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

Key Factors Shaping Satisfaction and Continued Use of MOOCs Among Computer Science Majors: Insights from Sichuan, China

Yang Shanhong*

Received: August 29, 2024. Revised: September 16, 2024. Accepted: Febuary 18, 2025.

Abstract

Purpose: This study determines how satisfied undergraduate computer science students are with using Massive Open Online Course (MOOCs) for learning at a science and technology university in Sichuan, China. The study establishes a theoretical framework comprising seven variables (information quality, confirmation, system quality, perceived ease of use, satisfaction, perceived usefulness, and continuance intention). **Research Design, Data, and Methodology:** A quantitative survey approach was employed to survey 500 undergraduate computer science students who had used MOOCs in their academic study for at least one year, utilizing a questionnaire as the primary instrument. Survey data were gathered through a multi-stage strategy involving judgment and quota sampling. Confirmatory factor analysis was used to evaluate the data to confirm the measurement model's validity and ensure that each observed variable appropriately reflects its corresponding latent factor. Subsequently, additional structural equation modeling analyses are used to evaluate the measurement model's accuracy, investigate the connections between the variables in the structural model. **Results:** The findings from the study supported the research assumptions, particularly in showing that continuance intention is significantly affected by satisfaction, with perceived usefulness having the most immediate and major effect on satisfaction. **Conclusions:** The findings are critical in determining students' satisfaction and preparedness to continue with MOOCs. Consequently, educational reforms should be tailored accordingly.

Keywords: MOOCs, Continuance Intention, Satisfaction, Information Quality, Confirmation, System Quality

JEL Classification Code: E44, F31, F37, G15

1. Introduction

The rapid growth of information and communication technology in recent years has allowed the field of e-learning to reach levels never previously achievable. The surge of digitization has empowered learners to engage in the vibrant and inventive era of online learning through digital platforms (Rekha et al., 2023). MOOC, commonly known as a Massive Open Online Course, denotes an online learning format delivered to a broad audience for free or at a nominal cost. These courses typically encompass various components, including concise video lectures, reading materials, quizzes, and interactive online exercises, offering learners a versatile and varied educational experience. Thanks to their convenience and inclusiveness, MOOCs have garnered substantial attention and widespread adoption on a global scale, establishing themselves as a highly favored model for learning in contemporary times (Cheng et al., 2023). As of the end of 2021, MOOCs have significantly impacted globally, with approximately 220 million learners worldwide. Notably, 950 universities have announced or launched a staggering 194,000 MOOCs.

In 2008, Massive Open Online Courses were first launched, providing a platform for individuals worldwide to learn various courses without restrictions through the

1*Yang Shanhong, School of Computer Science and Engineering, Sichuan University of Science & Engineering, China. Email: 4232898@qq.com

Internet, thus triggering a revolution in online education (Pappano, 2012). MOOCs, this type of education through the use of network platforms so that students can participate in high-quality courses at anytime and anywhere through the Internet, breaking the time and space constraints of traditional education, providing learners with more flexible and convenient learning opportunities (Weinhardt & Sitzmann, 2019). MOOCs could be characterized as an all-encompassing system that seamlessly combines the power of social networks, expert knowledge, and a wealth of freely accessible online resources. This innovative approach to education has transformed the traditional learning landscape, providing learners with an unparalleled opportunity to engage with a diverse community, tap into expert insights, and access a vast array of educational materials (Guerrero-Quiñonez et al., 2023b). Furthermore, MOOCs adopted diversified teaching methods designed to respond flexibly to learners' various needs and preferences. This flexibility ensures the learning experience is personalized and efficient, allowing each learner to be catered for at their own pace and subject interests (Ram et al., 2023). Compared to traditional education models, MOOCs possess a series of unique features, including their openness, sharing, high academic quality, unique accessibility, flexibility, and diverse course options, making them an advanced education model that fulfills the various demands of students (Guerrero-Quiñonez et al., 2023a).MOOCs have emerged as a viable alternative to conventional in-person courses, offering satisfactory assistance and engagement with the instructor within specified timeframes s (Papadakis, 2023).

As of the last month of 2022, with over 61,900 online catechism courses, 402 million users who have registered, 979 million students in order, and 350 million school pupils receiving credits, China's People's Republic holds the record for having the most learners and catechism courses worldwide (People's Daily, 2023)). MOOCs represent a novel concept in the realm of remote learning. This is a universal education concept (ALDABBAGH). However, there are certain persistent issues with MOOCs that require attention. Previous research has consistently arrived at a similar consensus, indicating that fewer than 10% of enrolled MOOC participants ultimately achieve course completion and obtain certification (Li & Baker, 2018; Reparaz et al., 2020; Wei et al., 2021). There have been no indications of an improvement in the extremely low percentage of graduates over time (Sun et al., 2020). Because the educational benefits depend on the degree of program completion, the learner's commitment to persevere determines the MOOCs' viability and sustainability. To fully comprehend MOOCs' eventual success, studying the variables affecting learners' intentions to continue and convert short-term usage into continued use over time is vital (Chao, 2019; Nikou & Economides, 2017).

Thus,this study's primary objective is to thoroughly examine the elements affecting Sichuan University of Science and Technology computer science students' satisfaction with MOOCs as a learning tool and the determinants affecting their intention to sustain the use of MOOCs for learning. To understand these factors more deeply, the research team developed a tailored questionnaire, integrating insights from prior research and encompassing five potential variables associated with satisfaction and intention to continue usage.

2. Literature Review

2.1 Perceived Usefulness

According to Davis (1989), "perceived usefulness" refers to the degree to which one thinks utilizing a particular system will improve work output. This concept holds significant influence and is pivotal in investigating the intentions of users to utilize information technology. As indicated by Wu and Chen (2017), perceived usefulness is a subjective evaluation of a user regarding how a specific system can enhance their performance in their work. It unveils the individual's perception of the system's value, rooted in their assessment of its potential to impact their work outcomes positively. The consistent findings across multiple studies underscore the crucial role of perceived usefulness in shaping user satisfaction. In the realm of e-learning, when users perceive the usefulness of an e-learning system, they commonly express high satisfaction levels with the system (Cheng, 2019; Lee, 2010). In the context of MOOCs, Cheng (2021) conducted a study focusing on the effect of interface design aesthetics and gamification on students' perceptions and willingness to stick with the MOOC. The study found that perceived usefulness influences user attitudes and total satisfaction. Cheng (2022) further investigated factors influencing an individual's inclination to keep using a MOOC, particularly highlighting how positive perceptions contribute to overall satisfaction. Building upon insights from existing literature and previous studies, the researcher formulated subsequent hypotheses:

H1: Perceived usefulness has a significant impact on satisfaction.

2.2 Perceived Ease of Use

According to Davis (1989), PEU refers to a person's assessment of the amount of work required to use a certain system. In brief, it encompasses the perception of accessibility, clarity of interaction with the system, ease of use, and flexibility (Sabah, 2020). This concept is a pivotal metric for assessing the cognitive abilities necessary to

comprehend and operate information systems. It reflects the user's engagement with a particular system and incorporates factors such as cognitive load, ease of mental processes, and the cognitive effort needed to accomplish a task (Gefen, 2003). According to Sun (2017), research on learning platforms for higher education, platform usability, and satisfaction were positively connected. This study successfully demonstrates how student satisfaction is greatly impacted by perceived ease of use, indicating that students who perceive the platform as user-friendly generally report higher satisfaction levels. Tang et al. (2023) reported that they utilized TAM to explore lifelong learning intentions in an online learning environment. Through empirical research, they demonstrated how perceived usefulness can greatly affect individuals' satisfaction. This study reinforces the notion that when learners perceive an online learning environment as user-friendly, their general satisfaction in the learning process will be increased. In the study conducted by Singh and Sharma (2021), TAM was employed to investigate the motivation of Indian students using a MOOC during a pandemic. According to the study's findings, perceptions of usability played a significant role in predicting satisfaction. Perceived ease of use has a favorable and significant impact on predicting student satisfaction with K-MOOCs and other MOOCs, as various research has proven (Dai et al., 2020; Joo et al., 2018). Leveraging insights from available literature and prior research, the researcher incorporated the subsequent hypothesis as a pivotal element within the framework:

H2: Perceived ease of use has a significant impact on satisfaction.

2.3 Information Quality

Information quality encompasses various dimensions, including accuracy, comprehensiveness, timeliness, and accessibility of information. These attributes collectively contribute to the efficiency and effectiveness of an information system, ensuring its alignment with user needs (DeLone & McLean, 2003). Ma et al. (2023) delineates the features of information quality, emphasizing the accuracy and applicability of the data presented. This includes the pertinence of content, meaningful assessment methods, and providing high-quality course materials and video resources. Their definitions underscore the significance of furnishing pertinent and high-quality information, ultimately enhancing the learning experience in MOOCs. According to research by Ohliati and Abbas (2019), the factors that influence student satisfaction with learning management systems were examined. According to their findings, student satisfaction was significantly impacted by the quality of the information provided, with higher satisfaction levels seen when the system offered fast, accurate, comprehensive, relevant, and consistent information. Moreover, within the realm of MOOCs, Aparicio et al.'s (2019) research aimed at identifying key factors influencing MOOC success firmly confirmed the high association between information quality and user satisfaction. Based on the previously mentioned research, the following third hypotheses are put forward in this paper:

H3: Information quality has a significant impact on satisfaction.

2.4 System Quality

SQ, which builds on this framework DeLone and McLean (2003) established, is concerned with the functionality built into the information system itself. This encompasses the system's functions' ease, accuracy, flexibility, efficiency, responsiveness, and reliability. System quality is recognized as a crucial and determinate factor influencing user satisfaction. Yang and Lee (2021) define system quality as reliability, stability, functionality, usefulness, compatibility, demonstrability, and complexity. Critical factors impacting the system quality of MOOC platforms encompass robust technical performance, user-friendliness, accessibility, and usability. Subsequently, a multitude of studies have consistently validated these concepts and findings. For instance, Almarashdeh (2016) explored factors influencing faculty satisfaction with Learning Management Systems (LMS), revealing that system quality emerged as a key predictor of satisfaction, underscoring its significance. In their comprehensive investigation, Yakubu and Dasuki (2018) delved into the success factors affecting Nigerian university students who utilized the Canvas e-learning platform. They state that user satisfaction is heavily impacted by the system's quality, providing a thorough exploration of this correlation. This study underscores the significant role played by system quality in shaping and conditioning user satisfaction. Aparicio et al. (2019) utilized ISSM in a study investigating MOOCs' critical success factors. The results robustly confirmed the strong association between information quality and user satisfaction. Leveraging insights from existing literature and prior research, the researcher introduced subsequent hypotheses:

H4: System quality has a significant impact on satisfaction.

2.5 Confirmation

Bhattacherjee (2001) defines confirmation as the degree of consistency users perceive between their expectations and the actual performance when using an information system or technology. Confirmation indicates the assessment by users of whether a product, service, or technical artifact lives up to their initial expectations (Alraimi et al., 2015). Regarding the

application of information systems, user expectation confirmation is a crucial measure for evaluating user satisfaction. Optimistic outlook User satisfaction and confirmation have a positive correlation, indicating that when users' actual experiences meet or surpass their expectations, they are more likely to feel satisfied (Halilovic & Cicic, 2013). The ECM model underscores the close connection between satisfaction and user expectations (Bhattacherjee, 2001). Specifically, in the e-learning environment, users tend to have higher satisfaction with the system when their initial expectations align with or even exceed the system's actual performance (Cheng, 2020). The ECM approach has attracted much interest in MOOC research lately. When it comes to the MOOC environment, confirmation of learner expectations implies that they have achieved the anticipated benefits through participating in the MOOC. Learners express higher satisfaction when their experiences align with or surpass their initial expectations (Alraimi et al., 2015). Notably, Cheng (2022) investigated the factors influencing MOOCs' sustained intention, finding that confirmation significantly impacts satisfaction. Drawing inspiration from existing literature and previous research, the researcher introduces subsequent hypotheses as key components:

H5: Confirmation has a significant impact on satisfaction.

2.6 Satisfaction

Satisfaction is the overall user experience when utilizing an information system or technology (Bhattacherjee, 2001). An important focus in the ECM study was the importance of satisfaction with usage to their intentions to continue using the information system. According to Cheng (2021), it was conducted within the framework of online learning systems, underscoring that satisfaction is a crucial predictor of users' willingness to continue learning. Users who regard a system as satisfactory are more likely to articulate their intention to continue using it. This underscores a robust connection between user satisfaction and the intention to continue using the system, emphasizing how positive experiences foster continued use in subsequent instances. Through their study, the validity and accuracy of the conclusion that learner satisfaction has a major impact on learners' propensity to persist in online learning were confirmed by Yu and Cai (2022). This confirms the fundamental role of user satisfaction in motivating learners to persevere within the field of online education. Within the MOOC domains, the satisfaction derived by learners significantly influences their inclination to persist in these educational endeavors. This underscores the notion that when learners are content with their MOOC experiences, they are more prone to expressing an intent to persist in their participation (Chen et al., 2018; Joo et al., 2018). Cheng (2022) developed a novel paradigm to investigate the factors influencing learners' intentions to continue participating in a MOOC, building on the ECM. The study's conclusions unequivocally demonstrated a strong positive association between learners' willingness to continue participating in the MOOC and their level of satisfaction. This suggests that an enhancement in satisfaction is associated with an increased inclination to continue participating in the MOOC. Taking cues from established literature and prior research, the researcher integrated the following hypotheses as crucial components within their conceptual framework:

H6: Satisfaction has a significant impact on continuance intention.

2.7 Continuance Intention

The ECM, introduced by Bhattacherjee (2001), underscores the significance of information system users' continuity intentions as a superior metric for assessing system success. Continuity intention pertains to the conduct of users who persist in using a service or system beyond its initial adoption. It can also be construed as a user's belief in the willingness to continue using an innovation (Venkatesh et al., 2003). In e-learning, persistence intention denotes users' willingness to adhere to their selected online education platform because it effectively satisfies their online learning needs (Chen et al., 2022). This mirrors the subjective probability that learners will continue to engage in e-learning, as emphasized by Chiu et al. (2007). Numerous studies have demonstrated the critical role of continuation intentions in sustaining long-term information systems (IS) use (Franque et al., 2021). Cheng (2022) highlights users' inclination to remain with e-learning systems due to their perceived increased learning efficiency. Chen et al. (2022) provided insights into how the level of continuation intentions reflects users' perceptions of the frequency of their future use of the online education platform, a critical factor for cultivating user loyalty and platform retention. The strength of the learners' intention to keep using a technology significantly influences their decision to persist in its usage (Yu & Cai, 2022).

3. Research Methods and Materials

3.1 Research Framework

This study developed a conceptual framework through a thorough synthesis of theories and frameworks from previous research. A conceptual framework serves as a theoretical model developed by the researcher, building upon existing research theories and models to elucidate the variables under investigation and their causal relationships

(Ahmed, 2016). Three pivotal theoretical models were integrated into this study: the ISSM, the ECT, and the TAM. In crafting the conceptual framework, the researcher considered the findings of Aparicio et al. (2019), highlighting the interrelation between system quality, satisfaction, and information quality. Joo et al. (2018) validated the relationships among satisfaction, perceived usefulness, perceived ease of use, and continuance intention.

Additionally, a correlation between satisfaction, confirmation, and continuance intention was shown by Alraimi et al. (2015). The conceptual framework is firmly grounded in the theoretical constructs, establishing connections between MOOC researchers, MOOC practitioners, and MOOC programs. This comprehensive approach thoroughly explains the reasons and motivations driving university students continued learning through using MOOCs. This contributes to ensuring the study's credibility and reinforces its empirical nature and methodological rigor. Figure 1 presents the conceptual structures of the research topic.

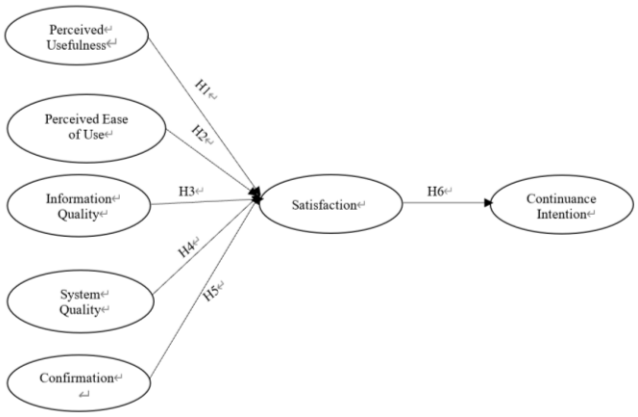

Figure 1: Research Conceptual Framework

H1: Perceived usefulness has a significant impact on satisfaction.
H2: Perceived ease of use has a significant impact on satisfaction.
H3: Information quality has a significant impact on satisfaction.
H4: System quality has a significant impact on satisfaction.
H5: Confirmation has a significant impact on satisfaction.
H6: Satisfaction has a significant impact on continuance intention.

3.2 Research Methodology

The investigator systematically conducted a questionnaire survey among computer science students at Sichuan University of Science and Technology using quantitative research methods. The structured instrument questionnaire was meticulously crafted to elicit insights into respondents' opinions, attitudes, behaviors, and background details through a set of questions (Dillman et al., 2014). A detailed examination of the information received will be used to pinpoint the crucial factors influencing the behavioral intentions of computer science undergraduates regarding the utilization of MOOCs for ongoing learning. The questionnaire was structured into three segments. Initially, meticulous screening of questions was implemented to ensure alignment between the study's target population and the study's scope and objectives, thereby bolstering data accuracy and reliability (Groves et al., 2011).

After that, the researcher developed a series of demographic questions intended to collect fundamental information about the college students, encompassing aspects such as gender, academic year, specific course areas studied through MOOCs, frequency of weekly participation in MOOC classes, and the devices employed for MOOCs engagement. A five-point Likert scale was applied to gauge responses. Likert scales, widely utilized in social science research, provide a quantitative measure of the degree to which respondents concur or dissent with specific ideas or statements. These scales give respondents a spectrum to explicitly articulate their attitudes toward a given issue based on personal perspectives (DeVellis & Thorpe, 2021). Each response on the Likert scale is assigned a numerical score, 1 denoting strong disagreement and 5 denoting strong agreement, revealing how the participant feels about the topic.

To evaluate the Index of Objective Coherence (IOC) for the items, three experts with doctoral degrees and computer expertise were enlisted in the research project. This index entails the empirical review of scales by the evaluation team and experts to gauge the content validity level of the research instrument (Lodico & Voegtle, 2006). According to Pongpaew (2009), a score of 0.67 or higher was deemed acceptable, as provided by the experts. A pilot test with fifty students was then carried out. Through this pilot test, researchers assessed the clarity and comprehensibility of survey questions, confirmed that the data collection process was feasible, verified the general validity of the study design, and assessed the applicability of the research protocol. This thorough evaluation ensured a seamless research process, guaranteed accurate data collection, and successfully achieved the research objectives (DeVellis & Thorpe, 2021). Cronbach's alpha scores were used to assess the internal consistency and reliability of the questionnaire. Reliability is assessed using Cronbach's alpha coefficient; a coefficient of 0.7 or greater is regarded as excellent (Nunnally, 1975). The outcomes revealed that all items passed with scores of 0.85 or above.

Concerning the sampling methodology, this study implemented a blended approach, incorporating probability

sampling in the first stage and non-probability sampling techniques in the second stage. In the initial phase, the judgmental sampling method, falling under the non-probability sampling category, was employed to meticulously select 2,030 college students from the three core majors within the School of Computer Science and Engineering at Sichuan University of Science and Technology as the focal participants. Following this, the researchers applied the probability sampling technique of stratified sampling to disseminate 500 electronic questionnaires through Questionstar among respondents from these three core majors, encompassing students from first-year students to seniors. Statistical evaluation of the study results was performed using Jamovi 2.3.28 and AMOS 26 methods. Additionally, the researchers employed a compilation of characteristics to evaluate the measurement device's convergence reliability, encompassing characteristics like composite reliability, average variance extracted, factor loading, and discriminant validity. These criteria were utilized to gauge the inter-item correlation within the measurement tool, ensuring a consistent and reliable measurement of the same construct.

3.3 Population and Sample Size

Sekaran and Bougie (2016) defined the target audience as a specific group of individuals under study by researchers aiming to derive meaningful conclusions from interventions and generalize findings to this particular group. This study focused on undergraduate students majoring in computer science and technology, software engineering, and network engineering at Sichuan University of Science and Technology. Hair et al. (2010) noted that the minimum sample size recommended for SEM, a method known for its complexity, ranges between 200 and 500 respondents. Given the framework of this study, which incorporates seven latent variables and 30 observed variables, a minimum of 425 respondents was deemed necessary based on calculations from a specialized statistical tool. Consequently, the researcher finalized a sample of 500 students from an initial pool of 2030 through rigorous screening, filtering, and quota allocation to uphold the data's validity.

3.4 Sampling Technique

The study employed a multi-stage sampling approach divided into two phases. Initially, researchers utilized a judgmental sampling technique to screen 2,030 students from three majors at Sichuan University of Science & Technology, all of whom had at least one year of experience with MOOCs. Following this, 500 respondents were selected from these three majors using a quota selection method to constitute the final sample.

Table 1: Sample Units and Sample Size

Target majors for the computer science program at Sichuan University of Science and Technology	Grade	Population Size Total	Proportional Sample Size Total
Computer Science and Technology Program	Freshman	160	39
	Sophomore	211	52
	Junior	220	54
	Senior	209	52
Software Engineering Program	Freshman	151	37
	Sophomore	227	56
	Junior	210	52
	Senior	195	48
Network Engineering Program	Freshman	70	17
	Sophomore	120	30
	Junior	125	31
	Senior	132	32
Total		**2030**	**500**

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

Table 2 shows the combined demographics of the respondents, with 500 respondents. Male respondents constituted 63.20% of the total, and female respondents constituted 36.80%. According to the listing of majors, the average number of students focusing on computer science and technology reached 39.41%, 38.57% in Software Engineering, and 22.02% in Network Engineering. Regarding grade classification, 18.60% of the respondents were first-year students, and 27.60% were sophomores. There were 26.40% seniors and 27.40% juniors.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	316	63.20%
	Female	184	36.80%
Major Direction	Computer Science an	197	39.41%
	Software Engineering	193	38.57%
	Network Engineering	110	22.02%
Grade	Freshman	93	18.60%
	Sophomore	138	27.60%
	Junior	137	27.40%
	Senior	132	26.40%

4.2 Confirmatory Factor Analysis (CFA)

CFA is a complex statistical analysis that can be employed to evaluate and confirm the applicability of measurement models to the relationships between observed variables and underlying factors (Brown, 2015). Its central goal is to

validate a theoretical model pre-constructed by the researcher to determine its consistency with the actual observed data (Kline, 2016).

The CA coefficients for the five latent variables are displayed in Table 3, with two exceeding 0.90 and all five over 0.80 (Hair et al., 2010). In addition, CR was higher than 0.70, the factor loadings were all over 0.50 overall, and the AVE was above 0.50 (Bagozzi & Yi, 1988).

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

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived Usefulness (PU)	Joo et al. (2018)	6	0.918	0.790-0.819	0.918	0.651
Perceived Ease of Use (PEOU)	Joo et al. (2018)	6	0.922	0.794-0.842	0.922	0.664
Information Quality (IQ)	Aparicio et al. (2019)	4	0.894	0.790-0.849	0.894	0.679
System Quality (SQ)	Aparicio et al. (2019)	4	0.886	0.789-0.853	0.887	0.662
Confirmation (CF)	Alraimi et al. (2015)	3	0.844	0.773-0.822	0.844	0.644
Satisfaction (SA)	Aparicio et al. (2019)	4	0.867	0.771-0.803	0.867	0.620
Continuance Intention (CI)	Joo et al. (2018)	3	0.840	0.792-0.805	0.840	0.636

Table 4 for absolute fit metrics such as the GFI, CMIN/DF, RMSEA, and AGFI and incremental fit indices such as NFI, CFI, and the TLI metric values, each maneuver met the applicable requirements. Therefore, all these fit measures showed satisfactory results in this study's CFA test and can be fully accepted.

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	<3.00 (Hair et al., 2010)	1.127
GFI	>0.85 (Bagozzi & Yi, 1988)	0.946
AGFI	>0.80 (Bagozzi & Yi, 1988)	0.934
CFI	>0.90 (Bentler, 1990)	0.995
NFI	>0.90 (Browne & Cudeck, 1992)	0.954
TLI	>0.90 (Bentler & Bonett, 1980)	0.994
RMSEA	<0.08 (Pedroso et al., 2016)	0.016
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, CFI = comparative fit index, NFI = normalized fit index, TLI = Tucker Lewis index, and RMSEA = root mean square error of approximation

In Table 5, the values on the diagonal represent the square root of the AVE for each variable, reflecting the results of differential validity. Every coefficient that joins any two latent variables is less than 0.80 (Afthanorhan, 2013; Kline, 2016). Thus, these quantitative measures confirm the effectiveness of discrimination.

Table 5: Discriminant Validity

	PU	PEU	IQ	SQ	CF	SA	CI
PU	**0.807**						
PEU	0.297	**0.815**					
IQ	0.336	0.301	**0.824**				
SQ	0.236	0.325	0.319	**0.814**			
CF	0.222	0.293	0.294	0.210	**0.802**		
SA	0.390	0.361	0.392	0.355	0.302	**0.787**	
CI	0.320	0.393	0.285	0.327	0.319	0.424	**0.797**

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

4.3 Structural Equation Model (SEM)

SEM is a statistical calculation and evaluation tool for intricate networks of interactions. Because it combines elements of regression and component analysis, it is ideally suited for examining the direct and indirect effects of several variables on one another. This allows researchers to investigate possible correlations and causality between variables (Ainur et al., 2017; Kline, 2016). As shown in Table 6, after adjustments in AMOS, the aggregated GFI, AGFI, CMIN/DF, NFI, TLI, RMSEA, and CFI values are higher than the acceptable acceptance threshold. As a result, the SEM model fit was deemed adequate.

Table 6: Goodness of Fit for Structural Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	<3.00 (Hair et al., 2010)	1.975
GFI	>0.85 (Bagozzi & Yi, 1988)	0.891
AGFI	>0.80 (Bagozzi & Yi, 1988)	0.874
CFI	>0.90 (Bentler, 1990)	0.916
NFI	>0.90 (Browne & Cudeck, 1992)	0.956
TLI	>0.90 (Bentler & Bonett, 1980)	0.952
RMSEA	<0.08 (Pedroso et al., 2016)	0.044
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, CFI = comparative fit index, NFI = normalized fit index, TLI = Tucker Lewis index, and RMSEA = root mean square error of approximation

4.4 Research Hypothesis Testing Result

Table 7 results indicate that perceived usefulness has the greatest effect on satisfaction, as indicated by a standardized path coefficient (β) of 0.278 (t-value of 5.806***).

Following this, information quality demonstrates the next strongest influence on satisfaction, with a β of 0.234 (t-value of 4.922***). System quality also plays a notable role in affecting satisfaction, represented by a β of 0.228 (t-value of 4.774 ****). Perceived ease of use shows a coefficient of 0.202 (t-value of 4.331 ****), while confirmation exerts the least impact on satisfaction, registering a β of 0.166 (t-value of 3.420 ****). Furthermore, the study's results show that satisfaction significantly impacts learners' intention to continue using MOOCs, with a β coefficient of 0.493 (t-value of 8.951 ****).

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-value	Result
H1: PU→SA	0.278	5.806 ***	supported
H2: PEU→SA	0.202	4.331 ***	supported
H3: IQ→SA	0.234	4.922 ***	supported
H4: SQ→SA	0.228	4.774 ***	supported
H5: CF→SA	0.166	3.420 ***	supported
H6: SA→CI	0.493	8.951 ***	supported

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

The researchers' recommendations for growth are outlined below. They were based on the data analysis conclusions presented in Table 7. These suggestions aim to investigate possible new areas, optimize associated models, and enhance comprehension of the research issue.

H1, it has been identified that perceived usefulness is a key factor influencing learners' satisfaction. It has a value of 0.278 for β. In addition, Cheng (2021) highlighted the critical role of perceived usefulness in the influence of the satisfaction of users. A deeper understanding of the importance of perceived usefulness provides valuable insights into user preferences and their tendency to remain loyal to a product, service, or technology. According to Yang and Su (2017), users usually continue to interact with entities they perceive as beneficial. As a result, users who perceive MOOCs as valuable are inclined to show greater satisfaction than the other groups (Singh & Sharma, 2021).

The statistical results for H2 confirm the hypothesis that perceived ease of use significantly impacts satisfaction. Specifically, the standardized coefficient is 0.202, indicating a positive relationship between perceived ease of use and satisfaction. This finding suggests that higher perceived ease of use leads to a significant increase in user satisfaction. In the context of online learning environments, the empirical studies conducted by Tang et al. (2023) provided support by showing that when learners perceive online learning environments as user-friendly, they feel increasingly satisfied with the learning experience increases significantly. Users are more likely to feel satisfied and delighted when they find a MOOC that is easy to use, and this good feeling raises their level of satisfaction with the platform as a whole (Dai et al., 2020). Therefore, when learners perceive the MOOCs environment as user-friendly, their contentment with the learning experience increases.

Based on the analysis findings from H3, one of the primary determinants of satisfaction is information quality, indicated by a standardized coefficient of 0.234. Ohliati and Abbas (2019) demonstrate the notable influence of information quality on student satisfaction. Similarly, research conducted by Aparicio et al. (2019) identifies information quality as pivotal for MOOC success. Hence, when MOOC systems deliver accurate, timely, comprehensive, relevant, and consistent information, student satisfaction tends to be higher.

Aside from that, the study's H4 results support the importance of system quality in satisfaction. In particular, there is a positive correlation between system quality and user satisfaction, as evidenced by the β of system quality of 0.228. Urbach et al. (2010) conducted research affirming the central role that system quality plays in user satisfaction. Aparicio et al. (2019) investigated key success factors in MOOCs, robustly validating the close relationship between system quality and learner satisfaction; thus, when students engage with MOOCs for learning, higher levels of satisfaction result from responsive, dependable, and user-friendly systems.

Additionally, based on the findings from H5 in this study, although confirmation significantly influences satisfaction, its impact is relatively modest, with a standard coefficient of 0.166. Cheng (2020) highlights that user expectations are crucial for assessing satisfaction in an e-learning setting. The study by Cheng (2022) attested to the substantial influence of validation on satisfaction in regard to MOOCs. Therefore, in the MOOC learning environment, students' expectations of validation indicate that they achieve their anticipated benefits through MOOC participation. When their actual experiences align with or surpass their initial expectations, their satisfaction with the system tends to be higher.

In the end, the study's H6 hypotheses had the greatest value—a β of 0.493—which suggests that the effect of satisfaction on one's willingness to continue practicing is highly significant. The findings of the research conducted by Cheng (2022) showed a notable positive correlation between satisfaction and the propensity to sustain engagement in MOOCs. Therefore, within the MOOC context, the satisfaction learners derive from their experiences significantly shapes their inclination to persist in participating in these courses. Higher satisfaction with the MOOC experience increases the likelihood that learners will desire to continue their engagement (Chen et al., 2018).

5. Conclusion and Recommendation

5.1 Conclusion

This study attempts to discover the key variables that affect undergraduate computer science students' satisfaction and sustained participation in MOOCs in the Sichuan region. According to the conceptual framework in this study, six hypotheses are proposed to examine how perceived usefulness, perceived ease of use, information quality, system quality, confirmation, satisfaction, and willingness to continue interacting with each other. To assess these relationships, the researcher surveyed 500 undergraduate students majoring in computer science; each student has at least one year of MOOC experience. They are invited to complete an electronic survey. The researchers thoroughly validated the measurement model using a validated factor analysis (CFA). This procedure ensured data validity and model accuracy by assisting in the identification and correction of any issues with the measurement model, such as improper factor loadings or error terms. Second, structural equation modeling, or SEM, examines the intricate links between latent and observable variables.SEM gives empirical support for theoretical hypotheses, examines the relationships between variables, and enables a thorough evaluation of model fit.

The survey findings reveal that student satisfaction with MOOCs significantly influences their intention to continue to use them, indicating that satisfaction is a crucial factor in students' decisions to continue with MOOC-based learning. Furthermore, the satisfaction level of learners is notably affected by the following factors: perceived usefulness, information quality, system quality, perceived ease of use, and confirmation. Specifically, perceived usefulness exerts the strongest influence on satisfaction; information quality comes later, with confirmation having a relatively minor impact on satisfaction.

5.2 Recommendation

The study extensively examined the fundamental factors influencing the satisfaction of computer science students with MOOC learning and the intention of these students to continue using MOOCs in Sichuan. Drawing from quantitative survey data, the researchers propose careful consideration of the interrelationships among perceived usefulness, perceived ease of use, information quality, system quality, confirmation, satisfaction, and continuous intention. To devise more rational and advanced educational strategies aimed at boosting computer science majors' sustained engagement with MOOCs, this paper outlines the following recommendations:

Firstly, college students' satisfaction with Massive Open Online Courses (MOOCs) fundamentally influences their decision to continue using them. When students feel contented with the system, they are generally more likely to voice their intention to persist with its use. This study identified five underlying variables affecting student satisfaction, with perceived usefulness being the most significant. Therefore, MOOCs platforms should ensure that their computer science courses provide practical value, including industry applications, and stay current with the latest technological trends. Furthermore, curriculum design should prioritize vocational skills in computer science to enable students to effectively navigate work environments and enhance their competitiveness in the job market, thereby boosting perceived usefulness. These actions ensure that students' actual needs are met, ultimately enhancing their satisfaction and motivating them to actively and consistently use the learning platform.

The survey also underlined how important information quality is in determining university students' satisfaction with MOOC platforms. Ensuring the material on a MOOC platform is accurate, clear, and thorough is essential. Information of the highest caliber can effectively meet students' learning needs and improve their educational experience, fostering a deeper understanding and mastery of computer science knowledge among students. Educators are vital in delivering high-quality instructional content to facilitate effective teaching. High-quality information enables educators to guide students toward core concepts in computer science courses more effectively. Clear explanations and illustrative examples enhance comprehension of intricate topics, improving learning efficiency and depth. Given the rapid evolution of computer science, staying abreast of current industry trends and technological advancements is imperative as they directly impact student satisfaction and learning outcomes.

Additionally, further investigation reveals that system quality also determines in a significant way college students' contentment with MOOCs. To maintain high system stability, MOOC platforms must prevent disruptions that could interfere with students' learning experiences. Providing a dependable and consistent learning environment builds trust among students and enhances overall satisfaction. Timely technical support is crucial for promptly resolving students' technical issues, ensuring smooth platform navigation, and improving system quality. Emphasizing system stability and responsive technical assistance helps instill confidence in students, enhances satisfaction levels, and contributes positively to the learning journey.

Ultimately, this study shows that perceived ease of use significantly influences university faculty satisfaction with MOOC platforms. Thus, MOOC platforms must prioritize the design of a user-friendly interface that is intuitive, straightforward, and easy to navigate. Clear and transparent navigation paths alleviate challenges in course learning and ultimately enhance perceived ease of use. Optimizing the platform for various devices, such as computers, tablets, and mobile phones, is recommended to improve adaptability and ensure seamless usage across different scenarios. By enhancing user experience and usability, MOOC platforms can effectively cater to students' needs, encourage active engagement in learning, and ultimately boost overall satisfaction.

5.3 Limitation and Further Study

The study focuses on undergraduate students majoring in computer science at a university in Sichuan, China. Its conceptual framework employs quantitative research methods and incorporates seven potential variables. Future research could expand in several directions: Firstly, by broadening the scope to include other regions of China or Asian countries； Secondly, by considering the integration of additional theories of technology acceptance, for instance, TPB, TAM, TRA, etc., to help developing the research framework； Furthermore, future studies might explore the integration of qualitative research methods, for example, focus groups, interviews, and observations, or to adopt a blended approach combining both qualitative and quantitative research to achieve more robust and comprehensive findings. These combined approaches aim to promote an understanding of college students' satisfaction and intentions to persist with MOOCs.

References

Afthanorhan, W. (2013). A comparison of partial least square structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM) for confirmatory factor analysis. *International Journal of Engineering Science and Innovative Technology*, *2*(5), 198-205.

Ahmed, S. (2016). Media Review: Mixed Methods Research: A Guide to the Field. *Journal of Mixed Methods Research*, *11*(3), 415-416. https://doi.org/10.1177/1558689816666438

Ainur, A., Sayang, M., Jannoo, Z., & Yap, B. (2017). Sample Size and Non-Normality Effects on Goodness of Fit Measures in Structural Equation Models. *Pertanika Journal of Science & Technology*, *25*(2), 10-20.

Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course. *Computers in Human Behavior*, *63*, 249-255. https://doi.org/10.1016/j.chb.2016.05.013

Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education*, *80*, 28-38. https://doi.org/10.1016/j.compedu.2014.08.006

Aparicio, M., Oliveira, T., Bacao, F., & Painho, M. (2019). Gamification: A key determinant of massive open online course (MOOC) success. *Information & Management*, *56*(1), 39-54. https://doi.org/10.1016/j.im.2018.06.003

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the academy of marketing science*, *16*(1), 74-94. https://doi.org/10.1007/bf02723327

Bentler, P. M. (1990). *Comparative fit indexes in structural models*. *Psychological Bulletin, 107*(2), 238-246. https://doi.org/10.1037/0033-2909.107.2.238

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS quarterly, 25*(3), 351-370. https://doi.org/10.2307/3250921

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (1st ed.). Guilford publications.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research, 21*(2), 230-258. https://doi.org/10.1177/0049124192021002005

Chao, C.-M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in Psychology*, *10*, 1652. https://doi.org/10.3389/fpsyg.2019.01652

Chen, C.-C., Lee, C.-H., & Hsiao, K.-L. (2018). Comparing the determinants of non-MOOC and MOOC continuance intention in Taiwan. *Library Hi Tech*, *36*(4), 705-719. https://doi.org/10.1108/lht-11-2016-0129

Chen, G., Shuo, C., Chen, P., & Zhang, Y. (2022). An Empirical Study on the Factors Influencing Users' Continuance Intention of Using Online Learning Platforms for Secondary School Students by Big Data Analytics. *Mobile Information Systems*, *2022*, 1-13. https://doi.org/10.1155/2022/9508668

Cheng, J., Yuen, A. H., & Chiu, D. K. (2023). Systematic review of MOOC research in mainland China. *Library Hi Tech*, *41*(5), 1476-1497. https://doi.org/10.1108/lht-02-2022-0099

Cheng, Y.-M. (2019). How does task-technology fit influence cloud-based e-learning continuance and impact? *Education+ training*, *61*(4), 480-499. https://doi.org/10.1108/et-09-2018-0203

Cheng, Y.-M. (2020). Students' satisfaction and continuance intention of the cloud-based e-learning system: roles of interactivity and course quality factors. *Education+ training*, *62*(9), 1037-1059. https://doi.org/10.1108/et-10-2019-0245

Cheng, Y.-M. (2021). Can gamification and interface design aesthetics lead to MOOCs' success?. *Education+ training*, *63*(9), 1346-1375. https://doi.org/10.1108/et-09-2020-0278

Cheng, Y.-M. (2022). Which quality determinants cause MOOCs continuance intention? A hybrid extending the expectation-confirmation model with learning engagement and information systems success. *Library Hi Tech, 41*(6), 1748-1780. https://doi.org/10.1108/lht-11-2021-0391

Chiu, C. M., Chiu, C. S., & Chang, H. C. (2007). Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention. *Information systems journal*, *17*(3), 271-287.

Dai, H. M., Teo, T., Rappa, N. A., & Huang, F. (2020). Explaining Chinese university students' continuance learning intention in the MOOC setting: A modified expectation confirmation model perspective. *Computers & Education*, *150*, 103850. https://doi.org/10.1016/j.compedu.2020.103850

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), 9-30.

DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications* (1st ed.). Sage publications.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (1st ed.). John Wiley & Sons.

Franque, F. B., Oliveira, T., Tam, C., & Santini, F. d. O. (2021). A meta-analysis of the quantitative studies in continuance intention to use an information system. *Internet Research*, *31*(1), 123-158. https://doi.org/10.1108/intr-03-2019-0103

Gefen, D. (2003). TAM or just plain habit: A look at experienced online shoppers. *Journal of Organizational and End User Computing (JOEUC)*, *15*(3), 1-13. https://doi.org/10.4018/joeuc.2003070101

Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2011). *Survey methodology*. John Wiley & Sons.

Guerrero-Quiñonez, A. J., Bedoya-Flores, M. C., Mosquera-Quiñonez, E. F., Ango-Ramos, E. D., & Lara-Tambaco, R. M. (2023a). The MOOC as an alternative model for university education. *Ibero-American Journal of Education & Society Research*, *3*(1), 280-286.

Guerrero-Quiñonez, A. J., Bedoya-Flores, M. C., Mosquera-Quiñonez, E. F., Ango-Ramos, E. D., & Lara-Tambaco, R. M. (2023b). Schuwer, R., Gil-Jaurena, I., Aydin, C. H., Costello, E., Dalsgaard, C., Brown, M., & Teixeira, A. (2015). Opportunities and threats of the MOOC movement for higher education: The European perspective. International review of research in open and dist. *Ibero-American Journal of Education & Society Research*, *3*(1), 280-286. https://doi.org/10.56183/iberoeds.v3i1.630

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate data analysis. In *Multivariate data analysis* (pp. 785-785).

Halilovic, S., & Cicic, M. (2013). Antecedents of information systems user behavior–extended expectation-confirmation model. *Behavior & Information Technology*, *32*(4), 359-370. https://doi.org/10.1080/0144929x.2011.554575

Joo, Y. J., So, H.-J., & Kim, N. H. (2018). Examination of relationships among students' self-determination, technology acceptance, satisfaction, and continuance intention to use K-MOOCs. *Computers & Education*, *122*, 260-272. https://doi.org/10.1016/j.compedu.2018.01.003

Kline, R. B. (2016). Principles and practice of structural equation modeling.

Lee, M.-C. (2010). Explaining and predicting users 'continuance intention toward e-learning: An extension of the expectation-confirmation model. *Computers & Education*, *54*(2), 506-516. https://doi.org/10.1016/j.compedu.2009.09.002

Li, Q., & Baker, R. (2018). The different relationships between engagement and outcomes across participant subgroups in Massive Open Online Courses. *Computers & Education*, *127*, 41-65. https://doi.org/10.1016/j.compedu.2018.08.005

Lodico, M. G., & Voegtle, K. H. (2006). *Methods in Educational Research: From Theory to Practice* (1st ed.). Jossey-Bass, An Imprint of Wiley.

Ma, L., Pahlevan Sharif, S., Ray, A., & Khong, K. W. (2023). Investigating the relationships between MOOC consumers' perceived quality, emotional experiences, and intention to recommend: an NLP-based approach. *Online Information Review*, *47*(3), 582-603. https://doi.org/10.1108/oir-09-2021-0482

Nikou, S. A., & Economides, A. A. (2017). Mobile-based assessment: Investigating the factors that influence behavioral intention to use. *Computers & Education*, *109*, 56-73. https://doi.org/10.1016/j.compedu.2017.02.005

Nunnally, J. C. (1975). Psychometric theory-25 years ago and now. *Educational Researcher*, *4*(10), 7-21. https://doi.org/10.2307/1175619

Ohliati, J., & Abbas, B. S. (2019). Measuring students' satisfaction in using learning management system. *International Journal of Emerging Technologies in Learning (Online)*, *14*(4), 180. https://doi.org/10.3991/ijet.v14i04.9427

Papadakis, S. (2023). MOOCs 2012-2022: An overview. *Advances in Mobile Learning Educational Research*, *3*(1), 682-693. https://doi.org/10.25082/amler.2023.01.017

Pappano, L. (2012). The Year of the MOOC. *The New York Times*, *2*(12), 2012.

Pedroso, V., Valdivié Navarro, Y., Berrios Fleites, M., & Sosa Solis, I. E. C. (2016). Feeding systems with foliage of Morus alba and sugar cane stalks for fattening rabbits. Technical note. *Rev. electron. Vet., 17*(12), 1-7

Pongpaew, T. (2009). *Educational Research.* Mahasarakhram University.

Ram, I., Harris, S., & Roll, I. (2023). Choice-based Personalization in MOOCs: Impact on Activity and Perceived Value. *International Journal of Artificial Intelligence in Education. 34*(2), 376-394. https://doi.org/10.1007/s40593-023-00334-5

Rekha, I., Shetty, J., & Basri, S. (2023). Students' continuance intention to use MOOCs: empirical evidence from India. *Education and Information Technologies*, *28*(4), 4265-4286. https://doi.org/10.1007/s10639-022-11308-w

Reparaz, C., Aznárez-Sanado, M., & Mendoza, G. (2020). Self-regulation of learning and MOOC retention. *Computers in Human Behavior*, *111*, 106423. https://doi.org/10.1016/j.chb.2020.106423

Sabah, N. M. (2020). Motivation factors and barriers to the continuous use of blended learning approach using Moodle: students' perceptions and individual differences. *Behavior & Information Technology*, *39*(8), 875-898. https://doi.org/10.1080/0144929x.2019.1623323

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach* (1st ed.). john wiley & sons.

Singh, A., & Sharma, A. (2021). Acceptance of MOOCs as an alternative for internship for management students during COVID-19 pandemic: an Indian perspective. *International Journal of Educational Management*, *35*(6), 1231-1244. https://doi.org/10.1108/ijem-03-2021-0085

Sun, Y., Guo, Y., & Zhao, Y. (2020). Understanding the determinants of learner engagement in MOOCs: An adaptive structuration perspective. *Computers & Education*, *157*, 103963.

Sun, Z. (2017). A Study on Learner Satisfaction and its Influencing Factors of the College English Independent Learning Platform. *For Lang e-Learn*, *3*, 15-21. https://doi.org/10.1016/j.compedu.2020.103963

Tang, W., Zhang, X., & Tian, Y. (2023). Investigating Lifelong Learners' Continuing Learning Intention Moderated by Affective Support in Online Learning. *Sustainability*, *15*(3), 1901. https://doi.org/10.3390/su15031901

Urbach, N., Smolnik, S., & Riempp, G. (2010). An empirical investigation of employee portal success. *The Journal of Strategic Information Systems*, *19*(3), 184-206. https://doi.org/10.1016/j.jsis.2010.06.002

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly, 27*(3), 425-478. https://doi.org/10.2307/30036540

Wei, X., Saab, N., & Admiraal, W. (2021). Assessment of cognitive, behavioral, and affective learning outcomes in massive open online courses: A systematic literature review. *Computers & Education*, *163*, 104097. https://doi.org/https://doi.org/10.1016/j.compedu.2020.104097

Weinhardt, J. M., & Sitzmann, T. (2019). Revolutionizing training and education? Three questions regarding massive open online courses (MOOCs). *Human Resource Management Review*, *29*(2), 218-225. https://doi.org/10.1016/j.hrmr.2018.06.004

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior*, *67*, 221-232. https://doi.org/10.1016/j.chb.2016.10.028

Yakubu, N., & Dasuki, S. (2018). Assessing eLearning systems success in Nigeria: An application of the DeLone and McLean information systems success model. *Journal of Information Technology Education: Research*, *17*, 183-203. https://doi.org/10.28945/4077

Yang, H.-H., & Su, C.-H. (2017). Learner behavior in a MOOC practice-oriented course: In empirical study integrating TAM and TPB. *International Review of Research in Open and Distributed Learning*, *18*(5), 35-63. https://doi.org/10.19173/irrodl.v18i5.2991

Yang, Q., & Lee, Y.-C. (2021). The critical factors of student performance in MOOCs for sustainable education: a case of Chinese universities. *Sustainability*, *13*(14), 8089. https://doi.org/10.3390/su13148089

Yu, R., & Cai, X. (2022). Impact of Immediacy of Feedback on Continuous Intentions to Use Online Learning from the Student Perspective. *Frontiers in Psychology*, *13*, 865680. https://doi.org/10.3389/fpsyg.2022.865680