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Factors Affecting Students' Continuous Intention to Use Online Art Education Software in Chengdu, China

Fangrui Chen*, Satha Phongsatha

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Abstract

Purpose: This study aims to explore the analysis of factors influencing the continuous use of online art education software by private art education institutions in Chengdu, Sichuan Province, China. The conceptual framework is based on TAM, and IS success model, indicating the relationship between self-efficacy, perceived ease of use, perceived usefulness, attitude, satisfaction, information quality, and continuous intention to use. **Research design, data, and methodology:** The researchers used quantitative methods (n=500) to distribute questionnaires to students at three private fine arts institutions. Confirmatory factor analysis (CFA) and a structural equation model (SEM) were used for data analysis, including model fitting, reliability, and validity of the structure. **Results:** The results indicate that satisfaction and attitude are significant factors affecting the continuous use intention of online art education software. Perceived ease of use has the most significant effect on perceived usefulness. Among them, the perceived usefulness and perceived ease of use significantly affect the attitude. Furthermore, information quality significantly impacts students' satisfaction with using online art education software. However, self-efficacy has no significant effect on perceived ease of use. **Conclusions:** Therefore, this study suggests that educators should create a more suitable learning platform for combining technology and art in the course design and teaching of online art education software.

Keywords: Online Art Education, Self-Efficacy, Continuous Intention to Use, Technology Adoption, TAM

JEL Classification Code: M15, M21, M31, P23

1. Introduction

Online education has become an important way for people to continue learning. It is an important tool for establishing a lifelong education system and a learning society. Currently, China's network art education is still in the period of exploration and development, with more reference cases. The online art education APP and other products are mainly based on the business capital management mode. There are many difficulties in the development mode of online art education. Technical problems and teacher problems existing in the online education industry are the key factors affecting the continuous use willingness of users in the online education industry. In China, the mainstream users of online art education are teenagers and children. Due to their younger age and weak self-efficacy, such users often need help

1*Fangrui Chen, Ph.D. Candidate in Technology, Education and Management, Graduate School of Business and Advanced Technology Management, Assumption University. Email: 1033379907@qq.com
2 Satha Phongsatha, Program Director, M.Ed. in Teaching and Technology, Graduate School of Business and Advanced Technology Management, Assumption University. Email: sathaphn@au.edu

learning online art. It is necessary to study the relevant influencing factors from the perspective of students' intention to continuously use online art education software, which is also an area to explore in online art education research. The researchers constructed conceptual models and related variables by summarizing previous studies. A survey questionnaire was used to collect the data. Through the study and analysis of the data, the factors affecting the students' intention to make continuous use of the online art education software were determined, and conclusions were drawn. This study details the factors influencing the willingness of adolescents, art high school candidates, and adult art lovers to use online art education software continuously. This research contributes to online art education software course developers and the highest managers of higher education institutions to determine the influence of users continue to use online art education software will include variables, which can be applied to projects, investments and make full use of online art education software development and perfect, to create a more appropriate art learning platform for student users. This paper's main purpose is to study the factors influencing the continuous use intention of online art education software in private art education institutions in Chengdu, Sichuan Province.

The conceptual research framework employs two core theories: the technology acceptance model or TAM by Davis et al. (1989), and DeLone and McLean Information Systems (IS) Success Model, which are self-efficacy, satisfaction, persistent intention behavioral intentions, and the quality of information used in the IS success model. Fokides (2017) studied the factors that influence the willingness of pre-working Greek teachers to use computers when becoming practicing teachers. The extended TAM theoretical model was used for estimation and testing. The researchers selected the four variables involved in the study that could influence behavioral intent: self-efficacy, perceived ease of use, perceived usefulness, and attitude. The study constructed the following predictors: attitude and satisfaction were determinants of continued use intention. Based on the previous findings above, the investigators believe that self-efficacy, perceived ease of use, perceived usefulness, satisfaction, attitude, and quality of information influence user intention to continuously use online art education software.

2. Literature Review

2.1 Self-efficiency

The self-efficacy of computers originates from the concept of self-efficacy. The latter refers to a person's belief in his or her ability to perform specific tasks (Bandura, 1977), while the former refers to the degree to which a person believes that he or she can perform a specific task using a computer (Compeau & Higgins, 1999). Self-efficacy plays an essential role in electronic technology because the more self-efficacy consumers feel about a piece of software, the higher their expectations will be (Venkatesh & Davis, 2000). Research on the effect of self-efficacy on computer use and error situations has demonstrated the effect of self-efficacy on user technology acceptance (Meuter et al., 2005). Lewis et al. (2003) found that self-efficacy positively impacted the perceived ease of use of technology systems. Therefore, this study proposes:

H1: Self-efficacy has a significant influence on perceived ease of use of online art education.

2.2 Perceived Ease of Use

Perceived ease of use refers to the extent that users think the technology is not very laborious (Davis et al., 1989). Perceived ease of use means that users have higher ease of using the technology and more opportunities to benefit from the tool's performance (Agrebi & Jallais, 2015). The perceived ease of use is the ease of using new technologies to address some of these difficulties (Lee, 2006). Perceived ease of use can also be understood as the degree of physical and mental freedom people feel when using some relevant systems engineering (Suki, 2011). According to the research, it is found that perceived ease of use is the fundamental key factor of individual emotion. The easier it is for users to achieve their goals, the more likely they will rely on and continue to use the system (Didyasarin et al., 2017). Davis et al. (1989) confirmed the casual relationship between perceived ease of use and perceived usefulness. Li et al. (2012) agreed that perceived ease of use significantly influences attitude. Thus, hypotheses are indicated:

H2: Perceived ease of use has a significant influence on perceived usefulness of online art education.

H3: Perceived ease of use has a significant influence on attitude toward online art education.

2.3 Perceived Usefulness

The study found that perceived usefulness played a significant role in individuals' willingness to use new technology (Wu & Zhang, 2014). In other words, attitude is the intermediate variable between perceived ease of use and perceived usefulness for the user's intention to continue using (Li et al., 2012). In the research situation of this paper, it is assumed that users believe that online art education software helps improve their painting ability, and users will have a positive attitude toward using it (Huang & Duangekanong, 2022). Davis et al. (1989) acknowledged

that perceived usefulness has a significant impact on attitude. Based on the above assumptions, a following hypothesis is constructed:
H4: Perceived usefulness has a significant influence on attitude toward online art education.

2.4 Attitude

Attitudes are the emotional assessment of a specific object or behavior and are often considered important in determining people's choices and behavior (Kroesen et al., 2017). Attitude refers to the state of people accepting and responding to technology in life, which can be understood as the individual's view of the state of use. (Giles, 2019; Wang et al., 2022). The expression of attitude is the effect or the amount of effect on a specific object, or it is not the complicated feeling of using the M-Library application to accomplish the target task. Thus, it can be seen that attitude determines the user's intention to engage in certain behaviors (Chen & Huang, 2010). Examining the role of self-efficacy as a cognitive and affective antecedent seems to contribute to a complete understanding of consumer acceptance of new technologies (Davis et al., 1989). Accordingly, a proposed hypothesis is as follow:
H6: Attitude has a significant influence on continuous intention to use online art education.

2.5 Information Quality

Information quality is also a dimension of the accuracy, completeness, and format of the output of information systems (Nelson, 2005). Information quality is an effective indicator to measure the information state generated by knowledge reserve and system technology (Petter & Mclean, 2008). Information quality is the total of knowledge and content, news quality, and product advertising quality (Wu & Wang, 2005). Bharatia and Chaudhury (2004) conducted an empirical study on Web-based Decision Support Systems (DSS) and believed that information and system quality were significant factors affecting satisfaction. Through literature research, we can see that providing high-quality information is very effective because it can help users make the right decisions and thus improve their work efficiency. Therefore, it can be assumed that information quality is a vital construction condition affecting user-perceived value and satisfaction. Consequently, a hypothesis is derived:
H5: Information quality has a significant influence on student satisfaction.

2.6 Satisfaction

Satisfaction can also be considered as a user's perception and emotional expression of the overall experience of a service or a product (Oliver, 1980). Satisfaction is a state in which one recognizes that an experience produces a positive feeling (Rust & Oliver, 1994). According to the previous research, the user's attitude and satisfaction are the primary conditions for establishing continuous use intention in the usage intention and the system technology approval model (Sumak et al., 2011). Recognition of customer satisfaction is an essential factor in a company's development strategy and an indicator of company activities, which plays a vital role in market research (Lin & Wang, 2012). Thereby, customers' satisfaction with the online learning system will affect their willingness to continue using it per a proposed hypothesis below:
H7: Satisfaction has a significant influence on continuous intention to use.

2.7 Continuous Intention to Use

Persistent willingness is the degree to which a person can use a system and recommend it to others in the future. (Joo et al., 2018) The intent to continue to use the service is defined as the behavior of consumers who will continue to use the service after approving the service (Bhattacherjee, 2001). Much attention in the literature on the factors of educational technology identification. However, the intention to continue using is affected to a certain extent in the context of the four different constructs. Lin et al. (2011) takes continuous use instead of behavioral intention as the main framework to develop a new research model to investigate the critical factors of users' continuous use of e-learning (Lee, 2010). Many researchers adopted the IS model to analyze the intention of continuous use. Research shows that user satisfaction and perceived usefulness are essential to determining continued use intention (Ifinedo, 2006).

3. Research Methods and Materials

3.1 Research Framework

In this study, the investigators have created a conceptual framework based on two core theories and previous studies. The TAM theoretical mode, and the IS success model formation conceptual framework use seven factors to explain the continuous use intention affecting the online fine arts education software. (Figure 1).

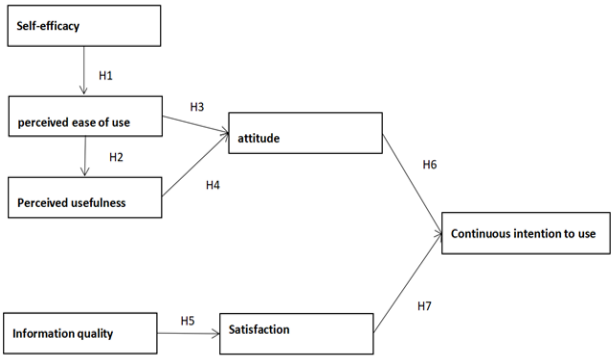

Figure 1: Conceptual Framework

H1: Self-efficacy has a significant influence on perceived ease of use of online art education.
H2: Perceived ease of use has a significant influence on perceived usefulness of online art education.
H3: Perceived ease of use has a significant influence on attitude toward online art education.
H4: Perceived usefulness has a significant influence on attitude toward online art education.
H5: Information Quality has a significant influence on Student Satisfaction.
H6: Attitude has a significant influence on continuous intention to use online art education.
H7: Satisfaction has a significant influence on continuous intention to use.

3.2 Research Methodology

This quantitative research is to distribute online and offline questionnaires to the target population. The questionnaire was divided into screening questions, Likert five-point scale measurements, and demographic information. The item-objective Concordance Index (IOC) test was used to verify the validity of the questionnaire tool. Among the 30 items of 7 structures, the highest score was one, and the lowest was 0.67. Therefore, all 30 items in this paper fit the content validity. The level of internal consistency for each construct is acceptable, with Cronbach A estimates ranging from 0.72 to 0.93, thus above the 0.7 recommended by Nunnally (1978).

3.3 Population and Sample Size

The target population of this study is students who have more than one year of experience using online art education software. Based on the expected results and the expected statistical power level, the questionnaire involved 7 variables, 30 items, and probability scales, and the minimum sample size obtained in the sample calculator using the above data was 425. To obtain better statistical results, the researchers increased the number of samples by 20% and finally decided to collect 500 samples from three private fine arts education institutions in Chengdu.

3.4 Sampling Technique

The researchers conducted non-probability sampling. In the first step, three private fine art education institutions in Chengdu, China, were selected through judgmental sampling. The selected educational institutions are the three local private art training institutions in Chengdu: The Muzi Art Institution, the Chengdu Art Examination Studio, and the Fangyuan Oil Painting Room. The second step uses the quota sampling method to select 500 students with at least one year of experience using online art education software. For convenience sampling, the online questionnaire was distributed to the target group.

4. Results and Discussion

4.1 Demographic Information

Demographic information collected from the respondents included the gender and student status, as shown in Table 1. There were 161 women and 339 men, accounting for 32.2% and 67.8%, respectively. For student status, 110 primary school students accounted for 22%, 219 high school students for 43.8%, and 171 of higher education for 34.2%.

Table 1: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Men	161	32.2%
	Woman	339	67.8%
Student Status	Primary school students	110	22.0%
	High school students	219	43.8%
	Higher Education	171	34.2%

4.2 Confirmatory Factor Analysis (CFA)

Construct validity validated the association or interactions with other constructs in the conceptual framework (Salkind, 2010). Convergent and discriminant validity are two common statistical methods of structure validity (Straub, 1989). According to Lewis et al. (2003), the CFA is a multivariate analysis procedure to test multiple assumptions simultaneously, building an evaluation matrix. The measurement model was validated, and the correlation between the model's latent and observed variables was tested by CFA (Bashir & Madhavaiah, 2015). SPSS AMOS was used to test and modify the CFA measurement as shown in Table 2. The internal consistency of self-efficacy, perceived ease of use, perceived usefulness, attitude, information

quality, satisfaction, and intention to continue use was excellent as all were above 0.9. Factor loading measured the coefficient between construct groups (O'Rourke & Hatcher, 2013). The greater the factor load value, the higher the reliability of the item (Hair et al., 2010). The acceptable threshold for the factor load is 0.5 or higher (Hair et al., 1998). In this study, all individual items had a load of factors above 0.70 and mostly above 0.80, ranging from 0.724 to 0.937. Composite or structural reliability (CR) and mean-variance extraction (AVE) are other measures of the reliability and consistency of the scale items (Peterson & Kim, 2013). As Fornell and Larcker (1981) recommended, the values for CR and AVE are 0.7 or higher, respectively, and are both acceptable at 0.4 or higher. The CR results in this study were all above the threshold values. The composite reliability values ranged from 0.925 to 0.951. The AVEs were also greater than 0.7, ranging from 0.717 to 0.830. Depending on the composite reliability, the structure with the highest internal consistency is perceived as useful. Therefore, the goodness-of-fit metrics of the present study model in the CFA test are all acceptable.

Table 2: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
Self-Efficacy (SE)	(Zhen, 2018)	4	0.924	0.790-0.909	0.925	0.756
Perceived ease of use (PE)	(Zhen, 2018)	4	0.925	0.724-0.929	0.930	0.769
Perceived usefulness (PU)	(Watjatrakul, 2016)	4	0.950	0.887-0.937	0.951	0.830
Attitude (AT)	(Lee, 2006)	4	0.932	0.882-0.866	0.932	0.773
Information quality (IQ)	(Lee et al., 2002)	4	0.929	0.843-0.930	0.930	0.768
Satisfaction (ST)	(Diener et al., 1985)	5	0.935	0.775-0.923	0.936	0.747
Continuous intention to use (CITU)	(Gbenga et al., 2015)	5	0.935	0.827-0.859	0.927	0.717

As shown in Table 3, the value obtained in this study is greater than the acceptable value, which verifies the good fitting effect of the model. In addition, the measurement results of these models consolidate the effectiveness of discrimination and verify the effectiveness of subsequent structural model estimates.

Table 3: Discriminant Validity

	SE	PE	PU	AT	IQ	ST	CITU
SE	**0.869**						
PE	-0.022	**0.877**					
PU	0.056	0.247	**0.911**				
AT	0.133	0.162	0.133	**0.879**			
IQ	0.298	0.085	0.146	0.231	**0.876**		
ST	0.046	0.329	0.295	0.205	0.123	**0.864**	
CITU	0.220	0.227	0.190	0.130	0.257	0.125	**0.847**

Note: The diagonally listed value is the AVE square roots of the variables
Source: Created by the author.

4.3 Structural Equation Model (SEM)

Model fit was assessed, and the statistical values for each metric were compared with the acceptable goodness-of-fit values shown in Table 4. The statistics were CMIN / DF=1.872, GFI=0.914, AGFI=0.896, NFI=0.947, CFI=0.975, TLI=0.971, and RMSEA = 0.042. Numerically, all indicators were acceptable. Therefore, the model of the data does not require modification.

Table 4: Goodness of Fit for Structural Model

Index	Acceptable Values	Statistical Values
CMIN/DF	≤ 5.0 (Wheaton et al., 1977)	718.816/384 or 1.872
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.914
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.896
NFI	≥ 0.80 (Wu & Wang, 2005)	0.947
CFI	≥ 0.80 (Bentler, 1990)	0.975
TLI	≥ 0.80 (Sharma et al., 2005)	0.971
RMSEA	≤ 0.10 (Hopwood & Donnellan, 2010)	0.042
Model Summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index and RMSEA = Root mean square error of approximation
Source: Created by the author.

4.4 Research Hypothesis Testing Result

The research model judges the significance of the regression path coefficient according to its t-value and calculates the explanatory ability of the independent variable to the dependent variable according to R2. Table 5 reports that at the level of significance p=0.05, all hypotheses are supported, except H1.

Table 5: Hypothesis Testing Result

Hypothesis	(β)	t-Value	Result
H1: SE→ PE	-0.018	-0.379	Not Supported
H2: PE → PU	0.247	5.355*	Supported
H3: PE→ AT	0.139	2.859*	Supported
H4: PU → AT	0.100	2.056*	Supported
H5: IQ → ST	0.124	2.612*	Supported
H6: AT→CITU	0.113	2.367*	Supported
H7: ST→ CITU	0.105	2.207*	Supported

Note: * p<0.05
Source: Created by the author

The magnitude of the correlation between the independent and dependent variables proposed in the hypothesis is measured by regression coefficients or standardized pathway coefficients. As shown in Table 5, six out of seven hypotheses are supported. The standardized path coefficient is -0.018, and t-value is -0.379. Thus, perceived ease of use was not affected by attitude, Therefore, the **H1** is not supported. **H2** shows the standardized path coefficient in this assumption that learners' perceived ease of use affects learners' perceived usefulness in online art education is 0.247 and t-value is 5.355, aligned with previous literatures (Davis et al., 1989; Hsu & Lin, 2020). **H3** proves that perceived ease of use is an influential factor of attitude as the standardized path coefficient is 0.139, and t-value is 2.859. **H4** presents that perceived usefulness has a significant influence on learners' attitude towards online art education is 0.100, and t-value is 2.056. **H5** is established the standardized path coefficient of information quality and satisfaction is 0.124, and t-value is 2.612. **H6** confirms the significant relationship between attitude and continuous intention to use online learning software, representing the standardized path coefficient of 0.113, and t-value is 2.367, **H7** assumes that learners' satisfaction influencing learners' willingness to continue using online art education, reflecting 0.105, and t-value is 2.207.

5. Conclusions and Recommendation

5.1 Conclusion and Discussion

This study achieves its objectives to explore the analysis of factors influencing the continuous use of online art education software by private art education institutions in Chengdu, Sichuan Province, China. The conceptual framework is based on TAM, and IS success model. CFA and SEM were used to implement the data analysis of this study. The results indicate that satisfaction and attitude are significant factors affecting the continuous use intention of online art education software. Perceived ease of use has the most significant effect on perceived usefulness. Among them, the perceived usefulness and perceived ease of use significantly affect the attitude. Furthermore, information quality significantly impacts students' satisfaction with using online art education software. However, self-efficacy has no significant effect on perceived ease of use.

Curriculum development researchers of online art education software can use the above key factors to adopt factors related to user use in online art education software development and technology improvement. In this study, perceived usefulness was the strongest predictor of attitude and use intention for continuous use. Therefore, an emphasis must be placed on promoting the system's effectiveness. This means that users are willing to use online art education software if they view their online art education software systems as useful tools to improve their painting skills. Curriculum developers, teachers, and higher education institutions' highest managers should ensure system quality, information quality, and service quality when using online art education software.

5.2 Recommendation

Through a survey of art education institutions, the key factors of self-efficacy (SE), quality of information (IQ), perceived ease of use (PE), perceived usefulness (PU), attitude (AT) and satisfaction (ST) affecting continuous use intention (CITU) of online art education software were identified. In the Curriculum Development of online art education software, researchers can rely on the above key factors to obtain the willingness of users to adopt relevant factors in the development and technology improvement of online art education software. Emphasis must therefore be placed on promoting the effectiveness of the system. This means that users are willing to use online art education software if they think the system is a helpful tool to improve their drawing ability. Course developers, teachers, and top managers of higher education institutions should ensure the attributes of system quality, information quality, and service quality when using online art education software.

Online art education software should have the advantages of responsiveness, flexibility, and accuracy. Its characteristics should include high-quality technical assistance, so adequate training should be carried out to improve the service level of engineers and service managers to help learners learn online art courses more effectively and improve learners' willingness to use online art education software. Once the quality characteristics, the usefulness of the system, self-efficacy operating procedures, and other factors are assured, the supported facilities should be promoted to students, such as training or media dissemination, to increase their awareness and recognition. These can stimulate or increase positive attitudes and satisfaction with the possibility of using online art education software in the exemplary art learning process.

In summary, this study elaborates on the factors that influence the willingness of adolescents, art high school candidates, and adult art lovers to use online art education software continuously. It provides developers of online art education software courses and top managers of higher education institutions with the ability to identify variables that affect the willingness of users to continuously use online art education software, which can be applied to projects, investments, and the full utilization of online art education software.

5.3 Limitation and Further Study

The limitations of this study are the scope of the target population and the specific types of online fine art learning, focusing on the three private fine art institutions in Chengdu, Sichuan province. Exploring different online fine arts learning types at different institutions may yield different research findings and recommendations. In addition, research methods can also consider a combination of qualitative methods in data collection and analysis. In conclusion, this study details the factors influencing the willingness of adolescents, art school examinees, and adult art lovers to continuously use online art education software. It provides developers of online art education software courses and top managers of higher education institutions to determine variables affecting users' willingness to continuously use online art education software, which can be applied to projects, and investments and make full use of it.

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