



# Research on the Correlations among Mobile Learning Perception, Study Habits, and Continuous Learning

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In addition to the rapidly developed Internet information technology, the admission to secondary schools has changed from single entry to multiple entries, among which the performance of Basic Competence Test and at schools have replaced Joint University Programs Admissions System. Traditional instruction therefore could no longer cope with such rapidly changing educational environments that the instructional design and methods need to be largely updated in order to keep up with the demand of multiple entries. A teacher should thoroughly utilize computers and the Internet resources in the instruction for enhancing the teaching effect.

Students in Shanghai Open University are sampled for the questionnaire survey in this study. Total 500 copies of questionnaires are distributed. Having deducted invalid and incomplete ones, 344 copies are valid, with effective retrieval rate 69%. The results are summarized as below. 1. Mobile learning perception presents significantly positive correlations with study habits. 2. Study habits reveal remarkably positive correlations with continuous learning. 3. Mobile learning perception shows notably positive correlations with continuous learning. 4. Study habits appear mediation effects on the correlation between mobile learning perception and continuous learning. According to above results, suggestions are proposed in this study for the service or establishment of education contents, expecting to further help learners acquire knowledge.

*Keywords:* mobile learning, learning perception, study habits, continuous learning, Personality trait

## INTRODUCTION

In the approach of information age, new learning philosophy no longer stresses on the possession of information, but emphasizes the ability to integrate and analyze information. Some memory and storage tasks are organized with computers, while

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people will acquire the required data from abundant information. The development of Internet does not simply affect the society, but also presents great impact on school education.

The emergence of World Wide Web further expands the diversification and applicability of media application. With the emergence of global information, interaction among people is no longer restricted to time and space so that lots of people could learn distinct knowledge with the convenience. Future instruction focuses on cultivating students' abilities of collecting, analyzing, integrating, and applying information which is further transformed to create new knowledge.

For this reason, future education should be implemented in school education and daily life with science & technology and diversification (Ahmadi, 2014).

Although the advance of network technology actually results in great impact on educational environments, the rapid development of Internet information increases more interesting general information. However, the educational value is worth thinking deeply.

The Internet could provide positive and educational support, and it indeed reforms multimedia materials and promotes the education and creation mechanism. Students therefore could find out necessary data without visiting libraries or purchasing books that apparently presents the convenience of the Internet. Students from the world could share the learning experiences on the Internet. In order to have students' learning be more efficient and interesting, a teacher could provide different teaching methods from traditional instruction and offer students with brighter and diversified instructional information through various dynamic teaching resources on the Internet to promote the learning interests. For this reason, it is considerably important to allow students learning without being restricted to time and places. In addition to formal learning environments, the combination with informal learning environments is proposed in this study. Edwardset al. (2014) indicated that mobile phones were suitable for the fast learning of adults in short time or the lifelong and informal learning environments; such mobile learning revealed that learners could ubiquitously proceeding learning with personal mobile phone or personal digital assistant (PDA). Mobile learning therefore could be defined as any services or devices offering electronic information and education contents to further help learners acquire knowledge without being restricted to time and places.

### ***State of the literature***

- It is considerably important to allow students learning without being restricted to time and places. In addition to formal learning environments, the combination with informal learning environments is proposed in this study.
- Mobile phones were suitable for the fast learning of adults in short time or the lifelong and informal learning environments; such mobile learning revealed that learners could ubiquitously proceeding learning with personal mobile phone or personal digital assistant (PDA).
- The difference between continuous learning intention or behaviors and study habits and indicated that study habits were individual frequent learning behaviors at the stage, while continuous learning was the future activity.

### ***Contribution of this paper to the literature***

- The establishment of indicators is related to the direction of the information education. Formulating teachers' information literacy key indicators therefore allow teachers setting goals with the reference standard of indicators to indirectly enhance the information literacy.
- More vivid design, such as color frames and sound or pictures at scanning or being scanning, could be added in mobile learning to reinforce the ease of use for students engaging in mobile learning.
- It is suggested to frequently promote activities combined with mobile learning so that the students would unconsciously precede mobile learning when seeing the activity information. It could enhance the students' continuance of mobile learning.

## LITERATURE REVIEW

### Mobile learning perception

Considering the research on technology and informal learning environments, e-learning and mobile learning are often discussed. Eishani et al. (2014) defined mobile learning as the learning process through mobile computing equipment. Johnson et al. (2013) proposed the similar opinion that mobile learning could combine learning and daily life, as mobile computing technology could be applied to enhance learning and allow learners participating in learning without being restricted to time and places. Murre et al. (2015) pointed out mobile learning as tasks or equipment ubiquitously providing learners with general digital message and education contents and helping learners acquire knowledge. Bergmann & Sams (2012) also regarded the characteristics of mobile devices, including portability of small size and light weight, wireless function for practice at any time without solid lines, and use mobility. Peterson & Rutledge (2014) also considered the mobility of mobile learning being able to highlight the advantage of learning strategy. Peterson & Rutledge (2014) particularly concerned about the primary role of mobility in mobile learning. In sum, Mobile learning, as the opinion of Poon et al. (2012), does not simply mean digitalization but also present mobility without being restricted to time and space. Similar to Staddon's point of view (2014), mobile devices offer users with short-term learning opportunities; in comparison with e-learning which is restricted to learning environments, the handy mobile learning equipment allows learners easily acquiring learning information, enhancing informal learning opportunities, and solving the problem of inadequate time for formal learning. Mobile learning is defined in this study as users using mobile devices with wireless network for acquiring knowledge without being restricted to time and places to immediately and effectively achieve the learning effect.

According to Lin's (2012) Technology Acceptance Model extended from Theory of Reasoned Action, the dimensions for mobile learning perception in this study are organized as below.

(1) Perceived Usefulness. Perceived usefulness is defined as user perception of enhancing the job performance or learning performance with specific information systems in an organization environment. Besides, users with higher perceived usefulness of the information system would present more positive attitudes towards the system and higher intention to use the information system.

(2) Perceived Ease of Use. Perceived ease of use is referred to users perceiving the ease of applying certain information system to the learning. Moreover, an individual perceiving the ease of operation and use of information products would further prefer to use such information products and consider the information products being helpful for the task.

### Study habits

Study habits are generally comprehended as the repeated learning to become automatic reaction being able to acquire certain objectives or final status (Gunjan, 2012). Habits need to be learnt; compared to reflection, study habits are not innate, but present individual learning reaction to certain stimuli (Argote & Linda, 2012). Study habits are resulted from repeated reaction, which could be simultaneously proceeded with other activities (Kashefi et al., 2012). In this case, study habits are automatically executed, without purposive attention. When learning behaviors become habit-oriented, people do not need to consider too much, i.e. the behavior without thinking (Braisby et al., 2012), and the attention to execution would be reduced (Naghavi1 & Redzuan, 2012). Once habits are established, learning

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behaviors would be automatically executed (Shahtalebi & Javadi, 2014), and users merely need to pay some conscious attention and the least mental efforts (Siemens, 2014). Mahasneh (2013) proposed the following characteristics to form habits. (1) Habits needed to be learnt. (2) Study habits were the automatic reaction under specific situations or stimuli and were restricted to certain area. (3) Study habits occurred in repeated reaction. (4) Study habits were automatic reaction to perception, allowing people making quick responses or paying less attention to similar activities. (5) Study habits were automatic behaviors reacted based on individual past experiences. Accordingly, study habits, under mobile learning, was defined as “learners’ preference and tendency to the prior mobile learning use behaviors (Siemens, 2014).

Referring to Mahasneh (2013), the following dimensions for study habits are applied to this study.

(1) Personality trait: The idea comes from individual perception of reinforcement and internal reinforcement. In other words, the factor in individual learning lies in individual belief in the reinforcement being resulted from personal behaviors beyond rewards and punishments.

(2) Self-concept: It is a kind of individual perception model, which generates the perception of self-experience through introspection or feedback from others; such perception would affect individual confidence and the social interaction behaviors.

(3) Learning motivation: Effective learning could result in achievement. In regard to learning effect, motivation plays a critical role in the learning process.

## **Continuous learning**

Users would be affected the intention to use mobile learning again after the first use. Such a process is similar to consumers’ repurchase intention being influenced by the first purchase experience. In other words, the decision making for “continuous learning” and “repurchase” is similar (Averell et al., 2011). The idea of continuance was originated from consumers’ repurchase behaviors in Oliver’s Expectation Confirmation Theory in marketing studies (Chopra & Nangru, 2013). Hamdi et al. (2015) considered that consumers would compare the expectation before product purchase with the actual perception after purchase to judge the overall perception of the product for the future reference of continuous purchase. Kassim (2013) pointed out the similar decision-making process between consumers’ repurchase behaviors and users’ continuance of mobile learning and modified a part of the theory to propose a post-acceptance model of IS continuance. Past research on the acceptance of learning with information systems utilized continuance intention for predicting and explaining users’ continuous behaviors of learning with information systems.

Regarding the measurement of continuance of mobile learning, most researchers applied two measuring items proposed by Kolb (2015), including users’ acceptance to follow the initial decision and the intention to change other similar services in the process. A reverse question was added to reach the minimum standard of dimensions. Such measuring items are therefore used in this study.

## **Research hypothesis**

Huang et al. (2010) indicated that users’ continuance intention after using mobile learning was affected by the perceived usefulness and satisfaction with the mobile learning. Kolb & Kolb (2011) pointed out the correlation between perceived usefulness and consumers’ decision to revisit mobile learning. Other researchers also proved the explanatory power of perceived usefulness to continuous learning intention (Osredkar, 2012). Shahtalebi et al. (2011) proposed the significant effects

of perceived ease of use and perceived usefulness on continuous learning. Mann et al. (2015) pointed out the remarkable effects of perceived ease of use on users' continuance intention of mobile learning.

March et al. (2011) considered the notable effect of perceived usefulness on users' study habits in the continuance of mobile learning and advocated that the continuance intention of mobile learning was driven by perceived usefulness, perceived enjoyment, and automatic behaviors perceived by the two; it explained the relationship between study habits and continuous learning. Past research proved that study habits would enhance the continuity of existing learning behaviors (Skinner et al., 2011) and could effectively predict repeated learning behaviors (Truman, 2011). Tsai & Lee (2014) emphasized the difference between continuous learning intention or behaviors and study habits and indicated that study habits were individual frequent learning behaviors at the stage, while continuous learning was the future activity. Yi et al. (2011) regarded study habits as the antecedent of learning intention. Researchers proved that study habits and perceived usefulness would affect consumers' continuance of mobile learning. According to above inference, the following hypotheses are further proposed in this study.

*H1: Mobile learning perception presents remarkably positive correlations with study habits*

*H2: Study habits show notably positive correlations with continuous learning.*

*H3: Mobile learning perception reveals significantly positive correlations with continuous learning.*

*H4: Study habits appear mediation effects on the correlation between mobile learning perception and continuous learning.*

## **METHODOLOGY**

### **Research subject**

Students in Shanghai Open University are sampled for being distributed 500 copies of questionnaire. Having deducted invalid and incomplete ones, total 344 copies are valid, with the effective retrieval rate 69%. Universities in Mainland China opening distance education courses used to be called "radio and TV universities". Based on Radio and TV University, a national open university was formally established at Great Hall of the People on July 31, 2012. Afterwards, radio and TV universities were established in various provinces, such as Beijing Open University, Shanghai Open University, Jiangsu Open University, Yunnan Open University, and The Open University of Guangdong. Total 68 universities have established network education institutes for certificate curricula, which students could precede mobile learning through the Internet. Students in Shanghai Open University are therefore selected for the questionnaire survey.

### **Analysis method**

Regression Analysis is applied to understand the correlations among mobile learning perception, study habits, and continuous learning, and Hierarchical Regression is used for testing the mediation effect of study habits on mobile learning perception and continuous learning.

## **EMPIRICAL DATA AND ANALYSIS**

### **Factor Analysis of mobile learning perception**

The mobile learning perception scale is extracted, with Factor Analysis, two factors of Perceived Usefulness (eigenvalue=3.263,  $\alpha=0.86$ ) and Perceived Ease of

Use (eigenvalue=2.891,  $\alpha=0.82$ ). The accumulative covariance explained reaches 82.463%.

The study habit scale is extracted, with Factor Analysis, three factors of Personality Trait (eigenvalue=2.572,  $\alpha=0.83$ ), Self-concept (eigenvalue=2.137,  $\alpha=0.88$ ), and Learning Motivation (eigenvalue=1.934,  $\alpha=0.81$ ). The accumulative covariance explained achieves 80.534%.

The accumulative covariance explained of continuous learning, with Factor Analysis (eigenvalue=2.633,  $\alpha=0.87$ ), reaches 86.227%.

## RESULTS AND DISCUSSION

### Correlation analysis of mobile learning perception and study habits

Applying Regression Analysis to test the hypothesis and the theoretical structure, the first regression, Table 1, reveal the significance of the regression equation ( $F=13.753$ ,  $p<0.001$ ). Mobile learning perception appears remarkable effects on personality trait, where Perceived Usefulness and Perceived Ease of Use in mobile learning perception present notably positive effects on personality trait in study habits, with the significance ( $\beta=1.738$ ,  $p<0.05$ ,  $\beta=1.866$ ,  $p<0.05$ ).

The second regression, Table 1, shows the significance of the regression equation ( $F=16.842$ ,  $p<0.001$ ). Mobile learning perception reveals significant effects on self-concept, where Perceived Usefulness and Perceived Ease of Use in mobile learning perception show remarkably positive effects on self-concept in study habits, with the significance ( $\beta=2.122$ ,  $p<0.01$ ,  $\beta=2.327$ ,  $p<0.01$ ).

The third regression, Table 1, appears the significance of the regression equation ( $F=21.396$ ,  $p<0.001$ ). Mobile learning perception presents notable effects on learning motivation, where Perceived Usefulness and Perceived Ease of Use in mobile learning perception present significantly positive effects on learning motivation in study habits, with the significance ( $\beta=2.241$ ,  $p<0.001$ ,  $\beta=2.463$ ,  $p<0.001$ ). As a result, H1 is supported.

**Table 1.** Regression Analysis of mobile learning perception and study habits

Independent variable↓	Dependent variable→		Study habits			
	Personality trait		Self-concept		Learning motivation	
	$\beta$	$\rho$	$\beta$	$\rho$	$\beta$	$\rho$
Mobile learning perception						
Perceived Usefulness	1.738*	0.023	2.122**	0.002	2.241**	0.000
Perceived Ease of Use	1.866*	0.019	2.327**	0.000	2.463**	0.000
F	13.753		16.842		21.396	
P	0.000***		0.000***		0.000***	
R2	0.186		0.217		0.253	
Adjusted R2	0.016		0.023		0.027	

Note: \* stands for  $p<0.05$ , \*\* for  $p<0.01$ , \*\*\* for  $p<0.001$ .

### Correlation Analysis of mobile learning perception, study habits and continuous learning

Utilizing Regression Analysis for testing the hypothesis and the theoretical structure, the first regression, Table 2, shows the significance of the regression equation ( $F=19.623$ ,  $p<0.001$ ). Mobile learning perception reveals remarkable effects on continuous learning, where Perceived Usefulness and Perceived Ease of Use in mobile learning perception appear notably positive effects on continuous learning, with the significance ( $\beta=2.517$ ,  $p<0.001$ ,  $\beta=2.335$ ,  $p<0.001$ ). H2 is therefore supported.

The second regression, Table 2, presents the significance of the regression equation ( $F=27.534$ ,  $p<0.001$ ). Study habits show remarkable effects on continuous

learning, where Personality Trait, Self-concept, and Learning Motivation in study habits reveal notably positive effects on continuous learning, with the significance ( $\beta = 2.276, p < 0.01, \beta = 2.134, p < 0.001, \beta = 2.315, p < 0.001$ ). Consequently, H3 is supported.

**Table 2.**Regression Analysis of mobile learning perception, study habits and continuous learning

Dependent variable→	Continuous learning			
Independent variable↓				
Mobile learning perception	$\beta$	$\rho$	$\beta$	$\rho$
Perceived Usefulness	2.517**	0.000		
Perceived Ease of Use	2.335**	0.000		
Study habits				
Personality trait			2.276**	0.000
Self-concept			2.134**	0.000
Learning motivation			2.315**	0.000
F		19.623		27.534
P		0.000***		0.000***
R2		0.194		0.232
Adjusted R2		0.017		0.021

Note: \* stands for  $p < 0.05$ , \*\* for  $p < 0.01$ , \*\*\* for  $p < 0.001$ .

### Mediation effects of study habits on the correlation between mobile learning perception and continuous learning

Regarding the mediation effect of study habits, Hierarchical Regression Analysis in Table 3 reveals the significant explanation of mobile learning perception and study habits on continuous learning ( $F = 36.158, p < 0.001$ ). According to Model 2 and considering the effects of mobile learning perception and study habits on continuous learning to discuss the mediation effect of study habits,  $\beta$  of Perceived Usefulness remarkably drops from 2.517 ( $p < 0.001$ ) to 2.133 ( $p < 0.01$ ), presenting that study habits would reduce the direct effect of Perceived Usefulness on continuous learning. Second,  $\beta$  of Perceived Ease of Use notably drops from 2.335 ( $p < 0.001$ ) to 2.083 ( $p < 0.001$ ), showing that study habits would weaken the direct effects of Perceived Ease of Use on continuous learning. Apparently, study habits appear mediation effects on the correlation between mobile learning perception and continuous learning that H4 is supported.

**Table 3.** Hierarchical Regression of mobile learning perception, study habits and continuous learning

Dependent variable→	Continuous learning			
	Model 1		Model 2	
Independent variable↓	$\beta$	$\rho$	$\beta$	$\rho$
Mobile learning perception				
Perceived Usefulness	2.517**	0.000	2.133**	0.000
Perceived Ease of Use	2.335**	0.000	2.083**	0.001
Study habits				
Personality trait			2.215**	0.000
Self-concept			2.244**	0.000
Learning motivation			2.183**	0.000
F		19.623		36.158
P		0.000***		0.000***
R2		0.194		0.373
Adjusted R2		0.017		0.032

Note: \* stands for  $p < 0.05$ , \*\* for  $p < 0.01$ , \*\*\* for  $p < 0.001$ .

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## CONCLUSIONS

The research results reveal notable effects of mobile learning perception on study habits and continuous learning that students would present higher continuance intention of mobile learning when they perceive the usefulness of mobile learning. Moreover, study habits would enhance the continuity of existing behaviors and could effectively predict the repetition of personal behaviors. In other words, the more students get used to use mobile learning, the less doubt to use it in the future that the continuous learning would be enhanced.

Aiming at the research results, the following suggestions are proposed as following.

1. Broadly applying mobile learning to learning activities: In mobile learning and traditional learning situations, mobile learning, presenting convenience, short contents, and recording and reminder functions, allows learners in the mobile learning environment reviewing lessons at any time and utilizing free time for learning without being restricted to time and space. In this case, it shows great help on the promotion of learning effect. Future research therefore could apply mobile learning to learning activities.

2. Properly establishing reward standards: More vivid design, such as color frames and sound or pictures at scanning or being scanning, could be added in mobile learning to reinforce the ease of use for students engaging in mobile learning. Besides, reducing text descriptions and increasing animation or sound play allow the students not focusing on the screen during learning, but scanning and listening to the interpretation at the same time. It therefore reinforces the usefulness of mobile learning for users.

3. It is suggested to frequently promote activities combined with mobile learning so that the students would unconsciously precede mobile learning when seeing the activity information. It could enhance the students' continuance of mobile learning.

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