Determinants of College Students' Satisfaction with Online Education of Professional Technical Courses

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Abstract

Purpose: This study comprehensively analyzes and evaluates the causal relationship among system quality, information quality, service quality, perceived usefulness, perceived ease of use, and students' satisfaction with online education of professional technical courses. **Research design, data, and methodology:** Item-objective congruence (IOC) analysis and a pilot test were used to guarantee its validity and reliability with this study's instrument. Questionnaires was sent to the target group. All data was analyzed using multiple linear regression to ascertain the degree of influence and logical connection between the variables. In addition, 30 of the 80 pre-test subjects were selected as the experimental group for strategic planning. After reading the strategic plan, a post-test team conducted a T-Test for a paired sample to contrast a data change for current and expected situations. **Results:** The significant positive effects of system quality, information quality, service quality, perceived usefulness, and perceived ease of use on satisfaction were determined. It was found that the acceptance degree of the post-test group to the research hypothesis and research framework was significantly higher than that of the pre-test group. **Conclusions:** Taking a public university in Chengdu as the research background, the determinants that affect college students 'satisfaction with online education of professional technical courses are determined.

Keywords: System Quality, Information Quality, Service Quality, Perceived Usefulness, Satisfaction

JEL Classification Code: I23, J28, L2

1. Introduction

Nowadays, digitalization, networking, and intelligence play an increasingly prominent function in empowering socioeconomic growth, and human society is entering an era of digital survival. At the same time, the accelerated evolution of the world's scientific and technological revolution and industrial transformation has put forward new requirements for higher education to adapt to the globalization of economic development, intelligent information technology, aging population structure, life-long education and teaching, and diversity of student source structure. Therefore, higher education needs to accelerate the transformation of the education concept, take digital transformation as the endogenous variable of overall and systemic change, and cultivate many middle and high-end talents with digital literacy and digital ability.

To speed up the promotion of education digitalization and smoothly promote online education, we must adhere to student-centered, and we must consider whether students like it, whether they are willing, whether they support it, whether they agree, and whether they develop it. After all, student satisfaction runs through the whole process of schools, majors, teachers, and classrooms, which is the starting point for the creation of education and teaching situations and is the "life field" to realize the organic combination of educational utility needs and human nature needs of education.

Research on satisfaction with online education has yet to be restricted in its comparison between online education and

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traditional education. More carefully considering network, information, digitalization, and other factors must be made, and students' perceptions must be ignored to varying degrees. There is also no comprehensive and systematic analysis of the impact of hardware and software construction quality on satisfaction.

To this end, this study takes students from a public university in Chengdu as the target group to comprehensively analyze and evaluate the logical relationships among system quality, information quality, service quality, perceived usefulness, perceived ease of use, and satisfaction. It provides information support and implementation suggestions for online education decision-making command, policy formulation, and support services at the course, professional, school, and government levels. It prepares for in-depth study within associated areas.

2. Literature Review

2.1 Satisfaction

Since the inception of information systems, satisfaction has been the sole yardstick by which to assess an information system's effectiveness or use (DeLone & McLean, 1992). Freeze et al. (2010) further elaborated the definition of satisfaction based on the perspective of information systems and interaction and collaboration; that is, satisfaction is a level at which clients think that the information and services provided by the information system meet their needs. Customer satisfaction rises as the information system's ability to meet their needs grows and falls when it does not. The influencing factors of satisfaction are characterized by multiplicity and complexity, which are difficult to abstract (Mahmood et al., 2000). To this end, this study focuses on online education comprehensively. It systematically analyzes what influences the level of satisfaction around their factors about system quality, information quality, service quality, perceived usefulness, and perceived ease of use.

2.2 System Quality

According to Bharati and Chaudhury (2004), system quality is a crucial metric for assessing the caliber of system management, execution, interaction, and other functions. It encompasses the degree of system hardware and software. Three characteristics can be used to assess a system's quality: stability, timeliness, and interaction. They are integrated to evaluate a system's effectiveness and excellence (DeLone & McLean, 2004). The base of online education is the quality of the online education system, which is directly associated with the resources and service output of online education. To

this end, the research incorporates system quality into the list of key elements in the conceptual framework.

According to Ozkan and Koseler (2009), system quality possesses a moderate to strong beneficial correlation with satisfaction for online education customers. Almaiah and Alismaiel (2019) found in their research on the key factors affecting the success of online education that system quality can affect the satisfaction of online education customers as a positive factor. At the same time, many scholars have focused on the connection between satisfaction and system, data, and support excellence and confirmed that a system's caliber directly leads to a degree of customer satisfaction (Stacey, 2006). To sum up, the following is the study's first hypothesis:

H1: System quality has a significant impact on satisfaction.

2.3 Information Quality

Numerous research studies have demonstrated that the quality of information is determined by how easily consumers can access relevant and useful information, and the criteria for evaluating information quality are scientific, systematic, accurate, and authoritative of information (Miller, 1996). The degree to which consumers believe that information is reliable, thorough, and up-to-date is known as information quality, according to Lee et al. (2007). The Information Systems Success Model (ISSM), developed by DeLone and McLean (1992) considers information quality a critical metric for consumer satisfaction (Gable & Sedera, 2008). To this end, this study incorporates information quality as one of the key factors in the conceptual framework.

Although the current attention to information quality in online education is low, as early as 1997, DeLone and McLean (1992) proved that its impact on client satisfaction must be addressed through the matching study of technology promotion and customer satisfaction. In addition, relevant research discovered that information quality not only enormously affects customer satisfaction but also further affects customer's re-purchase intention (Ranganathan & Ganapathy, 2002). Alsamarrae et al. (2018) even proved that information quality affects customer satisfaction more to some extent than system quality. In summary, the following is the study's second hypothesis:

H2: Information quality has a significant impact on satisfaction.

2.4 Service Quality

DeLone and McLean (2003) agree that service quality is an essential component to measuring customers' sense of experience, gain, and satisfaction in technical support, so they optimize ISSM by replacing individual impact indicators with service quality as well as taking service

quality as an about their indicators to measure the achievement of information systems. Service quality, effectiveness of the system, and data superiority constitute the external conditions that affect customer satisfaction in online education (Ozkan & Koseler, 2009). Almarashdeh et al. (2010) emphasized that service quality includes technical support, timely response, emotional attitude, and other dimensions: the specific performance of online education software and hardware developers and operators' service capabilities. Based on the digital survival era, whether it can provide services with strong pertinence, high flexibility, and wide coverage is related to the sustainable development of online education. To this end, this study incorporates service quality as one of the key factors into the conceptual framework.

Related research on the electronic information service industry shows that high-quality service can improve customer satisfaction, maintain existing customers, improve reputation, and expand new customers (Lee & Lin, 2005). Han and Ryu (2009) pointed out that online education customers are in a situation with a large amount of information and a wide range of choices, and providing excellent service helps increase customer spending power and improve their satisfaction. Liu (2010) concur that the caliber of services rendered significantly impacts client satisfaction. In their research on information systems, Gorla and Somers (2014) found that service quality positively affects customer satisfaction. To summarize, the third hypothesis outlined in this research is:

H3: Service quality has a significant impact on satisfaction.

2.5 Perceived Usefulness

The Technology Acceptance Model (TAM) takes perceived usefulness as a key factor into the framework of the model to clarify customers' usage status and intention. Davis (1989) found that when a customer thinks software is useful, his friendly attitude will be attached to the software. He will choose to use it continuously with a high probability. At the same time, perceived usefulness, as a significant element influencing the advancement of computer technology, will always have a profound impact on customers' use intention (Bhattacherjee, 2001). Han et al. (2020) agree that perceived usefulness indicates the extent to which a new technology improves the convenience of a customer's life. To this end, this study incorporates perceived usefulness as one of the key factors in the conceptual framework.

Hsu and Chiu (2004) confirmed in their research on information service choice tendency that perceived usefulness determines customer satisfaction. Related studies have also verified the positive impact of perceived usefulness as an exogenous factor on an endogenous factor of customer satisfaction (Ghani et al., 2017). Zhou (2017) research on large-scale online education and online courses showed that perceived usefulness positively affected student satisfaction. In summary, the following is the study's fourth hypothesis:

H4: Perceived usefulness has a significant impact on satisfaction.

2.6 Perceived Ease of Use

To understand customers' usage status and intention, TAM incorporates perceived ease of use as the crucial component of the model architecture. Based on the era of digital survival, perceived ease of use is reflected in how well the logic, form, and appearance of the content output by the information platform meet customers' requirements for easy adoption (Unal & Uzun, 2020). Chen et al. (2002) believed that the research on the influencing factors of frontier technology empowering traditional industries still lacked the need for more systematization, leading to inconsistent research conclusions. No matter how complete and superior a system is, it is useless if the customer finds it inconvenient. Related research shows that only 20% of online education learners using the latest systems pass academic tests. Widjana and Rachmat (2011) emphasizes that perceived ease of use refers to when a customer feels no effort when using a system and thinks that the system can reduce his workload. To this end, perceived ease of use is an important component of this study's conceptual framework.

When online education customers feel the convenience of online education platforms, their enthusiasm for learning will significantly increase, and they will prioritize online education programs when taking courses. Therefore, perceived ease of use for online education customers positively affects satisfaction (Liaw, 2008). Nguyen et al. (2020) showed that online education customers are more inclined to choose online education systems that reduce their labor and effort. After all, they will be satisfied with some online education systems only when they feel convenient and easy to use. At the same time, many researchers have proved through practice that perceived ease of use is constructively correlated with satisfaction (Metlo et al., 2021). In summary, the following is the study's fifth hypothesis:

H5: Perceived ease of use has a significant impact on satisfaction.

3. Research Methods and Materials

3.1 Research Framework

The researcher also used three theoretical frameworks proposed by Chang (2013), Cheng (2022), and Salimon et al. (2021) for reference and used this information to construct the study's conceptual framework, as seen in Figure 1.
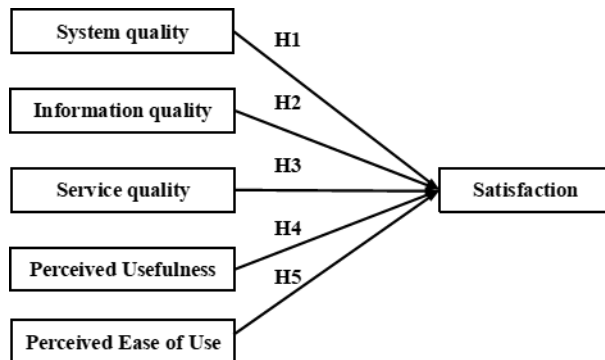

Figure 1: Conceptual Framework

H1: System quality has a significant impact on satisfaction.
H2: Information quality has a significant impact on satisfaction.
H3: Service quality has a significant impact on satisfaction.
H4: Perceived usefulness has a significant impact on satisfaction.
H5: Perceived ease of use has a significant impact on satisfaction.

3.2 Research Methodology

The research project is a quasi-experimental study. Using pre-testing a pre-test group, setting up a post-test group, pairing analysis, and comparison, researchers identify the Current Situation, formulate a strategic plan, clarify the expected situation, and then determine the influencing factors and research hypotheses. The main research steps are as follows:

Step 1: The questionnaire was created using the 5-Likert scale, and its validity and reliability were confirmed using the Pilot Test and Item-Objective Congruence (IOC) analysis.

Step 2: 80 people from the target group were selected as the pre-test control group, questionnaires were issued, and the data was analyzed using multiple linear regression to ascertain the degree of influence and logical relationship between the variables.

Step 3: After formulating the strategic plan, 30 subjects from 80 pre-test subjects were selected as the experimental group and asked to read and judge it.

Step 4: Questionnaires were sent to the post-test group again, and a T-test for Pair-Sample was carried out to contrast a data change about their Current Situation with their Expected Situation.

Step 5: Determine the influencing factors and research hypotheses and conclude the objectives and assumptions of the research.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

Students specializing in mechanical manufacturing and automation at a public university in Chengdu in grade 2022 make up the research population for this study. According to the schoolrooms' student status system data, the school has 282 students in the class, cladding to the conceptual framework; for the research, there is one dependent variable and five independent variables. Based on Field (2013) study findings, a minimum standard for the number of valid questionnaires in quantitative research is larger than all the variables combined. Therefore, there should be more than 60 valid questionnaires during this study. Considering factors such as questionnaire recycling and invalid questionnaires, the researchers determined that 80 students out of the 282 students of this major in 2022 were selected to carry out a questionnaire survey.

3.3.2 Sample size

The researcher chose thirty students to distribute questionnaires to for the internal consistency reliability examination of the survey and computed the Cronbach Alpha coefficient to confirm the questionnaire's reliability. In this pre-test group, 80 students were selected to issue questionnaires; after gathering 70 valid questionnaires, multiple linear regression analyses were done. Upon creating a strategic plan, 30 students were selected from the pre-test control group to read and judge the strategic plan, and questionnaires were issued again for a paired sample T-test.

3.3.3 Sampling Procedures

Non-probabilistic and probabilistic sampling is utilized to determine sampling objects, assign abstract quantities, and select sampling approaches within the research.

Stage 1: Judgment sampling in non-probability sampling is adopted. The researchers chose 2022 mechanical manufacturing and automation majors from a public Chengdu university as the study subjects.

Stage 2: Quota sampling in probability sampling is adopted. A public university in Chengdu has 282 students in 6 classes majoring in machinery manufacturing and automation in grade 2022. The researchers proportionally

assigned 80 questionnaires to each class and randomly distributed them.

Stage 3: Judgmental sampling and convenience sampling. The class of 2022 pupils majoring in mechanical manufacturing and automation at a public college in Chengdu are the subject of objective sampling. Convenience sampling refers to sending questionnaires through online and offline delivery.

3.4 Research Instruments

3.4.1 Design of Questionnaire

Based on three theoretical frameworks proposed by Chang (2013), Cheng (2022), and Salimon et al. (2021), this study designed a questionnaire for variables in the conceptual framework. The questionnaire has two sections.

Part One: Information regarding those tested personnel. Including gender, class, whether to be a student leader, whether there is a desire to upgrade, and whether there are difficulties in graduation.

Part Two Measures the degree of identification. It includes 27 questions, such as system quality (5 questions), information quality (6 questions), service quality (3 questions), perceived usefulness (4 questions), perceived ease of use (6 questions), and satisfaction (3 questions). The test subjects can choose one of five choices: strongly agree, agree, not necessarily, disagree, and strongly disagree.

3.4.2 Components of Questionnaire

To make a good content validity analysis of the questionnaire, the researchers specially invited three university teachers with more than ten years of teaching experience in professional technical courses, who had obtained the title of associate professor or above, to implement IOC and asked them to score each question in the questionnaire. The rating scale is 1 for Congruent, 0 for Questionable, and -1 for Incongruent. The average score of all questions in the questionnaire prepared in this study is above 0.5 points, and all questions can be retained in the questionnaire.

3.4.3 IOC Results

Researcher invited five independent experts or scholars or doctors to implement IOC (Index of item-objective congruence), and one of them was Thai professor and the other four were Chinese professors. In this IOC process, independent experts or scholars or doctors marked +1 for Congruent, 0 for Questionable, and -1 for Incongruent. In this research, all questionnaire items were greater than 0.67, so researcher retained all questionnaire items.

3.4.4 Pilot survey and Pilot test results

Thirty students were given the questionnaire to complete, and the Cronbach Alpha coefficient was calculated using Jamovi software. According to Cortina (1993), every internal consistency reliability analysis variable should have a Cronbach Alpha coefficient larger than or equal to 0.7. The findings demonstrated that each variable in this study's Cronbach Alpha coefficient was higher than 0.7. Table 1 shows the detailed analysis results.

Table 1: Pilot Test Result

Variables	No. of items	Sources	Cronbach's Alpha	Strength of Association
System quality	5	Chang (2013)	0.774	Good
Information quality	6	Chang (2013)	0.821	Very Good
Service quality	3	Chang (2013)	0.842	Very Good
Perceived Usefulness	4	Cheng (2022)	0.881	Very Good
Perceived Ease of Use	6	Salimon et al. (2021)	0.892	Very Good
Satisfaction	3	Chang (2013)	0.798	Good

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

Table 2 displays the study's population structure. Thirty valid questionnaires were obtained from the post-test experimental group, and 70 were obtained from the pre-test control group.

Table 2: Demographic Profile

Entire Research Population (n=70)		Frequency	Percent
Gender	Male	62	88.57%
	Female	8	11.43%
Class	Mechanism 2201	11	15.71%
	Mechanism 2202	12	17.14%
	Mechanism 2203	13	18.57%
	Mechanism 2204	11	15.71%
	Mechanism 2205	12	17.14%
	Mechanism 2206	11	15.73%

Entire Research Population (n=70)		Frequency	Percent
Whether it is a class cadre	Yes	13	18.57%
	No	57	81.43%
Intention to upgrade to college	Have the will	14	20.00%
	Have no will	56	80.00%
Have graduation difficulties	Yes	3	4.29%
	No	67	95.71%
Total		**70**	**100%**
Strategic planning participant (n=30)		Frequency	Percent
Gender	Male	27	90.00%
	Female	3	10.00%
Class	Mechanism 2201	4	13.33%
	Mechanism 2202	6	20.00%
	Mechanism 2203	6	20.00%
	Mechanism 2204	4	13.33%
	Mechanism 2205	6	20.00%
	Mechanism 2206	4	13.34%
Whether it is a class cadre	Yes	6	20.00%
	No	24	80.00%
Intention to upgrade to college	Have the will	7	23.33%
	Have no will	23	76.67%
Have graduation difficulties	Yes	1	3.33%
	No	29	96.67%
Total		**30**	**100%**

4.1.2 Results of multiple linear regression

Multiple linear regression analysis conducted on seventy verified surveys revealed that the P-values of the significance test results of the five independent variables were all less than 0.05, which proved that they had positive effects on the dependent variables. Each of these five independent variables has a standardized coefficient above 0, indicating the active relationship between the independent and dependent variables. There is no multicollinearity among these five independent variables, as indicated by their VIF values below 5. In addition, the R-square value of the change index of the five independent variables is 0.524, indicating that this proportion for independent variables that jointly cause its change for the dependent variable is 52.4%. Table 3 displays the findings of the multiple linear regression analysis.

Table 3: The multiple linear regression of five independent variables on satisfaction

Variables	Standardized Coefficients Beta value	t-value	p-value	VIF	R^2
System quality	0.230	2.405	0.019*	1.232	
Information quality	0.207	2.185	0.033*	1.207	
Service quality	0.250	2.599	0.012*	1.246	0.524
Perceived Usefulness	0.242	2.554	0.013*	1.211	
Perceived Ease of Use	0.219	2.234	0.029*	1.296	

Note: p-value <0.05*

In summary, these five research hypotheses put out within the research are entirely supported by the multiple linear regression analysis findings, and this research framework for the research has been confirmed. On this basis, the researchers put forward the hypothesis that each independent variable and dependent variable have significant changes before and after the strategic plan, as follows:

H6: There is a significant mean difference in system quality between the current and expected situations.

H7: There is a significant mean difference in information quality in current and expected situations.

H8: There is a significant mean difference in service quality during the current and expected situations.

H9: There is a significant mean difference in perceived usefulness between the current situation and the expected situation.

H10: There is a significant mean difference in perceived ease of use during the current situation and expected situation.

H11: There is a significant mean difference in the satisfaction of use during the current and expected situations.

4.2 Strategic Plan Stage

According to the study plan, the researchers combined the outcomes from multiple linear regression analyses to develop a 14-week strategic plan program. The program was then submitted to the experimental group for reading and evaluation. The strategic plan options are shown in Table 4.

Table 4: The Main elements of Strategic Plan Stage

No.	Time and Duration	Keywords
1	Week 1	Publicity and mobilization
		Team establishment
2	Week 2-4	Panel discussion
		SWOT diagnostic analytic tool
		Creation plan effect
3	Week 5-12	Interpretation of professional development trends
		Subdivision knowledge goal
		Subdivision skill goal
		Subdivided affective goal
		Professional ability improvement incentive
		Methods ability improvement incentive
		Personal ability improvement incentive
		Social ability improvement incentive
4	Week 13-14	Summary

4.3 Results Comparison between Pre and Post Strategic Planning Stage

After the experimental group read and evaluated the strategic plan, the researchers sent questionnaires again to analyze the differences in the Current and Expected situations of each independent and dependent variable through the T-Test for the sample. Table 5 displays the T-Test for Pair-Sample findings.

Table 5: Paired-Sample T-Test Results

Variables	Mean	SD	P-value
System quality			
Current Situation	3.214	0.881	p<0.05
Expected Situation	3.737	0.691	
Information quality			
Current Situation	3.448	1.042	p<0.05
Expected Situation	4.138	0.719	
Service quality			
Current Situation	3.462	0.935	p<0.05
Expected Situation	4.190	0.638	
Perceived Usefulness			
Current Situation	3.371	0.921	p<0.05
Expected Situation	4.286	0.673	
Perceived Ease of Use			
Current Situation	3.424	0.994	p<0.05
Expected Situation	4.186	0.749	
Satisfaction			
Current Situation	3.381	1.016	p<0.05
Expected Situation	4.029	0.798	

The T-Test for Pair-Sample analysis of Table 5 indicates that the Expected Situation mean value for every variable within the research is significantly higher than its Current Situation mean level. Among them, their mean values of perceived usefulness and perceived ease of use increased significantly, resulting in 0.915 as well as 0.762, accordingly. Therefore, this T-Test for Pair-Sample results fully support

the hypotheses about this strategic plan, as follows:

The Current Situation indicators of system quality are M=3.214, SD=0.881, and the Expected Situation indicators are M=3.737, SD=0.691. The mean value is increased by 0.523. Explanation: There is a marked change within System quality during Current Situation and Expected Situation. Thus, H6 was established.

The Current Situation indicators of information quality are M=3.448, SD=1.042; the Expected Situation indicators are M=4.138, SD=0.719, and the mean value is increased by 0.69. Explanation: There is a marked change in information quality in current and expected situations. So, H7 was established.

The Current Situation indicators of service quality are M=3.462, SD=0.935, and the Expected Situation indicators are M=4.190, SD=0.638, with a mean value increased by 0.728. Explanation: There is a marked change in service quality between the current and expected situations. So, H8 was established.

The Current Situation indicators of perceived usefulness are M=3.371, SD=0.921, and the Expected Situation indicators are M=4.286, SD=0.673, with a mean value increased by 0.915. Explanation: There is a marked change within Perceived usefulness during Current Situation and Expected Situation. Therefore, H9 was established.

The Current Situation indicators of perceived ease of use are M=3.424, SD=0.994; Expected Situation indicators are M=4.186, SD=0.749; the mean value is increased by 0.762. Explanation: There is a marked change between the perceived ease of use during the current situation and the expected situation. So, H10 was established.

The Current Situation Indicators of Satisfaction are M=3.381, SD=1.016, and the Expected Situation Indicators are M=4.029, SD=0.798, with a mean value increase of 0.648. Explanation: There is a marked change in Satisfaction with use during the Current and Expected situations. Therefore, H11 was established.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

The research aligns with the educational characteristics of the age of digital survival. Guided by ISSM and TAM, it fully draws on the theoretical framework of predecessors, builds a conceptual framework around system quality, information quality, service quality, perceived usefulness, perceived ease of use, and satisfaction, and uses research tools such as questionnaires, Jamovi software, and strategic planning. Using multiple linear regression analysis, the T-Test for Pair-Sample, the pilot test, as well as other

techniques in a reasonable manner, this paper comprehensively and systematically analyzes and determines the determining factors affecting the online teaching satisfaction of professional technical education for college students specializing in automation and mechanical manufacturing, as well as after that derives this study's conclusions.

The study's target population was the 2022 mechanical manufacturing and automation majors at a Chengdu public college. The study was carried out in strict accordance with the procedures of the pre-test control group, the establishment of the experimental group, and paired analysis and comparison. The Pilot Test and Item-Objective Congruence (IOC) analysis of the disseminated questionnaires were both successful. In this pre-test control group, 80 questionnaires were distributed (70 valid questionnaires were recovered), and the data was analyzed using multiple linear regression to determine the degree of influence and logical relationship among the variables. In the experimental group stage, 30 pre-test subjects were selected from 80 pre-test subjects as the experimental group, and the strategic plan was read and evaluated. In the paired analysis and comparison stage, 30 questionnaires were sent to this post-test group for a T-Test for a paired sample to contrast the data changes between the current and expected situations.

The results show which system quality, information quality, service quality, perceived usefulness, and perceived ease of use all had both beneficial and advantageous impacts upon satisfaction, as well as a sequence for impact, follows: service quality, perceived usefulness, system quality, perceived ease of use and information quality. Based upon this, to improve the satisfaction of online education, one needs to pay close attention to and attach great importance to five dimensions: system quality, information quality, service quality, perceived usefulness, and perceived ease of use. At the same time, hardware and software supporting construction can be sequentially promoted according to the actual situation and the impact size.

In addition, through the paired sample T-test analysis, the Expected Situation mean value of each variable within the research was significantly higher than the Current Situation mean level, which fully supports various assumptions about strategic planning. It shows that students' cognition of satisfaction can be optimized through strategic planning, and the development of scientific strategic planning can significantly positively affect satisfaction.

In summary, this study's identification of the factors influencing college students' satisfaction with online education can assist higher education institutions in raising student satisfaction levels and the caliber of online education at the course and major levels. The research results can also provide data support for online education decision-making command, policy formulation, and support services at the school and government levels and prepare data for in-depth research in related fields. At the same time, the research methods, tools, and procedures used in this study can also provide references for related social science research.

5.2 Recommendations

Based on the age of digital survival, online education has the characteristics of many points, including wide coverage and deep lines. It is urgent and realistic to improve college students' satisfaction with online education, especially from the system, management, and implementation levels, to create a good atmosphere for online education's healthy and sustainable development. This study, which aims to identify practical strategies for raising educational standards, focuses on the factors that influence university pupils' satisfaction with online education at a public university in Chengdu, optimize the level of education, and improve satisfaction with online education. Based on this, the following suggestions are put forward to promote the benign and rapid growth of online education:

First of all, educational institutions authorities, as well as colleges and universities, should clarify the development status of online education, pay attention to the value-added and empowering role of online education in academic education and social training, attach importance to the promotion of online education, encourage teachers to actively participate in online education, and set up special funds to actively invest in providing resource channels and convenient channels for advancement for online education.

Secondly, from the modern perspective on education and the Internet, colleges, and universities should increase the systematic, structured, and quantitative research on online education satisfaction to prepare the model and resource construction for the model innovation, teaching method refining, and resource construction of relevant courses.

Third, colleges and universities should conform to the trend of digitalization, develop or purchase high-quality online education systems according to the characteristics of schools, majors, and courses by the principle of adapting to local conditions and overcoming difficulties in stages, as well as accomplish excellent work within upgrading, optimizing as well as hardware supporting building online education systems promptly, in order to establish the basis over a healthy and sustainable growth for online education.

Fourth, education authorities and institutions of higher learning should actively explore and build a management system guarantee mechanism for enhancing the excellence of online education data, such as data review systems, information acquisition, and release processes, intellectual property protection systems, etc., to ensure the scientific, accurate and reliable provision of online education information, and protect the rights and interests of schools,

teachers, and students.

Fifth, colleges, and universities should pay close focus on these services provided by online education, actively integrate their resources from those school teaching teams, online education system suppliers, and online education operation teams, establish a collaboration mechanism, build a technical service platform, and provide timely, convenient, and efficient technical service support for online education.

Sixth, colleges and universities should conform to the background of the digital survival era, integrate digital thinking and digital literacy into professional construction, introduce new digital technologies and new norms into curriculum development, optimize existing courses, and create new courses according to the online education model, and ensure the perceived usefulness of online education.

Seventh, colleges and universities should optimize online education's management and supervision mechanism and strengthen the tracking and guidance of the whole process of online education. It includes push prior to the lesson, communication while on the lesson, thinking soon after lessons and other links to create a real teaching situation, ensuring that learners or users get a good learning experience, and improving the perceived ease of online education.

In summary, the factors influencing college pupils' satisfaction with online education identified in this study provide certain opinions and suggestions for government decision-making, school planning, professional construction, and curriculum development of online education. Suppose educators and education administration departments can implement the above recommendations in an orderly and effective manner. In that case, it will certainly improve the satisfaction of online education, thereby improving the teaching quality, the reputation of schools, and the development level of service areas. At the same time, the suggestions put forward in this study have certain reference significance for the teaching model research, management model innovation, and teaching team construction of higher education based on the digital survival era.

5.3 Limitations for Future Research

While the study's findings offered some perspectives and recommendations for exploring how satisfied students are with online education, there are also one-sidedness and limitations. In future research, we can take the one-sidedness and limitation for this research to be the new beginning location for more in-depth and comprehensive research and exploration.

Research Scope and Sample Sources: This study's research is conducted at a public university in Chengdu, and the sample sources are students of specific majors. In future research, we can consider sampling in multiple institutions of higher learning (including private institutions of higher

learning) and multiple majors, expand the scope of research and sample sources, and improve the applicability and usefulness of research results.

Influencing Factors: According to the research results in this study, these five independent variables all have a significantly positive impact on satisfaction. In future studies, independent variables that have no or negative impact on satisfaction should be included in the study, and research conclusions should be drawn from positive and negative aspects that broaden its coverage for a study.

Strategic Plan: This study designed a unique strategic plan for the same level of research objects. In future research, we can consider designing hierarchical strategic plans for research objects at different levels or multiple strategic plans for research objects at the same level to carry out comparative research.

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