts. Experience Sampling Method was used in Shernoff to measure student EN and PL in undergraduate financial accounting courses. The study confirmed that the higher the average student EN, the higher the average PL.

H8: EN exerted crucial effect on students' PL towards using M-Learning.

2.6. Perceived Learning (PL)

Rovai defined PL as a sense of building knowledge and understanding. In the study of Alavi et al., PL was defined as "the change in learners' perception of skills and knowledge level before and after

learning”.

2.7. Continuance Intention (CI)

Nabavi defined CI as a student’s decision to continue using the M-Learning that he or she was already using. Similarly, Chang pointed out that CI indicates the degree to which students would like to use M-Learning and recommend it to others in the future.

3. Research Methods and Materials

3.1. Research Framework

The conceptual framework in Figure 1 was supported and studied by two main theories (TAM and ECM) and previous academic research frameworks.

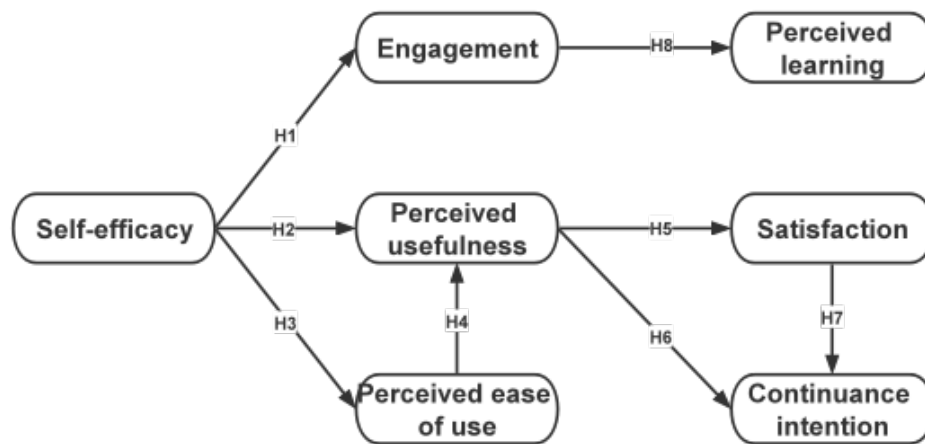


Figure 1: The Conceptual Framework

3.2. Methodology

This study conducted a quantitative survey of 500 art and design undergraduates with mobile learning experience in Sichuan University of Media and Communication by means of online questionnaire. Reliability of the questionnaire was verified by Cronbach's Alpha pilot test of 30 subjects, where all items were retained with a score of at least 0.6 or higher, resulting in retention of all items. Objective sampling and quota sampling are adopted in this study. Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) are used to verify the goodness of fit of the model and confirm the hypotheses.

3.3. Population and Sample Size

In this study, art and design undergraduates (1st, 2nd, 3rd, and 4th years) with experience in M-Learning at Sichuan University of Media and Communications (SUMC), a private university in Chengdu, China, were selected as the target population. In addition, the A-Priori sample size calculator of Soper’s. Structural Equation Model (SEM) was also used in this study for calculation, and the minimum sample size was suggested to be 425.

3.4. Sampling Technique

The researcher conducted the purposive and quota sampling technique. As shown in Table 1. The researcher first selected 2,710 art and design major undergraduates with M-Learning experience from a private university in Chengdu, using purposive sampling. According to Campbell, the advantage of adopting targeted sampling was that the samples can better match the research objectives, which was conducive to improving the credibility and tightness of the research results.

Table 1: Sample Units and Sample Size

Target Private University	Sampling Units	Population Size Number of students	Proportional Sample Size
Sichuan University of Media and Communications	Freshman	579	107(579*500/2710)
	Sophomore	731	135(731*500/2710)
	Junior	670	124(670*500/2710)
	Senior	730	134(730*500/2710)
	Total	2710	500

Source: Constructed by the researcher

4. Results and Discussion

4.1. Demographic Information

500 questionnaires were distributed across the four grades and 488 were collected, 476 of which were valid as presented in Table 2. Among the 476 participants, there was 50.8% male and 49.2% female participants in this survey. In terms of academic year organization, freshmen account for 21.4%, sophomores account for 27.3%, juniors account for 24.4%, and seniors account for 26.9%.

4.2. Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) was applied to structural equation modeling (SEM) in this study. It focuses on the interrelation between unobserved and observed variables that validate that questions set of all constructs which can test the hypotheses. Similarly, In the study of Hair, to achieve a better fit, the acceptable way was to draw covariance lines to error terms of the model, and the error should be drawn within the same construct's errors terms as avoiding theoretical concerns and maintain unidirectionality.

Table 2: Results of CFA, CR, and AVE

Latent Variables	Source of Items	No. of Items	CA	Factors Loading	CR	AVE
SE	Ozturk(2016)	6	.890	.654- .782	.886	.566
EN	Diemer et al. (2012)	4	.844	.693- .789	.845	.577
PU	Leon(2018)	5	.846	.702- .739	.846	.524
PEOU	Kulviwat et al. (2014)	5	.869	.738- .787	.869	.570
SA	Cheng (2014)	4	.845	.741- .772	.839	.566
CI	Mouakket and Bettayeb (2015)	4	.825	.719- .768	.845	.578
PL	Barzilai and Blau (2014)	4	.838	.740- .761	.825	.541

Note: CA= Composite reliability, CR = Composite reliability, AVE = Average variance extracted

Source: Constructed by the researcher

4.3. Structural Equation Model (SEM)

Table 3: Goodness of Fit for SEM

Index	Acceptable Values	Value
CMIN/DF	≤ 3 Hair et al. (2010)	763.837/450=1.697
AGFI	≥ .80 Filippini et al. (1998)	.901
GFI	≥ .90 Hair et al. (2006)	.916
RMSEA	< .08 Hu and Betler (1999)	.038
CFI	≥ .90 Hair et al. (2006)	.962
NFI	≥ .90 Arbuckle (1995)	.913
TLI	≥ .90 Hair et al. (2006)	.958

Source: Constructed by the researcher

Defined as a statistical approach to measure the correlation of structural equations. As shown in Table 3. This research employed SEM to verify the relationship between structure and hypothesis. Similarly, in the study of Hair et al., to achieve a better fit, the acceptable way was to draw covariance lines to

error terms of the model, and the error should be drawn within the same construct's errors terms as avoiding theoretical concerns and maintain unidirectionality.

4.4. Research Hypothesis Testing Result

The importance of each variable was studied in terms of standardized path coefficient (β) and T-value. According to table 4, the outcomes showed that each hypothesis was backed. The results showed that each hypothesis was significantly supported when $p < .5$. In addition, Table 4 explained the Standardized Path Coefficients and T-values. Therefore, the details of the research hypothesis test were as follows: H1 had shown significant impact of SE on EN, this structural pathway results in the standard coefficient value of .666, and the t-value at 12.273***. H2 had presented significant impact of SE on PU with the standard coefficient value of .467, and the T-value at 8.721***. H3 had revealed that SE exerts crucial influence on PEOU with value of .709 of standard coefficient, and the T-value at 12.835***. H4 had the standard coefficient worth of .320 of which publicized essential influence of PEOU on PU, and the t-value at 6.639***. On the basis of the result of H5, the significant impact between PU and SA had exposed the standard coefficient worth of .947 which confirmed H5, and the T-value at 11.29***. H6 had the standard coefficient worth of .676 of which publicized significant influence of PU on CI, and the T-value at 9.338***. Per H7, SA on CI presented the worth of .479 on standard coefficient which confirmed the essential influence, and the T-value at 7.138***. Finally, H8 hypothesized that EN exerts a crucial influence on PL on the basis of the results of .999, and the T-value at 12.321***. In a word, the importance was verified H1, H2, H3, H5, H6, H7 as well as H8.

Table 4: Hypothesis Result of the SEM

Hypotheses	Paths	Standardized Path Coefficient (β)	T-value Tests	Results of Testing
H1	SE→EN	.666	12.273***	Supported
H2	SE→PU	.467	8.721***	Supported
H3	SE→PEOU	.709	12.835***	Supported
H4	PEOU→PU	.320	6.639***	Supported
H5	PU→SA	.947	11.29***	Supported
H6	PU→CI	.676	9.338***	Supported
H7	SA→CI	.479	7.138***	Supported
H8	EN→PL	.999	12.321***	Supported

Note: *** $p < .001$

Source: Constructed by the researcher

5. Conclusion and Recommendation

In the research, undergraduates of art and design major in a private university in Chengdu, Sichuan Province, China were selected as the target population of the research. This conceptual framework aimed to explore the effect of SE, EN, PU, PEOU together with SA on PL and CI in M-Learning. In his study, SPSS 24.0 version and AMOS 23.0 version were adopted to analyze the hypotheses in the conceptual framework. Questionnaires were distributed to 500 undergraduates majoring in art and design at Sichuan University of Media and Communications in Chengdu, China, who had at least one month of M-Learning experience. CFA was adopted to guarantee reliability, convergence together discriminant validity. What's more, SEM was employed to examine all hypotheses and verify the main influencing factors of PL and CI.

According to the outcome of the study on the factors that affect the PL as well as CI of the undergraduates majoring in art and design in Sichuan University of Media and Communications in Chengdu, China. Therefore, the following suggestions were specifically proposed by the researcher to improve students' PL and CI in M-Learning.

In addition, according to the specific characteristics of art and design courses, teachers should effectively integrate the teaching content of traditional classrooms and online learning platforms, take video content as auxiliary teaching, gradually improve the corresponding text, pictures and teaching content, and build a systematic teaching design. This teaching design can effectively reduce the learning difficulty of professional core courses, promote students' progress, and obtain satisfactory learning results. Therefore, university students' positive psychology of PEOU and PU of M-Learning would improve students' SA with M-Learning, and ultimately generate students' CI towards M-Learning.

In the future research could be carried out from the following aspects. Firstly, this research could be further replicated in public and private universities to obtain a more representative state of M-Learning in higher education institutions in Chengdu, China, so as to obtain more comprehensive research conclusions. Secondly, student demographic variables should be considered in future studies to compare results. These factors included age, previous online learning experience, traditional versus non-traditional learners, and online learning preferences. Thirdly, other forms of interaction should also be considered, such as learner interaction with technology, as well as learner autonomy, flexibility, and synchronous versus asynchronous forms of learning. Lastly, future investigations should also consider the impact of online learning support, the design of online courses, the knowledge of teachers, and the training of online instruction.

References

- [1] Bandura A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, N.J.: Prentice-Hall.
- [2] Davis F. D., Bagozzi R. P., & Warshaw P. R. (1989). *User acceptance of computer technology: A comparison of two theoretical models*. *Management science*, 35(8), 982-1003. [https://doi.org/ 10.1287/mnsc.35.8.982](https://doi.org/10.1287/mnsc.35.8.982)
- [3] Oberer B. & Erkollar A. (2013). *M-Learning in higher education: a marketing course design project in Austria*. *Procedia - Social and Behavioral Sciences*, 93, 2125-2129.
- [4] Li Y., Duan Y., Fu Z. & Alford P. (2012). *An empirical study on behavioural intention to reuse e-learning systems in rural china*. *British Journal of Educational Technology*, 43(6), 933-948.