

A Research on Factors Influencing Online Education Users' Continuance Usage Intention

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Abstract

With the rapid development of Internet and mobile Internet technology, and the popularization of intelligent terminal and high speed Internet service, online learning as a new educational mode gradually gains its popularity. The purpose of this paper is to study the influencing factors of users' continuance usage intention in online education platform. Based on the Expectation Confirmation Model (ECM) of information system and the Technology Acceptance Model (TAM), the theoretical model of the influencing factors of user's intention to use continuously is constructed. The SEM analysis method is used to verify the validity of the model. According to the results, users' continuance intention model built demonstrates acceptable model fit, which indicates the assumed path relationship accords with the data collected. *User satisfaction, perceived usefulness, perceived ease of use* and *social influence* are factors directly influencing the *users' continuance usage intention*.

Keywords: Online education, User behavioral, Continuance usage intention, SEM

1. Introduction

Nowadays, with the innovation and development of Internet application technology and application services, the trend of online learning and mobile learning is becoming more and more obvious, and the market scale of online education industry in China is growing rapidly. Many Internet enterprises have set foot in the online education industry, such as Baidu, Tencent, Alibaba and other Internet giants. It fully confirmed that online education is the industrial commanding point for the education industry in the future, which contains huge commercial value. On the other hand, many traditional education and training institutions rely on profound educational industry resources and operational experience, one after another, to layout online education service, with the purpose of joining the ranks of online education industry.

At present, there are more than a dozen famous online education platforms in China. Under the competitive situation, whether the online education platforms can achieve their expected commercial value depends on whether they can effectively seize the user market. In order to effectively reduce the wastage rate of registered users, and improve the users' usage stickiness, it is necessary to deeply analyze the factors that affect the users' sustainable use behavior in the online education platform. And then we can formulate the corresponding strategies to improve the users' willingness to use continuously and enhance the users' stickiness.

2. Literature review

To be sure, the initial adoption of online education by users is the first step for an online education platform to reach potential users. But users' willingness to keep using their chosen platform is the key to the online education platform's ability to truly leverage its commercial and educational value. So we focus on reviewing the relevant research on continuance usage intention.

Based on the Technology Acceptance Model (Davis, 1989), User Information Satisfaction Theory and Expectancy Disconfirmation Theory, a study on the behavior intention of continuous use of e-learning was carried out. Through empirical analysis of 172 sample data collected, the study concluded that the continuance intention of e-learning is mainly determined by the following factors: *perceived usefulness, information quality, system quality, service quality* and *expected confirmation, satisfaction* (Roca, Chiu & Martínez, 2006).

An extended expectation confirmation model is proposed by Ming-Chi Lee (2010) who integrates the Expectation Confirmation Model (Bhattacharjee, 2001), the Initial Technology Acceptance Model, the Planning Behavior Theory. Based on 363 user sample data collected, the empirical analysis shows that *satisfaction* has the greatest effect on users' continuous use intention. Some other factors with certain influence are *perceived usefulness, attitude, concentration, subjective norm*.

Kan-Min Lin (2011) extends the expectation confirmation model from a negative perspective by introducing the *frequency of negative critical events* of e-learning experience and the *ease of perception*. The *user's experience* has a significant effect on the adjustment of other latent variables in the model, but the users with less online learning experience have higher satisfaction with the use of the online learning

Lin & Wang (2012) integrated expectation confirmation model, task technology fit model (Goodhue & Thompson, 1995) and IS Success Model (DeLone & McLean, 2003). Based on a questionnaire survey of 88

students in the online learning system, it was found that *perceived fit* and *system factor* were the key factors affecting the degree of user expectation confirmation. Perceived usefulness and system use satisfaction have a key impact on the user's intention to use continuously.

In addition, Erdemir et al. (2016) analyzed the factors influencing the users' satisfaction of online education system through an empirical study. They found that *perceived flexibility*, *perceived security* and *perceived security* are the key factors that affect users' satisfaction.

Because of the convenience of the research, most of the empirical data in the present study come from the student group, the sample population is narrow, and the conclusion is not universal. Perhaps because the research data are difficult to collect, research on the sustainable use behavior of commercial online education platform users has not yet appeared.

In order to fill in the gaps in the existing research on the users' behavior of commercial online education platform, we carry out a research on factors influencing online education users' continuance usage intention in China. Based on the good cooperative relationship with *Hujiang online school* (a well-known online education platform in China), the users are investigated on a large scale with the help of *Hujiang online school*.

3. Conceptual model and hypotheses

This paper aims to interpret impact factors that affect users' continuance usage intention of commercial online education platform. The theoretical model is constructed based on *Expectation Confirmation Model* (ECM) of information system and the *Technology Acceptance Model* (TAM) (Figure 1).

3.1 Continuance Usage Intention

In this study context, the user's *continuance usage intention* (CUI) is defined as continuing to use the selected online education platform for online learning. The level of is not only the expression of users' perception of whether they will often use the selected online education platform in the future, but also whether users are loyal to it. The *continuance usage intention* is the core dependent variable of the study, which is directly or indirectly affected by other potential variables. The measurement of the user's *continuance usage intention* will be measured in terms of whether the user has the will to continue to use it, whether it will be used frequently, and whether he or she is willing to recommend the platform he uses to others.

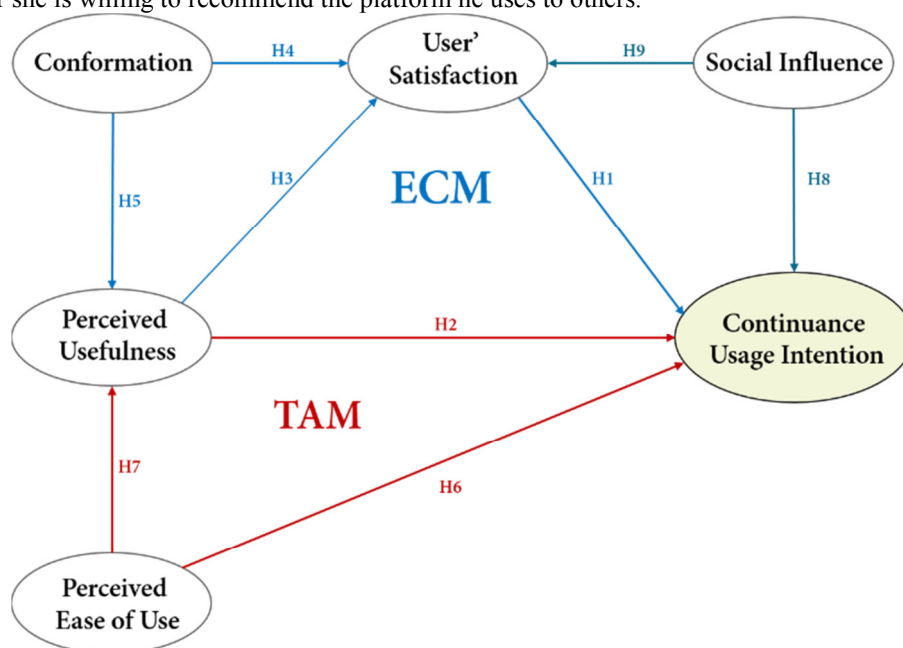


Figure 1. Theoretical model of impact factors for users' continuance usage intention

3.2 User Satisfaction

In the Expectation Confirmation Model (ECM), Bhattacharjee (2010) and subsequent research have confirmed that satisfaction is the main factor determining the user's continuous use intention. In this study context, *user satisfaction* (US) refers to the overall evaluation of user experience and use effect after the use of online education platform. Many studies have confirmed that *satisfaction* is an important indicator of the continuing use intention of online learners (Lee et al, 2010; Yang Genfu, 2016). The measurement of *user satisfaction* is situational adaptation based on the previous research maturity scale.

The more satisfied the user is on experience of the online education platform used by the user, the stronger

the intention of its continuous use of the platform. Hence, we put forward a hypothesis:

H1: User satisfaction has a significant positive effect on the continuance usage intention.

3.3 Perceived Usefulness

In this study, *perceived usefulness* (PU) refers to the perceived degree of usefulness of the online education platform to improve their learning performance when the user uses it. *Perceived usefulness* can not only influence the initial adoption of information system by users, but also affect the user satisfaction with use and the intention of continuous use.

Many studies on MOOC situation have proved that *perceived usefulness* can not only directly affect the user's intention to use continuously, but also indirectly influence it by influencing the user satisfaction. On the contrary, if the user's learning performance is not good after using the online education platform, it will produce negative evaluation on the platform used, and then affect the overall evaluation of the satisfaction with the use experience, and reduce their willingness to use continuously. Based on this, this study proposes the following hypotheses:

H2: Perceived usefulness has a significant positive effect on the continuance usage intention.

H3: Perceived usefulness has a significant positive effect on user satisfaction.

3.4 Conformation

Bhattacharjee (2001) defines *conformation* (CF) as the level of confirmation that the information system user expects to obtain after the use of the information system before the use of it. In this study context, the confirmation refers to the degree of confirmation that the users make before the use of the education platform. In the expectation confirmation model, the *confirmation* is the key factor that directly affects the user's perceived usefulness and user satisfaction. The higher the user's pre-expected confirmation degree is, the higher the satisfaction evaluation will be for the use of online education platform. And the more they find it useful to use an online education platform. Therefore, The following assumptions are made:

H4: User confirmation had a significant positive effect on user satisfaction.

H5: User confirmation has a significant positive impact on perceived usefulness.

3.5 Perceived ease of use

Davis (1989) defines *perceived ease of use* (PEU) as the perceived ease of use of a certain information system, and considers that it has a significant positive impact on the perceived usefulness and use intention. In this research context, *perceived ease of use* refers to users' perception of the ease of use of the online education platform. In the Internet era, when users feel that it is easier to operate and learn more easily when they use an online education platform, their willingness to continue to use it may be enhanced, and the more fully the functional value of the platform can be fully explored. Thus, two hypotheses are put forward:

H6: User perceived ease of use has a significant positive impact on continuance useage intention.

H7: User perceived ease of use has a significant positive impact on perceived usefulness.

3.6 Social influence

social influence (SI) is new variable added in our theoretical model. In this study context, *social influence* (SI) means that users are influenced by the advice and behavior of some important related people (teachers, classmates, friends, etc.) when they choose to use an online education platform. In addition, this study suggests that when users choose to use a certain platform when they are advised by important people around them, their satisfaction may be improved because of the influence of social factors. Therefore, this study proposes the following hypotheses:

H8: Social influence have significant positive effects on continuance useage intention.

H9: Social influence have significant positive effects on user satisfaction.

4. Data and methodology

4.1 Data collection and sample characteristics

The data for this study were collected by a web survey of users of the Huijiang online school (<http://class.huijiang.com>) between August and September 2016. In order to measure the conceptual model, we designed 21 items measured on five-point Likert scales requesting the respondents. A total of 554 valid questionnaires were received. In order to ensure the validity of questionnaires, 14 sample data with no difference were removed from the remaining 554 questionnaires by manual identification. Finally, through cleaning the sample data, 540 valid data samples for empirical analysis were obtained from 554 questionnaires, and the effective rate of sample recovery was 97.5%.

540 interviewees showed the characteristics of being young and highly educated, most of whom were middle and low income students and white-collar workers. This coincides with the characteristics of online

education users, who are mostly students, parents, working people, younger and more educated people, as found in the "online Education user behavior Survey report 2015" released by *Sina Education*. It shows that the sample data of this survey is more representative.

4.2 Data analysis methods

In this study, structural equation modeling (SEM) was used. SEM is a combination of confirmatory factor analysis and path analysis. To test the reliability and validity of the questionnaire instrument, factor analysis and reliability test function in SPSS22.0 were used.

5. Data analysis results

Reliability of questionnaire was assessed with *Composite Reliability* (CR) and *Item Loadings*(IL). If the value of CR reached 0.7 or above, and the value of IL reached 0.5 or above, the measurement model had good reliability. Convergent validity was assessed with CR, IL and *Average Variance Extracted* (AVE). If the value of CR reached 0.7 or above, and the value of IL and AVE both reached 0.5 or above, the measurement model has good convergence validity. As shown in Table 1, all indicators met the standard. It indicates that the measurement model in this study had good reliability and convergent validity.

Table 1. Item Loadings, AVE, Composite Reliability on the model constructs

Items	Perceived Usefulness	User Satisfaction	Social Influence	Perceived Ease of Use	Conformation	Continuance Usage Intention
PE1	0.792					
PE4	0.787					
PE2	0.753					
PE3	0.738					
US2		0.844				
US4		0.812				
US1		0.767				
US3		0.765				
SI3			0.869			
SI2			0.856			
SI4			0.672			
SI1			0.640			
PEU2				0.835		
PEU3				0.798		
PEU1				0.790		
CF2					0.817	
CF1					0.796	
CF3					0.772	
CUI2						0.859
CUI1						0.790
CUI3						0.722
AVE	0.560	0.578	0.581	0.701	0.514	0.573
Composite Reliability	0.835	0.845	0.845	0.876	0.760	0.799

Furthermore, as shown in Table 2, the average variance extracted (AVE) square root value for each latent variable was greater than the correlation coefficient with other variables. Hence, the measurement model has good discriminant validity.

Table 2. Discriminant Validity of the Model Constructs

Latent Variables	PU	US	SI	PEU	CF	CUI
PU	0.749					
US	0.297	0.760				
SI	0.295	0.642	0.762			
PEU	0.387	0.198	0.283	0.837		
CF	0.344	0.193	0.219	0.140	0.717	
CUI	0.308	0.298	0.310	0.299	0.198	0.757

Note: The numbers in bold represent the square root of the AVEs.

Table 3 shows that the fitting parameters ($\chi^2 /df= 2.496$, RMSEA= 0.588, CFI=0.924, GFI=0.912) are up to or close to the evaluation standard, which indicates that the model put forward in this study is a good fit. AMOS 21.0 is used to verify the assumed causal relationship between latent variables, and to perform the significance

test of path coefficients.

Table 3. Model Fit Parameter

Model Fit Index	Absolute Fit Index			Parsimony-Adjusted Index		Relative Fit Index	
	χ^2/df	GFI	RMSEA	PNFI	PGFI	NFI	CFI
Evaluation Standard	<3	>0.9	<0.8	>0.5	>0.5	>0.9	>0.9
Current Model	2.496	0.912	0.588	0.677	0.712	0.896	0.924
Fitness Result	Good	Good	Good	Good	Good	General	Good

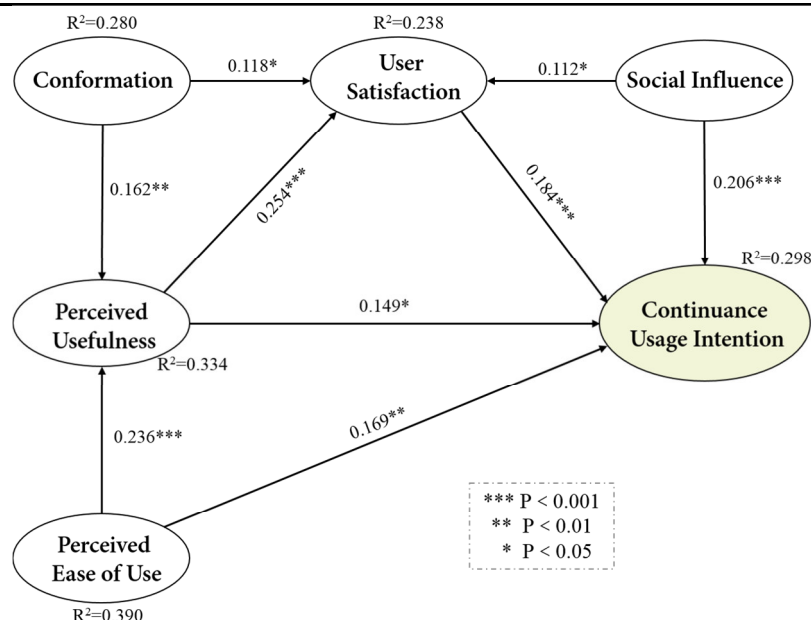


Figure 2. Model hypothesis test and path analysis result

The test results of path coefficients (Figure 2) show that four variables have significant positive direct effects on user's continuance usage intention. *Social influence*, with a standardized coefficient (β) of 0.206*** ($P < 0.001$), has the strongest influence on continuance usage intention. *User satisfaction* ($\beta = 0.184***$), *perceived ease of use* ($\beta = 0.169**$) and *perceived usefulness* ($\beta = 0.149*$) also have a significant (though not very strong) positive influence on user's continuance usage intention. Therefore, H1, H2, H6, H8 are all proved.

What's more, *perceived usefulness* ($\beta = 0.254***$, very significant), *confirmation* ($\beta = 0.118*$), *social influence* ($\beta = 0.112*$) has a significant positive effect on *user satisfaction*. Therefore, H3, H4 and H9 are all proved. As we can see from this, *perceived usefulness* is the key influencing factor of *user satisfaction*. In addition, hypothesis 7 of that user *perceived ease of use* ($\beta = 0.236***$) has a significant positive impact on *perceived usefulness*, is very significantly proved.

6. Discussion and Conclusion

According to the results, user satisfaction, perceived usefulness, perceived ease of use and social influence are factors directly influencing the users' continuance usage intention. Therefore, it is suggested that during the development of the online education platform, attention should be paid to improving the user experience. In order to improve the users' sense of usefulness and satisfaction, and then improve the users' use stickiness, the platforms can improve the usability design of system by providing high-quality content and services, after the learners have registered as users of the platform.

In addition, in the process of operation, the online education platform should also pay attention to the marketing and publicity of the platform, play a positive role in community influence, and enhance the users' trust and satisfaction with the platform. In order to achieve the platform's educational function and commercial value, it is very necessary to cultivate more potential sticky users.

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Notes

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