DETERMINANTS INFLUENCING THE LEARNING SATISFACTION OF ONLINE ART EDUCATION FOR POSTGRADUATES IN PUBLIC UNIVERSITIES IN SICHUAN, CHINA

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Abstract

This study aims to measure determinants influencing learning satisfaction of art graduates with their online education during the COVID-19 era at public universities in Sichuan Province. The conceptual framework includes system quality, information quality, service quality, self-efficacy, perceived utility, perceived ease of use, and learning satisfaction. The investigation and research methods involve judgmental, stratified random, and convenience sampling. The target population is 496 participants who are postgraduate students. In order to analyze the data, the researcher utilized confirmatory factor analysis and structural equation modeling to evaluate the hypotheses and the relationships between the variables. The findings demonstrate that all hypotheses are supported. This study can therefore be applied to enhance students' learning efficiency and satisfaction in Sichuan public universities' online programs for art majors.

Keywords: Online Education, System Quality, Information Quality, Service Quality, Learning Satisfaction.

Introduction

Online education has advanced dramatically in recent years, thanks to China's rapid development of Internet technology. Accorded to the data statistics from the China Internet Information Center, there were 23.246 million students enrolled in online courses as of June 2019, up from 110.14 million in 2015. The number of online education users also increased by about 100 million after stabilizing between June 2019 and the end of March 2021. The pandemic caused nearly 200 million users, demonstrating the impact of the coronavirus outbreak to contribute to the promotion of online education. It also signifies that the rate at which modern education utilizes the Internet is rising quickly yearly.

Online education was building network resources and investing in hardware for education to rise annually in China. The pioneering role of colleges and universities has greatly aided the expansion of online education and colleges and universities have invested in network resources. However, because of their unique characteristics, online education and art teaching are still in the early stages of growth (Xie, 2020). Accelerating research into online art

education is essential to enhancing network service and teaching quality and better preparing for the current pandemic environment (Wang et al., 2020). Li (2021) suggested that the Internet and art education together would surely advance the field of art education. In order to achieve the diversification of education and teaching methods, network art education research should not only incorporate the legislation of art education but also broaden the diversity of network teaching modes as feasible.

The success of Internet-based art education depends on the system's overall level, system optimization, and network system interaction conditions (Wu & Wang, 2006). Researchers sorted out the variables affecting online art education and summarized them into objective and subjective characteristics using Aldholay et al. (2018), and Baber (2021). The online teaching process, however, prioritizes exterior form above internal substance (Sun, 2019). It is clear from this that a study on the elements affecting online education is a crucial step in raising the standard of instruction and that student satisfaction with learning was a vital indicator of the effectiveness of online art education. Therefore, it is crucial to research the variables influencing learning pleasure in online art education and their interactions.

Literature Review

1. System Quality (SYQ)

System quality is a metric used to assess a system's capacity for information processing, including its dependability, potency, and accessibility. It is also described as a measure of a system's capacity to process data and an assessment of a computer's capacity to examine its inbuilt documents (Chang, 2013). System quality could be assessed to enhance user experience using a system's dependability and efficacy. Users' satisfaction is greatly affected by the alignment of information exchange efficiency and real efficiency (Masrek & Gaskin, 2016). This study infers the following presumption:

H1: System quality has a significant effect on learning satisfaction.

2. Information Quality (IQ)

Information quality measures how helpful information is when it is supplied using a computer platform. IQ indicates to users whether the platform's content is current, accurate, and comprehensive (Chang, 2013). According to Masrek and Gaskin (2016), IQ is a crucial indication for assessing the accuracy and completeness of the information offered to users by the computer platform, as well as its utility, thoroughness, and accuracy. It also suggested that IQ serves as one of the markers for gauging how much pleasure people genuinely experience. The satisfaction and propensity to repurpose users are greatly influenced by high-quality material (Chang, 2013). Thus, it is possible to assume the following:

H2: Information quality has a significant effect on learning satisfaction.

3. Service Quality (SEQ)

The effectiveness of the service offered by the service provider to the user is known as service quality, which also referred to the user's acceptance of the received service, including the acceptance of the service's dependability, assurance, empathy, empathy, and responsiveness (Yuce et al., 2019). According to Aldholay et al. (2018), high SEQ quality would significantly affect how happy and satisfied the consumer feels throughout actual use. Additionally, good SEQ could considerably enhance students' academic achievement, reduce their learning time, and significantly enhance their learning satisfaction (Yuce et al., 2019). As a result, the following conclusion can be made:

H3: Service quality has a significant effect on learning satisfaction.

4. Self-Efficacy (SE)

Self-Efficacy is defined as an active process of a person's subjective cognition that he can do a particular activity according to the expectation (Chughtai, 2018). Through training, SE could become more confident using internet tools and experience less technology-related anxiety (Zhao et al., 2008). Aldholay et al. (2018) noted that subjective cognition impacted SE. The perception of SE would impact how the learners evaluate the usefulness of system information and its simplicity of use, which would positively affect the learners' learning interest and academic success (Eom, 2012). As a result, a hypothesis made the following presumptions:

H4: Self-efficacy has a significant effect on perceived usefulness.

H5: Self-efficacy has a significant effect on perceived ease of use.

5. Perceived Ease of Use (PEOU)

Sharma et al. (2014) asserted that PEOU describes a person's conviction that particular technology and system can be utilized effectively without extensive training. It refers to how simple it is for students to use an online learning platform while studying. There is a strong correlation between perceived utility and perceived ease of use among students who rated the usefulness of the online learning system by how easy it was for them to use (Ifinedo, 2017). Cheng (2012) also agreed the point that learners with a strong desire to learn can make the system easier to use, which would increase their satisfaction in the system and increase their motivation to use it repeatedly. Therefore, it is possible to assume the following hypotheses:

H6: Perceived ease of use has a significant effect on perceived usefulness.

: Perceived ease of use has a significant effect on learning satisfaction.

6. Perceived Usefulness (PU)

When a person who believed that the particular system he/she utilizes could increase work efficiency is known as “perceived usefulness” (PU) (Cheng, 2012). In other words, PU refers to cognition in which people think accessing platforms and content from computer systems would help them perform better and reap benefits (Masrek & Gaskin, 2016). According

to Sharma et al. (2014), perceived usefulness is a personal motivator that influences whether or not students accept e-learning systems and is one of the critical variables that affects students' learning satisfaction and acceptance of teaching strategies. According to Ifinedo (2017), a link between usefulness and contentment suggested that students' understanding of the network system's utility could help increase student satisfaction. Hence, a hypothesis is proposed:

H7: Perceived usefulness has a significant effect on learning satisfaction.

7. Learning Satisfaction (LS)

Learning satisfaction is termed as how would users of an online learning system perceive the products or services that are made available to them (Kitcharoen, 2018). The main elements influencing users' satisfaction with an online learning system and whether they would continue to use it are its usefulness and value (Chang, 2013). When customers receive assistance from a service provider to complete chores, they are satisfied, which is a highly individualized psychological endeavor (Masrek & Gaskin, 2016). Accorded to Aldholay et al. (2018), the number, swiftness, quality, and format of system functions that consumers accept constitute user pleasure.

Research Framework

Figure 1 illustrates the conceptual framework of this study, based on precedent academic research frameworks. The variables are system quality, information quality, service quality, self-efficacy, perceived utility, perceived ease of use, and learning satisfaction.

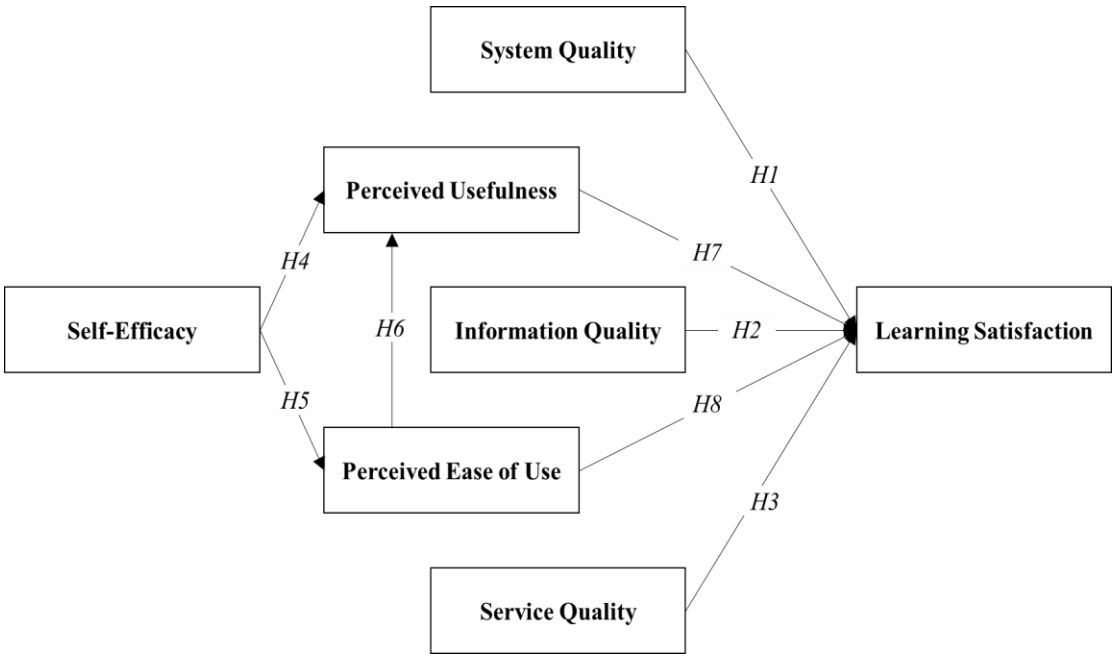

Figure 1 Conceptual Framework

Research Methodology

The researchers used online and offline questionnaires to gather data. The questionnaire was distributed to 496 Art graduate students from the three target universities. The investigation and research methods involve judgmental, stratified random, and convenience sampling. The survey comprises of screening questions, demographic inquiries, and a 5-point Likert measurement scale. Before the survey's distribution, the researcher asked three specialists from related fields to test the questionnaire's target consistency, and all of the items passed with a score of at least 0.6. A preliminary sample test with a sample size of 30 was then carried out to guarantee the validity and internal consistency of the constructs at a score of 0.7 or over. The confirmatory factor analysis (CFA) and the structural equation model (SEM) were used to analyze the data.

1. Population and Sample Size

Graduate art students from three prestigious universities in Sichuan Province, which are Sichuan University, Chengdu University, and Sichuan Normal University. The sample size calculator determines that the reference sample size needed for the research is 444 when combined with the particular project scale of the theoretical framework for the study (Soper, 2022). In order to produce accurate and trustworthy study results, the researchers planned to collect data from 500 samples.

2. Sampling Techniques

The judgmental sampling was determined to 496 art graduate students from the three target universities who have had at least month of learning experience. For stratified random sampling, 496 postgraduate students were randomly chosen from 1,200 to complete a questionnaire survey. Convenience sampling was carried out by online and offline questionnaire distribution. The academic staff delivered the paper-based questionnaire as well as online survey link to 500 art graduates of the three universities.

Results and Discussion

1. Demographic Information

The demographic results are based on 496 valid Reponses. There were 45% male and 55% female. For online education experience, there was 19.3% of less than one year, followed by 36.5% of 1-2 years, 28.2% of 3-4 years, and 16% of over 4 years.

2. Confirmatory Factor Analysis (CFA)

CFA was employed in the study to validate the measurement model. 496 valid data were analyzed using IBM SPSS Amos. According to Hair et al. (2010), the degree of freedom (CMIN/DF) was 1.948, less than 3.00, GFI was 0.912, higher than 0.90 (Hair et al., 2006), AGFI was 0.892, more than 0.80 (Jöreskog & Sörbom, 1989), and the comparative fitting index (CFI) was 0.956, more than 0.90. (Hair et al., 2006), The root mean square error (RMSEA) was around 0.044, less than 0.05 (Arbuckle & Wothke, 2008), and the normalized fit index (NFI) was 0.915, higher

than 0.90. (Arbuckle, 1995).

All of the indicators obtained for this study pass the CFA test. In Table 3, the factor load value was more significant than 0.50 (Salkind, 2010), the t value was more significant than 1.98, the P value was less than 0.50, and the total reliability (CR) was more significant than 0.70 (Hair et al., 2010). The average variance extracted (AVE) was more significant than 0.50. In addition, all variables in the theoretical framework have Cronbach's alpha values greater than 0.80. (Hair et al., 1998). As a result, the model test was used for the discriminant and convergent validities.

Table 1 Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Latent Variables	Source of Questionnaire	No. of Items	Cronbach's Alpha	Factors Loading	CR	AVE
System Quality	Cheng (2014)	3	0.794	0.687-0.794	0.797	0.568
Information Quality	Cheng (2014)	4	0.875	0.687-0.905	0.877	0.645
Service Quality	Wang et al. (2014)	5	0.877	0.717-0.813	0.878	0.591
Perceived Usefulness	Cheng (2014)	4	0.823	0.678-0.810	0.826	0.544
Perceived Ease of Use	Sharma et al. (2014)	4	0.850	0.623-0.892	0.853	0.598
Self-Efficacy	Ren and Chadee (2017)	4	0.919	0.843-0.879	0.919	0.741
Learning Satisfaction	Wang et al. (2014)	5	0.859	0.662-0.819	0.861	0.555

Source Created by the author.

As shown in Table 2, 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 2 Discriminant Validity

	SYQ	IQ	SEQ	PU	PEOU	SE	LS
SYQ	**0.783**						
IQ	0.368	**0.773**					
SEQ	0.230	0.225	**0.758**				
PU	0.300	0.260	0.268	**0.810**			
PEOU	0.328	0.253	0.266	0.474	**0.794**		
SE	0.300	0.276	0.252	0.380	0.520	**0.814**	
LS	0.532	0.442	0.285	0.422	0.393	0.372	**0.742**

Note The diagonally listed value is the AVE square roots of the variable

3. Structural Equation Model (SEM)

Accorded to Hair et al. (2014), structural equation models had taken over as the primary technique for evaluating causal models with potential variables and could reduce the estimation of measurement errors. They were crucial to the theoretical framework and hypothesis testing because they were utilized to evaluate the link between independent and observable variables and internal and external factors (Ramlall, 2017). The evaluation values for various structural model parameters are displayed in Table 3 below. The fit values for CMIN/DF, GFI, AGFI, RMSEA, CFI, NFI, and TLI, are satisfactory.

Table 3 Goodness of Fit for Measurement and Structural Model

Index	**Acceptable Criterion**	**Statistical Values Before Adjustment**	**Statistical Values After Adjustment**
CMIN/DF	< 3 Hair et al. (2010)	2.131	1.947
GFI	≥ 0.90 Hair et al. (2006)	0.898	0.906
AGFI	≥ 0.80 Hooper et al. (2008)	0.878	0.887
RMSEA	< 0.05 MacCallum et al. (1996)	0.048	0.44
CFI	≥ 0.90 Hair et al. (2006)	0.946	0.955
NFI	≥ 0.90 Mulaik et al. (1989)	0.904	0.912
TLI	≥ 0.90 Hair et al. (2006)	0.940	0.949
Model Summary		**Unacceptable Model Fit**	**Acceptable Model Fit**

Note: 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, RMSEA = Root mean square error of approximation CFI = Comparative fit index, and TLI = Tucker-Lewis index

4. Hypothesis Testing Result

Structural equation modeling (SEM) verifies all hypotheses in this study. SEM calculates the R^2 variance matrix and regression weight to determine the significance of each hypothesis variable. As shown in Table 4, Self-Efficacy (SE) had the greatest impact on Perceived Usefulness (PU) in the whole calculation evaluation, and its standardized path coefficient (**β**) was 0.603, (T-Value = 8.931***); The influence value of SYQ on LS was 0.356, (T-Value = 6.514***); The influence value of IQ on LS was 0.285, (T-Value =5.834***); The influence value of SEQ on LS was 0.262, (T value = 5.222* * *); The influence value of SE on PEOU was 0.425, (T-Value = 8.052***); The influence value of PEOU on PU was 0.226, (T-Value =4.399***); The influence value of PU on LS was 0.149, (T-Value = 2.659**); The influence value of PEOU on LS was 0.188, (T-Value =2.837**). Except that PU and PEOU had a relatively small impact on LS, other hypotheses significantly impacted LS, and all P values are less than 0.05. In addition, SE had an indirect effect on LS, with an impact value of 0.155.

Table 4 Hypothesis Results of the Structural Equation Model

Hypothesis	(β)	t-Value	Result
H1: SYQ ⟶ LS	0.356	6.514***	Supported
H2: IQ ⟶LS	0.285	5.834***	Supported
H3: SEQ ⟶ LS	0.262	5.222***	Supported
H4: SE ⟶ PU	0.603	8.931***	Supported
H5: SE ⟶PEOU	0.425	8.052***	Supported
H6: PEOU ⟶PU	0.226	4.399***	Supported
H7: PU ⟶ LS	0.149	2.659**	Supported
H8: PEOU ⟶LS	0.188	2.837**	Supported

Note: *** p<0.001, ** p<0.01

Source: Created by the author.

The results in Table 4 can be concluded per below:

System quality is one of the critical factors that significantly impact student's learning satisfaction, according to Yuce et al. (2019). The H1 demonstrates SYQ's has a significant impact on LS with standardized path coefficient value of 0.356.

The standardized path coefficient value of 0.285 confirms Chan et al. (2017)'s assertion that information quality was the primary determinant of satisfaction with an online learning platform, which would significantly impact e-learning system satisfaction. The IQ in H2 has a significant effect on LS.

SEQ in H3 significantly affects LS with its standardized path coefficient value of 0.262. Supported the argument made by Wang et al. (2009), service quality is one of the critical

factors influencing learners' satisfaction with online learning.

H4 presents the strongest causal relationship from SE to PU. The standardized path coefficient has a value of 0.507, demonstrating that when using an e-learning system, the usefulness of the perception system and learning information would be correlated with the student's level of self-awareness and a high degree of subjectivity (Sánchez et al., 2013).

H5 confirms the influence of SE on PEOU, and the standardized path coefficient is 0.425. The findings support the notion that learners' self-efficacy would increase their perception of how much simpler the learning system is to use and their aptitude for doing so (Huang & Liaw, 2018).

PEOU also significantly affects PU as of H6, with a standardized path coefficient value of 0.226. According to Huang and Liaw (2018), PEOU's forecast of PU would impact learners' attitudes, which would then impact how well they perform in online learning.

With a standardized path coefficient value of 0.149 in H7, the considerable impact of PU on LS could validate that the perceived utility hypothesis put forward by Limayem et al. (2007) would impact students' satisfaction and willingness to continue using online education.

The standardized path coefficient value is 0155 in H8 which approves the substantial impact of PEOU on LS. Perceived ease of use, according to Yu (2012) and Roca et al. (2006), was one of the critical factors influencing user satisfaction in the e-learning environment.

Conclusions, Recommendations, Limitations and Future Research

1. Conclusions

The primary goal of this academic study is to analyze the key variables influencing the learning satisfaction of online art education. As a result, the researcher reviewed a wide range of earlier research findings to develop the theoretical foundation for this study. The study's hypotheses were presented, and an in-depth investigation was done based on the theoretical framework. In the study, 496 valid responses were gathered. Following data analysis, it was discovered that, in line with other studies, every element put forth in the theoretical framework significantly affects learning satisfaction.

Regarding objective variables influencing learning satisfaction, system quality, information quality, and service quality are all significant. System quality is the following information quality and service quality as critical influences on learner satisfaction. This is in line with Masrek and Gaskin's (2016) investigation. The results provide a preliminary assessment of the system quality, information quality, and service quality, all of which are crucial for the online learning of art students and served as prerequisites for students to feel satisfied with their learning experiences when using the online learning system. Self-efficacy, perceived usefulness, and perceived ease of use significantly impacted learning satisfaction and could have a direct or indirect effect. In other words, learners' initiative would help to promote

learners' learning satisfaction when the objective components (SYQ, IQ, and SEQ) that affect learning satisfaction could match the needs of learners (Aldholay et al., 2018; Huang & Liaw, 2018; Kilic et al., 2015).

2. Recommendations

This study topic was being offered for several reasons, one of which was the significant issues that COVID-19's worldwide effects had presented for online education. Additionally, the Chinese government had been actively implementing anti-epidemic measures for a long time, and all colleges, schools, and primary and secondary schools were required to normalize the online education mode over time due to the continuous impact of domestic and international epidemics. To address this issue, it would therefore be crucial to continue researching and improving online education technology. Research on the factors that affect learning satisfaction in online education could be a valuable resource for universities and other organizations that want to enhance the platform for online learning and raise the standard of online education. It could also serve as a solid foundation for future planning of the system's educational platform and adjustments to the teaching style.

In other words, if we want to increase learners' satisfaction with online learning, we should start with the objective above and subjective factors. This can increase the likelihood that students will reuse their learning, acknowledge the learning benefits provided by the learning platform, and accomplish the goal of enhancing learning effectiveness and performance. This serves as a resource for colleges and other organizations that must use the online learning platform.

3. Limitations and Future Research

The following restrictions apply to this study. Firstly, only graduate students in art from three comprehensive institutions in Chengdu, Sichuan Province, were chosen to participate in the survey. After all, it cannot represent all majors or all universities in Sichuan Province. Secondly, the theoretical framework may eliminate highly beneficial variable correlations, like system compatibility, self-managed learning, practical application, and student loyalty. Lastly, in the future, the researchers should refine the research issues, deepen the research, make the most of the research resources, and work to produce more worthwhile research findings.

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