# An Empirical Study of the University Teachers' Continuance Usage of Online Teaching Platform

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Abstract

This study is with the purpose of verifying the indirect relationships between variables in the measurement model and confirms all 11 indirect paths of influence. The quantitative design and the empirical analysis have confirmed that service quality, system quality, and IT self-efficacy have indirect impacts on the dependent variable. This finding of this study shows that the system quality and service quality of online teaching platforms have a significant impact on the usage intention and behavior of teacher users. Improving the quality of the system and services can increase the satisfaction and perceived usefulness of teacher users towards the platform, thereby enhancing their continuance intention and continuance usage behavior. Meanwhile, IT self-efficacy plays a crucial role in the continuance intention and behavior of teacher users, and improving their IT self-efficacy can help increase their intention to use online teaching platforms. Enhancing the IT self-efficacy of teacher users: Through training and skill improvement, help teachers improve their IT skills and enhance their confidence in using online teaching platforms. For the research and practical implications, and for the future research, other possible factors that may affect teachers' continuance usage of online teaching platforms, such as organizational support and peer influence, can be further explored. In addition, it is possible to study the differences in the use of online teaching platforms by teachers in different disciplines, educational stages, and regions, to understand the motivations more comprehensively for teachers to continue using online teaching platforms.
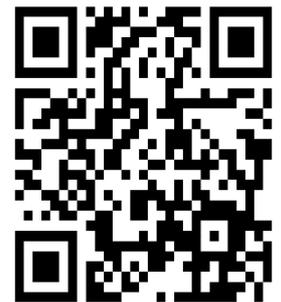
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Introduction

The important reason that threatens social order is the inequality of educational resources. Acquiring knowledge has always been a privilege of the elite. The national education policy directly points out that educational equity is the foundation of social equity. The advent of the information age has changed this inequality. The rise of the Internet has broken down barriers of geography, time, and social class, making knowledge more accessible. The rapidly developing online education can optimize the allocation of educational resources. (Al-Maroof & Salloum 2021; Baber 2021; Bao & Huang 2022; Cao et al. 2022; Dai et al. 2020; Gu & Sun 2021; Gupta et al. 2021; Yang 2021; Ye et al. 2022; Wilson et al. 2021). With the rise of the Internet, education reform has also been constantly innovating with the help of the Internet. In recent years, the country has attached great importance to the construction of modern education, actively guiding the development of online education through policy documents, and has successively issued documents such as the "Ten-Year Development Plan for Educational Informationization (2011-2020)", "Educational Informationization 2.0 Action Plan", and "Guiding Opinions on Promoting the Healthy Development of Online Education", clearly stating that modern information technology should be fully utilized to provide online education services, enrich modern learning methods, and accelerate the construction of a learning society. Especially during the 2020 COVID-19 pandemic, online education became a capital competition hotspot. Traditional teaching platforms and internet giants are competing in the race for online teaching platforms. Traditional online teaching platforms such as MOOC and Cloud Class are increasing their investment, while internet giants Tencent, Alibaba, and Bilibili are also increasing their efforts to develop online education. New models, new business forms, and new technologies have been applied, and most of the new users come from markets in lower-tier cities. Led by Internet giants such as Alibaba and Tencent, various regions are actively exploring and building new online education models in segmented areas such as K12 education, vocational training, higher education and lifelong education. Content service-oriented companies such as Chinese TAL Education Group and Huatu Education, platform service-oriented companies such as Tencent Classroom and MOOC, and tool service-oriented online education and training companies such as Yuansouti and Shanbay are constantly emerging. In an environment of favorable policies, capital support and demand release, the market has produced many "unicorns" such as VIPKID, Zuoyebang, Hujiang Online School and Studyvp. According to Tianyancha data, there are more than 230,000 enterprises in the online education industry in China, and online education enterprises are showing explosive development. Online education presents many highlights, and the application of new models, new business forms, and new technologies refresh the consumer experience. The emergence of the COVID-19 epidemic at the end of 2019 has led to a surge in the number of users using online education. According to survey data from Beijing QuestMobile Information Technology Co., Ltd., the daily active users of educational learning apps have increased from the usual 87 million to 127 million during the epidemic, an increase of 46%. According to Liu Xingliang, a member of the Information and Communication Economy Expert Committee of the Ministry of Industry and Information Technology, there are 180 million students in China, and as people's awareness of online education deepens, the market size of online education consumption will continue to expand in the future, and the prospects for online education are promising.
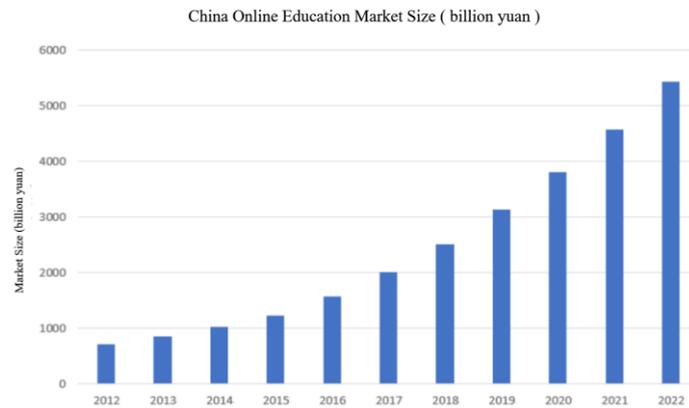
China Online Education Market Size (billion yuan)

Figure 1-1 Trend Chart of the Scale of China's Online Education Market in the Past Decade

For teaching platforms, the continuance usage of users is also very important for the operation of online teaching platforms. According to market analysis, K12 online education users have a very serious problem of user churn due to their own timeliness issues. The percentage of higher education online education users who continue to use online teaching platforms is relatively high. The main sources of learners in higher education online education are as follows: first, from advertisements placed by online teaching platforms; second, from importing users by schools cooperating with online teaching platforms; third, from bringing in users by teachers; and fourth, from spontaneous search by learners. For a teaching platform, learner users are its main benefit flow, and the source of enterprise profits or potential value development. Currently, many scholars are studying the issue of learners' continuance usage. However, there are relatively few studies on the continuance usage of online teaching platforms by teacher users. From the perspective of user acquisition, it can be seen that teacher users are of great significance to the increase of higher education learners. For enterprises operating online teaching platforms, it is possible to allocate manpower and financial resources more reasonably for brand promotion, more efficiently attracting learners to use the teaching platform, and bringing substantial profits and value to the enterprise. In higher education, teachers usually use online teaching platforms to create courseware, videos, organize teaching, assign and correct homework, etc.

Problem Statement

For online teaching platforms, teachers are both users of the platform and creators of courses and other resources. The stable and continuance usage of teacher users not only brings more learner user traffic to the online teaching platform, but also is the most important information resource of the online teaching platform. The learning activities organized by instructors on online learning platforms are valuable data for companies to analyze how learners use the platform. Therefore, it is of great significance for educational platform operating companies to study whether teacher users can continue to use the teaching platform. Given that there is still relatively little research on the continuance usage of online teaching platforms by teacher users, this study will focus on the continuance usage of online platforms by teachers engaged in higher education. (Al-Maroof & Salloum 2021; Baber 2021; Bao & Huang 2022; Cao et al. 2022; Dai et al. 2020; Gu & Sun 2021; Gupta et al. 2021; Yang 2021; Ye et al. 2022; Wilson et al. 2021)

Research Question

What are the primary reasons that university lecturers choose to use online learning

platforms? Currently, there are different brands of online teaching platforms operated by various enterprises in the market. It is very important for enterprises which online platform college teachers choose to use. Teacher users can not only bring stable student users to online teaching platforms, but also provide high-quality teaching resources for online teaching platforms.

Research Objective

With the rapid development of information technology, educational informationization is also constantly updating. The demand for online teaching is constantly increasing, especially after the outbreak of the COVID-19 pandemic in 2020. Various online teaching platforms are competing fiercely in the market. Operators of online teaching platforms recognize that teachers are very important users of the platform who not only provide quality course resources, but also bring a large number of learner users to the platform. Therefore, studying the usage behavior of teachers on online teaching platforms is of great significance to the operating enterprises of online teaching platforms. It enriches the research on the factors of continuance intention and usage behavior of online teaching platforms with university teachers as the research subjects. By studying the relationship between system quality, service quality, favorable conditions for using online teaching platforms, teachers' expectations and satisfaction with online teaching platforms, teachers' perceived usefulness of online teaching platforms, and teachers' intention and behavior to continue using online teaching platforms, to further understand the behavior and factors of teachers using online teaching platforms.

Scope of Study

This paper starts from the perspective of the operating company of online teaching platforms, takes the high school teachers who use online teaching platforms as the research object, and studies the factors influencing the continuance usage behavior of high school teachers using online teaching platforms. The findings of the study provide advice to the operating company of the online teaching platform to improve the quality, service quality, and promotion methods of this online platform, and ultimately improve the stickiness of the online teaching platform to teacher users, bring more course resources, student user resources, and teaching activity resources to the online teaching platform, thus increasing the market share of this online platform. Therefore, in this paper, there are specific definitions for the research object and related variables. Online teaching platform, i.e. network educational platform, is a network information system that provides teachers and students with text, voice, video, live streaming, homework, activities, and other functions through computer network technology to realize teaching and learning activities between teachers and students. Currently, popular online teaching platforms include Tencent Classroom, Chaoxingerya, Mooc China, Mosoteach, etc.

Literature review
Dependent Variables: Continuance Usage Behavior

Online teaching platform is a network information system product that provides teaching services. The adoption of information systems by users is a prerequisite for the realization of the value of information systems, and the continuance usage of information systems by users is the key to the realization of the value of information systems. Currently, there are many theories that study the adoption and use of information systems, including the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Extended Technology Acceptance Model (TAM2), the Theory of Planned Behavior (TBP), the Unified Theory of Acceptance and Use of Technology (UTAUT), Delone and McLean IS success model (D&M), and the Expectation Confirmation Model of Information System Continuance (ECM-ISC), etc.
Consumer behavior is an important foundation of marketing. Since the beginning of the 20th

century, many scholars have started to study consumer behavior. For example, W.D. Scott's (1910) "The Psychology of Advertising" initiated research on consumer psychology, mainly studying advertising and promotional behavior. R Bartels (1976) believed in his "The History of Marketing Thought" that the concept of consumer behavior began to emerge around 1950. In 1969, J.A. Howard and J.N. Sheth proposed the "Theory of Buyer Behavior". Around 1985, the emergence of the Theory of Planned Behavior (TPB) promoted the rapid development of behavioral research in marketing, followed by the emergence of numerous classic behavioral research theories.

Table 2-1 Summary of Studies on Continuance Usage Behavior

Scholars	Main content of the research	Years
Cidral, W. A., Oliveira, T., Di Felice, M., Aparicio, M.	Through the study of the continuance usage of e-learning by Brazilian university teachers, it was found that collaboration quality, information quality, and users' perceived satisfaction significantly and positively influenced teachers' use of e-learning. The driving factors of users' perceived satisfaction are information quality, system quality, teacher attitude towards e-learning, diversity of evaluation, and perceived interaction between learners and others. System quality, usage, and users' perceived satisfaction explain individual influence.	2018
Dong	When studying the stickiness of mobile education game users, it was found that continuance usage behavior is an external manifestation of continuance usage intention. Among the factors influencing user stickiness of mobile educational games, user stickiness is measured by three dimensions of product reuse, dependence, and loyalty in continuance usage behavior.	2019
Wang & Li	When analyzing the continuance usage behavior of Shaanxi farmers on mobile internet, it was found that satisfaction, perceived usefulness, perceived cost, and education level have a significant impact on the continuance usage behavior of Shaanxi farmers on mobile internet.	2021
Chen	To conduct research on the influencing factors of college students' continuance usage of Internet finance, based on the expansion of the user's continuous theory (ECM-ISC) as the basic model, and study the influencing factors of college students continuance usage of Internet finance. It is found that consumption situation, perceived usefulness, expectation confirmation, immersive experience, satisfaction, and continuance intention positively impact college students' continuance usage of Internet finance.	2022
Le, Lu, & Li	An empirical analysis was conducted on the factors influencing the continuance usage behavior of MOOC among college students users, and the factors and relationships between them that affect the continuous learning behavior of college students in MOOCs. It was found that intrinsic motivation is the main influencing factor of learners' satisfaction; trust is an important influencing factor for users to continue using MOOC platforms; the user's continuance usage behavior model after introducing trust and commitment has stronger explanatory power; trust and commitment play a partial mediating and chain mediating role in the positive impact of satisfaction on users' continuance usage.	2022
Wen & Wu	When studying the public usage behavior of government short videos, it was discovered that studying the influencing factors of public usage behavior of government short videos from the audience's perspective helps to deepen understanding of user behavior and thus use effective strategies to enhance the dissemination effect. Based on the unified theory of acceptance and use of technology, the study selected nine variables such as immersion and social influence from two dimensions of technology acceptance factors and content experience factors, and analyzed their impact on the public's usage behavior of government short videos. Using structural equation models, it was found that social influence, facilitating conditions, and immersion had significant positive effects on usage behavior, and perceived playfulness, perceived content quality, and perceived responsiveness had significant positive effects on usage behavior through the mediator variable immersion. It is suggested that operators of government short videos should strengthen the construction of content quality and enhance entertainment and interaction, thus enhancing user immersion and forming a linkage with government Weibo and government WeChat.	2022
Li	A model of factors influencing the continuance usage behavior of NetEase Cloud Music users was developed, and factors affecting users' usage of NetEase Cloud platform were explored. The research results showed that perceived usefulness, perceived quality, and transfer cost positively influence users' usage behavior.	2022

Zhi	She studied the usage behavior of online travel app users and conducted an empirical analysis on the factors that affect user usage behavior. Research has found that perceived ease of use has a significant positive impact on perceived usefulness; perceived usefulness has a positive impact on attitude towards use; perceived relative advantage has a significant positive impact on attitude towards use; attitude towards use has a positive impact on intention to use; intention to use has a significant positive impact on actual use.	2022
Yuan	When studying the continuance usage behavior of mobile commerce users, it was found that all the pooled effect sizes in the ECM-ISC model were significant, and the strongest correlation was between "expectation confirmation degree–satisfaction", with a significant impact of perceived usefulness on satisfaction.	2022
Zhou & Hong	During the empirical study on the influencing factors of teachers' participation in online training, it was found that performance expectations, effort expectations, and favorable conditions are key factors affecting teachers' participation in online training. Gender, teaching experience, and expertise play an important moderating role in teachers' participation in online training.	2022
Huang, Shen, & Li	Users' information attention and satisfaction with the video will directly affect their Vlog usage decisions. Users' feelings about the overall effect embodied in the video will directly affect the judgment of users' continuance usage behavior. Due to the difference in different video types, the emotional identity and immersive experience of different users are significantly different.	2022
Duan, Zhu, Cai, & Wang	A study of the factors influencing the public's continuance usage of government information in public health emergencies found that the triggering paths of the public's continuance usage of government information in different stages of the epidemic were different, and personal drivers, information quality, and government feedback were the core factors triggering the public's continuance usage of government information in public health emergencies.	2022
Wen & Wu	When studying the public use behavior and influencing factors of government short videos, it was found that social influence, facilitating conditions, and immersion have a significant positive impact on usage behavior. perceived playfulness, perceived content quality, and perceived responsiveness have a significant positive impact on usage behavior through the mediating variable of immersion.	2022
Hossein Mohammadi	Through a survey of electronic learning users at four public universities in Iran, the results showed that both 'intention to use' and 'user satisfaction' have a positive impact on the actual use of electronic learning. The "system quality" and "information quality" were found to be the main factors driving users' intention and satisfaction in using e-learning. At last, the perceived usefulness moderated the relationship between ease of use and user intention.	2015
Manuela Aparicio, Fernando Bacao, & Tiago Oliveira	Research on the usage of online learning systems by users has found that information quality positively affects the usage of e-learning systems, while service quality negatively affects the usage of e-learning. Perseverance, information quality, system quality, and service quality have a significant impact on e-learning satisfaction.	2017
Mohammed Amin Almaiah & Ibrahim Youssef Alyoussef	In a study of student use of e-learning systems, it was found that factors such as course design, course content support, course assessment, and instructor characteristics in the system information had a significant impact on the actual use of the e-learning system.	2019
Daniel Opoku et al.	In the study of teachers using the online teaching system LSM, it is found that system quality has a positive and statistically significant impact on the intention of teachers to use LMS. The results also indicate that system quality has a positive impact on the perceived usefulness of teachers using the LMS. However, system quality has no significant impact on lecturers' satisfaction with LMS. Perceived usefulness has a significant impact on the lecturer's intention to use it. In addition, service quality has a positive impact on the satisfaction of lecturers with LSM and their intention to use LSM. Information quality has a positive impact on lecturers' satisfaction with using LMS, but it does not have a positive impact on their intention to use LMS. The satisfaction of lecturers has a positive impact on the intention to use LMS, but not on the behavior itself.	2020
Sonia San-Martín et al.	Researchers found that the quality and organization of electronic teaching systems are key factors that motivate teachers to continue using online teaching. The impact of perceived usefulness on teachers' continuance usage of online learning systems is not significant.	2020

Favorable conditions

In this study, favorable conditions are considered as environmental factors that influence teachers' actual behaviors in using teaching platforms, including the support and facilitating forces from external sources, such as support and rewards from schools and educational institutions, that teachers receive in their continuance usage of online teaching platforms.

Favorable conditions, as a key variable for the continuance usage model of information systems, are usually directly introduced as independent variables in research. In the Unified Theory of Acceptance and Use of Technology (UTAUT), favorable conditions are also considered as an independent variable that directly influences acceptance behavior. (Gupta et al. 2021; Yang 2021; Ye et al. 2022; Wilson et al. 2021)

Farah et al.(2018), when studying the intention and behavioral factors of consumer adoption and use of mobile banking (m-banking), found that favorable conditions significantly influence consumers' usage of mobile banking.Blaise et al. (2018), in an effort to fill the research gap regarding the conditions that facilitate user acceptance of mobile commerce, investigated mobile commerce users' usage behavior, performance expectations, effort expectations, social influence, and trust, and found that favorable conditions significantly predicted purchase intention for mobile commerce.

Table 2-2 Summary of Favorable Conditions Research

Scholars	Research content	Years
Shamsul Anuar Mokhtar, Hamidon Katan, & Imdadullah Hidayat-ur-Rehman	The results of studying the behavior of teachers using learning management systems show that task technology fit (TTF), perceived usefulness (PU), and perceived ease of use (PEOU) have a direct impact on behavioral intention, while TTF, compatibility, favorable conditions, self-efficacy, personal innovativeness, and subjective norms have a significant impact on perceived usefulness and perceived ease of use.	2018
Mohammed Amin Almaiah et al.	In studying the usage of mobile learning systems by high school students in higher education, it was found that convenient conditions have a significant impact on students' acceptance and use of mobile learning systems.	2019
Syed Ali Raza et al.	When studying the factors influencing the acceptance of mobile banking of Islamic banks in Pakistan, it was found that facilitating conditions significantly affect users' behavior in using mobile banking.	2019
Ramon Palau-Saumell et al.	When studying the usage behavior of the mobile application MARSR for restaurant search and/or booking, it was found that the intention-driving factors for using MARSR are, in order of influence: habit, perceived credibility, hedonic motivation, price-saving orientation, effort expectations, performance expectations, social influence, and facilitating conditions. Habits, facilitating conditions, and usage intentions are significantly correlated with usage.	2019
Wang et al.	When studying the acceptance of wearable medical devices by consumers, it was found that performance expectations, effort expectations, facilitating conditions, social influence, and task-technology fit positively affect consumers' behavioral intentions to use wearable medical devices.	2020
Niu, Zhang, Wang, & Wang	In studying the continuance usage intention of online learning spaces by students, it was found that facilitating conditions directly affect students' continuance usage intention of online learning spaces.	2021
Zhu & Wang	When studying the behavior of young users adopting digital transmission of intangible cultural heritage, it was found that performance expectations, favorable conditions, ease of use expectations, and perceived playfulness positively influence users' intention to adopt intangible cultural heritage digital transmission content.	2021
Wang	When studying the intention of consumers in Hefei to use shared cars, it was found that favorable conditions would significantly affect their intention to use shared cars.	2021
Wang et al.	A study of college students' adoption of online learning found that favorable conditions affect students' intention to adopt online learning.	2022
Liang & Liu	When studying the intention of users to use tourism information service platforms, it was found that effort expectations, social impact, favorable conditions, level of trust, and product or service authority have a significant positive impact on usage intention.	2022

Xu, Lan & Wang	When studying the forwarding behavior of Weibo users during sudden events, it was found that favorable conditions significantly affect forwarding behavior.	2022
Niu, Wu & Sha	In studying the factors influencing the public's intention to use and behavior of contact tracing technology in China, it was found that performance expectation, effort expectation, social influence, favorable conditions, government trust, and technological trust significantly and positively influenced the public's intention to use contact tracing technology, respectively; the intention to use mediated the relationship between performance expectation, effort expectation, social influence, favorable conditions, government trust, technological trust, and usage behavior, respectively;	2022
Li, Wang, & Weng	Research on the usage of online learning platforms has found that favorable conditions significantly affect users' intention to use them.	2022

System Quality

In the context of this study, system quality refers to the quality of the online teaching platform system itself, including aspects such as interface design, navigation clarity, ease of use, and response speed (DeLone & McLean, 1992). System quality involves factors such as stability, security, and convenience of online teaching platforms, which in turn affect user satisfaction. When teachers use online teaching platforms, they first pay attention to whether the platform's interface design is beautiful, whether it conforms to usage habits, and whether they can smoothly enter the teaching work link. These factors will affect users' intention to use and directly determine whether they will continue to use the platform. Therefore, the interface design of online teaching platforms should be beautiful and reasonable, meeting teaching needs. The navigation design should be arranged reasonably according to user needs, placing commonly used functions for teacher users in prominent positions and setting appropriate links for related information content, so that teacher users can quickly find the required functions. In addition, teachers attach great importance to teaching efficiency, so online teaching platforms should have ease of use. After entering the online teaching platform, teachers should be able to quickly master the operation methods, and quickly find the required information and services. If the system settings are too complex or unreasonable, teachers may give up the platform and seek other convenient alternatives. The response time of online teaching platforms is equally important for real-time teaching. If the platform can quickly be opened and ensure a smooth teaching process, user satisfaction will be higher. On the contrary, users may close the platform due to lack of patience, thereby reducing their satisfaction and the probability of reusing the online teaching platform. (Al-Maroof & Salloum 2021; Baber 2021; Bao & Huang 2022; Cao et al. 2022)

Methodology
Research Design

This study mainly uses literature research methods, questionnaire survey methods, and empirical analysis methods to explore the influence mechanism of college teachers' continuance usage behavior of online teaching platforms. First, this study systematically reviewes various existing literature on continuance usage behavior to identify the theoretical basis for constructing the research framework. Then a questionnaire survey is conducted on university teachers to collect data on nine variables: continuance usage behavior, continuance usage intention, user satisfaction, perceived usefulness, expectation confirmation, favorable conditions, system quality, service quality, and collaboration quality. Finally, the various hypotheses in the framework model are verified through empirical testing. Therefore, this study provides multiple guarantees for the scientificity and rigour of the research content through literature review, questionnaire survey, and empirical test.

Literature Analysis

After reviewing literature related to the topic, the development background and current situation of online teaching platforms are summarized. The theories commonly used in research on teachers' adoption and continuance usage of online teaching platforms are also summarized, providing a reference for the construction of the theoretical model in this study. Based on the characteristics of online teaching platforms, the model of factors influencing teachers' adoption and continuance usage of online teaching platforms is proposed by combining the expectation confirmation theory and the information system success model theory.

Questionnaire survey

Based on the mature measurement scales widely used by scholars in the past, this paper refers to the characteristics of online teaching platforms used by university teachers to design measurement scales and then designs a survey questionnaire on this basis. Use Wenjuanxing online survey platform to distribute survey questionnaires to university teachers, collect feedback information from survey respondents, and obtain data samples. Conduct a preliminary investigation before conducting a formal investigation to further ensure the reliability of the questionnaire, verify the reliability of the questionnaire based on the survey data, make reasonable revisions, and distribute the formal survey questionnaire again. The obtained data is used for subsequent model verification and analysis. The online questionnaire for this study consists of two parts: 1. Basic information of users and their usage of online teaching platforms; 2. Questionnaire measuring factors affecting the continuance usage behavior of teacher users.

Population/Sampling/Unit of Analysis
Instrumentation

This study uses a 7-point Likert scale, represented by numbers 1-7. 1 represents 'strongly agree', 2 represents 'agree', 3 represents 'somewhat agree', 4 represents 'neither agree nor disagree', 5 represents 'somewhat disagree', 6 represents 'disagree', and 7 represents 'strongly disagree'.

Scale Design of Questionnaire

By reviewing previous research, it can be found that Delone & Mclean's designed items are commonly used in the two scales of system quality and service quality. System quality mainly focuses on aspects such as usability, reliability, responsiveness, and navigability. Although information systems are developing rapidly, these three aspects are still the most important requirements for current users. Service quality mainly focuses on aspects such as reliability, empathy, and timeliness. The favorable conditions are mainly concentrated in aspects such as support, environment, and equipment. Perceived usefulness is mainly focused on functional requirements, efficiency, performance improvement, etc. User satisfaction mainly focuses on feelings of fulfillment, enjoyment, and satisfaction. The main focus of continuance usage intention is on willingness, frequency, and recommendation. The continuance usage behavior mainly focuses on aspects such as frequency, duration, and resources. In this paper, System Quality is abbreviated as SQ, and the corresponding items are SQ1, SQ2, SQ3, SQ4; Server Quality is abbreviated as SER, and the corresponding items are SER1, SER2, SER3; Favorable Conditions are abbreviated as FC, and the corresponding items are FC1, FC2, FC3; Information Technology Self-Efficacy is abbreviated as IT, and the corresponding items are IT1, IT2, IT3; Perceived Usefulness is abbreviated as PU, and the corresponding items are PU1, PU2, PU3; User Satisfaction is abbreviated as US, and the corresponding items are US1, US2, US3; Expectation Confirmation is abbreviated as CF, and the corresponding items are CF1, CF2, CF3;

Continuance Intention is abbreviated as CI, and the corresponding items are CI1, CI2, CI3, CI4; Continuance Usage Behavior is abbreviated as CU, and the corresponding items are CU1, CU2, CU3.

Table 3-3 Scales

System Quality (SQ)	SQ1	I think all the functions of the online teaching platform can operate normally and stably.	Delone & Mclean (2003); Yang (2016); Guan (2020)
	SQ2	I think the response speed of online teaching platforms is very fast.	
	SQ3	I can easily access the online teaching platform whenever I want.	
	SQ4	I think online teaching platforms have good website layouts and user interface design.	
Service Quality (SER)	SER1	I think online teaching platforms can provide promised services.	Delone & Mclean (2003); Yang (2016); Guan (2020)
	SER2	When I encounter problems while using online teaching platforms, I can receive timely service.	
	SER3	Online teaching platforms can provide training services on how to use them according to the needs of different schools.	
Favorable Conditions (FC)	FC1	The school has provided me with good support for teaching using online teaching platforms.	Bhattacherjee (2008; Ding (2021); Liang et al. (2022)
	FC2	The network environment for the online teaching platform I use is very good.	
	FC3	The school's teaching equipment can support me well in using online teaching platforms for teaching.	
IT self-efficacy (IT)	IT1	I believe I am capable of learning to use new online teaching platforms.	Al-Azawei et al. (2020); Compeau & Higgins (1995)
	IT2	When encountering difficulties on the online teaching platform, I have confidence in solving the problem.	
	IT3	I am very confident in my ability to master online teaching platforms.	
Perceived usefulness (PU)	PU1	Online teaching platforms can meet my teaching needs.	Bhattacherjee (2001); Yang (2016); Le et al. (2022)
	PU2	Using online teaching platforms for teaching can save my time.	
	PU3	Using online teaching platforms for teaching can make my teaching work simpler and more efficient.	
User Satisfaction (US)	US1	I am satisfied with the teaching results achieved when using online platforms for teaching.	Bhattacherjee (2001); Le et al. (2022)
	US2	My evaluation of using online teaching platforms for teaching is positive.	
	US3	I am happy to use online teaching platforms for teaching.	
Expectation Confirmation (CF)	CF1	The efficiency of teaching using online teaching platform is better than what I expected.	Bhattacherjee (2001); Yang (2016); Le et al. (2022)
	CF2	All the teaching functions I expected have been implemented in the online teaching platform.	
	CF3	The teaching effect of using online teaching platforms exceeded my expectations.	
Continuance Intention (CI)	CI1	I have intention to use online teaching platform to teach more courses	Bhattacherjee (2001); Yang (2016), Liang et al. (2022)
	CI2	I have the intention to use online teaching platforms for teaching regularly.	
	CI3	I will frequently use this online teaching platform for teaching in the future, instead of stopping using it.	
	CI4	I intend to continue using this teaching platform at the current frequency for teaching.	
Continuance Usage Behavior (CU)	CU1	I will continue to use online teaching platforms to interact with students for teaching.	Bhattacherjee (2001); Yue et al. (2022); Liang et al. (2022)
	CU2	I will continue to use online teaching platforms to create a large number of teaching resources.	
	CU3	I will continue to use online teaching platforms to complete teaching activities.	

Data Collection Process
The main method used in this study to obtain data samples is through questionnaires survey. As the author is engaged in higher education, the main sample source of this study is from multiple universities in Guangdong Province, and the questionnaire respondents are all teachers engaged in teaching work. After sorting out the various theories of behavioral research, the questionnaire is designed on the premise of referring to the mature questionnaires of previous researchers and making reasonable adjustments to the relevant questions by considering the current environmental factors and information system updates. The study uses the seven-point Likert scale for design and divides the items according to the degree of agreement. It is divided into 7 levels. Among them, 1 means strongly agree, 2 means agree, 3 means somewhat agree, 4 means neither agree nor disagree, 5 means somewhat disagree, 6 means agree, and 7 means strongly disagree. The questionnaire is divided into two parts. The first part is the questionnaire entity, which conducts a satisfaction survey of university teachers. The second part is the basic information survey, which investigates the gender, age, professional title, teaching experience, major, which online teaching platform is being used, and how long it has been used by university teachers. Ethical considerations are explicitly taken into account in the survey questionnaire, which was designed to avoid questions involving privacy issues, and promise that the data would be used for academic research only and not for commercial purposes, and that the data will be collected anonymously. The questionnaire is distributed in the form of an online questionnaire. The author conducted surveys in multiple schools through various channels, mainly distributing the questionnaire through WeChat groups, enterprise WeChat, and other methods to ensure the effective recovery of the questionnaire and the reliability of the questionnaire source. The survey encouraged respondents to participate by using incentivized methods, such as distributing small red envelopes on WeChat or enterprise WeChat when distributing questionnaires. This method can not only increase the willingness of the respondents to participate, but also ensure the quality of the questionnaire.

Reliability & Validity Analysis
Before conducting structural equation model verification analysis on the user's continuance usage intention hypopaper model constructed, it is necessary to test the reliability and validity of the measured data to ensure that the data used for model verification analysis is appropriate. Given that some mature scales were contextually adapted during the design of the measurement model, it is necessary to first conduct a validity test on the questionnaire and then analyze the reliability and validity of the measurement model. Therefore, this study conducts reliability and validity analysis on both questionnaire data and measurement models separately. Reliability refers to the consistency, stability, and reliability of test results, and is generally expressed by internal consistency to indicate the reliability of the test. The higher the reliability coefficient, the more consistent, stable, and reliable the test results are. System error has little effect on reliability, because it always affects measurement values in the same way, so it does not cause inconsistency. On the contrary, random error may lead to inconsistency and thus reduce reliability. The level of reliability of data results testing is generally expressed by measuring the internal consistency of the data. Currently, commonly used methods for reliability analysis include test-retest reliability, parallel-forms reliability, split-half reliability, internal consistency reliability, etc. In actual empirical research, it is difficult to conduct two surveys repeatedly, so it is difficult to determine the test-retest reliability and parallel-forms reliability due to objective conditions. Most researchers use internal consistency reliability to measure the reliability of data results. In the analysis of questionnaire data reliability and validity, this study will use Cronbach's α reliability coefficient of the Cronbach coefficient

formula to measure the internal consistency of the research questionnaire. In the measurement model validation analysis, composite reliability (CR) and average variance extracted (AVE) will be used to explain and reflect the internal consistency reliability of the measurement model. Cronbach's α coefficient is often used to test the reliability of scales in reliability analysis.

Table 3-4 Table of Reliability Test

Range of Cronbach's α coefficient	Acceptability
<0.65	Unacceptable
0.65-0.7	Minimum acceptable range
0.7-0.8	Quite good
0.8-0.9	Very good

Validity refers to the degree to which a validity testing method or tool can accurately reflect the measured target. It is generally divided into content validity, construct validity, criterion validity, correlation validity, etc. In structural equation modeling analysis, validity refers to the extent to which the data results measured by the measurement model (measurement items) can reflect the degree of the latent variables to be measured, and usually requires analysis of the content validity and construct validity of the measurement model. Construct validity is generally divided into convergent validity, discriminant validity, and feature validity. In specific analysis, this study will use feature validity to analyze the construct validity of the survey questionnaire, and use convergent validity and discriminant validity to test the construct validity of the measurement model.

Findings

From the statistical data, it can be seen that the survey respondents are basically using online teaching platforms for teaching. There are 91 people who have used it for less than two years, accounting for 25.6% of the total, 168 people who have used it for three to five years, accounting for 47.3%, 80 people who have used it for five to ten years, accounting for 22.5%, and 16 people who have used it for more than ten years, accounting for 4.5%. The main platforms used include Chaoxingerya, Mosoteach, and Tencent Classroom.

Table 4-5 Statistics Table of Usage Characteristics

		Frequency	Percentage
Number of years using online teaching platform	Within two years	91	25.6
	Three to five years	168	47.3
	Five to ten years	80	22.5
	More than 10 years	16	4.5
	Total	355	100.0
Online platforms being used	MOOC China	4	1.1
	Chaoxingerya	47	13.2
	Mosoteach	237	66.8
	Tencent Classroom	40	11.3
	DingTalk	12	3.4
	Other	15	4.2
	Total	355	100.0

Descriptive Statistical Analysis of Variables

Descriptive statistical analysis of the data for each variable is required before hypopaper testing conclusions on the survey data. The following is a descriptive statistical analysis of the sample data from the 355 valid questionnaires for the eight variables of system quality, service quality, perceived usefulness, user satisfaction, expectation confirmation, favorable conditions, IT self-efficacy, continuance usage intention, and continuance usage behavior, and the results are shown in the following table.
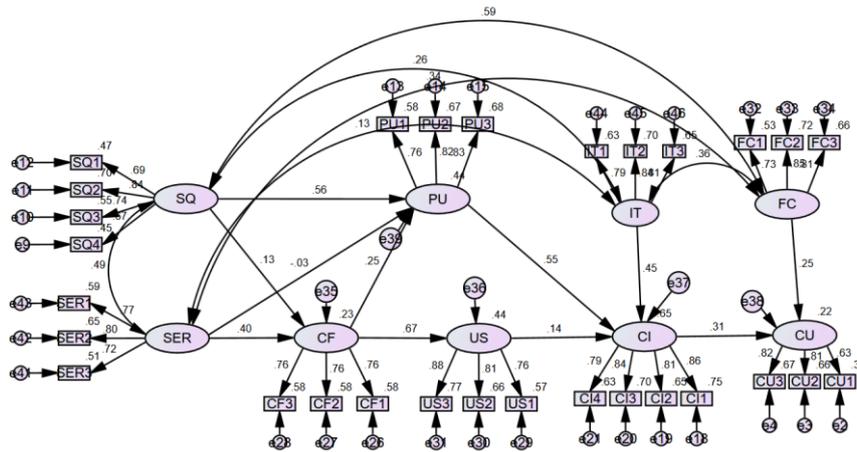
This part constructs a theoretical model of the influencing factors of college teachers' continuance usage of online teaching platforms. Based on the continuance theory model, integrating system quality and service quality of the information system success model as the antecedents of expectation confirmation and perceived usefulness, the behavioral influencing factors of college teachers' continuance usage of online teaching platforms and their relationships are explored, and the empirical results are as follows: First, favorable conditions and continuance usage intention are significantly related to continuance usage behavior, respectively, and the contribution of explaining and predicting continuance usage behavior is in order of continuance usage intention (0.311 ***) > favorable conditions (0.252 ***). The research results confirm that both the continuance intention and favorable conditions have a significant positive impact on continuance usage behavior. This finding supports the hypopaper and is consistent with previous research on the impact of favorable conditions and intentions on actual usage behavior (Venkatesh, 2003; Zhou, Lu, & Wang, 2010) In the context of college teachers using online teaching platforms, the continuance usage intention has a dominant effect on the continuance usage behavior, and favorable conditions also have a certain impact on the use of online teaching platforms by teachers. It indicates that in the population of college teachers, personal intention has a high influence on actual behavior, and whether the work environment in which college teachers work facilitates the use of online teaching platform also directly affects teachers' usage behavior. Second, perceived usefulness, favorable conditions, IT self-efficacy, and continuance usage intention are significantly correlated, and their contributions to explaining and predicting the university teachers' continuance intention of online teaching platforms are in the order of perceived usefulness (0.548 ***) > favorable conditions (0.451 ***) > user satisfaction (0.14 P=0.002). The study determines that there is a significant positive correlation between satisfaction, perceived usefulness, IT self-efficacy, and continuance usage intention in online teaching platforms. These findings are consistent with previous research on technology acceptance and sustainability (Venkatesh, Morris, Davis & Davis, 2003; Compeau & Higgins, 1995). Whether university teachers are willing to continue using online teaching platforms is mainly determined by whether the platform can meet their teaching needs. Whether online teaching platforms are useful plays a major role in teachers choosing to use them for teaching. In addition, whether the working environment where the teacher is located can provide strong support will also affect the teacher's usage intention. Satisfaction has the least impact on teachers' continuance intention among the three factors, mainly because in the current environment, online teaching has become a commonly used teaching tool for teachers. The impact of satisfaction on teachers' usage intention is also reduced due to the need for teaching tools. Third, expectation confirmation is significantly correlated with satisfaction. The contribution of explanation and prediction of satisfaction is expectation confirmation (0.666

***). Expectation confirmation, system quality, and perceived usefulness are significantly correlated, and the contributions to explaining and predicting perceived usefulness are in the order of system quality (0.558 ***) > expectation confirmation (0.246 ***), while service quality has no correlation with perceived usefulness. From this result, the study confirms the positive impact of expectation confirmation on satisfaction and perceived usefulness, which is consistent with previous research (Bhattacherjee, 2001; Davis, 1989). In addition, system quality has a significant positive impact on perceived usefulness, supporting the hypopaper and corresponding with the research of DeLone & McLean (2003) and Kim et al. (2018). However, the relationship between service quality and perceived usefulness is not significant, indicating that service quality may not directly affect the perceived usefulness in the online teaching platform environment, but the possibility of other mediating or moderating factors that may explain this relationship should be considered in future research.

Conclusion

First, the original paths of the expectation confirmation model for information systems continuance (ECM-ISC) are supported by empirical analysis results. The relationships between variables such as expectation confirmation, perceived usefulness, satisfaction, IT self-efficacy, favorable conditions, continuance usage intention, and continuance usage behavior have been verified, indicating that the psychological mechanism of "expectation-confirmation-satisfaction-intention-behavior" is applicable to explaining the continuance usage behavior of online teaching platforms by university teachers. Before using online teaching platforms, college teachers have certain expectations. After using online teaching platforms for teaching, the degree of confirmation of whether the previous expectations have been met affects the satisfaction and perceived usefulness of college teachers toward the online teaching platform. Satisfaction and perceived usefulness of college teachers toward the online teaching platform, in turn, will affect their usage intention, which will affect their continuance usage of the online teaching platform for teaching. Therefore, developers and higher education institutions should focus on addressing these factors when designing and implementing online learning platforms. (Gupta et al. 2021; Yang 2021; Ye et al. 2022; Wilson et al. 2021). Second, the system quality of online teaching platforms can affect the judgment of university teachers on the usefulness of online teaching platforms, but it does not have a significant effect on expectation confirmation. System quality mainly includes the stability, response speed, access speed, and user-friendliness of the online teaching platform information system. Online teaching platforms are a tool or means of teaching in the work of college teachers. If this tool is often unstable, unavailable, or inappropriate, the usefulness of the tool is considered problematic. It is found in this study that there is no significant correlation between system quality and expectation confirmation. In the context of this study, due to the high popularity and maturity of information systems in work and life, the expectations of university teachers for the system quality of online teaching platforms, as a type of information system, have been lowered. This indicates that the relationship between system quality and expectation confirmation is complex. In today's work and living environment, the high penetration and maturity of information systems may lead to this complexity. This highlights the need for further research on how to effectively manage and improve system quality to meet the expectations of university teachers and promote their continuance usage of online teaching platforms. (Al-Maroof & Salloum 2021; Baber 2021; Wilson et al. 2021). Third, university faculty have high expectations for the services that online teaching platforms can provide. For teachers, a new teaching tool or method requires a lot of time to adapt and learn. If the online teaching platform cannot provide relevant support services such as training, answering technical questions, and providing assistance during this process, it will reduce the confirmation of teachers' expectations for the online teaching platform. From the research results, service quality does

not affect the perceived usefulness of online teaching platforms by university teachers. University teacher users and learner users are significantly different and online platforms are a teaching tool or means for university teachers. Therefore, in this research environment, the quality of service is not significantly associated with the perceived usefulness of online teaching platforms by university teachers. Although service quality does not directly affect the usefulness of online teaching platforms for university teachers, it is still an important aspect to consider when designing and implementing these platforms. University teachers' unique needs and expectations should be considered to ensure that the services provided effectively meet their needs. Educational institutions play a key role in the successful adoption and continuance usage of online learning platforms. Institutions should cooperate with platform operators to ensure that their specific needs and requirements are met. By establishing clear channels of communication with platform operators, schools can help develop user-friendly features and functionality that are appropriate for their unique educational environment. To support teachers' continuance usage of online platforms, schools and educational institutions should invest in professional development programs and resources that focus on digital literacy and online teaching skills. These plans should be customized based on the different levels of IT self-efficacy of educators, so that they can confidently browse and utilize online teaching platforms. (Al-Maroof & Salloum 2021; Baber 2021; Bao & Huang 2022; Cao et al. 2022; Dai et al. 2020; Gu & Sun 2021; Gupta et al. 2021; Yang 2021; Ye et al. 2022; Wilson et al. 2021).

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