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Examining Significant Factors of Satisfaction and Performance with Online Learning Among Graduate Students in Chengdu, China

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Abstract

Purpose: The aim of this study is to investigate the factors that impact students' satisfaction with and effectiveness of online learning within the context of four universities closely affiliated with the Ministry of Education in Chengdu. Within this research framework, we have selected seven latent variables for in-depth analysis: perceived usefulness, perceived ease of use, perceived quality, trust, satisfaction, behavioral intention, and performance. **Research design, data, and methodology:** The study was executed using a quantitative survey methodology by the researchers. A comprehensive on-site questionnaire survey was administered to 500 graduate students who had previous online learning experience within four universities in Chengdu. The sampling process incorporated judgmental, stratified random, and convenience sampling methods. In terms of statistical techniques, this study made use of confirmatory factor analysis (CFA) and structural equation modeling (SEM). **Results:** Perceived usefulness, perceived ease of use, perceived quality, and trust exert significant influences on satisfaction. Additionally, satisfaction plays a significant role in shaping behavioral intention and performance. However, it is worth noting that perceived ease of use does not significantly impact perceived usefulness. **Conclusions:** Educational institutions and policymakers should take these findings into consideration when designing and implementing online learning programs.

Keywords : Trust, Satisfaction, Behavioral Intention, Performance, Online Learning

JEL Classification Code: E44, F31, F37, G15

1. Introduction

In 2018, the Chinese Ministry of Education introduced the "Education Informatization 2.0 Action Plan," which outlines proactive measures for advancing "Internet+ Education." This plan aims to elevate educational resources, enhance the digital literacy of educators and learners, and inaugurate the era of intelligent education (Zhang et al., 2020). The "Internet+ Education" concept has emerged as a pivotal area of study, attracting domestic and international scholarly attention, and has become a focal point within education. A range of strategic documents, such as the "Ten-Year Development Plan for Education Informatization (2011-2020)," was released. Also, the "Thirteenth Five-Year Plan for Education Informatization" was released. This signified the paramount importance of educational informatization.

The integration of advanced technologies, particularly Artificial Intelligence (AI), has ushered in a new phase of network course construction. AI-driven personalized learning systems have improved course adaptability and efficacy, providing learners with customized learning paths and real-time feedback. Moreover, incorporating virtual and augmented reality technologies has facilitated immersive learning experiences, enabling learners to engage with course content in novel and interactive ways (Zhang et al., 2020).

As network course construction evolves, ensuring the quality of online courses has become critical (Sarker et al., 2019). Universities have implemented rigorous evaluation mechanisms and quality standards to maintain the credibility and reputation of online education. Social learning elements,

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such as online discussions and collaborative projects, have also been integrated to promote learner engagement, peer interaction, and knowledge sharing (Chiu & Wang, 2008).

The COVID-19 pandemic accelerated online course development (Cho et al., 2009). With the sudden shift to remote teaching, universities rapidly expanded their online course offerings to ensure continuity in education (Liang & Zhang, 2011). The pandemic underscored the significance of online education and prompted universities to invest more in enhancing their digital infrastructure and pedagogy (Roy & Zhao, 2009).

A thorough investigation and data analysis will be conducted to uphold the validity and reliability of the research. The study will utilize established scales and validated questionnaires to assess online learning satisfaction. The data gathered from the survey will undergo analysis using suitable statistical methods, aiming to yield valuable insights into the correlation between the factors influencing online learning and students' overall satisfaction, as suggested by Zhang (2023).

The research results could serve as valuable insights for administrators of higher education institutions, aiding them in formulating evidence-based policies that foster the seamless integration of online learning within higher education. As the higher education landscape in China continues to evolve, there is an urgent need to effectively leverage technological advancements while ensuring that student satisfaction and learning experiences are prioritized. Therefore, the research objective is to investigate the factors that impact students' satisfaction with and effectiveness of online learning.

2. Literature Review

2.1 Perceived Ease of Use

Gefen et al. (2003) asserted that perceived ease of use involves users' evaluation of the operational aspect of technology or systems. It encompasses whether users perceive using the technology as an easily manageable process. Venkatesh et al. (2012) proposed that perceived ease of use characterizes the cognitive exertion required by users during technology or system usage. It reflects users' perception of the technology's simplicity and accessibility. Gefen et al. (2003) figured out that users' perception of a technology's user-friendliness fosters trust and satisfaction.

Ndubisi (2006) investigated the influence of perceived usefulness and perceived ease of use on the acceptance of online banking services among non-users. The study unveiled that recognizing the practicality and user-friendliness of online banking services increased the likelihood of engaging with the platform. Wu and Wang (2006) affirmed the significant impact of perceived ease of use on perceived usefulness. Susanto et al. (2016) demonstrated a direct link between perceived ease of use and satisfaction. Kim and Yuan (2012) emphasized the significant influence of perceived ease of use in determining satisfaction within the domain of mobile banking. Therefore, the researcher formulates the following hypotheses:

H1: Perceived ease of use has a significant influence on perceived usefulness.

H3: Perceived ease of use has a significant influence on satisfaction.

2.2 Perceived Usefulness

Tan and Teo (2000) pointed out that perceived usefulness is defined as individuals' belief that online shopping can provide them with a convenient and efficient way to shop. Venkatesh et al. (2003) delved into the domain of health information systems. They characterized perceived usefulness as an individual's belief that engaging with a particular health information system would improve health management and medical outcomes. In education, perceived usefulness refers to whether an individual is helpful and valuable to educational technology, online learning platforms, or educational applications in learning.

Kim and Yuan (2012) reaffirmed perceived usefulness as the determinant of satisfaction. Furthermore, contributing to this discussion, Susanto et al. (2016) examined the significant influence of perceived usefulness on users' satisfaction with smartphone banking services, emphasizing the pervasive role that perceived utility plays in shaping users' overall contentment. As a result, the researcher formulated the following hypothesis:

H2: Perceived usefulness has a significant influence on satisfaction.

2.3 Perceived Quality

Calvo-Porral et al. (2013) analyzed to identify the primary dimensions of perceived quality in higher education. The study indicated that tangibility and empathy are the most influential factors affecting the perceived quality of higher education. Ma et al. (2022) concluded that the mediation of positive emotions plays a role in the connections between three perceived attributes—namely, course content quality, instructor quality, and platform quality—and the intention to recommend. Kumar et al. (2017) affirmed that perceived quality significantly stimulates learner engagement and motivation within e-learning-based executive education programs.

Researchers have identified a connection between perceived quality and the restaurant ambiance in the realm of restaurants, impacting customer mood, satisfaction, and

behavioral intentions (Marinkovic et al., 2014). Angelova and Zeqiri's (2011) research underscore the importance of comprehending consumer perceptions of product/service quality and their measurement for enhancing customer satisfaction. Based on this literature, the researcher proposes a hypothesis:

H4: Perceived quality has a significant influence on satisfaction.

2.4 Trust

Jarvenpaa and Tractinsky (1999) introduce the notion of trust in online milieus, underlining its emergence due to uncertainty and risk inherent in digital interactions. The authors posit that nurturing trust within online ecosystems hinges on the dependability of information sources and safeguarding individual privacy. In education, numerous investigations have been conducted on the concept of trust. Kim et al. (2010) delved into trust within online educational environments, revealing that students' reliance on online education platforms significantly impacts their learning outcomes and overall satisfaction.

Cyr et al. (2010) revealed a substantial nexus between trust and customer satisfaction, illuminating the intricate tie between users' trust in e-commerce platforms and their overall gratification with shopping. Kim et al. (2010) illustrated that trust directly and positively influences user satisfaction and the propensity for recurrent usage, as customers' trust in online food delivery platforms directly influences their satisfaction and loyalty. Hence, a hypothesis is derived:

H5: Trust has a significant influence on satisfaction.

2.5 Satisfaction

Prior research has spotlighted the elements that shape satisfaction. Roy and Zhao (2009) delved into the factors impacting online shoppers' contentment and future actions. Their findings revealed that objective and subjective interactivity, functioning through distinct frameworks, positively affected the gratification and subsequent actions of online shoppers. Ryu et al. (2012) concluded that customer perception of value is a pivotal determinant affecting satisfaction of customers. Furthermore, customer satisfaction emerges as a significant predictor of future behavioral intention.

Liang and Zhang (2011) scrutinized the correlation between customer satisfaction, interaction orientation, and behavioral intention across diverse businesses in the hospitality sector. Furthermore, Zhang et al. (2020) emphasized the substantial positive correlation between satisfaction and users' intention for prolonged usage. This highlights that satisfied users are more prone to engage with a product or service over an extended period. Gopal et al. (2021) investigated the determinants influencing student satisfaction and performance in online courses amidst the COVID-19 pandemic, establishing interrelations between satisfaction and performance. Building upon the insights gleaned from previous findings, the following hypotheses are posited:

H6: Satisfaction has a significant influence on behavioral intention.

H7: Satisfaction has a significant influence on performance.

2.6 Behavioral Intention

Venkatesh et al. (2003) contributes the "Expectation-confirmation model" perspective, emphasizing that behavioral intention is shaped by an individual's expectation confirmation based on past experiences. This approach establishes a link between past encounters and future behavioral intentions. Moon and Kim (2001) establish a connection between behavioral intentions and the quality and utility of user experiences, suggesting that users' encounters and perceptions of a system impact their inclination to undertake certain actions. McKnight et al. (2002) stress that trust entails gauging risk tolerance amid incomplete information. This conceptualization portrays trust as multidimensional, encompassing the intentions and capacities of others. In the realm of education, many studies have directed their focus on trust.

2.7 Performance

Performance research encompasses various dimensions of education, including student performance, teaching effectiveness, and institutional outcomes. Carter et al. (2016) underscored the influence of student feedback, learning strategies, and self-regulation on student performance. Marzano and Marzano (2003) investigated the interplay of students' learning skills, cognitive strategies, and attitudes toward their academic achievements. Kauffman (2015) delved into an extensive array of elements influencing the performance and satisfaction of adult learners within online learning environments. This exploration encompassed factors such as learning outcomes, instructional design, and learner attributes, ultimately concluding that these factors indeed significantly impact online learning. Research has found that appropriate teaching methods, support, course structure, and design can improve student performance and satisfaction.

3. Research Methods and Materials

3.1 Research Framework

In reference to the prior research frameworks, the first framework was introduced by Mungra and Yadav (2019). This particular framework delved into aspects such as trust, commitment, relationship duration, satisfaction, performance, and governance costs. The second research framework, carried out by Zhang et al. (2020), examined both positive and negative social and cultural impacts, as well as positive and negative economic and environmental impacts, satisfaction, and behavioral intention. Meanwhile, the third research framework, developed by Lee et al. (2015), explored elements such as usability, usefulness, compatibility, fun, confirmation, satisfaction, and the influence of perception on the learning process. Finally, Askariazad and Babakhani (2015) established the fourth prior research framework, with a focus on variables such as customer expectations, corporate image, perceived quality, customer satisfaction, trust, and more. This study consolidates and identifies these relevant variables, as illustrated in Figure 1.

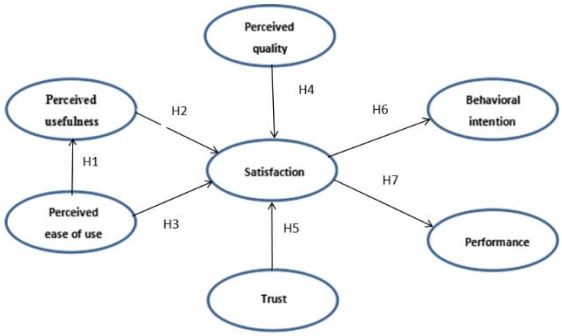

Figure 1: Conceptual Framework

H1: Perceived ease of use has a significant influence on perceived usefulness.
H2: Perceived usefulness has a significant influence on satisfaction.
H3: Perceived ease of use has a significant influence on satisfaction.
H4: Perceived quality has a significant influence on satisfaction.
H5: Trust has a significant influence on satisfaction.
H6: Satisfaction has a significant influence on behavioral intention.
H7: Satisfaction has a significant influence on performance.

3.2 Research Methodology

The data collected via the Questionnaire Star survey was initially stored in Excel format and subsequently transformed into SPSS data for analysis. The analytical process encompassed the computation of response frequencies and percentages for all survey data. To ensure the questionnaire's reliability, a pilot test was conducted with a sample of 30 students. Moreover, prior to disseminating the questionnaire to the selected participants from the targeted universities, three experts in the field of education management were consulted. They employed the Index of Item-Objective Congruence (IOC) method to evaluate the survey items, thereby verifying the questionnaire's validity.

After collecting all the quantitative data, the researchers carried out Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to comprehensively analyze the data. For both validity and reliability assessment, the Cronbach's Alpha method was employed. The questionnaire's reliability was initially evaluated through an Index of Item-Objective Congruence (IOC) assessment and a pilot test. In the IOC analysis, three experts independently rated each item on the scale, with all items scoring 0.67 or higher, demonstrating strong agreement. A pilot test involving 30 participants was conducted, and the questionnaire's reliability was confirmed using the Cronbach alpha coefficient. The results indicated that all questionnaire items exhibited robust internal consistency, with a reliability score of 0.60 or greater, as reported by Hair et al. (2006).

3.3 Population and Sample Size

This study focuses on graduates who have engaged in online learning within four universities directly associated with the Ministry of Education in the Chengdu region. According to Herzog et al. (2009), they recommended a minimum sample size of 100 to 200 for structural equation modeling. Hence, in consideration of the complexity of the models in this research, a minimum sample size of 500 was determined to be appropriate.

3.4 Sampling Technique

A step-by-step sampling procedure is employed as the primary sampling strategy for this study. Initially, students from four universities directly affiliated with the Ministry of Education in Chengdu were chosen as the research subjects using judgmental sampling methods. Subsequently, the target population was divided into two distinct groups using stratified sampling, as outlined in Table 1. Additionally, convenience sampling was utilized as a quick and efficient method to reach undergraduate students with online learning experience through an online survey.

Table 1: Sample Units and Sample Size

College Name	Population Size	Proportional Sample Size
SWUFE	9740	62
SCU	29000	185
UESTC	21770	139
SJU	17683	113
Total	**78193**	**500**

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

The demographic information in the dataset reveals valuable insights into the characteristics of the study's participants based on two key factors: gender and the level of study (Master's Degree or Doctor's Degree). The data indicates that 272 participants, or 54.4% of the total sample, are male. In contrast, 228 participants, comprising 45.6% of the total sample, are female. From this breakdown, it is evident that the study's sample exhibits a relatively balanced gender distribution, with a slightly higher representation of males. The majority of the participants, specifically 339 individuals, or 67.8% of the total sample, are pursuing a Master's Degree. On the other hand, 161 participants, making up 32.2% of the total sample, are enrolled in Doctoral programs. This demographic information highlights that the study has a significant proportion of Master's Degree students, with Doctoral Degree students forming a substantial but smaller segment of the sample.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	272	54.4%
	Female	228	45.6%
Year of Study	Master's Degree	339	67.8%
	Doctor's Degree	161	32.2%

Source: Constructed by author

4.2 Confirmatory Factor Analysis (CFA)

In this research, Confirmatory Factor Analysis (CFA) served as the statistical method employed to scrutinize hypothetical constructs that exhibit apparent reliability but necessitate thorough examination. The analysis results unveiled strong internal consistency across all constructs, consistently yielding reliability scores exceeding 0.7 (Sarmento & Costa, 2016). These outcomes are corroborated by the values presented in Table 3, which demonstrate that Cronbach's Alpha values consistently surpass the 0.7 threshold, indicating robust internal consistency.

Moreover, composite reliability (CR) exceeded the established 0.70 benchmark, further reinforcing the reliability of the measurements. Convergent validity, another pivotal facet of construct evaluation, was successfully established. Average extracted variance (AVE) consistently exceeded the 0.50 threshold, signifying robust convergent validity. Furthermore, the factor loading values, all surpassing the 0.50 threshold, provide additional confirmation of the credibility of the underlying factors (Hair et al., 2006).

Table 3: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived usefulness	Abdullah et al. (2016)	6	0.899	0.711–0.810	0.878	0.603
Perceived ease of use	Kumar et al. (2017)	5	0.874	0.730–0.797	0.858	0.581
Perceived quality	Watjatrakul (2020)	4	0.836	0.725–0.811	0.838	0.565
Satisfaction	Solimun and Fernandes (2018)	3	0.850	0.759–0.870	0.852	0.658
Trust	Khan et al. (2023)	4	0.866	0.730–0.881	0.867	0.622
Behavioral intention	Abdullah et al. (2021)	3	0.828	0.727–0.876	0.832	0.623
Performance	Gardas and Navimipour (2021)	5	0.884	0.730–0.856	0.872	0.611

In this study, the goodness of fit for research group 1 was CMIN/df =2.200, GFI=0.902, AGFI=0.881, NFI=0.897, CFI=0.940, TLI=0.933, and RMSEA=0.050. In conclusion, all six indicators met the criteria, preventing the need to modify the model and demonstrating that the conceptual framework under consideration was compatible with the CFA model, as shown in Table 4.

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	2.200
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.902
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.881
NFI	≥ 0.80 (Wu & Wang, 2006)	0.897
CFI	≥ 0.80 (Bentler, 1990)	0.940
TLI	≥ 0.80 (Sharma et al., 2005)	0.933
RMSEA	< 0.08 (Pedroso et al., 2016)	0.050
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, NFI = normalized fit index, CFI = comparative fit index, TLI = Tucker Lewis index and RMSEA = root mean square error of approximation

In our investigation, we conducted a comprehensive assessment of the variables, encompassing not only their internal consistency through convergent validity but also their distinctiveness from one another, a concept referred to as discriminant validity. To evaluate discriminant validity in this study, we followed the methodology proposed by Fornell and Larcker (1981). According to this approach, discriminant validity is confirmed when the square root of the Average Variance Extracted (AVE) for a specific construct surpasses the correlations between that construct and all other related constructs. In our examination, we found that the value representing discriminant validity exceeded all interconstruct factor correlations. As a result, we concluded that the discriminant validity in this study is satisfactory and that the constructs are indeed statistically distinct from one another.

Table 5: Discriminant Validity

	PU	PEU	PQ	SA	TR	BI	PE
PU	**0.777**						
PEU	0.046	**0.762**					
PQ	0.093	0.241	**0.752**				
SA	0.271	0.429	0.407	**0.811**			
TR	0.052	0.269	0.166	0.293	**0.789**		
BI	0.109	0.119	0.138	0.344	0.126	**0.790**	
PE	0.128	0.212	0.22	0.471	0.195	0.156	**0.782**

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

4.3 Structural Equation Model (SEM)

As per the insights provided by Hair et al. (2010), Structural Equation Modeling (SEM) serves as a robust tool for affirming causal relationships among variables within a proposed model, effectively accommodating measurement inaccuracies within the structural coefficients. The assessment of the goodness of fit indices for the Structural Equation Model (SEM) is elaborated upon in Table 6. After adjustment in SEM analysis, data reported that CMIN/df=1.420, GFI=0.933, AGFI=0.921, CFI=0.976, TLI=0.979, RMSEA=0.029. In conclusion, after adjustment, the proposed model met all criteria for index and got model fit in SEM.

Table 6: Goodness of Fit for Structural Model

Index	Acceptable	Statistical Values Before Adjustment	Statistical Values After Adjustment
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	2.158	1.420
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.901	0.933
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.883	0.921
NFI	≥ 0.80 (Wu & Wang, 2006)	0.896	0.932
CFI	≥ 0.80 (Bentler, 1990)	0.935	0.976
TLI	≥ 0.80 (Sharma et al., 2005)	0.941	0.979
RMSEA	< 0.08 (Pedroso et al., 2016)	0.049	0.029
Model Summary		**Unacceptable Model Fit**	**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, , NFI = normalized fit index, CFI = comparative fit index, TLI = Tucker Lewis index and RMSEA = root mean square error of approximation

4.4 Research Hypothesis Testing Result

Form Table 7, the analysis of the hypotheses reveals that the majority of the proposed relationships are supported by the data, indicating significant associations among the variables under investigation. However, Hypothesis 1 (H1), which suggested a relationship between perceived ease of use and perceived usefulness, is not supported by the findings.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypotheses	Standardized Estimate	S.E.	C.R.	P	Testing Result
PEOU→PU	0.077	0.046	1.109	0.267	Not Supported
PU→SA	0.299	0.052	6.733	***	Supported
PEOU→SA	0.430	0.052	5.722	***	Supported
PQ→SA	0.260	0.065	6.706	***	Supported
T→SA	0.271	0.043	3.48	***	Supported
SA→BI	0.502	0.049	7.797	***	Supported
SA→PE	0.350	0.036	10.49	***	Supported

Note: *** p<0.001
Source: Created by the author

The analysis suggests that Hypothesis 1 (H1) is not supported by the data with standardized coefficient value = 0.777. In other words, the study did not find a statistically significant relationship between perceived ease of use and perceived usefulness.

Hypothesis 2 (H2) is strongly supported by the data, indicating a statistically significant relationship between perceived usefulness and satisfaction with standardized coefficient value = 0.299.

Hypothesis 3 (H3) is also supported by the data, indicating a statistically significant relationship between perceived ease of use and satisfaction with standardized coefficient value = 0.430.

Hypothesis 4 (H4) finds strong support in the data with standardized coefficient value = 0.260, revealing a statistically significant relationship between perceived quality and satisfaction.

Hypothesis 5 (H5) is supported, indicating a statistically significant relationship between trust and satisfaction with standardized coefficient value = 0.271.

Hypothesis 6 (H6) is strongly supported by the data with standardized coefficient value = 0.502, indicating a statistically significant relationship between satisfaction and behavioral intention.

Finally, Hypothesis 7 (H7) is overwhelmingly supported by the data with standardized coefficient value = 0.350, demonstrating a statistically significant relationship between satisfaction and performance.

5. Conclusion and Recommendation

5.1 Conclusion and Discussion

The findings of this study shed light on the factors that play a crucial role in students' satisfaction with and effectiveness of online learning in the context of four universities closely affiliated with the Ministry of Education in Chengdu. The research framework, which included seven latent variables—perceived usefulness, perceived ease of use, perceived quality, trust, satisfaction, behavioral intention, and performance—provided a comprehensive analysis of the dynamics at play in the online learning environment.

One of the key results of this study is the significant influence of perceived usefulness, perceived ease of use, perceived quality, and trust on students' satisfaction. This finding underscores the importance of these factors in shaping students' overall experience with online learning. When students perceive online learning as useful, easy to use, of high quality, and trust the platform and institution delivering it, they are more likely to be satisfied with their online learning experiences.

Furthermore, the study revealed that satisfaction has a significant impact on both behavioral intention and performance. This indicates that when students are satisfied with their online learning experiences, they are more likely to express a positive intention to continue using online learning platforms and are also more likely to perform well academically. This is a crucial insight for educators and institutions, as it emphasizes the importance of prioritizing student satisfaction to enhance student outcomes and retention in online learning programs.

However, an interesting observation from the study is that perceived ease of use does not significantly impact perceived usefulness. This finding suggests that, for students in this context, the ease of using online learning tools and platforms may not be the primary factor influencing their perception of usefulness. Other factors, such as the quality of the content or the trustworthiness of the institution, may play a more significant role in shaping students' perceptions of usefulness.

In conclusion, this study provides valuable insights into the factors that influence students' satisfaction with and effectiveness of online learning in the context of universities affiliated with the Ministry of Education in Chengdu. The research design, which incorporated a quantitative survey methodology, a sample of 500 graduate students, and advanced statistical techniques like confirmatory factor analysis and structural equation modeling, ensured a robust and comprehensive analysis of the variables under investigation.

The results emphasize the importance of perceived usefulness, perceived ease of use, perceived quality, and trust in influencing students' satisfaction. Additionally, satisfaction was found to be a critical factor affecting students' behavioral intention to continue using online learning and their academic performance.

Educational institutions and policymakers should take these findings into consideration when designing and implementing online learning programs. Strategies to enhance perceived usefulness, ease of use, quality, and trust can lead to greater student satisfaction and, subsequently, improved educational outcomes. Furthermore, ongoing efforts to monitor and improve online learning experiences should continue to ensure the success of online education in the Chengdu region and beyond.

5.2 Recommendation

The following recommendations are derived from a comprehensive study examining the factors influencing students' satisfaction with and effectiveness of online learning within the context of universities closely affiliated with the Ministry of Education in Chengdu. The study employed a quantitative survey methodology and advanced statistical techniques to analyze seven latent variables: perceived usefulness, perceived ease of use, perceived quality, trust, satisfaction, behavioral intention, and performance. Based on the findings and conclusions, the following recommendations are proposed for educational institutions and policymakers.

Educational institutions should prioritize the development and curation of high-quality online learning materials and resources. Regular updates and improvements to course content are essential to meet the evolving needs and

expectations of students. Recognize that students have varying preferences for learning modalities. Consider offering a blend of synchronous and asynchronous learning opportunities to accommodate diverse learning styles and preferences.

Instructors should be offered comprehensive training and professional development opportunities to enhance their online teaching skills. Implement strategies designed is to increase student engagement in online courses, such as interactive discussion forums, collaborative group projects, and other participatory activities. It should be considered to encourage ongoing research and evaluation of online learning practices to remain current with emerging trends and technologies, and foster collaboration with researchers and educational experts to continually assess and improve online learning initiatives.

Flexibility and accessibility can ensure that online courses are designed and delivered with accessibility in mind, ensuring that they are fully inclusive for all students, including those with disabilities. This includes providing flexibility in terms of access to course materials and assessment deadlines to accommodate students' diverse needs and circumstances.

These recommendations, based on empirical findings, aim to inform educational institutions and policymakers in their efforts to create more effective and satisfying online learning environments. Implementation of these suggestions can lead to improved online learning experiences, benefiting both students and educational institutions

5.3 Limitation and Further Study

Some limitations should be acknowledged in the context of the study on factors influencing students' satisfaction with and effectiveness of online learning in universities closely affiliated with the Ministry of Education in Chengdu. First, the study's findings are specific to the Chengdu region and may not be readily applicable to other geographic locations or cultural contexts. Different regions and cultures may exhibit variations in online learning dynamics and factors influencing student satisfaction. Second, the study employed a quantitative survey methodology with a sample of 500 graduate students. While efforts were made to ensure diversity in the sample through sampling methods, there may still be inherent biases in the selection of participants that could impact the generalizability of the results. Third, although the study considered seven latent variables, other unexplored variables may also play a role in shaping online learning experiences and student satisfaction. Future research could broaden the scope to include additional factors.

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