

Factors Impact on Fine Art Major Student's Continuance Intention to Blended Education of the Public Universities in Chengdu Region

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Abstract—A blended learning strategy combines traditional in-person instruction with online education. During the COVID-19 pandemic, traditional face-to-face teaching has been severely challenged. Blended learning, which combines the advantages of traditional learning methods and online learning, has gradually been widely adopted by the majority universities in China. The objective of this quantitative research is to investigate the elements that influence students majoring in painting at Chengdu's public colleges and universities' continuance intention to engage in blended learning. The information systems success model, the expectation confirmation model, and the theory of planned behavior provided the intellectual foundation of this research. It is assumed that the five latent variables of information quality, system quality, perceived usefulness, satisfaction, and attitude have the significant impact on continuation intention. The study adopted quantitative research, selected three public colleges and universities in the Chengdu area, and stratified sampling students who had experience in blended learning, obtained valid questionnaires, and explored the key factors affecting college students' continuous use of blended education in the post-epidemic era. Based on the conclusion of this study: the attitude of the target students had the greatest impact on continuance intention. These factors also provide guidelines for schools to implement blended learning in teaching and learning environments.

Keywords—blended learning, higher education, continuance intention

I. INTRODUCTION

A. Background of the Research

Education is the foundation of cultivating talents, so the exploration and development of new education models are of great significance to the development of education and the cultivation of talents. Since the end of 2019, under the new crown epidemic environment, traditional face-to-face teaching has been severely challenged. Blended learning, which combines traditional classroom teaching and learning methods with the advantages of network technology, has gradually been widely adopted by major universities in China. And it provides a guarantee for the

smooth progress of teaching. It is made clear that a platform for e-learning makes it easier to study collaboratively, develop relationships, and construct knowledge [1]. The diverse functions of online learning apps and network platforms also provide the possibility of blended education.

Although practically all Chinese universities have embraced online learning technology throughout the COVID-19 pandemic. Universities that use online learning systems have widely implemented blended learning courses [2]. At the same time, we have also noticed that the number of relevant literatures on “blended education” on CNKI is increasing year by year. According to Eurostat's statistics on the proportion of online classroom use in European countries in 2015 and 2021, the proportion of online classroom use has increased significantly. To sum up, blended learning has a good development prospect in the new era. However, there is a dearth of studies on the general engagement and satisfaction of students in blended learning, as well as the ongoing usage of blended learning, in relation to the issues that occur in the blended learning process.

As of July 2023, there are only 1,090 documents searched for “blended education” in China National Knowledge Infrastructure (CNKI), which is one of the essential academic database websites in China, of which there are only 4 related to “continuous will”. The number of research literature on blended learning has shown a rapid upward trend since 2014, especially after the epidemic in 2019. The number of researches on mixed education has increased. Therefore, quantitative research on mixed education based on theoretical models has a high academic value.

With the development of science and technology, teaching models are increasingly integrated with electronic technology. The use of blended learning provides new ways and methods for teaching. Consequently, research on students' continuance intention to engage in blended learning is conducive to the improvement of students' academic performance and the improvement of teaching content. The strength of students' continuance intention to the teaching mode is an important reference index for whether a teaching system can continue to be used, and it will also have an impact on the formation and development

of new teaching modes. In addition, the importance of this research is self-evident. At the same time, the study of the factors that impact blended learning's willingness to change through time, as well as the creation and improvement of blended learning platforms, have a beneficial impact.

B. Research Questions

- (1) What aspects influence students majoring in painting in Chengdu's inclination to continue using blended learning?
- (2) What connection exists between these factors and the desire to carry on?
- (3) What factors can influence painting undergraduates to continue to accept blended teaching and improve learning satisfaction?

C. Research Objectives

- (1) To identify the factors impacting fine art students' persistent tendency to blended instruction in the Chengdu Area.
- (2) To identify relationships among other variables that significantly influence willingness to continue.
- (3) To suggest additional research directions regarding students' use of blended instruction to improve academic performance.

D. Significance of the Research

The transmission of educational concepts and the adoption of educational methods will have a certain degree of impact on the cultivation of talents. Based on the current mixed teaching environment, this study identifies the variables that influence students' continuance intention to use mixed-mode instruction, which can better implement mixed teaching and improve students' learning performance. This study also aims to provide positive data support for the development of teaching models, to provide reference for the future mixed teaching mode and reform of painting major.

II. LITERATURE REVIEW

A. Blended Instruction

Blended learning creates a hybrid learning environment by integrating face-to-face and online aspects [3]. Some scholars' research has emphasized the advantages of blended learning, including the versatility of higher education [4]. Blended learning is attractive because it employs a variety of modalities and is thought to improve learners' learning results [5]. In general, blended learning has gotten increasing attention as a more flexible method of learning, and it has been recognized by major colleges and students [6].

B. System Quality

Delone argues that if users see a considerable improvement in System Quality (SQ), the system is regarded helpful and satisfactory [7]. At the same time, according to several studies, if the design of system functions in the teaching process matches or exceeds

learners' expectations, it will have a beneficial impact on learners' satisfaction [8]. As a result, the system's quality becomes a critical factor that may be used to assess the system's success [9]. Based on this, the following assumption can be determined.

H1: SQ has a significant impact on Satisfaction (SAT).

C. Information Quality

Information Quality (IQ) and satisfaction are strongly correlated, and both have beneficial effects on learning [10]. The clearer and more effective the instructional content, the more favorable the learning effect, and the learners' perception of effective and fulfilling learning [11]. The e-learning system's information quality can boost user satisfaction and student engagement with the system [12]. Based on this, the following assumption can be determined.

H2: IQ has a significant impact on SAT.

D. Perceived Usefulness

Perceived Usefulness (PU) refers to the extent that students think that participating in blended learning would improve their academic performance [13]. Additionally, perceived usefulness in e-learning systems has a significant role in determining continuation intention [14]. In integrated learning contexts, perceived usefulness is a strong predictor of felt satisfaction [15]. Based on this, the following assumption can be determined.

H3: PU has a significant impact on SAT.

E. Satisfaction

A happy or pleasant mood indicates Satisfaction (SAT), which is a measure of how content a learner is with their current learning [16]. Student satisfaction is a key indication for assessing students' attitudes in academic settings and learning-related research. It is also a key metric for assessing the effectiveness of blended learning as a teaching strategy [17]. The direct connection between distance delivery and learning experience can also be considered to be positively recognized by learning satisfaction [18]. Based on this, the following assumption can be determined.

H4: SAT has a significant impact on Continuance Intention (CI).

F. Attitude

A person's Attitude (ATD) is how they view a certain system [19]. A crucial component in determining whether someone will continue to use e-learning in the classroom is attitude [20]. According to some academics, attitudes have a significant influence on continuation intentions and are tied to and related to continuation intentions [21]. Based on this, the following assumption can be determined.

H5: ATD has a significant impact on CI.

G. Continuance Intention

A person's intention to use a specific system going forward is referred to as Continuance Intention (CI) [22]. Usually, the continuing willingness to use an information system is determined by the user's satisfaction. The

primary observational variable of Technology Acceptance Model (TAM) and Information System Success Model (ISSM) is continuance intention, which refers to the willingness to engage in an activity [23]. Numerous studies have shown that continued intention has an immediate and significant effect on actual use [24].

III. RESEARCH METHODOLOGY AND MATERIALS

A. Conceptual Framework

The Information System Success Model (ISSM) serves as the foundation for the theoretical framework of this research. Initially, based on the academic research of Seman, Hashim, and Roslin [25], four latent variables' pertinent mechanisms were discovered by them: System Quality (SQ), Information Quality (IQ), Satisfaction (SAT), and Continuation Intention (CI). Secondly, the research of Lin and Wang [26] identified the link between Perceived Usefulness (PU), SAT and CI. Finally, in the study of Ref. [27], it was determined that Attitude (ATD) had a significant impact on CI, Fig. 1 illustrates the conceptual foundation for this investigation.

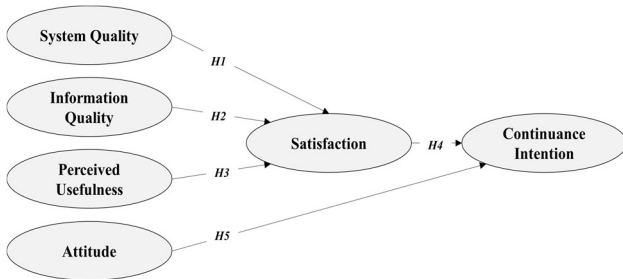


Fig. 1. Conceptual framework.

B. Research Methodology

The factors that impact the continuance intention of blended learning for painting majors in public colleges in Chengdu were examined in this study using a quantitative survey methodology. Initially, based on the conceptual framework of this empirical research, a corresponding questionnaire was established, as shown in Table I. In this study, three experts in this educational background with a Ph.D. were invited to evaluate the content validity of the questionnaire to ensure the effectiveness of the research instrument. Additionally, the researcher sampled 30 painting major students with blended learning experience in the target university for a pilot test. Cronbach's Alpha was employed to assess the questionnaire's internal consistency reliability.

After the validity and reliability of the measurement instruments had been confirmed, through the stratified random sampling method, 516 students majoring in fine art from the target universities such as Chengdu University, Sichuan Conservatory of Music, and Sichuan Normal University, three public colleges were chosen for assessment. Analyze data using IBM SPSS Statistics 24.0 and AMOS Graphics 18.0. Finally, path model analysis and assumption testing were conducted using Structural Equation Modeling (SEM).

TABLE I. RESEARCH INSTRUMENT GRID

Variable	Indicator	Source
SQ1	When I encounter errors in the blended learning system, I can get immediate feedback by email and phone.	Tahar <i>et al.</i> [28]
SQ2	I have not faced any system errors on blended learning.	
SQ3	I can find required information easily on blended learning.	
IQ1	Blended learning provides me sufficient contents I want.	Chunyu <i>et al.</i> [29]
IQ2	The difficulty level of the learning contents provided by the blended learning is appropriate.	
IQ3	Blended learning provides me information is well formatted.	
IQ4	Blended learning provides me timely information.	
PU1	Blended learning enhances my learning effectiveness.	Chunyu <i>et al.</i> [29]
PU2	Blended learning can improve my learning performance.	
PU3	Blended learning gives me greater control over my learning.	
PU4	I find blended learning useful in my learning.	
SAT1	I am content with the performance of blended learning.	Chunyu <i>et al.</i> [29]
SAT2	I found choosing blended learning was a wise decision.	
SAT3	I am happy with the functions provided by blended learning.	
SAT4	I am satisfied with the overall experience of blended learning.	
ATD1	I would like my coursework more if I used blended learning.	Baranova <i>et al.</i> [30]
ATD2	Using blended learning in my coursework would be a pleasant experience.	
ATD3	Using blended learning in my coursework would be a wise idea.	
CI1	I intend to continue blended learning in the future.	Chunyu <i>et al.</i> [29]
CI2	I will learn more about using blended learning systems in the future.	
CI3	I will frequently use system provided by blended learning on a regular basis in the future.	
CI4	My intentions are to continue blended learning than traditional learning.	

C. Participants and Sample Size

Students majoring in fine art at three target universities who have had blended learning experiences comprise the study's participants, with a total of 1044 undergraduates. According to the research of Halabí and More-Esquivel [31], in order to have high validity of the statistical results, 200 people is the minimum size of the research sample.

D. Sampling Technique

During the COVID-19 epidemic, the fine art majors of the three target universities all adopted blended learning. Initially, through judgmental sampling, a total of 1,044 fine art majors with blended learning experience were selected from the three target universities. Additionally, through the stratified random sampling method, 516 undergraduate fine art major students with sufficient blended learning experience were finally selected. As

shown in Table II, 516 undergraduates were ultimately chosen as the final sample.

TABLE II. THE SAMPLE UNITS AND SUB-SAMPLE SIZE

Target University	Academic Years	First Level Sample Size (N = 1044)	Secondary Level Sample Size (N = 516)
Chengdu University	Freshman	50	20
	Sophomore	60	35
	Junior	90	48
	Senior	85	38
Sichuan Conservatory of Music	Freshman	120	53
	Sophomore	119	57
	Junior	121	68
	Senior	119	62
Sichuan Normal University	Freshman	70	28
	Sophomore	70	35
	Junior	70	34
	Senior	70	38

IV. RESULTS AND DISCUSSION

A. Demographic Information

TABLE III. DEMOGRAPHIC INFORMATION PROFILE

Demographic Information (N = 516)	Frequency	Percentage	
Gender	Male	116	21.7%
	Female	400	75.2%
Academic Years	Freshman	89	16.6%
	Sophomore	129	24.2%
	Junior	140	26.2%
	Senior	158	29.8%
Major Direction	Chinese painting	229	43.1%
	Oil Painting	207	38.8%
	Printmaking	80	15%

Table III displayed demographic data. Male respondents made up 21.7% of the total, while female respondents made up 75.2%. Divided by academic year as follows: freshmen accounted for 16.6%, sophomores

accounted for 24.2%, juniors accounted for 26.2%, and seniors accounted for 29.8%. In terms of major direction, Chinese painting accounted for 43.1%, oil painting accounted for 38.8%, and printmaking accounted for 15%.

B. Confirmatory Factor Analysis (CFA)

On the data, a Confirmatory Factor Analysis (CFA) was carried out. Locating and examining speculative creations that appear to be founded on trustworthy data requires the use of a statistical technique called Confirmatory Factor Analysis (CFA) [32].

As shown in Table IV, the chi-square value to degree of freedom (CMIN/DF) in the statistical findings from AMOS was 1.297, which was below the criterion of 3.000 [33]; The Goodness-of-Fit Index (GFI) was 0.958, exceeding the minimum threshold point of 0.900 [34]; Above a threshold of 0.800, the Adjusted Goodness-of-Fit Index (AGFI) was 0.945 [35]; below the cutoff of 0.050, the Root Mean Square Error of Approximation (RMSEA) was 0.024 [36]. The Comparative Fit Index (CFI) was 0.989, exceeding the minimum threshold point of 0.900 [37]; the Normalized Fit Index (NFI) was higher than the cutoff value of 0.900 at 0.953; at last, the Tucker-Lewis Index (TLI) was 0.987, above the cutoff of 0.900 [38]. In summary, all the values were within the acceptable range.

TABLE IV. GOODNESS OF FIT FOR CFA

Index	Criterion	Source	Adjusted Value
CMIN/DF	< 3	Hair <i>et al.</i> [33]	1.297
GFI	≥ 0.90	Bagozzi and Yi [34]	0.958
AGFI	≥ 0.80	Filippini <i>et al.</i> [35]	0.945
RMSEA	< 0.05	Browne and Cudeck [36]	0.024
CFI	≥ 0.90	Hair <i>et al.</i> [37]	0.989
NFI	≥ 0.90	Hair <i>et al.</i> [37]	0.953
TLI	> 0.90	Bentler and Bonett [38]	0.987

TABLE V. EVALUATION OF THE CONFIRMATORY FACTOR ANALYSIS

Latent Variable	Cronbach's Alpha	Variable	Factor Loading	S.E.	T-Value C.R.	P-Value	CR	AVE
System Quality	0.821	SQ1	0.738	-	-	-	0.823	0.609
		SQ2	0.787	0.067	15.469	***		
		SQ3	0.814	0.068	15.590	***		
Information Quality	0.872	IQ1	0.821	-	-	-	0.872	0.631
		IQ2	0.764	0.051	18.456	***		
		IQ3	0.818	0.048	19.995	***		
		IQ4	0.772	0.049	18.692	***		
Perceived Usefulness	0.839	PU1	0.723	-	-	-	0.840	0.569
		PU2	0.688	0.067	14.328	***		
		PU3	0.792	0.068	16.274	***		
		PU4	0.808	0.063	16.521	***		
Satisfaction	0.845	SAT1	0.768	-	-	-	0.845	0.578
		SAT2	0.761	0.063	16.688	***		
		SAT3	0.730	0.064	16.020	***		
		SAT4	0.780	0.064	17.109	***		
Attitude	0.810	ATD1	0.725	-	-	-	0.814	0.593
		ATD2	0.789	0.063	15.518	***		
		ATD3	0.794	0.062	15.579	***		
Continuance Intention	0.853	CI1	0.802	-	-	-	0.854	0.594
		CI2	0.759	0.050	17.541	***		
		CI3	0.759	0.051	17.558	***		
		CI4	0.759	0.055	17.553	***		

Note: *** = $p < 0.001$.

TABLE VI. DISCRIMINANT VALIDITY

Construct	SQ	IQ	PU	SAT	ATD	CI
SQ	0.780					
IQ	0.078	0.794				
PU	0.153	0.323	0.754			
SAT	0.255	0.345	0.464	0.760		
ATD	0.207	0.247	0.400	0.381	0.770	
CI	0.216	0.284	0.400	0.372	0.500	0.771

The Cronbach’s Alpha values for all the latent variables were greater than 0.800, as can be shown in Table V, demonstrating the results’ strong internal consistency reliability. Then again, all the factor loadings were above 0.700, and all of the t-values were over 14.000, the p-values were below 0.050, the CR was above 0.800, and the AVE was above 0.500 [39]. Therefore, every valuation in this data was at a respectable level. This time, the data’s average value was perfect.

Concerning discriminant validity, all values were at the ideal range, as indicated in Table VI. Therefore, the convergent and discriminant validity were proved. Consequently, the results of the matrix evaluation can also promote discriminant validity and verification to predict the effectiveness of subsequent SEM evaluation.

C. Structural Equation Model (SEM)

A quantitative statistical technique for simulating the interactions between directly and indirectly observable (latent) variables is Structural Equation Modeling (SEM). Regression, factor analysis, route analysis, and projected growth curve modeling are all integrated into the SEM framework in addition to the simultaneous solution of systems of linear equations [40]. After CFA, SEM was used in this study to analyze the data.

TABLE VII. GOODNESS OF FIT FOR SEM

Index	Criterion	Source	Adjusted Value
CMIN/DF	< 3	Hair <i>et al.</i> [33]	2.185
GFI	≥ 0.90	Bagozzi and Yi [34]	0.925
AGFI	≥ 0.80	Filippini <i>et al.</i> [35]	0.907
RMSEA	< 0.05	Browne and Cudeck [36]	0.048
CFI	≥ 0.90	Hair <i>et al.</i> [37]	0.954
NFI	≥ 0.90	Hair <i>et al.</i> [37]	0.918
TLI	> 0.90	Bentler and Bonett [38]	0.947

TABLE VIII. EVALUATION OF THE HYPOTHESES

Hypotheses	Path	Standardized Path Coefficient(β)	T-Value	Test Results
H1	SAT ← SQ	0.232	4.808***	Supported
H2	SAT ← IQ	0.255	5.445***	Supported
H3	SAT ← PU	0.499	9.009***	Supported
H4	CI ← SAT	0.298	6.100***	Supported
H5	CI ← ATD	0.502	9.190***	Supported

Note: *** = $p < 0.001$.

As shown in Table IX. The mediating variable in this study was SAT, and its R² was 0.367, which means that 36.7% of the change was jointly affected by PU, IQ, and SAT. These three variables had a direct impact on it, and

Table VII displays the findings of AMOS version 18.0 after adjustments. Results from the tests CMIN/DF, GFI, AGFI, RMSEA, CFI, NFI, and TLI all fell within the expected range, so all the indicators of goodness of fit in SEM evaluation were ideal.

D. Hypothesis Testing Results

Based on regression weights and R² variances, the importance of each latent variable was computed for the study matrix. According to Table VIII, ATD had the greatest impact on continuance intention, standardized path coefficient (β) = 0.502, t-value = 9.190***. In addition, SQ, IQ, and PU all had an impact on attitude. Their β values were: 0.232, 0.255, and 0.499, and their t-values are: 4.808***, 5.445***, and 9.009***. So, it can be shown that all hypotheses were supported due to the p-value being below 0.001.

The study of the data in the table allowed for the drawing of pertinent conclusions. According to H1 results, SQ affected SAT with a standardized path coefficient of 0.232. According to Abeygunasekera’s research, the effectiveness of the system will increase learners’ contentment [8].

The results for H2 indicated that IQ affected SAT, and the value of its standardized path coefficient was 0.255. According to research by Halawi *et al.*, a system’s information quality can enhance user satisfaction and students’ use of the system [12].

The data related to H3 showed that PU was the key factor affecting SAT, and the second-most significant factor’s standardized path coefficient value was 0.499. According to Rahmi’s research, perceived usefulness in blended learning settings significantly predicts felt satisfaction [15].

The data related to H4 showed that satisfaction had an impact on continuance intention, and the standardized path coefficient value was 0.298. In Lin’s research, learners’ intention to continue using the e-learning system increases when they were satisfied with it [41].

The data related to H5 showed that ATD had a great influence on CI, and the value of the standardized path coefficient was 0.654, making the factor that had the greatest impact on CI. Nikou *et al.*’s research indicates that a user’s pleasure with an information system is what determines whether they will continue to use it [23].

the sizes of their impact were respectively 0.499***, 0.255***, and 0.232***.

The dependent variable in this study was CI, and its R-square was 0.341, which means that 34.1% of the change

was jointly affected by PU, IQ, SQ, ATD, and SAT. The two variables ATD and SAT had a direct impact on it, the effect sizes were 0.502*** and 0.298*** respectively; PU,

IQ, and SQ had indirect effects on them, and the effect sizes were 0.149***, 0.076***, and 0.069*** respectively. Fig. 2 is a path diagram of relevant data.

TABLE IX. DIRECT, INDIRECT, AND TOTAL EFFECTS

Dependent Variables (DV)	Effect	Independent Variables (IV)				
		PU	IQ	SQ	ATD	SAT
SAT	DE	0.499***	0.255***	0.232***	–	–
	IE	–	–	–	–	–
	TE	0.499***	0.255***	0.232***	–	–
	R ²			0.367		
CI	DE	–	–	–	0.502***	0.298***
	IE	0.149***	0.076***	0.069***	–	–
	TE	0.149***	0.076***	0.069***	0.502***	0.298***
	R ²			0.341		

Note: *** = $p < 0.001$.

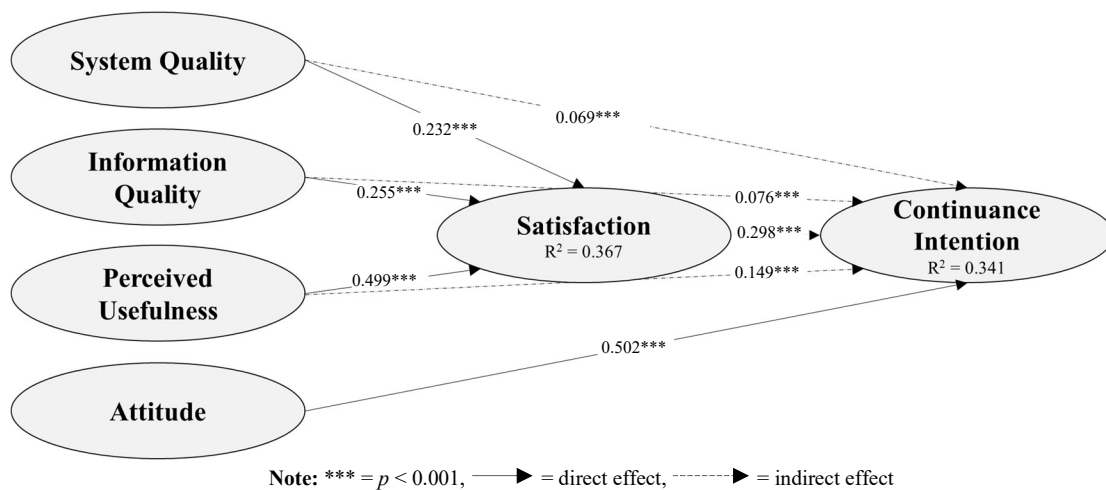


Fig. 2. Path diagram.

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

The objective of this study was to examine the variables that influence painting majors' intention to continue using blended learning in Chengdu's public colleges and institutions. As a conceptual framework, five hypotheses were put forth to investigate how students' continuance intention to use blended learning was influenced by SQ, IQ, PU, SAT, and ATD. A quantitative questionnaire survey was conducted among 516 undergraduate painting majors with blended learning experiences at three public universities in the Chengdu area. The conceptual framework's reliability and validity were tested using CFA. The primary determinants of satisfaction have been examined using SEM. All assumptions have been verified to be true.

According to the findings, attitude had the greatest influence on continuance intention. Therefore, promoting students' attitudes towards blended learning can enhance students' willingness to continue.

Additionally, satisfaction influences the intention to continue in some way, which was also in line with Bhattacharjee's findings, which demonstrated a relationship between the desire to continue and students' happiness with the system.

Moreover, PU had the highest impact on SAT, indicating that students' PU of blended learning had a positive impact on satisfaction. At the same time, SQ had a higher impact on satisfaction than IQ. SQ and IQ had an important impact on students' satisfaction with blended learning.

To sum up, this study revealed that SQ, IQ, PU, SAT, and ATD were all key factors affecting the CI of blended learning of painting majors in public colleges and universities in Chengdu. All hypotheses were tested.

B. Recommendation

This study analyzes the relevant factors that affect the willingness of college students majoring in painting in Chengdu to continue to receive blended education. According to the researchers' findings, opinions and suggestions can be put forward for blended learning, which can promote students' continuous willingness to blended learning mode by improving students' related attitudes and satisfaction.

In the context of the prevalence of blended learning, teachers should cultivate students' correct cognition of blended learning, so that students have a good learning ATD towards blended learning, to promote the continuance intention of fine art major students to blend learning.

In order to enhance students' overall satisfaction with blended learning, e-learning platforms should optimize the learning platform based on students' actual needs, enhance IQ and SQ levels, and carry out innovative designs in content and functions to create a good learning experience and environment for students to promote overall student SAT with blended learning. Teachers should also combine the advantages of e-learning to build course content to increase the flexibility and continuity of learning, thereby improving students' PU of blended learning.

In addition, teachers should also combine the characteristics and needs of the fine art major to optimize the course structure, enhance students' interest in learning, promote students' willingness to learn independently and achieve better academic results, and enhance students' CI to blend learning.

C. Limitations and Further Research

The target area of this study is exclusively in Chengdu, and only the field of painting is chosen for investigation.

Blended education has been widely used on university campuses. Blended learning can help students acquire knowledge more conveniently. The scope of the study might first be broadened to include other parts of China. Secondly, it can expand to other areas in the majors studied. Finally, other variables, such as self-efficacy, service quality, perceived ease of use, etc., can be considered for the potential relationship between students' continuous willingness to blended learning, so as to enrich the conceptual structure of students' continuance intention to blended learning.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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