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Assessing Factors Impacting Satisfaction and Continuance Intention of Middle School Art Teachers to Use E-Learning Systems in Chongqing, China

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Abstract

This paper aims to evaluate key elements that significantly impact the satisfaction and continuance intention to use e-leaning of art teachers from middle schools in Chongqing, China. The framework included relationships between engagement, course structure, system quality, information quality, service quality, perceived usefulness, satisfaction, and continuance intention. The researcher distributed the quantitative questionnaires to 500 teachers at 15 middle schools in Chongqing, China. The sampling strategies used to collect the data include judgmental, quota and convenience sampling. Before the data collection, the expert rating of the item's index–objective congruence (IOC) and pilot tested with 50 respondents. Confirmatory factor analysis and structural equation modeling were used to analyze the data. The result of the data analysis supported five hypotheses, with perceived usefulness showing the strongest impact on satisfaction. Furthermore, satisfaction has a significant impact on continuance intention. As technology advances, online education has become a viable and sometimes preferred option for delivering instruction. Instructors should recognize that online education can offer various benefits, such as flexibility, accessibility, and the ability to incorporate multimedia elements into lessons.

Keywords : e-learning, middle schools, service quality, satisfaction, continuance intention

Introduction

E-learning, according to a report by the Canadian Council on Learning, is the process of acquiring knowledge and skills with information and communication technologies (ICTs), especially to support interactions with learning materials, tools, and other people, according to Abrami et al. (2006). E-learning is becoming increasingly important for various reasons, including the development of consumer culture, the proliferation of information, and the global economy. Tirziu and Vrabie (2015) stated that 21st-century people need an adaptable system that enables individuals to balance employment, study, and family obligations. Alternative distribution techniques, such as Internet use and e-learning, exemplify this flexibility.

Due to its better flexibility and timeliness, e-learning can meet training demands 24 hours a day, 7 days a week, whereas traditional classroom-based training programs are

extremely inconvenient. E-learning enables individuals to get instruction at their leisure rather than having to wait until a class of students is assembled, as stated by Nagy (2005). It is an effective style of education to promote lifelong learning, and it is well-adapted to the actual needs of middle school art teachers in Chongqing. E-learning, or online education, can offer several significant benefits to art teachers in Chongqing, as well as educators in general. Chongqing is a major city in China with a diverse population and a growing emphasis on education and technology.

In recent years, China has made advancements in the information technology used to educate instructors, and the country has been diligently investigating Chongqing region. According to the literature, there are relatively few assessments of middle school art teachers' satisfaction with e-learning in the Chongqing region. According to Klassen and Chiu (2010), satisfaction refers to a learning attitude and feeling students have during the learning process. Feeling pleased with a good attitude is satisfaction. Therefore, the Chinese teacher education system must be changed to increase teacher instructional satisfaction. The effectiveness and performance of e-learning system are now highly correlated with instructors' learning satisfaction.

Using the results of the previous study as a foundation, the study's objective is to investigate the factors that significantly impact satisfaction and continuance intention of secondary school instructors in Chongqing, China's towards online art education. The investigation concentrated on the level of e-learning satisfaction among Chinese secondary school art teachers. Quantitative research is required to examine the satisfaction and continuance intention mechanism with six significant latent variables namely, engagement, course structure, system quality, information quality, service quality, perceived usefulness corresponding to the e-learning for middle school art school instructors in Chongqing, China.

Literature Review

Engagement

According to Kucuk and Richardson (2019), engagement has four dimensions: agentic, emotional, cognitive, and behavioral components. These four dimensions interact with one another. According to Ma et al. (2015), student participation and engagement in class impact their learning outcomes, cognitive development, and educational quality. Dennen et al. (2007) stated that student involvement is one of the key factors affecting persistence and improving learning effectiveness in online courses. From Jennings and Angelo's (2006) research, teachers can more successfully create classes and activities that will encourage students to take an active role in the learning process by monitoring student engagement and taking affective factors into account. According to Handelsman et al. (2005), students who put work and time into online learning have high levels of participation, performance, emotional engagement, and class participation. Therefore, this study proposes a hypothesis:

Hypothesis 1: Engagement has a significant impact on satisfaction.

Course Structure

According to Baber (2020), the course structure shows the rigidity or flexibility of the program's educational objectives, teaching methodologies, and evaluation systems, as well as

how well-suited an educational program is to meet the specific needs of each learner. Gray and DiLoreto (2016) discovered that the course format considerably impacted students' satisfaction, which is like Eom et al. (2006) 's findings. Gray and DiLoreto (2016) stated that the conception and design of the course materials, curriculum, instructional tactics, methodologies, course schedule, and overall planning of a course before, during, and after a course is given are all included in the course structure and organization. The course structure variations significantly impacted the students' feelings of anxiety, confidence, liking, and usefulness in the study by Yaghi and Ghaith (2002). Hence, a hypothesis is set:

Hypothesis 2: Course structure has a significant impact on satisfaction.

System Quality

The consistency of the user interface, usability, the caliber of the documentation, and sporadically the caliber and maintainability of the program code are all components of a system's quality, according to Gorla et al. (2010). According to Uzir et al. (2020), system quality primarily benefits perceived value and user pleasure. According to empirical research by Hassanzadeh et al. (2012), the effectiveness of educational systems directly and indirectly, impacts users' satisfaction. Dubey et al. (2012) stated that the degree to which an industry defines a set of desirable qualities that should be included in the product to improve its lifetime performance is known as system quality. The system's functionality, the relevancy of the linkages, and the volume of information are among the requirements of an interactive webpage or portal that Garett et al. (2016) mention as an important criterion of an effective homepage. Consequently, a hypothesis is suggested:

Hypothesis 3: System quality has a significant impact on satisfaction.

Information Quality

Prior studies have looked extensively at information quality (IQ), which is defined as users' perception of the quality of information presented on a Web site" in an online context by Liu et al. (2017). According to Andresile et al. (2022), the success of the monitoring, evaluation, accountability, and learning system is significantly influenced by the quality of the information. Ghasemaghaei and Hassanein (2015) stated that the Delone and McLean Information Systems (IS) success model (D&M) identifies information quality as one of the key variables influencing the satisfaction of consumers. Information quality was previously assessed using criteria like correctness, consistency, completeness, simplicity of understanding, personalization, relevance, security, and timeliness (Gable et al., 2008; Petter et al., 2012). Hence, a hypothesis is put forward:

Hypothesis 4: Information quality has a significant impact on satisfaction.

Service Quality

Stiakakis and Georgiadi (2009) claimed that e-service quality is the sum of a customer's perceptions, assessments, and evaluations of the service quality received from a virtual marketplace. According to Roca et al. (2006) and Lee (2010), the criterion of service quality should have been the extent to which a student perceives the general quality of personal support services offered by the e-learning system. Additionally, Liu et al. (2010) concluded that service quality is a crucial factor that can also affect customer satisfaction. There is proof that the use of E-learning and service quality are favorably associated, as Dominici and Palumbo (2013) claimed. Subsequently, a hypothesis is suggested:

Hypothesis 5: Service quality has a significant impact on satisfaction.

Perceived Usefulness

The extent to which a person thinks that utilizing a certain system will improve his or her ability to perform at work, according to Daneji et al. (2019). definition of perceived usefulness. Isik (2008) and Al-Fraihat et al. (2020) both identified a strong association between service quality and perceived usefulness, and Wang and Liao (2008) discovered a strong correlation between service quality and felt satisfaction. According to Alsabawy et al. (2016), the primary indicator of an e-learning system's acceptance and success is its perceived usefulness. Saadé (2007) claimed that students' attitudes toward their course experience would improve if they believed the electronic medium to deliver courses was valuable. This would also encourage them to adopt online courses in the future. Thereby, this study hypothesizes that:

Hypothesis 6: Perceived usefulness has a significant impact on satisfaction.

Hypothesis 7: Perceived usefulness has a significant impact on continuance intention.

Satisfaction

One of the many factors affecting the effectiveness of online learning programs is the satisfaction of students, according to Abel (2005). Pham et al. (2019) discovered in their research that students' emotional responses to e-learning systems, whether positive or negative, were measured by their satisfaction. Pham et al. (2019) approach presupposed that system, information, and service quality directly impacted user satisfaction and intention. In numerous study disciplines, significant studies have proven the close relationship between satisfaction and retention rates, according to Tsai et al. (2007). In eLearning courses, retention, and dropout rates are correlated with student satisfaction, according to Levy (2007). Accordingly, H8 is indicated:

Hypothesis 8: Satisfaction has a significant impact on continuance intention.

Continuance Intention

The topic of continuation intention in an E-Learning environment has drawn more attention recently, according to Chiu and Wang (2008). The factors influencing users with varying levels of e-learning experience may not be the same, as user beliefs and attitudes might change over time, according to Gao et al. (2015). According to Mouakket (2015) continuance intention refers to a person's deliberate wish to use or interact with technology for a lengthy period. Almahamid and Rub (2011) stated that system quality, information quality, service quality, online self-efficacy, intrinsic usefulness, and perceived usefulness were tested using multiple regression to see if they could accurately predict whether users would continue to use an e-learning system.

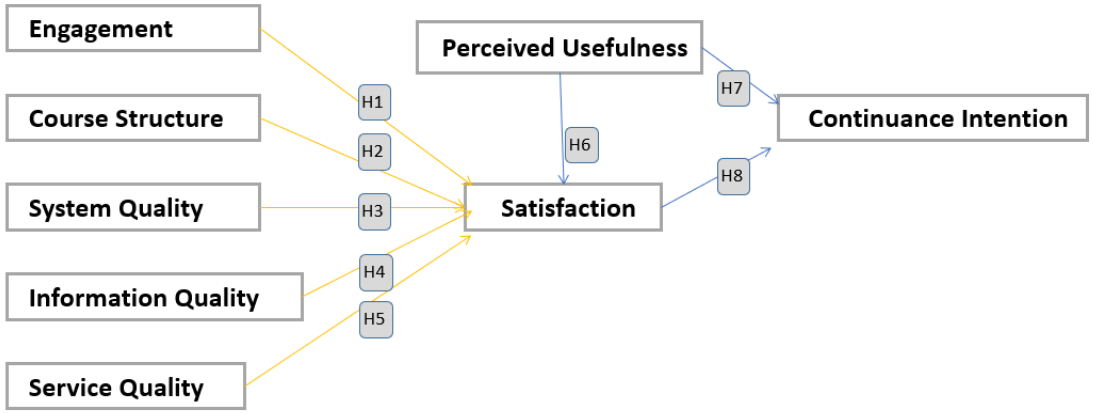
Conceptual Framework

Eight variables make up the conceptual framework for this study, and these variables can be categorized into independent, dependent, and mediator variables. The idea that the researcher wished to quantify their influence on the specific result served as the independent variable (Hair et al., 2013). According to Clark-Carter (1997), an independent variable may affect a related variable. Engagement, course structure, system quality, information quality,

service quality, and perceived value are the independent factors in the conceptual framework. This academic study's major goal was to determine what factors affect middle school art instructors' satisfaction with using an e-learning system in Chongqing, China. The research dependent variables were satisfaction and continuance intention. The variable that was impacted by the independent variable and had the potential to affect the dependent variable was the mediator variable. One mediator variable, satisfaction, was included in the conceptual framework. It is shown in Figure 1.

Figure 1

Conceptual Framework



Source: Constructed by author

Research Methodology

Research Design

This study measures the music, art, dance, and calligraphy teachers in Chinese middle schools' satisfaction with e-learning. This study's methodologies include the general study design, participants and sampling strategy, research instrument and its content validity, internal consistency reliability, data collection strategies, and statistical analysis procedures. In this study phase, item-objective congruence (IOC) testing and preliminary analysis are presented. The researcher describes how statistical techniques were used to evaluate the hypotheses, the structure and measurement model, and screen and predict the outcomes.

Before the data collection, the questionnaire was rated by experts using the item's index–objective congruence (IOC) and pilot tested with 50 respondents. IOC's results showed a score higher than 0.6. The result of the pilot test conducted shows Cronbach's alpha coefficient values exceeding the acceptable value of 0.7 (Nunnally & Bernstein, 1994).

The instrument used in the study is a questionnaire. The three main parts of the questionnaire used in this study to investigate the variables influencing middle school teachers' satisfaction with E-Learning in fine art, music, dance, and calligraphy in the Chongqing district, China, were the screening questions, demographic data, and factors affecting users' satisfaction and continuance intention with E-Learning.

Research Population and Sample

The target population for this study was Chongqing, China's middle school teachers of fine art, music, dance, and calligraphy. According to Taherdoost (2017), the sample size must be considered in any study that seeks to extrapolate knowledge about a population from a sample. According to the computed results, the Soper (2023)'s suggests that the minimum sample size should be at least 444. Finally, 500 samples were properly investigated. However, after the data screening, 498 responses were considered valid.

Data Analysis

The sampling strategies used to collect the data include judgmental, quota and convenience sampling. Judgmental sampling is to choose secondary art teachers at 15 schools. There were 1,683 middle school teachers in total in the first stage samples. For quota sampling, the researcher selected samples (teachers) from each subject area the teacher teaches. After that, the researcher chose about 500 middle school instructors for the sample. The data collection is to distribute online questionnaire via email and WeChat application.

Demographics of Participants

The complete demographic data of the 498 respondents are summarized in Table 2. Male respondents comprised 19.08% of the total, compared to female respondents, who comprised 80.92%. 20.88% of respondents have been working between one and five years, 22.09% have been working between six and ten years, 20.48% have been working between eleven and twenty years, 26.71% have been working between twenty-one and thirty years, and 9.84% have been working for more than thirty years. According to the distribution of disciplines, 49.20% of respondents teach fine art, 1.61% teach dance, 38.76% teach music, and 10.43% teach calligraphy.

Table 1

The demographic data

Demographic and General Data (n=498)	Category	Frequency	Percentage
Gender	Female	403	80.92%
	Male	95	19.08%
Years of work	One to five years	104	20.88%
	Six to ten years	110	22.09%
	Eleven to twenty years	102	20.48%
	Twenty-one to thirty years	133	26.71%
	More than thirty years	49	9.84%
Subject	Art	245	49.20%
	Calligraphy	52	10.43%
	Music	193	38.76%
	Dance	8	1.61%

Results and Discussion

CFA is a technique for measuring latent variables, according to Hoyle (2000), that relies on the variance and covariation among a larger variety of observed indicators to identify a more limited number of latent factors. Confirming the connections between and among the underlying factor structures of the scale items requires this procedure. Table 3 shows that composite reliability (CR) was above 0.7, the factor loading values were above 0.5, and the average extracted variance (AVE) values were larger than 0.5. (Cheung & Wang, 2017; DeCoster, 1998; Hair et al., 2014).

Table 2

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

Variables	Source of Questionnaire	No. of Item	Factors Loading	CR	AVE
System quality (SQ)	Gorla et al. (2010)	5	0.662-0.830	0.860	0.553
Information quality (IQ)	Teo et al. (2014)	6	0.742-0.877	0.907	0.621
Service quality (SEQ)	Lin and Wang (2006)	3	0.729-0.856	0.830	0.621
Course structure (CS)	Eom et al. (2006)	4	0.776-0.870	0.894	0.678
Engagement (ENG)	Lu et al. (2009)	5	0.670-0.791	0.842	0.517
Perceived usefulness (PU)	Alsabawy et al. (2016)	3	0.824-0.935	0.903	0.756
Satisfaction (SAT)	Pham et al. (2019)	4	0.776-0.844	0.890	0.669
Continuance intention (CI)	Mouakket (2015)	4	0.776-0.830	0.882	0.651

The findings of the discriminant validity are shown in Table 3. The diagonally defined quantity is the square root of the latent variables' AVE, and all coefficients connecting any two latent variables were less than 0.80. Thus, the discriminant validity was established.

Table 3

Square roots of AVEs and correlation matrix

	SQ	IQ	SEQ	CS	ENG	PU	SAT	CI
SQ	**0.744**							
IQ	0.730	**0.788**						
SEQ	0.697	0.772	**0.788**					
CS	0.732	0.781	0.779	**0.823**				
ENG	0.561	0.611	0.654	0.644	**0.719**			
PU	0.683	0.732	0.722	0.791	0.655	**0.869**		
SAT	0.673	0.733	0.733	0.797	0.638	0.794	**0.818**	
CI	0.655	0.720	0.757	0.750	0.601	0.756	0.790	**0.807**

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

When judging whether the structural equation model is tenable, it is mainly measured by measuring some relevant indicators, among which CMIN/df is generally required to be less than 3, GFI is the fitness index, AGFI is the adjusted fitness index, NFI standard fitness index, and CFI comparative fitness index. Generally, these values must be greater than 0.9, indicating that the model has good adaptability, but greater than 0.8 indicates that the model is acceptable. RMSEA should be less than 0.08, meaning the fit energy and model fit are good.

Table 4

Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	<3.00)Kline, 1998)	1.707
GFI	>0.90 (Marsh et al., 1988)	0.907
AGFI	>0.80 (Marsh et al., 1988)	0.889
RMSEA	<0.05 (Birch et al., 2001)	0.038
CFI	>0.90 (Birch et al., 2001)	0.972
NFI	>0.90 (Bentler, 1990)	0.935
TLI	>0.90 (Birch et al., 2001)	0.968
Model Summary		**In harmony with empirical data**

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, RMSEA = Root mean square error of approximation, CFI = Comparative fit index, NFI = Normed fit index, and TLI = Tucker–Lewis index.

Structural Equation Modeling (SEM)

According to Ullman and Bentler (2012), structural equation modeling (SEM) is a statistical technique that can be used to analyze the interactions between a small number of continuous or discrete independent variables (IVS). According to Sedera et al. (2004), structural equation modeling offers global fit metrics widely employed as omnibus assessments of the model's accuracy in practice. Table 5 demonstrates that the totals for CMIN/DF, GFI, AGFI, CFI, NFI, TLI, and RMSEA were all above the permitted limits. As a result, the efficacy of SEM was verified.

Table 5

Goodness of Fit for Structural Model

Fit Index	Acceptable Criteria	Statistical Values Before Adjustment	Statistical Values After Adjustment
CMIN/DF	<3.00)Kline, 1998)	6.423	1.662
GFI	>0.90 (Marsh et al., 1988)	0.649	0.910
AGFI	>0.80 (Marsh et al., 1988)	0.598	0.893
RMSEA	<0.05 (Birch et al., 2001)	0.104	0.037
CFI	>0.90 (Birch et al., 2001)	0.775	0.974
NFI	>0.90 (Bentler, 1990)	0.745	0.937
TLI	>0.90 (Birch et al., 2001)	0.757	0.970
Model Summary		**Not in harmony with empirical data**	**In harmony with empirical data**

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, RMSEA = Root mean square error of approximation, CFI = Comparative fit index, NFI = Normed fit index, and TLI = Tucker–Lewis index.

Hypothesis Outcomes

The results in Table 6 indicate that perceived usefulness had the greatest direct impact on satisfaction, with a standardized path coefficient (β) of 0.352 (t-value = 4.876 ***). The second most important factor significantly affecting satisfaction is course structure, with a β at 0.319 (t-value at 2.863 **), followed by service quality, with β at 0.267 (t-value at 2.166 *). Additionally, satisfaction greatly influences continuance intention withβat 0.739 (t- value at 8.130 ***), followed by perceived usefulness withβat 0.198 (t-value at 2.320 *).

Table 6

Summary of hypothesis tests

Hypothesis	Standardized path coefficient (β)	t-value	Testing result
H1: Engagement has a significant impact on satisfaction.	0.017	0.353	Not Supported
H2 Course Structure has a significant impact on satisfaction.	0.319	2.863 **	Supported
H3: System Quality has a significant impact on satisfaction.	-0.045	-0.771	Not Supported
H4: Information Quality has a significant impact on satisfaction.	0.068	0.900	Not Supported
H5: Service Quality has a significant impact on satisfaction.	0.267	2.166 *	Supported
H6: Perceived Usefulness has a significant impact on satisfaction.	0.352	4.876 ***	Supported
H7: Perceived Usefulness has a significant impact on continuance intention.	0.198	2.320 *	Supported
H8: Satisfaction has a significant impact on continuance intention.	0.739	8.130 ***	Supported

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

Discussion

H1 shows that engagement is not a significant predictor of satisfaction, with a standardized path coefficient value for this structural approach of 0.017. Numerous surveys also offer empirical evidence for the critical connection between variable engagement and satisfaction (Dennen et al., 2007; Jennings & Angelo, 2006; Ma et al., 2015).

For **H2**, with a standardized path parameter threshold of 0.319, Table 7 demonstrates that course structure is a significant predictor of satisfaction. Numerous studies also provide empirical support for the crucial link between satisfaction and variable course structure (Eom et al., 2006; Gray & DiLoreto, 2016; Lee & Rha, 2009).

H3 reveals that system quality has no significant impact on satisfaction, with a standardized path coefficient value of -0.045. The findings oppose the claim that the service features of the e-learning system can endorse user satisfaction (Dubey et al., 2012; Hassanzadeh et al., 2012).

With a standardized path coefficient value of 0.068, **H4** showed that information quality has no significant impact on satisfaction. The results oppose studies indicating that information quality directly affects students' pleasure. User satisfaction and information quality lead to a statistically significant positive association (Gable et al., 2008; Petter et al., 2012).

The results of the quantification investigation's observable statistics for **H5** supported the premise that service quality considerably impacted satisfaction. The standardized coefficient value of 0.267 indicated this. Researchers found that the relationship between service quality and intentions to continue receiving services was mediated by satisfaction (Fan et al., 2021; Fatima & Razzaque, 2014; Ozkan et al., 2009).

With a common coefficient value of 0.352, the statistical result for **H6** supported the hypothesis that perceived usefulness significantly impacts satisfaction. An earlier study found that satisfaction with a particular technology is favorably influenced by that technology's perceived usefulness (Chen & Chen., 2010; Prebensen & Xie, 2017; Ryu et al., 2008).

H7 found that perceived usefulness was linked to continuing intention, supported by statistical evidence, showing a common coefficient value of 0.198. Many previous studies have shown that perceived usefulness positively impacts the intention to continue using a particular technology (Aini et al., 2019; Chang et al., 2014; Zhao et al., 2016).

With a common coefficient value of 0.739, **H8** also demonstrated that participant satisfaction considerably impacted their intention to continue. An earlier study found a significant connection between pleasure and continuance intention. Previous studies demonstrated that intentions to use instructional technology are significantly and actively influenced by satisfaction (Chiu et al., 2005; Garg & Sharma, 2020; Kaewkitipong et al., 2016).

Conclusion

The research sought to identify the factors that had a major impact on the satisfaction and continuance intention of middle school art teachers to use e-learning in Chongqing Province of China. The conceptual framework showed eight hypotheses to validate the interaction between engagement, course structure, system quality, information quality, service quality, perceived usefulness, satisfaction, and continuance intention. 498 middle school art teachers with e-learning experience responded to the survey questionnaire to identify any interactions between these variables. Confirmatory Factor Analysis (CFA) was utilized to determine whether the data fit the specified theory-derived measurement model. The structural equation modeling (SEM) was also used to test the hypotheses and confirm the connections between the observable and latent factors that affect continuance intention. The study's findings suggest that perceived usefulness has the strongest direct influence on satisfaction. At the same time, perceived usefulness and satisfaction significantly impact the continuance intention. The strongest factor influencing continuance intention was satisfaction. Moreover, course structure and service quality also have an impact on satisfaction.

Recommendations

Based on the findings of this quantitative study, the researcher offered suggestions for ongoing e-learning platform. According to this study, perceived usefulness significantly impacts how satisfied students are with their e-learning experiences. Online learning should be connected to real teaching and learning to help teachers effectively teach and hence boost teacher satisfaction. This can assist in addressing the pedagogical concerns of teachers and help them understand how e-learning can enhance effective teaching and learning.

Course designers should present a rich curriculum that covers as much material as possible that teachers need to learn. Well-structured course content should also be presented. In addition, the material in the course should be organized logically to enhance its comprehensibility.

E-learning providers should always evaluate aspects that affect service quality. All service personnel should receive training so they can show empathy, politeness, and responsiveness. Recognizing teachers' demands and swiftly providing applicable services following their needs is essential.

Ultimately, Teachers' continuance intention in e-learning could be significantly improved if instructors emphasize the course structure, service quality, perceived usefulness, and e-learning satisfaction based on the findings.

Limitations and Further Study

The population and sample are from the Chinese province of Chongqing, and only eight latent variables were chosen in the conceptual framework. Two techniques could be pursued for additional examination: extending the research's geographic scope to cover all of China. Other technological acceptance theories, such as the Information System Success Model (ISSM) and the Theory of Planning Behavior (TPB), should be considered when developing the conceptual framework.

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