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Factors Influencing Students' Continuance Intention to Use Massive Open Online Courses (MOOCs): A Case Study at a Public College in Shandong, China

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Abstract

Purpose: This study aims to identify factors influencing students' continuance intention to use MOOCs and to develop a strategic plan that strengthens this intention in a public college in Shandong. **Research design, data and methodology:** The study applied an action research design in three stages. Using stratified random sampling, 182 students participated in a survey analyzed through Multiple Linear Regression (MLR) to verify factors shaping continuance intention. A purposive sample of 30 students was then recruited to co-develop and implement a strategic plan focusing on social influence, facilitating conditions, perceived usefulness, perceived ease of use, attitude, and course quality. Paired samples t-tests were conducted before and after implementation to assess changes. **Results:** MLR analysis identified perceived usefulness ($\beta = 0.421$), attitude ($\beta = 0.314$), perceived ease of use ($\beta = 0.281$), facilitating conditions ($\beta = 0.267$), and course quality ($\beta = 0.259$) as significant predictors of continuance intention, while social influence was not significant. After implementation, continuance intention increased significantly (mean difference = 0.46, $p < .01$). However, facilitating conditions and course quality showed limited short-term improvement. **Conclusions:** The results emphasize prioritizing system usability, perceived value, and learner attitudes in MOOC development to foster sustained engagement and build a more student-centered online learning environment.

Keywords: Continuance Intention, Massive Open Online Courses, College Students, Strategic Plan

JEL Classification Code: A20, D83, I23, M10, O30

1. Introduction

The rapid development of information and communication technologies has transformed education worldwide. Among the most influential innovations is the emergence of Massive Open Online Courses (MOOCs), which have become a prominent model of open and flexible learning. MOOCs allow learners to access high-quality educational resources regardless of location, attracting students, educators, and policymakers across higher education systems (Daneji et al., 2019; Mohan et al., 2020; Yang et al., 2017). Since their introduction in 2008 and rapid expansion in 2012, MOOCs have reshaped global higher education practices (Fianu et al., 2018; Kurniawan et al., 2021).

China has actively embraced this movement. Universities have collaborated with international platforms such as edX, Coursera, and Udacity, while establishing domestic platforms such as XuetangX, China University MOOC, and Icouse (Cheng et al., 2022; Zheng et al., 2018). These initiatives reflect China's commitment to integrating educational technology into higher education and promoting equitable access to learning.

Despite the rapid growth of MOOCs, low completion and retention rates remain a critical challenge. Studies report that fewer than 10% of registered learners complete their courses, raising concerns about the long-term sustainability of MOOCs (Daneji et al., 2019; Ouyang et al., 2017; Wu & Chen, 2017). The key issue is not only the adoption of MOOCs but also whether learners continue using them after initial engagement. Continuance intention, defined as the willingness to persist in using MOOCs, is therefore central

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to understanding the success and sustainability of these platforms (Wan et al., 2020).

Globally, research has shown that learners' continuance intention is strongly influenced by perceived usefulness, satisfaction, social influence, and system quality (Adomavičiūtė et al., 2023; Dai et al., 2020). These factors reflect both cognitive and emotional dimensions of learning engagement. However, most empirical studies on continuance intention have been conducted in Western or developed contexts, where digital learning ecosystems and institutional supports differ from those in developing countries.

In China, MOOCs operate within distinctive conditions shaped by language, platform design, and institutional structures (Al-Shami et al., 2022). Yet, there is limited empirical research examining how these contextual factors influence Chinese students' continuance intention. This lack of localized evidence creates a gap between global theories of online learning engagement and their practical application in Chinese higher education. Addressing this gap is vital because China represents one of the largest MOOC markets globally, and insights from this context can contribute to the broader international understanding of technology adoption and online learning persistence.

This study investigates the factors influencing students' continuance intention to use MOOCs in a public college in Shandong Province, China. The selected institution represents a typical environment in which MOOCs are encouraged but face issues such as limited infrastructure, insufficient training, and low completion rates. Using a SWOT-based organizational assessment, the study identifies key internal and external factors shaping MOOC implementation in the college.

The purpose of this research is to identify the determinants that drive or hinder students' continuance intention to use MOOCs within the Chinese higher education context. It also aims to bridge global perspectives on online learning with localized empirical evidence from China, providing practical insights for institutional improvement and contributing to international discussions on sustaining learner engagement in MOOCs.

2. Literature Review

2.1 Continuance Intention

Bhattacherjee (2001) defined continuance intention as an individual's decision to keep using an information system beyond initial adoption. This concept is critical because adoption alone does not ensure success; long-term system effectiveness depends on sustained use.

Research identifies several antecedents of continuance intention. These include psychological factors (satisfaction, attitude), technological factors (perceived usefulness, ease of use), social factors (subjective norm, social influence), and behavioral factors (habit, frequency of use) (Yan et al., 2021).

In MOOCs, where dropout rates are high, continuance intention has become a central issue. Studies show that factors such as attitude and perceived usefulness strongly shape students' willingness to persist (Dai et al., 2020; Tawafak et al., 2020; Wan et al., 2020).

Beyond antecedents, continuance intention is also linked to outcomes. Models such as TAM and UTAUT confirm that intention significantly predicts actual usage (Davis, 1989; Venkatesh et al., 2003), and recent IT research has reinforced this relationship (Kim & Min, 2015; Zhou et al., 2019).

2.2 Theoretical Origins

Studies on continuance intention to use MOOCs often draw on the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Davis (1989), building on the Theory of Reasoned Action (Fishbein & Ajzen, 1975), proposed TAM, which explains that perceived usefulness and perceived ease of use shape attitudes toward technology, thereby influencing intention and actual usage.

Venkatesh et al. (2003) later developed UTAUT to provide a broader framework for technology acceptance. It highlights four determinants of adoption and use: performance expectancy, effort expectancy, social influence, and facilitating conditions.

Beyond these models, researchers have also emphasized quality-related factors. DeLone and McLean's (2003) revised Information System Success Model identifies information quality, system quality, and service quality as critical predictors of user satisfaction and continued use.

2.3 Social Influence and Continuance Intention

Venkatesh and Davis (2000), in extending the Technology Acceptance Model (TAM 2), highlighted social influence as a key factor shaping use intention through three mechanisms. The first is compliance, where individuals align their behavior with the expectations of valued referents, even when they may not personally favor the behavior. The second is internalization, in which individuals adopt the beliefs of important referents. For example, if a referent views a system as useful, the individual is more likely to share that belief and develop the intention to use it. The third is identification, where individuals engage in behaviors that align with group norms to maintain a favorable image and strengthen group belonging (Venkatesh & Davis, 2000).

Empirical studies reinforce the role of social influence in

continuance intention across diverse contexts, including mobile payment systems such as OVO (Hutabarat et al., 2021), e-government platforms (Razak et al., 2017), and fitness applications (Li et al., 2022). In the MOOC context, research similarly confirms that social influence is a critical driver of students' continued participation (Ishak, 2020; Wan et al., 2020; Zhou, 2017).

Drawing on these findings, this study proposes that social influence plays a significant role in shaping students' continuance intention to use MOOCs.

H1: Social influence has a significant impact on students' continuance intention to use MOOCs.

2.4 Facilitating Conditions and Continuance Intention

Facilitating conditions refer to users' perceptions of the organizational and technical support available to enable system use (Venkatesh et al., 2003). In the Unified Theory of Acceptance and Use of Technology (UTAUT), Venkatesh et al. (2003) argued that facilitating conditions directly influence use intention when effort expectancy is not considered, since support infrastructures reduce the perceived effort required to use a system. This view has been supported by studies showing that facilitating conditions can directly predict continuance intention even without the inclusion of effort expectancy (Bhattacherjee et al., 2008; Kamarozaman & Razak, 2021).

Other research, however, demonstrates that facilitating conditions remain significant predictors of continuance intention even when effort expectancy is present. For instance, Purohit et al. (2021) found a significant role of facilitating conditions in explaining continuance intention to use mobile payments, while Tian and Wu (2022) reported similar findings in the context of mobile health equipment. In MOOC studies, Li and Zhao (2021) also confirmed that facilitating conditions significantly influence continuance intention, even when effort expectancy is included in the model.

Based on these insights, this study argues that facilitating conditions are likely to shape students' continuance intention to use MOOCs.

H2: Facilitating conditions have a significant impact on students' continuance intention to use MOOCs.

2.5 Perceived Usefulness and Continuance Intention

In his seminal work introducing the Technology Acceptance Model (TAM), Davis (1989) argued that perceived usefulness influences intention to use technology through its potential to enhance performance. Individuals are more likely to adopt or continue using a system if they believe it helps them perform better. This perspective builds on motivational theories, which suggest that organizational rewards, such as promotions or raises, reinforce performance-driven behavior (Schein, 1980; Vroom, 1964). Thus, when individuals perceive strong usefulness in a system, their behavioral intention to use it increases.

Recent studies continue to confirm perceived usefulness as a key determinant of continuance intention (Jo, 2023; Wang et al., 2022; Widjaja & Widjaja, 2022). In the MOOC context, research consistently shows that students' sustained engagement depends heavily on their perception of the usefulness of online courses (Daneji et al., 2019; Kim & Song, 2022; Rekha et al., 2023). Yeh and Teng (2012) further extended the construct to include social and personal usefulness, finding that these dimensions also positively influence ongoing system use.

Building on these insights, this study expects perceived usefulness to significantly shape students' continuance intention to use MOOCs.

H3: Perceived usefulness has a significant impact on students' continuance intention to use MOOCs.

2.6 Perceived Ease of Use and Continuance Intention

Davis (1989) argued that the benefits of using an information system may be offset if users perceive the system as difficult to operate. Thus, alongside perceived usefulness, perceived ease of use was identified as an important factor influencing intention to use technology. This view is grounded in Bandura's (1982) concept of self-efficacy, which refers to judgments about one's ability to execute actions needed to manage specific situations. When individuals believe that a task requires little effort and they are capable of performing it, they are more likely to engage in the behavior. Accordingly, perceived ease of use functions as a key determinant of behavioral intention, with individuals more inclined to adopt systems they consider easy to use (Davis, 1989).

Building on this foundation, many studies within the Technology Acceptance Model framework confirm the positive effect of perceived ease of use on continuance intention (Gupta et al., 2021; Hamid et al., 2016; Jatimoyo et al., 2021). In MOOCs, research similarly shows that students who perceive MOOCs as easy to navigate and operate are more likely to sustain their participation (Adomavičiūtė et al., 2023; Daneji et al., 2018; Zhang et al., 2023).

Based on this evidence, this study posits that perceived ease of use significantly influences students' continuance intention to use MOOCs.

H4: Perceived ease of use has a significant impact on students' continuance intention to use MOOCs.

2.7 Attitude and Continuance Intention

In developing the Technology Acceptance Model (TAM), Davis (1989) drew on the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975). TRA suggests that behavior is driven by behavioral intention, which in turn is shaped by both attitude toward the behavior and subjective norms. From this perspective, attitude plays a central role in influencing intention, which subsequently predicts actual behavior.

Empirical studies across different domains provide evidence of this relationship. Law (2020), in a study on Facebook usage, found that positive attitudes toward the platform increased users' willingness to continue engaging with it. Similarly, Laksamana et al. (2022) demonstrated that consumers' attitudes toward mobile payment systems, which were influenced by perceived usefulness, ease of use, risk, security, and trust, directly predicted their continued adoption. In another context, Foroughi et al. (2024) showed that favorable attitudes toward food delivery apps significantly enhanced customers' motivation to reuse them.

In the MOOC context, attitude has also been confirmed as a vital predictor of students' sustained engagement and continuance intention (Al-Mekhlafi et al., 2022; Dai et al., 2020; Wijaya et al., 2023). Students who perceive MOOCs positively are more likely to remain committed to ongoing participation.

Based on these insights, this study expects attitude to significantly shape students' continuance intention to use MOOCs.

H5: Attitude has a significant impact on students' continuance intention to use MOOCs.

2.8 Course Quality and Continuance Intention

In their updated Information System Success Model, DeLone and McLean (2003) identified information quality as a key determinant of users' intention to continue using a system. In online learning research, this construct is often adapted as course quality, reflecting the relevance, accuracy, and usefulness of information delivered through online courses. High-quality course content is assumed to strongly influence students' motivation to persist in online learning.

Recent studies confirm the predictive role of course quality in explaining students' continued study intentions (Chen et al., 2021; Liu & Pu, 2023; Puriwat & Tripopsakul, 2021). When students perceive online courses as valuable and reliable, their willingness to engage in sustained learning increases. Similarly, Yang et al. (2017), in a study on MOOCs, found that course quality significantly shaped students' ongoing participation and engagement.

Based on these findings, this study proposes that course quality plays an important role in shaping students' continuance intention to use MOOCs.

H6: Course quality has a significant impact on students' continuance intention to use MOOCs.

3. Research Methods and Materials

3.1 Research Framework

The purpose of this study is to identify the factors that influence students' continuance intention to use MOOCs and to design strategies that promote sustained participation in a public college in Shandong. The framework draws on three foundational models of technology adoption: the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Information System Success Model (IS Success Model).

The Technology Acceptance Model (TAM) (Davis, 1989) suggests that technology use is shaped by perceived usefulness and perceived ease of use, reflecting users' belief that a system is both valuable and easy to operate. These perceptions are essential for explaining continued engagement with learning technologies such as MOOCs.

The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) expands on TAM by emphasizing social and environmental influences. Within the MOOC context, students' participation can be encouraged by peer and instructor support as well as by sufficient institutional and technical resources.

The Information System Success Model (DeLone & McLean, 2003) highlights the importance of quality factors, suggesting that the effectiveness of MOOCs depends on the perceived quality of course design, content, and delivery.

In combination, these perspectives suggest that students' perceptions, attitudes, and environmental support collectively determine their continuance intention to use MOOCs (see Figure 1).

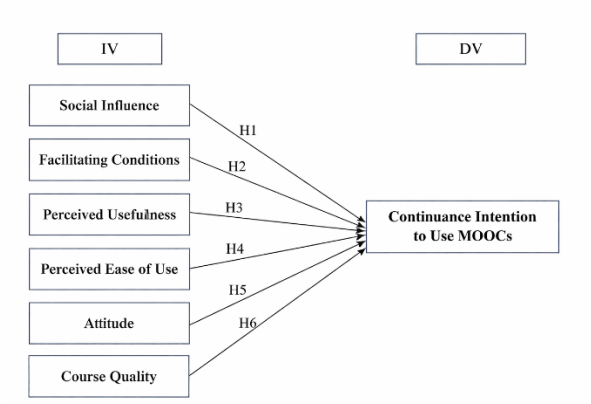

Figure 1: Conceptual Framework

3.2 Research Methodology

This study used an action research design to develop a strategic plan for increasing students' continuance intention to use MOOCs in a public college in Shandong. The research was conducted in three stages: pre-strategic plan, strategic plan, and post-strategic plan.

In the pre-strategic plan stage, students' current continuance intention and its key influencing factors were examined. In the strategic plan stage, an improvement plan was developed from these findings and implemented with student participation. In the post-strategic plan stage, data were collected again to assess changes in continuance intention and related factors.

A multi-stage sampling approach combining probability and non-probability methods was applied. First, purposive sampling identified three faculties—Intelligent Finance and Economics, Digital Marketing, and Cloud Computing Technology and Application—as the study setting. Second, stratified random sampling selected 200 students proportionally from these faculties. Finally, convenience sampling was used to distribute questionnaires through WeChat and QQ. For the strategic plan stage, 30 students were purposively chosen based on MOOC experience and interest in course improvement.

The data collection instrument was a structured questionnaire. Content validity was evaluated using the Item-Objective Congruence (IOC) method, where three educational experts reviewed each item for relevance and clarity. Reliability was tested in a pilot study with 50 students, using Cronbach's alpha in Jamovi 2.5.6. Items that did not meet acceptable thresholds were revised or removed.

Multiple linear regression (MLR) was used to identify factors significantly affecting continuance intention. These factors informed the development of the strategic plan. Paired-samples t-tests were then performed to compare students' responses before and after implementation. Prior to analysis, assumption checks were conducted to verify linearity, homoscedasticity, and the absence of multicollinearity (Daoud, 2017).

Ethical procedures were followed throughout. Participation was voluntary, and all respondents provided informed consent. Confidentiality was assured, and all data were anonymized and securely stored. The study was approved by the Institutional Review Board (IRB) of the selected college.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

The research population for testing the conceptual framework consisted of full-time students enrolled at the selected public college in Shandong. To conduct the investigation, the researcher focused on the three largest faculties out of a total of 14 within the college. These were the Faculty of Intelligent Finance and Economics (2,619 students), the Faculty of Digital Marketing (2,045 students), and the Faculty of Cloud Computing Technology and Application (2,169 students). Together, these faculties represented a total population of 6,833 students, who formed the basis for exploring continuance intention toward MOOC learning in the selected institution.

3.3.2 Sample Size

Hair et al. (2014) recommended that multiple regression analysis requires a minimum of 10 observations for each independent variable to ensure sufficient statistical power. Since the conceptual framework of this study included seven variables, at least 70 respondents were required. To account for possible non-responses and invalid data, as well as to improve the reliability of the results, the planned sample size was increased to 200 respondents for the questionnaire survey.

For the strategic plan stage, 30 students were recruited to participate in the design, implementation, and evaluation of the intervention. A sample size of 30 is commonly considered sufficient for experimental or intervention studies to apply statistical tests such as the paired samples t-test, as this number provides adequate power for detecting medium effect sizes (Cohen, 1992; Johanson & Brooks, 2010).

3.3.3 Sampling Procedures

For the questionnaire survey, the researcher applied a multi-stage sampling procedure that combined probability and nonprobability techniques. The process involved three stages.

In the first stage, purposive sampling was used to target students from the three selected faculties in the public

college in Shandong. In the second stage, stratified random sampling was applied to ensure proportional representation across the faculties. From the total of 200 respondents, 77 students were drawn from the Faculty of Intelligent Finance and Economics, 60 from the Faculty of Digital Marketing, and 63 from the Faculty of Cloud Computing Technology and Application. In the final stage, convenience sampling was used to reach participants by distributing online questionnaires through social media applications.

For the strategic plan stage, 30 participants were recruited using purposive sampling. Students were selected based on the following criteria: (a) current enrollment in one of the three selected faculties, (b) recent experience with MOOCs, and (c) willingness to participate in improving and developing MOOCs.

3.4 Research Instruments

3.4.1 Questionnaire Design

This study used a structured questionnaire to investigate students' continuance intention to use MOOCs. The questionnaire was developed based on an extensive review of MOOC-related literature and was designed to measure the seven variables in the conceptual framework: social influence (5 items), facilitating conditions (5 items), perceived usefulness (4 items), perceived ease of use (4 items), attitude (3 items), course quality (4 items), and continuance intention (5 items).

All items were measured using a five-point Likert scale with the following options: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree.

3.4.2 Questionnaire Components

The questionnaire consisted of two sections. The first section included demographic questions on age, gender, faculty, and grade. It also contained two screening questions: "Are you a student from the selected public college in Shandong?" and "Do you use Massive Open Online Courses (MOOCs)?" These ensured that only the target population was included in the study.

The second section presented items measuring the variables in the conceptual framework. These items were designed to capture students' ratings of the factors influencing their MOOC usage and continuance intention. All questions were adapted from prior empirical studies on students' continuance intention to use MOOCs identified through the literature review.

3.4.3 IOC Results

Three experts in the field of education were invited to evaluate whether the questionnaire items were relevant and accurately represented the proposed variables. Each expert rated the items on a scale of +1 (congruent), 0 (questionable), or -1 (incongruent). The researcher then calculated the Index of Item-Objective Congruence (IOC) for each item by dividing the total score given by the experts by the number of experts. According to Rovinelli and Hambleton (1976), an IOC score above 0.5 indicates acceptable validity.

The results showed that all 30 items achieved IOC scores higher than 0.5. Therefore, none of the items were removed from the instrument.

3.4.4 Reliability and Validity

A pilot test was conducted before distributing the questionnaire to the main research sample. Fifty students were randomly selected from the research population and asked to complete the questionnaire online. The collected data were analyzed using Jamovi 2.5.6 to calculate Cronbach's alpha coefficients for the scale items measuring each variable. A Cronbach's alpha value above 0.70 indicates an acceptable level of reliability (Heale & Twycross, 2015).

The results of the pilot test are presented in Table 1. All constructs achieved Cronbach's alpha values above the 0.70 threshold, demonstrating that the instrument had satisfactory reliability. Therefore, no items were removed from the questionnaire.

Table 1: Pilot Test Result (n = 50)

Variable	No. of Items	Cronbach's Alpha	Strength of Association
Social Influence	5	0.855	Good
Facilitating Conditions	5	0.864	Good
Perceived Usefulness	4	0.828	Good
Attitude	3	0.769	Acceptable
Course Quality	4	0.854	Good
Perceived Ease of Use	4	0.796	Acceptable
Continuance Intention	5	0.872	Good

Source: Created by the author

4. Results and Discussion

4.1 Demographic Profile

Out of 200 distributed questionnaires, 182 valid responses were collected. All respondents were full-time students at the selected public college in Shandong and had basic experience with MOOCs. As shown in Table 2, slightly more than half of the respondents were male, and most were between 18 and 21 years old. Students were evenly distributed across the three selected faculties, with the largest proportion from the Faculty of Intelligent Finance and Economics. In terms of academic year, over half of the respondents were second-year students, followed by third-year and first-year students.

For the strategic plan stage, 30 students participated. The group had a higher proportion of male participants and, similar to the survey respondents, most were between 18 and 21 years old. Representation across the three faculties was fairly balanced, and half of the participants were in their second year of study.

Overall, the demographic results show that both the survey respondents and strategic plan participants were predominantly young undergraduate students, mainly in their second year, with balanced representation across the three chosen faculties.

Table 2: Demographic Profile

Entire Research Population (n=182)		**Frequency**	**Percentage**
Gender	Male	101	55.5
	Female	81	44.5
Age	18 years old	1	0.5
	18-19 years old	85	46.7
	20-21 years old	70	38.5
	22-23 years old	24	13.2
	23 years old and above	2	1.1
Faculty	Intelligent Finance and Economics	65	35.7
	Digital Marketing	54	29.7
	Cloud Computing Technology and Application	63	34.6
Grade	Year 1	28	15.4
	Year 2	94	51.6
	Year 3	60	33
IDI Participants (n=30)		**Frequency**	**Percentage**
Gender	Male	18	60.0
	Female	12	40.0
Age	18 years old	0	0.0
	18-19 years old	13	43.3
	20-21 years old	10	33.3
	22-23 years old	7	23.4
	23 years old and above	0	0.0
Faculty	Intelligent Finance and Economics	12	40.0
	Digital Marketing	8	26.7
	Cloud Computing Technology and Application	10	33.3
Grade	Year 1	5	16.7
	Year 2	15	50.0
	Year 3	10	33.3

4.2 Results of Multiple Linear Regression

To examine the effects of social influence, facilitating conditions, perceived usefulness, attitude, course quality, and perceived ease of use on continuance intention, a multiple linear regression analysis was performed using Jamovi 2.5.8. The six independent variables together explained 34.6% of the variance in continuance intention, $R^2 = .346$, $F(6, 175) = 15.40$, $p < .001$.

Assumption checks were also conducted. The collinearity statistics indicated that the VIF values for all independent variables ranged from 1.21 to 1.40, which are well below the threshold of 5.0. This result suggests that multicollinearity was not a concern in the analysis (Daoud, 2017).

Table 3: The MLR Results on Continuance Intention (n = 182)

Variable	**Standardized Coefficients (β)**	**t-value**	**p-value**	**VIF**	**R^2**
Social Influence	-0.0140	-0.204	0.839	1.25	0.346
Facilitating Conditions	0.1731	2.394*	0.018	1.40	
Perceived Usefulness	0.2076	3.087*	0.002	1.21	
Attitude	0.1474	2.050*	0.042	1.38	
Course Quality	0.1633	2.322*	0.021	1.32	
Perceived Ease of Use	0.1753	2.445*	0.015	1.38	

Note: *p-value < .05

Based on these findings in Table 3, hypotheses H2, H3, H4, H5, and H6 were supported, while H1 was not supported. This indicates that continuance intention among students in the selected public college was significantly influenced by facilitating conditions, perceived usefulness, perceived ease of use, attitude toward MOOCs, and course quality. Social influence, however, did not have a meaningful effect on students' continuance intention.

Although social influence was not significant in the regression model, it was retained for further analysis in the strategic plan intervention. This decision was made to ensure that all proposed variables, including those that appeared less influential in the initial model, were assessed for potential improvement when intervention strategies were applied. Therefore, all six factors were carried forward into the next phase of analysis, where changes before and after the intervention were examined using paired-sample t-tests.

To evaluate the effectiveness of the intervention, a new set of hypotheses was formulated:

H7: Social influence significantly differs between the pre- and post-strategic plan phases.

H8: Facilitating conditions significantly differ between the pre- and post-strategic plan phases.

H9: Perceived usefulness significantly differs between the pre- and post-strategic plan phases.

H10: Perceived ease of use significantly differs between the pre- and post-strategic plan phases.

H11: Attitude significantly differs between the pre- and post-strategic plan phases.

H12: Course quality significantly differs between the pre- and post-strategic plan phases.

H13: Continuance intention significantly differs between the pre- and post-strategic plan phases.

4.3 Strategic Plan Stage

The strategic plan stage lasted 16 weeks and was divided into three phases: four weeks for pre-intervention data collection, eight weeks for plan development, implementation, and evaluation, and four weeks for post-intervention data collection and analysis. The plan targeted key factors identified in the regression model, aiming to improve conditions that support MOOC participation and ultimately enhance students' continuance intention.

An overview of the timeline and activities is presented in Table 4. Pre-intervention activities involved surveys and interviews to establish baseline data. The development phase included diagnosing the current situation, setting goals, and proposing practical strategies. These strategies were then consolidated into an implementation plan, carried out, and adjusted for sustainability. Finally, post-intervention activities involved collecting follow-up data through surveys and interviews to evaluate the effectiveness of the plan.

Table 4: Timeline and Activities of Strategic Plan

No.	Time and Duration	Activities
1	Week 1-4	Conducting pre-strategic plan data collection through online questionnaire survey and open-ended interview
2	Week 5-6	Diagnosing current situation, setting expected goals, identifying stakeholders
3	Week 7	Proposing practical strategies to improve social influence, facilitating conditions, and course quality
4	Week 8	Proposing practical strategies to improve perceived usefulness, perceived ease of use, and attitude
5	Week 9	Formulating the implementation plan of proposed strategies
6	Week 10	Implementing the strategic plan
7	Week 11-12	Making adjustments and improvements in the strategic plan, ensuring the sustainability
8	Week 13-16	Conducting post- strategic plan data collection through online questionnaire survey and open-ended interview

Source: Created by the author

4.4 Results of Paired Samples T-Test

The paired-samples t-test was conducted using Jamovi 2.5.6 to compare data collected before and after the strategic plan. The test examined whether significant differences existed in social influence, facilitating conditions, perceived usefulness, perceived ease of use, attitude, course quality, and continuance intention. Detailed results are presented in Table 5.

Table 5: Paired-sample t-test Results (n = 30)

Variable		Mean	SD	t-value	p-value
Social Influence	Pre-SP	3.57	1.045	-2.868	0.008
	Post-SP	4.12	0.448		
Facilitating Conditions	Pre-SP	3.81	1.074	0.298	0.768
	Post-SP	3.73	1.165		
Perceived Usefulness	Pre-SP	3.72	1.174	-2.510	0.018
	Post-SP	4.33	0.395		
Attitude	Pre-SP	3.69	1.002	-2.481	0.019
	Post-SP	4.23	0.489		
Course Quality	Pre-SP	3.57	1.203	-0.192	0.849
	Post-SP	3.62	1.080		
Perceived Ease of Use	Pre-SP	3.59	1.312	-2.701	0.011
	Post-SP	4.32	0.487		
Continuance Intention	Pre-SP	3.65	1.088	-2.602	0.014
	Post-SP	4.21	0.462		

Note: p-value < .05

The results showed significant increases in several variables after the implementation of the strategic plan.

Social influence improved significantly, with a mean difference of 0.55 ($t = -2.868$, $p = .008$). Perceived usefulness also increased by 0.61 points ($t = -2.510$, $p = .018$), while attitude improved by 0.54 points ($t = -2.481$, $p = .019$). The largest gain was observed in perceived ease of use, which rose by 0.73 points ($t = -2.701$, $p = .011$). Continuance intention strengthened as well, with a mean difference of 0.56 ($t = -2.602$, $p = .014$). In contrast, facilitating conditions declined slightly (-0.08, $t = 0.298$, $p = .768$) and course quality showed only a minor, non-significant increase (+0.05, $t = -0.192$, $p = .849$).

Overall, the strategic plan successfully improved students' perceptions in social influence, usefulness, ease of use, attitude, and continuance intention. However, it did not have a measurable impact on facilitating conditions or course quality.

5. Conclusions and Recommendation

5.1 Conclusions

This study identifies the key determinants of students' continuance intention to use MOOCs and highlights both alignment and divergence from prior research. Social influence was not significant in the pre-intervention model, which differs from previous studies that found it to be a strong predictor of technology adoption (Venkatesh & Davis, 2000; Venkatesh et al., 2003). The likely reason is that MOOC participation in the selected college was voluntary, and most students already had extensive experience with online learning. These learners tended to rely on their own judgments rather than on peers or instructors when deciding to continue using MOOCs. However, social influence showed a significant increase after the intervention,

suggesting that structured peer interaction and collaborative learning activities can transform it from a weak external factor into an internal motivational driver. This finding provides new insight into how social factors evolve when learning environments actively promote community engagement.

Perceived usefulness, perceived ease of use, and attitude were found to be strong and consistent predictors of continuance intention. Ease of use improved the most after the intervention, indicating that reducing effort barriers increases students' willingness to continue using MOOCs (Chen et al., 2022; Gu et al., 2021). Perceived usefulness confirmed that students are more likely to persist when they perceive MOOCs as effective tools for achieving learning goals (Wang et al., 2023; Zhao & Wang, 2022). Attitude also played a positive role, highlighting that favorable learner perceptions contribute to ongoing engagement (Al-Maroof et al., 2021; Zhou, 2021). Together, these findings indicate that continuance intention is driven by both cognitive evaluation and emotional attachment to MOOC learning.

Theoretically, this study extends the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) by validating their applicability in a Chinese higher education context. It demonstrates that internal motivational factors such as usefulness, ease of use, and attitude are more influential than external ones when participation is voluntary and learners are experienced. This suggests that continuance intention becomes increasingly self-regulated as students gain confidence and autonomy in technology use.

Overall, this study provides a clearer understanding of how students form and sustain their intentions to continue using MOOCs. It contributes to the literature by revealing the dynamic nature of social influence, affirming the enduring importance of internal motivational factors, and refining the theoretical application of TAM and UTAUT to non-Western, technology-based learning environments. These findings directly fulfill the study's objective by identifying the key factors influencing students' continuance intention and demonstrating how a structured intervention can enhance sustained MOOC participation in a Chinese higher education context.

5.2 Recommendations

Based on the findings, several practical measures are proposed to strengthen students' continuance intention to use MOOCs in the selected public college in Shandong. The intervention demonstrated that improvements in perceived usefulness, ease of use, and attitudes can meaningfully enhance continuance, while facilitating conditions and course quality showed limited change. Addressing these areas requires clear, targeted strategies supported by institutional commitment and student involvement.

First, course quality should be prioritized as a core area for improvement. Training for academic staff can be expanded to develop stronger skills in MOOC recording, delivery, and instructional design. Workshops on digital pedagogy and hands-on MOOC development could be organized each semester to ensure that instructors remain updated on effective online teaching practices. Collaborative teaching teams should review and refine course materials, interface design, and assessment rubrics to improve clarity and engagement. IT staff should perform regular system maintenance and provide technical support within set response times to guarantee stable access for students. At the institutional level, partial decentralization of budget allocation to teaching departments could allow faster implementation of quality initiatives, while central oversight ensures alignment with the college's overall digital learning strategy (Ellis et al., 2007).

Second, continuous integration of students' perspectives is essential. In this study, students' input before, during, and after the intervention ensured that improvement strategies met real learner needs and contributed to measurable outcomes. Prior research also confirms that involving students as partners in course design enhances relevance and accessibility (Cook-Sather et al., 2015). To institutionalize this approach, the college could establish a "Student-Faculty MOOC Advisory Panel" that meets quarterly to review ongoing MOOC performance, suggest improvements, and evaluate learner satisfaction. Feedback from this panel can guide regular revisions of course structure, assessment design, and support services.

Finally, enhancing usability and perceived usefulness should remain central to MOOC development. The intervention confirmed that students are more willing to persist when systems are intuitive and directly linked to learning goals. The college could adopt a user experience (UX) audit every academic year to identify navigation issues and usability challenges. Orientation sessions and short video tutorials can be created to help new users familiarize themselves with platform features. Additionally, instructors should clearly connect MOOC content with students' academic progression, internship preparation, and career pathways to strengthen perceived usefulness. These measures can reinforce both functional ease and motivational value, supporting positive attitudes and sustained engagement.

5.3 Limitation and Further Study

This study has several limitations that should be acknowledged. First, the representativeness of the research sample was limited. Data were collected only from one public college in Shandong, which means students from

other Chinese colleges were not included. As a result, the findings may not fully reflect the broader patterns of MOOC use across China. Future studies should expand the sample to multiple institutions to improve generalizability.

Second, the implementation period of the strategic plan was relatively short. Some measures, such as those designed to improve MOOC quality, require longer than four months to produce visible outcomes. Continuous monitoring and extended data collection would help capture the long-term effects of these interventions and provide stronger evidence of their impact.

Third, financial constraints restricted the full implementation of several improvement strategies. Limited funding prevented the establishment of infrastructure and resources that were expected to enhance facilitating conditions and course quality. This partial implementation may have reduced the effectiveness of the strategic plan. Future research supported by sufficient funding could fully apply the proposed strategies, allowing for a more reliable assessment of their contribution to MOOC enhancement and student engagement.

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