pISSN: 1906 - 6406 The Scholar: Human Sciences
eISSN: 2586 - 9388 The Scholar: Human Sciences
https://assumptionjournal.au.edu/index.php/Scholar

The Driving Factors of Online Learning Satisfaction and Online Continuous Learning Intention Among Sophomores in Chengdu, China

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Received: Frebuary 21, 2024. Revised: April 17, 2024. Accepted: Frebuary 18, 2025.

Abstract

Purpose: This study examines the factors influencing satisfaction with online learning and the continuous learning intention among sophomore university students in Chengdu. **Research Design, Data, and Methodology:** Quantitative methods and questionnaires were employed to gather sample data. Content validity and reliability of the questionnaire were assessed through item-objective congruence and pilot tests before distribution. Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) were utilized for data analysis, validating the model's goodness of fit and confirming causal relationships among variables for hypothesis testing. **Results:** Online learning satisfaction significantly predicts the intention to continue learning online. Information quality and instructor quality play pivotal roles in influencing students' online learning satisfaction, followed by system quality and course website quality, with reliability also impacting satisfaction. Consequently, students' satisfaction with online learning emerges as the strongest predictor directly and indirectly influencing their intention to continue learning online. Information quality and instructor quality significantly drive online learning satisfaction, while system quality and course website quality strongly impact satisfaction. **Conclusions:** This study is significant in exploring online education in higher education, especially amid the COVID-19 pandemic 2019. It provides insights into the experiences of second-year university students in transition, aiming to enhance their willingness to engage in online learning.

Keywords : Information Quality, Instructor Quality, Course Website Quality, Continuous Intention, Satisfaction

JEL Classification Code: E44, F31, F37, G15

1. Introduction

Online education in China utilizes the internet and information technology to provide educational content for various levels of education, including preschool and adult education. It offers students the opportunity to acquire necessary education in a shorter time frame, overcoming the limitations of traditional education in terms of time and space. Online education can address the imbalance in educational resources by providing a comprehensive view of students' learning experiences (Wang et al., 2018). With the help of cloud data and AI, teachers can now accurately and quickly understand their students' learning situations. Although many online education platforms have emerged recently, their quality could improve. One advantage of online education is that knowledge can be spread regardless of location or time. Users can learn through mobile phones, PDAs, and other mobile devices. In 2023, China's top ten online education brands include New Oriental Online, Hujiang Online School, Aopeng Education, Chalk Vocational Education, Zhengbao Accounting Online School, Xueershi Online School, Zhongpublic Network School, Gao Tu, Huatu Online, and Youdao Excellent Course. The list of top ten and most famous online courses includes those with a good reputation, high visibility, and strength, ranked in no particular order. Additionally, there are online learning platforms such as the MOOC network, Xuetang Online, Khan Academy, NetEase Open Class, and NetEase Cloud Class (Qu, 2023).

According to a report by Xinhua Net, approximately 270 million students in China have enrolled in online education

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programs. The report also highlights that daily user on various platforms have exceeded 10 million. The industry's growth can be attributed to the rise of the internet and the impact of the COVID-19 pandemic since January 2020. It is worth noting that the COVID-19 virus is highly contagious and poses a significant threat to the population. To tackle the epidemic control and prevention issue, China's Ministry of Education has introduced a new approach called 'school suspension without suspending school.' With the rapid growth and popularity of cloud computing and intelligent terminals, online learning has become more diverse. It started with distance education in the 1990s, followed by MOOC in 2012, and now includes smart classrooms (Zhou et al., 2020).

Andronie and Andronie (2014) explains that E-learning support systems are created by collaborating with an information system and a learning management system—the use of such systems in teaching and learning dates to the 1960s. Although the importance of learning management systems (LMS) was discussed in the early 20th century, developing E-learning support systems underwent several phases. It is important to consider the development of these systems, given that the Internet was the primary medium of communication during the learning period. Andronie and Andronie (2014) defines a learning management system as software that monitors and reports student activities in the classroom or online. Learning management systems (LMS) are software tools that automatically manage training program activities. Teachers can use LMS to monitor and improve the quality of education by communicating with students and keeping track of their progress. Users can record student data and track the courses they have taken. LMS is designed to work with various publishers and providers and does not focus on creating new courses. The system primarily deals with tasks related to existing ones. Stantchev et al. (2014) found that LMS can impact learners' interest and efficiency by affecting their emotions. Positive emotions can enhance users' interest in learning, while negative emotions can impede learning motivation. The authors observed that positive emotions can aid in improving students' motivation to learn, whereas negative emotions can hinder their efforts. Online learning is a study method that relies on the internet as its backbone. The internet, which evolved from the development of ARPANET in 1969, is also known as the international network. Networking connects computer networks, creating an interconnected structure with other networks. The Internet is a vast collection of interconnected networks arranged logically. The Internet has significantly impacted various aspects of people's lives, including education, entertainment, and the economy. It has fundamentally changed the way people live and has challenged outdated ideas.

The traditional education system adopted a face-to-face learning model, which was seen as the system's foundation. Teachers were seen as knowledge centers, and technical support became more sophisticated. In addition, information technology was used to support communication across the globe. According to Wong (2016), technology positively impacts learning and teaching. Tamim et al. (2011) noted that the use of computers in schools has increased continuously since the 1950s. Van Dusen (1960) also noted that the use of computers in classrooms. In the 1960s, the use of computers was not flexible due to the linear nature of the technology. In the 1990s, the availability of computers and the Internet led to the widespread use of fax machines and other electronic devices. Online learning was first introduced as a concept in 1969. The Internet is a learning system developed by the ARPANET in 1969. It is also referred to as an international network or computer network. The concept of the global Internet refers to a network that's interconnected around the world. It is a collection of interconnected networks arranged logically to form a single international framework. The Internet has greatly impacted many aspects of people's lives, including their education, work, and entertainment. It has also changed how people think about their future, and the emergence of the Internet has been seen as a major event in the history of the digital age. It has affected various socio-economic sectors and communications. The development of ICT has contributed greatly to the development of higher education. It has made it easier for students to access and use different educational institutions. It has also made higher education accessible to people from all socio-economic backgrounds. It has also encouraged sharing educational resources, which can help improve the quality of education in rural areas. Many universities now consider online and blended learning as their main teaching methods, and some countries have begun implementing policies and strategic plans for using technology in higher education. However, the practice of digital education has been slow to develop. In China, the development of a learning management system started late, and although several platforms provide different features and functions, such as learning management systems, the market share of these platforms in China is still small. Some universities have started using open-source platforms but cannot always maintain and operate them independently. In China, universities still use domestic integrated curriculum products or library resources. There were also various restrictions on how teachers could use these products. The Ministry of Education has recently launched an investment program for universities in western and central regions. There are 132 universities in China, including 51 private universities and 81 public institutions. The technology environment of these universities differs from that of other universities in different regions. Environmental factors and technology platforms are

considered the best in the East. On the other hand, online students' learning effect and satisfaction decreased in the western and eastern regions. To provide students with the best possible education, many universities offer a variety of degrees and programs that focus on career-focused studies. With the growing need for workers with the right skills, the number of students taking online courses has increased. Many students prefer courses that meet their future career goals and requirements rather than the standard courses offered by universities. The learning process has become more fragmented and multi-dimensional, requiring different tools and resources. the increasing number of students and the need for more personalized and shorter courses have forced universities to rethink their approach to higher education. According to studies, online courses meet the needs of today's learners and are expected to grow in popularity as educational institutions respond to increasing enrolments. Many universities and educational institutions suspended face-to-face classes in response to the coronavirus pandemic. Other factors, such as the rising cost of tuition and the increasing number of modern learners, have also contributed to the growing popularity of online learning. According to Sener, countries that have successfully managed the changes caused by the pandemic have shown that educational institutions need to develop online courses to survive. E-learning can help institutions prepare for the future by providing the necessary tools and resources to improve their operations. The quality of the learning experience is a crucial factor for students. Additionally, the continuous engagement of students is a key contributor to the success of e-learning. Batahej's perspective suggests that consumers continue using a product or service over time. Guo et al. (2022) identified online learning satisfaction as an early variable that affects the behavior of continuous participation in online learning.

2. Literature Review

2.1 Information Quality

DeLone and McLean (1992) defined information quality as the extent to which users trust information produced by an Enterprise Resource Planning (ERP) system based on its relevance, understandability, accuracy, and integration. Edmunds and Morris (2000) defined information quality as reflecting accuracy, relevance, and timeliness. Information quality refers to a system's ability to effectively communicate the intended information (Lin & Wang, 2012). Information quality is a multidimensional concept encompassing the information system output's precision, integrity, and format (Nelson et al., 2005). Additionally, information quality is often associated with the quality of content-based online services (Lin & Johnson, 2015). Van Birgelen et al. (2008) identified relevance, accuracy, and timeliness as key dimensions for measuring information systems. Information technology uses equipment and methods to obtain, transform, display, transmit, and store numerical, textual, sound, and image information. It involves providing services and equipment to support communication and computer technology. The quality of information technology is linked to the digital devices that students use for learning (Clark & Mayer, 2003). According to Lin and Wang (2012), information quality is the ability of a system to convey information intention. Digital technology has improved students' learning experience and environment (Rapanta et al., 2020). The impact of information quality on perceived effectiveness is significant, as Lin (2007) noted. Information quality is only deemed useful when customers perceive the information on the site to be accurate, well-informed, and up-to-date. (Perkowitz & Etzioni, 1999). Based on these studies, the following hypothesis has been formulated:

H1: Information quality has a significant impact on online learning satisfaction.

2.2 System Quality

System quality refers to hardware and software's reliability, compatibility, and stability (Ali et al., 2022). The six features of information system function, namely responsiveness, convenience, reliability, accuracy, flexibility, and efficiency, can reflect the system's quality (Huang & Duang-Ek-Anong, 2022). To ensure that the system is designed to meet the needs of students, teachers, and IT staff, the quality of the materials should be regularly monitored (Harasim, 2000). Cheng (2012) notes that system quality comprises system response, function, user interface design, and interaction. E-learning, also known as online learning, refers to the degree to which a system supports technology-based learning and is a component of e-learning system quality (Gorla et al., 2010). System quality is a subjective evaluation of information system usefulness and is one of the antecedents of perceived usefulness (Lederer et al., 2000). Hoffman and Novak (1997) argue that system quality in e-learning can be divided into website interface functionality and audio and video quality. System quality significantly impacts the use of information systems (DeLone & McLean, 2003).

Identifying functional groups and navigational aids in a virtual environment, facilitated by a high-quality website, enables customers to exchange information effectively. Therefore, system quality has a positive impact. The hypothesis is based on supported studies regarding the perceived usefulness (Kim et al., 2008). Based on these studies, the following hypothesis has been formulated:

H2: System quality has a significant impact on online learning satisfaction.

2.3 Course Website Quality

The quality of a course website is determined by various factors, including its content, security, and privacy. According to Rocha (2012), there are three dimensions to consider when assessing website quality: technical, content, and service. Niazi and Kamran (2016) added usability, functionality, efficiency, and reliability to the list when assessing the quality of Iranian university websites. Therefore, website quality is a vital component of online service delivery. Online learning courses are becoming increasingly popular in higher education due to their many benefits, such as easy access and modern learning styles. In today's rapidly advancing information and network technologies, learners can use these technologies to establish new learning methods. This type of network learning enables data communication and transmission, allowing learners to acquire the desired knowledge. The Blackboard platform, widely used by Harvard University, Stanford University, and others serves as a branch of a web-based teaching support platform. It is centered around the curriculum and provides necessary technical support. Teachers set up courses, and students choose courses and engage in self-study. The platform is divided into multiple independent areas, including a learning area and a communication area, which provide a powerful way for students to engage in blended learning. Moodle is a learning management system based on constructivist learning theory. Based on these studies, the following hypothesis has been formulated:
H3: Course website quality has a significant impact on online learning satisfaction.

2.4 Instructor Quality

The quality of a lecturer is determined by various factors, such as their level of awareness and interpersonal skills. The lecturer's professional code of conduct should also be considered to evaluate their work. This code typically includes professional knowledge, competence, and professionalism—teacher Ethics -- the core of teacher quality. Instructor quality displays teachers' teaching ability in teaching activities through the dimensions of courseware-making, communication ability, work experience, student perception, and responsiveness. The instructor's role is widely acknowledged as a crucial factor in the success of both traditional and online learning programs. This has been demonstrated in numerous studies of online learning systems. The relationship between responsiveness, communication style, attitude, and enthusiasm and the level of satisfaction perceived by users is believed to support the quality of teaching delivered by teachers (Liaw & Huang, 2013). Additionally, teaching technology is crucial in facilitating communication between teachers and students. According to Fink (2007), improving the quality of online education and course content can increase student satisfaction and engagement. Based on these studies, the following hypothesis has been formulated:
H4: Instructor quality has a significant impact on online learning satisfaction.

2.5 Reliability

Reliability refers to accurate and proactive in fulfilling commitments (Quang et al., 2017). Customer satisfaction is a crucial factor in assessing service quality. The quality of service depends on various factors, such as staff responsiveness and material adequacy (Parasuraman et al., 1988). To maintain an informed relationship with the school and commitment to service outcomes and core attributes that reflect student satisfaction, students require a superior customer experience. From the definition of reliability, reliability has three related indicators: prescribed conditions, prescribed time, and prescribed functions. In a broad sense, "reliability" refers to the degree of satisfaction of the user with the product or the degree of trust in the enterprise. This level of satisfaction or trust is subjective. Reliability includes durability, maintainability, and design reliability. Based on these studies, the following hypothesis has been formulated:
H5: Reliability has a significant impact on online learning satisfaction.

2.6 Online Learning Satisfaction

Learning satisfaction pertains to students' subjective perceptions of the learning process (Leong, 2011). Shen (2009) define student satisfaction as the degree to which their needs are met and their happiness with the process. Similarly, a study by Martin-Rodriguez et al. (2015) found that students' satisfaction with e-learning is determined by the university's ability to meet technological expectations. Furthermore, the study uncovered that certain students perceive the learning opportunities as highly adaptable and user-friendly. They also believe that this enables them to personalize their learning experience and utilize the diverse range of features offered by the platform. They also believe that this enables them to personalize their learning experience and utilize the diverse range of features offered by the platform. While some individuals may find online learning unstimulating and tedious, others may prefer to concentrate on the instructor's lectures. The learners will likely require significant time to acquire knowledge, as the emphasis is not on the learning process.

Additionally, the learning strategies and methods

employed by the learners may vary. For instance, some learners may meticulously take notes and complete exercises. Some learners are meticulous in their learning process but rarely backtrack to review previous knowledge points. Other learners read quickly but may benefit from reviewing related knowledge points. Based on these studies, the following hypothesis has been formulated:

H6: Online learning satisfaction has a significant impact on online learning continuous intention.

2.7 Online Learning Continuous Intention

Sustainable participation in online courses relies heavily on students' continuous intention to participate (Guo et al., 2022). Learning satisfaction is improved when learners' expected goals are met. Bhattacherjee (2001) illustrated the relationship between users' continuous use of information systems and repeated purchase by consumers. Learners attach great importance to the overall knowledge structure and framework of the corresponding teaching content in the learning process and constantly review these parts. In the learning process, learners choose the next knowledge point based on the overall knowledge framework of the teaching content. Therefore, learners' demand for teaching resources is reflected in the structured organization and design of teaching content rather than the design of an autonomous learning environment simply through the accumulation of quantities. From this perspective, organizing online learning content and teaching information reasonably push sequence and method can effectively promote learners' online learning. Humans can apply knowledge from one task to another, learning the latter without forgetting how to do the previous one. This technique is called continual learning or life-long learning. This ability can be boiled down to two main problems: how to use previous task experience to learn the current task faster and better and how to avoid forgetting the tasks already learned while learning the current task.

3. Research Methods and Materials

3.1 Research Framework

The researchers explored six relationships between variables in their investigation. The first relationship involves system quality and online learning satisfaction, where system quality is the external variable and online learning satisfaction is the internal variable. The second relationship pertains to information quality and online learning satisfaction, with variables influencing information quality and online learning satisfaction categorized as internal or external. The third relationship focuses on the quality of online courses and satisfaction with online learning, with online course quality as the exogenous variable and online learning satisfaction as the endogenous variable. Another crucial factor examined is the relationship between teacher quality and online learning satisfaction. Lastly, the connection between reliability and online learning satisfaction is also considered. The ultimate relationship explored is the correlation between online learning satisfaction and continuous learning intentions, with online learning satisfaction as the independent variable and continuous learning intention as the dependent variable.

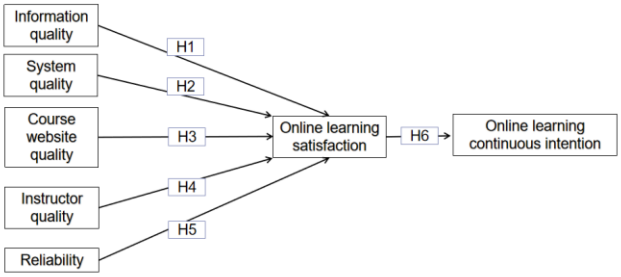

Figure 1: Conceptual Framework

H1: Information quality has a significant impact on online learning satisfaction.
H2: System quality has a significant impact on online learning satisfaction.
H3: Course website quality has a significant impact on online learning satisfaction.
H4: Instructor quality has a significant impact on online learning satisfaction.
H5: Reliability has a significant impact on online learning satisfaction.
H6: Online learning satisfaction has a significant impact on online learning continuous intention.

3.2 Research Methodology

This study employed empirical analysis and quantitative methods. The sample data was collected from the target population using a questionnaire. Prior to large-scale data collection, the content validity and reliability were assessed. The questionnaire was verified through the Item-Objective Congruence (IOC) test and the pilot test of Cronbach's Alpha. Before collecting data, researchers performed an Item-Objective Congruence (IOC) evaluation and conducted a pilot test. The IOC was assessed by a panel of three experts, with all items exceeding the acceptable threshold of 0.6. In the pilot test, which included 50 participants, Cronbach's alpha reliability was utilized. According to Tavakol and Dennick's recommendations from 2011, a measurement tool is deemed appropriate for use if the Alpha coefficient is 0.70 or higher, indicating satisfactory structural quality.

The questionnaires were distributed online to

undergraduate students, including sophomores and juniors, following the reliability test. The study surveyed seniors from five higher education institutions in Sichuan, China, who had at least one year of experience using LMS. The research employed the two-step Structural Equation Model (SEM) method proposed by Anderson and Gerbing (1988). The methodology adopted in this study for analyzing the sample data involved two steps. Firstly, statistical software was used for confirmation factor analysis.

(CFA) to examine convergent validity. Secondly, SEM was conducted to explore causal relationships. SEM aims to test the significance of influences and proposed hypotheses by examining the relationship between all constructs in the conceptual model. SEM has the advantage of synchronously exploring a range of dependencies, particularly when the model is complex. The model comprised direct and indirect influences between structures (Hair et al., 2010).

3.3 Population and Sample Size

Raza and Hanif (2013) state that the main objective of the research is to determine the appropriate sample size. Various views on the scope of the study have been presented in the literature. Tabachnick and Fidell (2007) recommend a sample size of 300 to 400, while Hair et al. suggest a more modest figure of 100. A sample size of approximately 150 to 200 respondents is reasonable. Herzog and Boomsma (2009) stated that a minimum sample size of 200 or 100 is required for a structural equation model. In 2013, a larger sample size was required for a more complex model. Williams et al. (2010) found that a sample size of 500 was the most accurate for complex equations. After entering all necessary information into the calculator, the expected effect size was 0.2, with a desired statistical power level of 0.8. The model consisted of 7 latent and 27 observed variables, with a probability scale of 0.05. The minimum detectable result was 425, and the minimum sample size for model structure was 109, with a recommended minimum sample size of 425. The researchers used the most appropriate sample size. To obtain more accurate statistical results, the researchers collected 500 samples from four institutions of higher learning in Sichuan based on previous studies, as shown in Table 1.

3.4 Sampling Technique

The questionnaires were made available online on the web boards of each institution's website for one month, commencing in May 2023. Consequently, convenience sampling was utilized, drawing respondents who voluntarily participated in the questionnaire. Respondents were selected based on quota sampling to ensure alignment with the study's target demographic, specifically undergraduates with a minimum of one year of experience in online study.

Table 1: Sample Units and Sample Size

The four schools	Population Size	Proportional Sample Size
Sichuan University	17952	185
Southwest University for Nationalities	13950	144
Sichuan Conservatory of Music	4469	46
Chengdu University	12229	126
Total	**48600**	**500**

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

The demographics of the total 500 respondents and the sample size of the four universities are shown in Table 2 below.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	155	31%
	Female	345	69%
Online Learning Experience	One year or below	170	34%
	2-3 Years	158	32%
	4-5 Years	49	10%
	Over 5 Years	123	24%

4.2 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) serves as a crucial initial step in Structural Equation Modeling (SEM) (Hair et al., 2010). CFA is employed for measuring the reliability and validity of variables (Byrne, 2010). Convergence validity can be statistically assessed using various measures such as Cronbach's Alpha reliability, factor load, mean-variance extraction (AVE), and composite reliability (CR) (Fornell & Larcker, 1981). A factor load exceeding 0.50 is highly significant (Hair et al., 1998).

In this study, the factor load for each factor exceeded 0.50, with most surpassing 0.70, ranging from 0.607 to 0.826, as indicated in Table 4. To ensure reliability, the recommended threshold for composite reliability (CR) is 0.70 or higher, and for mean-variance extraction (AVE), it should be greater than or equal to 0.4 (Fornell & Larcker, 1981; Hair et al., 1998). In Table 4, all estimates exhibit significance when CR values exceed 0.7 and AVE values exceed 0.5.

CFA was used before analyzing the measurement model with the structural equation model (SEM). The result of CFA indicated that all items in each variable are significant and have factor loading to prove discriminant validity. Hair et al. (2006) recommends guidelines to define the significance of

factor loading of each item and acceptable values in defining the goodness of fit. Factor loading is higher than 0.50, and the p-value is lower than 0.05. Furthermore, aligning with the recommendation from Fornell and Larcker (1981), the Composite Reliability (CR) is greater than the cut-off point of 0.7, and the Average Variance Extracted (AVE) is higher than the cut-off point of 0.4.

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
Information Quality (IQ)	Nelson et al. (2005)	3	0.822	0.760-0.810	0.822	0.607
System Quality (SQ)	Selwyn (2007)	3	0.808	0.745-0.793	0.809	0.586
Course Website Quality (CWQ)	Shen (2009)	4	0.795	0.627-0.799	0.810	0.518
Instructor Quality (IQUA)	Badia et al. (2019)	3	0.749	0.622-0.826	0.759	0.515
Reliability (REL)	Zeithaml and Bitner (2003)	5	0.852	0.688-0.763	0.853	0.538
Online Learning Satisfaction (OLS)	Strong et al. (2012)	5	0.807	0.572-0.745	0.810	0.462
Online Learning Continuous Intention (OLCI)	Guo et al. (2023)	4	0.808	0.607-0.792	0.816	0.528

The indicators of goodness of fit are shown in Table 7. The indicators used for measurement include CMIN/DF, GFI, AGFI, NFI, CFI, TLI, and RMSEA, and the CFA statistical values of these indicators are all greater than the acceptable values, which proves the goodness of fit of the measurement model.

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/ DF	≤ 5.0 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	587.234 / 303 = 1.938
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.923
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.904
NFI	≥ 0.90 (Wu & Wang, 2006)	0.890
CFI	≥ 0.80 (Bentler, 1990)	0.943
TLI	≥ 0.80 (Sharma et al., 2005)	0.934
RMSEA	< 0.08 (Pedroso et al., 2016)	0.043
Model Summary		**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

According to Fornell and Larcker (1981), testing for discriminant validity was evaluated by computing the square root of each AVE. Based on this study, the value of discriminant validity is larger than all inter-construct/factor correlations. Therefore, the discriminant validity is supportive. The convergent and discriminant validity were proved; Therefore, the evidence is sufficient for establishing construct validity.

Table 5: Discriminant Validity

	IQ	SQ	CWQ	IQUA	REL	OLS	OLCI
IQ	**0.779**						
SQ	0.186	**0.766**					
CWQ	0.155	0.158	**0.720**				
IQUA	0.123	0.178	0.187	**0.718**			
Rel	0.170	0.224	0.184	0.238	**0.733**		
OLS	0.324	0.294	0.279	0.349	0.256	**0.680**	
OLCI	0.202	0.249	0.211	0.199	0.190	0.352	**0.727**

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

4.3 Structural Equation Model (SEM)

This study used a structural equation model (SEM) to analyze the collected data. The advantages of SEM include many aspects. First, SEM can explore dependency relationships (Hair et al., 2010). Second, SEM examines the causal relationship between latent and observed variables. Third, random errors in the observed variables are used to provide more accurate measurement results. Fourth, use multiple indicators to measure potential variables. Finally, it can test hypotheses at the building level, not just at the project level (Hoyle, 2011). The goodness of fit reference values and literature are shown in Table 6. The goodness of fit of the structural model in this study is shown in Table 6. The statistical values were CMIN/DF = 2.314, GFI = 0.901, AGFI = 0.8882, NFI=0.8662, CFI = 0.916, TLI = 0.916, RMSEA = 0.051. The fitting indexes were all greater than the acceptable values, which confirmed the model's suitability.

Table 6: Goodness of Fit for Structural Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/ DF	≤ 5.0 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	735.913 / 318 = 2.314
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.901
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.882
NFI	≥ 0.90 (Wu & Wang, 2006)	0.862
CFI	≥ 0.80 (Bentler, 1990)	0.916
TLI	≥ 0.80 (Sharma et al., 2005)	0.916
RMSEA	< 0.08 (Pedroso et al., 2016)	0.051
Model Summary		**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

Regression coefficients or standardized path coefficients are used to measure the correlation between the independent and dependent variables proposed in the hypothesis.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-value	Result
H1: IQ→OLS	0.124	5.334*	Supported
H2: SQ→OLS	0.102	4.363*	Supported
H3: CWQ→OLS	0.105	4.047*	Supported
H4: IQUA→OLS	0.215	5.266*	Supported
H5: REL→OLS	0.071	2.268*	Supported
H6: OLS→OLCI	0.474	6.454*	Supported

Note: * $p<0.05$
Source: Created by the author

Table 7 show that all six proposed hypotheses are supported. Students' online learning satisfaction strongly influences their willingness to continue online learning. Students' online learning satisfaction is affected by information quality, system quality, website course quality, teacher quality, and reliability, among which the influence of information quality and teacher quality is significant. The relationship between information quality and students' online learning satisfaction is 0.124 in H1, and the T-value is 5.334. The path relationship between teacher quality and students' online learning satisfaction is a standardized path coefficient of 0.215 and a T-value of 5.266 in H4. The second is the impact of system quality and website course quality. The relationship between system quality and students' online learning satisfaction in H2 is 0.102, and the T-value is 4.363. The path relationship between website course quality and students' online learning satisfaction is a standardized path coefficient of 0.105 and a T-value of 4.047 in H3. The standardized path coefficient of reliability and students' online learning satisfaction in the path relation H5 is 0.071, and the T-value is 2.268.

Students' online learning satisfaction strongly influences their willingness to continue online learning, and the path relationship between the two is 0.474 standardized path coefficient and 6.454 T-value in H6. This shows that students' online learning satisfaction is not only affected by information quality, system quality, website course quality, teacher quality, and reliability but also strongly affects students' willingness to continue online learning.

5. Conclusion and Recommendation

5.1 Conclusion and Discussion

This study aims to comprehensively analyze the influencing factors of online learning satisfaction and online continuous learning willingness of sophomore college students in the Chengdu area. The researchers propose six hypotheses in the conceptual framework to explore the factors that affect online learning satisfaction and the willingness to continue online learning of second-year college students. After the questionnaire was compiled and verified, the questionnaire was sent to sophomore students through the Internet. The four universities selected are representative of Chengdu. Sichuan University is a comprehensive university, Southwest University for Nationalities has advantages in the higher education of ethnic minorities, Sichuan Conservatory of Music embodies the major of art, and Chengdu University is a university invested by the local government and is representative in Chengdu. Using the collected data, the validity and reliability of the research conceptual model were measured and tested by CFA. The influence factors of online learning satisfaction and online continuous learning willingness of sophomore college students in the Chengdu area were analyzed and discussed using scanning electron microscopy. All the six hypotheses proposed were supported and proved to be able to achieve the research objectives.

The results show that the conceptual model can predict the factors affecting online learning satisfaction and the willingness to continue learning of sophomore students in the Chengdu area. The results show that information quality and teacher quality are the most significant factors affecting students' online learning satisfaction, followed by system quality, website course quality, and reliability. Students' online learning satisfaction is the strongest predictor that directly and indirectly affects students' willingness to continue learning online.

5.2 Recommendation

The researchers identified the key factors influencing online learning satisfaction (OLS) among second-year college students: information quality (IQ), teacher quality (IQua), as well as website course quality (CWQ), system quality (SQ), and reliability (Rel), and the impact of online learning satisfaction (OLS) on willingness to continue learning online (OLCI). Chengdu region showed a higher value; the above key factors should be developed and developed. In this study, information quality and teacher quality have a significant driving effect on students' online learning satisfaction. Therefore, this study suggests that universities and institutions engaged in online learning

software development should pay attention to improving information quality and teacher quality factors and, at the same time, improve system quality to make students perceive the usefulness of the system and students' expectations of the learning system will determine their learning satisfaction (Lee, 2010; Lin et al., 2012). Moreover, it further improves students' willingness to continue learning online. Student satisfaction with online learning is the strongest predictor of both direct and indirect willingness to continue using it. In this study, students' satisfaction was influenced by five potential variables, the most significant of which was the quality of information. Therefore, in future teaching practice and software development, we should pay attention to the information quality of online learning. Some scholars' research on the relationship between information quality and online learning satisfaction proves that the quality of information, such as accessibility, timeliness, accuracy, and relevance, can affect the degree of subjects perceived online learning satisfaction. Therefore, this suggestion can effectively improve students' positive attitude toward college students' online learning satisfaction and their willingness to continue learning online.

5.3 Limitation and Further Study

This study has certain limitations. First, this study only focuses on higher education in the Chengdu area, and the data collection and selection are only conducted on second-year students in four universities. Hence, the scope and sample size is limited. In addition, there needs to be a detailed classification of the profession in the selection and a lack of accurate positioning. Further research could consider other potential variables such as behavioral intention, social influence, self-efficacy, effort expectation, trust, perceived interaction, learning motivation, and facilitating conditions to expand the research framework for the conceptual structure of student online learning satisfaction. In addition, it can also expand the correlation between the off-campus target group's online learning satisfaction and online continued learning willingness so that the research has more academic value and social role.

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