

Research Article

Examining teachers' influence on MOOCs learners' continuance learning intention: The mediating effects of perceived usefulness and satisfaction

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Although Massive Open Online Courses (MOOCs) have attracted extensive attention among educational stakeholders, the issue of the high dropout rate has yet to be solved. The current study aimed to unpack teacher influence on MOOCs learners' continuance learning intention, and to examine the mediating roles of students' perceived usefulness and satisfaction. Quantitative data were collected from 166 Chinese university students located in 18 provinces. Results indicated that teacher influence is significantly associated with learners' continuous learning intention, and when considering perceived usefulness and satisfaction, this relationship did not achieve significance but was mediated by students' perceived usefulness and satisfaction. In addition, teacher influence did not exert a direct and significant impact on students' satisfaction. The serial mediation model explained 65.8% of the variance of students' continuance learning intention. This study uncovered the important role of teacher influence on students' continuance learning intention in the Chinese MOOCs learning context. Results provided suggestions to policymakers, MOOCs platform and lecturers to promote MOOCs and design useful courses so as to engage students to learn continuously.

Keywords: MOOCs; Serial mediation model; Continuance intention; Teacher influence; Perceived usefulness; Satisfaction

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1. Introduction

As one of the innovative technological applications in education, Massive Open Online Courses (MOOCs) make learning, communication, and mutual assistance in the virtual environment a reality, providing learners with opportunities to obtain global education and lifelong learning (Badali et al., 2022). Therefore, MOOCs have aroused increasing attentions among system developers and educational stakeholders (Alturki & Aldraiweesh, 2023). Compared to traditional learning contexts featured by users' adoption of technological tools, MOOCs enable users to conduct autonomous learning, and have the flexibility to decide whether or to what extent they would engage in the courses (Borrella et al., 2022; Jansen et al., 2020). MOOCs enable teachers and

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students to be free from geographical and time constraints and particularly (Huang et al., 2023), MOOCs sustained teaching and learning caused by unexpected events such as the COVID-19 outbreak (Dhawan, 2020; Khan et al., 2020; Suanpang et al., 2021). In addition, users get access to high-quality educational resources around the world (Dai et al., 2020a). Due to these benefits, MOOCs have developed rapidly, and the number of courses and users has increased significantly (Xing & Du, 2019).

Although MOOCs have great development potential in the digital era, their drop-out rate is very high, which is about 90% as the previous studies suggested (Khoushehgir & Sulaimany, 2023; Wang et al., 2023; Xing & Du, 2019). The high drop-out rate has negative impacts on both the platform and users. As the platform provides free learning, dropping out increases the cost of the platform and results in challenges of long-term survival (Zhao et al., 2020). From the perspective of students, dropping out is a waste of time and energy and may let them form a bad habit of giving up halfway.

Scholars have made efforts to understand MOOCs learners' low completion (Dai et al., 2020a; Goopio & Cheung, 2021; Zhao et al., 2020). Existing studies focused on the courses, such as the course quality (Charo et al., 2020; Eriksson et al., 2017), the strength of interactivity, the proficiency of technology, the duration of the course and so on (Hone & El Said, 2016). Researchers also examined learners' engagement in MOOCs courses (Martín-Monje et al., 2018; Maya-Jariego et al., 2020), their learning habits and interests (Buhr et al., 2019; Tsai et al., 2018), learners' experience (Goopio & Cheung, 2021). Other studies unpacked social factors (Zhou, 2017; Junjie, 2017), learning motivation (Abdullatif & Velázquez-Iturbide, 2020) which combines needs and interest motivation (Aldowah et al., 2020), career motivation (Uchidiuno et al., 2018) to explain MOOCs learners' low completion phenomenon. However, very few studies examined the influence of schoolteachers on students' continuance intention. This is especially important for learners who are situated in the collectivism-oriented educational context, where teachers are considered as sacred in many aspects, including knowledge sources (Huang et al., 2020).

Based on the problem and research gap stated above, this study aims to explore the degree to which the influence of schoolteachers on students' continuance learning intentions in MOOCs and examines the potential mediation effects of perceived usefulness and satisfaction, in the Chinese higher educational context. Research questions are: (1) To what extent is teachers' influence associated with MOOCs learners' continuous learning intentions? (2) Do perceived usefulness and satisfaction mediate the relationship between teachers' influence and learners' continuous learning intentions?

2. Literature Review and Model Development

This study was guided by the Expectation-Confirmation Model (ECM, Bhattacharjee, 2001) and the Theory of Planned Behavior (TPB, Ajzen, 1991). Rationales of research constructs were provided in the following sections.

2.1. The Expectation Confirmation Model

The expectation-confirmation model (ECM) was initially developed to predict consumers' behavior (Bhattacharjee, 2001). It specified perceived usefulness, confirmation, and satisfaction as important antecedents to explain continuance intention. According to the ECM, continuance intention refers to the user's willingness to continue using the thing (Bhattacharjee, 2001). Perceived usefulness indicates the degree to which people perceive using the system improves productivity. Satisfaction suggests users' perceptions of feeling satisfied when using the system (Bhattacharjee, 2001). ECM specified that both the perceived usefulness and satisfaction significantly influenced continuance intention, in addition, perceived usefulness significantly influenced satisfaction. When users' continuance intentions become higher, they would form higher perseverance and greater loyalty to MOOCs platforms and thus, lower drop-out rates will be achieved (Nong et al., 2022).

Perceived usefulness is indicated as an important factor in both the technology acceptance model (TAM) and ECM for its salient power in showing users' evaluation of the benefits of IS expected by themselves (Lee et al., 2023). It refers to the user's perception of the benefits of using something (Bhattacharjee, 2001), and in this study, it means to what extent learners believe MOOCs have helped them to accumulate knowledge, or to perform better in learning. The importance of perceived usefulness has been confirmed by previous studies in many different contexts (Kim & Lee, 2020; Lee et al., 2023; Rafque et al., 2020), especially in the context of online learning (Bhardwaj & Goundar, 2018; Wang et al., 2022). Studies have also confirmed that users' perceived usefulness has a positive impact on their continuance intention in MOOCs learning context (Alraimi et al., 2015; Junjie, 2017; Ouyang et al., 2017). Based on ECM and previous findings, we believe students' perceived usefulness of MOOCs ought to be a crucial factor in influencing their continuance intention.

Satisfaction influences the relationship between users' original use and continuous usage (Joo et al., 2018). Based on the ECM (Bhattacharjee, 2001), satisfaction refers to the user's feelings about the previous using experience or the feedback of their using experience (Ouyang et al., 2017). In this study, it means MOOCs users' responses after learning in the MOOCs platform (good, bad or not bad). Users' continuous intentions can be highly affected by their satisfaction with previous using experience (Alraimi et al., 2015; Badali et al., 2022; Wu & Chen, 2017; Zhou, 2017). A high level of satisfaction will lead to MOOC users' high continuance learning intentions.

Moreover, several studies have confirmed that users' perceived usefulness has a positive impact on their satisfaction (Junjie, 2017; Ouyang et al., 2017). When learning of MOOCs improves students' learning performance (in or out of the classroom), fulfills their learning needs, and helps them gain benefits (such as honor), MOOCs users will be more satisfied with this platform and will continue to participate in MOOCs learning.

2.2. Teacher Influence

Scholars have endeavored to unpack factors that influence users' continuance intentions, results suggested MOOCs learners' continuance intentions were mainly influenced by learners, courses and social influence. Learners' habit and curiosity (Dai et al., 2020a, 2020b), perceived enjoyment and computer self-efficacy (Alraimi et al., 2015; Rekha et al., 2023), and the task-technology fit (Wu & Chen, 2017; Ouyang et al., 2017) significantly influenced their continuance intentions. The notability and quality of MOOCs courses, the information quality, system quality, and service quality offered by the MOOCs platform (Alraimi et al., 2015; Rekha et al., 2023; Nong et al., 2022) were suggested as important enough to influence learners' perceptions and behaviors. As for the social influence, Lee (2010) suggested subjective norm (a factor suggested in the TPB), such as the surrounding people's opinions and suggestions, was an important factor for people to make decisions. Similarly, Zhou (2017) suggested that the social influence including internal (superiors, friends or colleagues) and external influences (advertisements or mass media) significantly influenced Chinese MOOCs learners' intentions. In the current study, we used teacher influence to suggest subjective norm, which was proposed in the theory of planned behavior (TPB), given for the majority of Chinese university students, teachers' suggestions are the most important sources of subjective norm.

Ajzen (1991) proposed TPB to explain people's decision-making process. Specifically, it clarifies how attitude, perceived behavioral control, and subjective norm affect an individual's behavior intention. Subjective norm refers to a kind of social pressure that makes a difference in deciding whether or not to perform the behavior (Ajzen, 1991). This pressure comes from their friends, relatives, or superiors who give advice on the implementation of the act. Studies suggested subjective norm has a positive and significant influence on users' intention to use a service or platform (Chen et al., 2018; Cheung & Vogel, 2013; Lee, 2010). The measurement of subjective norm in previous studies was mostly through general statements (Huang et al., 2020), such as "People who are important to me expect me to use MOOCs for learning" (Cheung & Vogel, 2013).

but such a general statement may cause participants' understanding difficulty (Huang et al., 2020) and thus, should be more contextualized. Therefore, this study adopted the concept of teacher influence to suggest the importance of subjective norm. In this study, teacher influence refers to the degree to which a student believes that his/her teacher expects students to use MOOCs (Lai & Chen, 2011).

In the educational context, many students choose to use MOOCs because their teachers think some courses are useful and practical and thus, recommend to students. Studies have shown that subjective norm significantly influenced an individual's perceived usefulness (Lavidas et al., 2020; Lavidas et al., 2022). In the current study context, if the usefulness of MOOCs were highly recommended by their teachers, students would be more likely to perceive MOOCs are useful and have stronger intentions to use the platform. In addition, studies have indicated that subjective norms are an important factor in influencing users' satisfaction (Chen et al., 2018; Huang et al., 2020). Lee et al. (2023) confirmed that the subjective norm can be a strong prediction on people's satisfaction with E-wallet. This study proposed that teacher influence had a significant impact on MOOC users' satisfaction.

2.3. Research Hypotheses

Based on the ECM, TPB, and previous studies mentioned above, the present study proposed a research model consisting of several research hypotheses, with the aim to testify the degree to which teacher influence impact MOOCs learners' continuance learning intention, as well as to examine the mediating roles of perceived usefulness and satisfaction in influence the relationship between teacher influence and continuance intention.

To achieve an easy understanding, the hypotheses are proposed in sequence of the paths through mediators and Figure 1 illustrated the research model.

H1. Teacher influence is positively related to MOOCs learners' continuance intention.

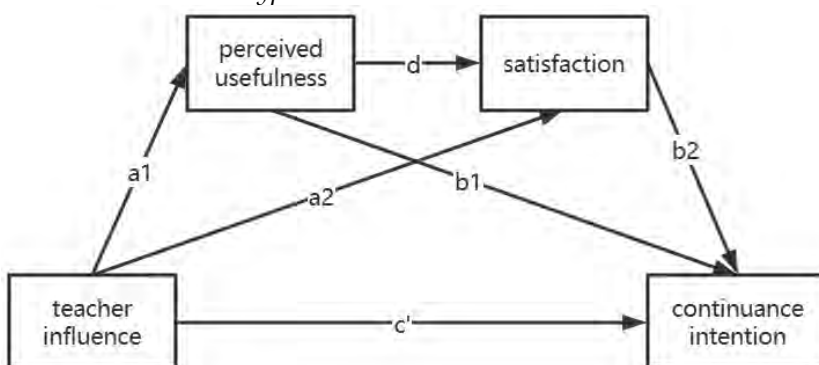
H2. Perceived usefulness mediates the relationship between teacher influence and continuance intention.

H3. Satisfaction mediates the relationship between teacher influence and continuance intention.

H4. Perceived usefulness and satisfaction serially mediate the relationship between teacher influence and continuance intention.

Figure 1

Research model and hypotheses



H1: Teacher influence \rightarrow Continuance intention = c' ;

H2: Teacher influence \rightarrow Perceived usefulness \rightarrow Continuance intention = a_1b_1 ;

H3: Teacher influence \rightarrow Satisfaction \rightarrow Continuance intention = a_2b_2 ;

H4: Teacher influence \rightarrow Perceived usefulness \rightarrow Satisfaction \rightarrow Continuance intention = a_1db_2 .

3. Method

3.1. Participants

Participants in the study were university students who participated in MOOCs courses. 192 questionnaires were collected and 26 were extracted because of casual fill with the same answers and data that do not fit the purpose of the study. The remaining data were responses from 166 university students who were located in 18 provinces in China, covering the provinces of Northern China, Eastern China, Southern China, and Central China. Among them, 36.1% were males and 63.9% were females; 67.5% were undergraduate students and 32.5% were graduate students. More than half of them (55.4%) have 1-3 years of MOOC learning experience, followed by 3-5 years (25.3%) and less than 1 year (18.1%). 38.6% of learners use MOOC for less than 1 hour per week. While most of them (51.2%) learn MOOC courses for about 1 to 4 hours per week.

Table 1

Participants' demographic information

<i>Demographics</i>	<i>Frequency</i>	<i>Percentage</i>
Gender		
Male	60	36.1%
Female	106	63.9%
Year of study		
Freshmen	4	2.4%
Sophomore	22	13.30%
Junior	35	21.1%
Senior	51	30.7%
Year 1 master	51	30.7%
Year 2 master	1	0.6%
Year 3 master	2	1.2%
MOOC learning experience (Year)		
<1	30	18.1%
1~3	92	55.4%
3~5	42	25.3%
>5	2	1.2%
Hours of learning in MOOC/week		
<1	64	38.6%
1-2	36	21.7%
2-4	49	29.5%
4-6	12	7.2%
>6	5	3.0%

3.2. Instrument

This study adopted a questionnaire to collect participants' responses to research items. The first section of the questionnaire inquires into participants' demographic information, such as gender, year of study, times of MOOC learning experience, hours of learning MOOC per week etc. The second part includes four dimensions, including perceived usefulness (PU), satisfaction (SAT), continuance intention (CI), and teacher influence (TI). Items underlying these dimensions were adapted from well-established scales that were published in previous studies, in order to ensure good reliabilities and validities of data. To be specific, perceived usefulness, satisfaction, and continuance intention were adapted from Bhattacharjee (2001). Items of teacher influence were adapted from Cheung and Vogel (2013). All questions were answered on a 7-point Likert scale (1= strongly disagree, 7 = strongly agree), which is a good and appropriate way of quantifying people's degree of recognition of a statement.

Considering the participants are Chinese and they may have difficulties in understanding English, items were translated into Chinese to ensure their understanding. We have adopted a

standardized translation and back-translation procedure to ensure the consistency of the meanings. Items were adapted where necessary to be suitable to the study context. For example, the item "Using MOOCs increase my productivity in learning" of perceived usefulness was changed to "Using MOOCs help me to understand related theories or knowledge". Reliabilities of the constructs were satisfying (Cronbach, 1951), with Cronbach's α coefficients ranging from 0.712 to 0.932 (see Table 2). And the Cronbach's alpha of the whole instrument is 0.934.

Table 2

The reliability of the measurement model

Constructs	Cronbach's alpha	Number of Items	References
Perceived Usefulness	0.867	4	Bhattacharjee, 2001
Satisfaction	0.932	4	Bhattacharjee, 2001
Teacher Influence	0.738	3	Cheung & Vogel, 2013
Continuance Intention	0.712	3	Bhattacharjee, 2001

3.3. Procedure

Purposeful sampling with the snowballing technique was used to collect data. University students who are familiar to the researchers were contacted to fill out the online questionnaires. All the participants were informed of the voluntariness of the participation. Besides, the confidentiality of data and anonymity were clearly shown at the beginning of the questionnaire. Since the research focus of this study is learners' continuance intention to learn MOOC courses, participants must have the experience of MOOCs learning (Dai et al., 2020b). So, the first question is "Have you ever joined a MOOC course?". Only the data from participants whose answer was yes is valid. Generally, participants spent an average of 3 minutes to fill out the questionnaire.

3.4. Data Analysis

To verify the hypothesized relationships, this study conducted a two-step data analysis by using SPSS 26.0. Firstly, multi-item psychometric scales are examined by using SPSS and AMOS: indicator reliability, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) (Hair et al., 2010). Confirmatory factor analysis (CFA) was conducted to get the goodness-of-fit indices (Hu & Bentler, 1999): the Tucker-Lewis index (TLI), the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). All of these data can ensure the reliability and validity of the research data and to lay the foundation for further analysis. Descriptive statistical analysis is used to show the general information of research items. Then, correlation analysis was estimated to test the associations between four variables.

Secondly, PROCESS v3.4.1 was used to test the hypothesized serial mediation model. PROCESS can be used to test the direct and indirect effects through ordinary least squares (Hayes, 2018), which are indicators of mediation effects proposed in the research model. To be specific, the present research adopted the Model 6 in the PROCESS, and the 95% confidence intervals, and 5000 bootstrap samples were used to test the indirect effects.

4. Results

4.1. Descriptive Results

Table 3 shows the result of descriptive statistics of all variables. It can be seen that the means of the variables ranged from 5.31 to 5.50 (SD ranged from 0.97 to 1.23), which indicated participants' positive responses to these variables. The univariate normality was tested by checking the values of likelihood maximum estimation of skewness and kurtosis for the observed variables, and the values ranged from -1.71 to -0.77 and from 0.42 to 4.92, respectively, meeting the recommended values of $|3|$ and $|8|$ (Kline, 2011).

Table 3

Results of descriptive statistics

<i>Variables</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>Kurtosis</i>
perceived usefulness	5.50	1.00	1.00	7.00	-1.71	4.92
satisfaction	5.31	1.18	1.00	7.00	-1.20	1.80
teacher influence	5.48	0.97	1.67	7.00	-1.21	1.67
continuance intention	5.34	1.23	1.00	7.00	-0.77	0.42

Table 4 indicated the results of the Pearson correlations of all variables. Teacher influence is significantly correlated with MOOCs learners' continuance intention (.51), perceived usefulness (.64) and satisfaction (.57). Continuance intention is also correlated significantly with perceived usefulness (.71) and satisfaction (.76). Satisfaction correlated significantly and positively with perceived usefulness (.78).

Table 4

Pearson correlations of variables

<i>Variables</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. perceived usefulness	1.00			
2. satisfaction	.779**	1.00		
3. teacher influence	.639**	.566**	1.00	
4. continuance intention	.707**	.759**	.513**	1.00

Note. * $p < 0.05$, ** $p < 0.01$.

4.2. Results of Factor Loadings

Table 4 showed the results of the factor loadings of research items. Factor loadings are all greater than 0.5, indicating good validity (Hair et al., 2010). Besides, the values of the composite reliability (CR) (ranged from 0.754 to 0.933) for all the constructs were above 0.70, showing good construct reliability and internal consistency (Hair et al., 2010). All the values of average variance extracted (AVE) (ranged from 0.513 to 0.778) were greater than 0.5, which meet the requirements of good convergent validity (Fornell & Larcker, 1981).

In addition, the constructs showed an adequate or good model fit. The value of χ^2/df is 1.843, which is between the ideal value of 1~3 (Carmines & McIver, 1981). The RMSEA = 0.065 [0.044, 0.084], which is within the suggested value of 0.8. And the test results of TLI (.96) and CFI (.969) are both at an excellent level (Hair et al., 2010). The value of SRMR is .0398.

Table 5

Results of standardized factor loadings

<i>Variable</i>	<i>Item</i>	<i>Factor loading</i>	<i>AVE</i>	<i>CR</i>
Perceived Usefulness	PU1	0.805	0.622	0.868
	PU2	0.789		
	PU3	0.771		
	PU4	0.790		
Satisfaction	SAT1	0.859	0.778	0.933
	SAT2	0.869		
	SAT3	0.885		
	SAT4	0.914		
Teacher Influence	TI1	0.827	0.513	0.757
	TI2	0.704		
	TI3	0.600		
Continuance Intention	CI1	0.890	0.518	0.754
	CI2	0.711		
	CI3	0.505		

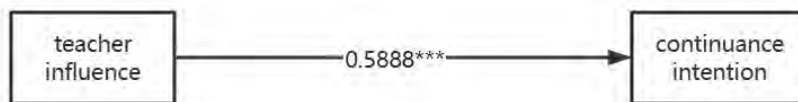
Note. CR: composite reliability; AVE: average variance extracted.

4.3. Results of Mediation Analysis

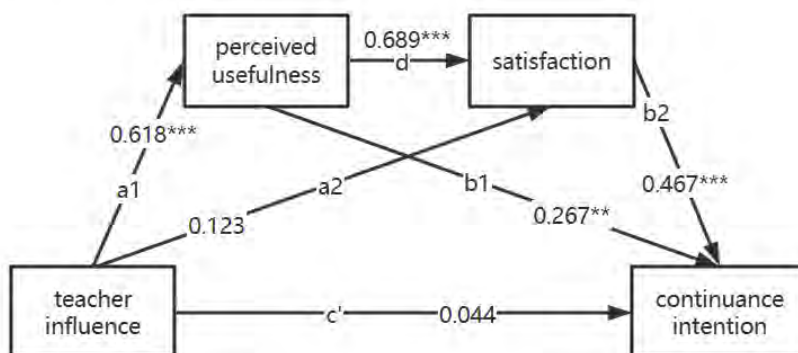
Mediation analysis suggested in the research model were demonstrated in Table 5 and Table 6 by controlling gender and grade. All in all, the total effect of the research model (Figure 2) showed that there is a positive relationship between teacher influence and continuance intention ($\beta = 0.589$, $p < 0.001$). 65.8% of the variance of continuance intention was explained by the variables. To be specific, teacher influence is not significantly associated with MOOCs learners' continuance intention ($\beta = 0.044$, $p = 0.47$). Thus, H1 is not supported. Teacher influence was significantly and positively related to perceived usefulness ($\beta = 0.618$, $p < 0.001$) and the perceived usefulness has a significant and positive relationship with continuance intention ($\beta = 0.267$, $p < 0.01$), indicating that teacher influence had a significant indirect effect on continuance intention via perceived usefulness (a_1b_1) (Effect = 0.209, 95% CI = [0.040, 0.398]). Thus, H2 was supported. In addition, results showed that continuance intention has a significant and positive correlation with satisfaction ($\beta = 0.467$, $p < 0.001$), but there is no significant correlation between teacher influence and satisfaction ($\beta = 0.123$, $p = 0.051$). That is to say, teacher influence did not have an indirect effect on continuance intention via satisfaction (a_2b_2) (Effect = 0.073, 95% CI = [-0.007, 0.166]). Thus, H3 was not supported. For the serial mediation analysis, the indirect effect of teacher influence on continuance intention serially via perceived usefulness and satisfaction was found to be significant (a_1db_2) (Effect = 0.252, 95% CI = [0.135, 0.397]). Thus, H4 was supported. Since the direct effect of teacher influence on continuance intention was not significant, the proposed research model was a structural model with full mediation (Zhao et al., 2020). The proposed mediation model explained 65.8% of the variance of continuance intention variable, 63.1% of satisfaction variable, and 42.3% of perceived usefulness variable. Detailed results were illustrated in the Figure 2 and Table 6.

Figure 2
Results of research model

Total effect



Mediation effect



Note. *** $p < 0.001$, ** $p < 0.01$

Table 6

Results of serial mediation effects and hypotheses

<i>Path</i>	<i>B</i>	<i>SE</i>	<i>BootLLCI</i>	<i>BootULCI</i>	<i>Results</i>
Total effect (c)	0.589***	0.080	0.431	0.747	
H1: Direct effect (c')	0.056	0.077	-0.097	0.209	Unsupported
a1	0.636***	0.063	0.512	0.760	
a2	0.149	0.076	-0.001	0.299	
b1	0.328**	0.099	0.133	0.523	
b2	0.488***	0.080	0.331	0.645	
d	0.812***	0.074	0.665	0.959	
Indirect effects					
Total indirect effect	0.533	0.105	0.336	0.746	
H2: Indirect 1	0.209	0.090	0.040	0.398	Supported
H3: Indirect 2	0.073	0.043	-0.007	0.166	Unsupported
H4: Indirect 3	0.252	0.067	0.135	0.397	Supported

Note: *** $p < 0.001$, ** $p < 0.01$. B: unstandardized regression coefficient.

5. Discussion

This study examined the relationship between teacher influence and continuance intention via the serial mediation role of satisfaction and perceived usefulness in the Chinese higher educational context. Results showed that teacher influence did not directly and significantly influence MOOCs learners' continuance intention (H1), but through the perceived usefulness and satisfaction. This suggested that teachers' opinions or suggestions did not significantly influence students' continuance intention to use MOOCs. These results were not aligned with findings in the previous research (Bhardwaj & Goundar, 2018; Wang et al., 2020) but are consistent with Cheung & Vogel's (2013) and Zhou (2016). A possible explanation is that university students are becoming more and more independent learners who have the rights to choose learning contents. Although teachers usually suggest or even require students to use MOOCs, the final decisions rely on students themselves. Especially when the MOOCs are not tied to their academic credits.

Perceived usefulness was proved to mediate the relationship between teacher influence and continuance intention (H2). Students tend to continue to use MOOCs if they acquire the perceived usefulness of MOOCs, such as improving their personal abilities and academic performance, or helping them find new jobs (Hew & Cheung, 2014; Shanshan & Wenfei, 2022). This is also consistent with studies of Alraimi et al. (2015), Kim & Lee (2020), Ouyang et al. (2017), Wu & Chen (2017), Zhou (2017). Furthermore, students that choose to learn MOOCs will tend to follow their teachers' opinions because they may think that the teachers were at a high level in this field (Wang et al., 2020). Courses recommended by scared schoolteachers were believed to have high quality to offer knowledge and skills and thus, students may form perceived usefulness. Once the perceived usefulness is increased, they will be more likely to continue their MOOCs learning.

This study did not suggest satisfaction played a mediating role in the relationship between teacher influence and continuance intention (H3). One possible reason is that MOOCs users' satisfaction is affected by many factors, and it might not be highly influenced by their teachers. In fact, learners pay more attention to their own personal needs (Olasina, 2018) rather than other people's words or requirements. Previous studies have shown that pleasant and interesting courses, courses that meet or exceed expectations, or courses provided by well-known teachers can better improve users' satisfaction (Alraimi et al., 2015). Kim & Lee (2020) also pointed out that users' satisfaction also depends on the costs of the course, whether they can learn the course at their own pace, or whether they can interact and communicate with teachers or peers. Therefore, teachers' suggestions or opinions are not sufficient in influencing students' satisfaction.

Although the indirect mediation effect of teacher influence via satisfaction on continuance intention was not proved, satisfaction was found to have a significant and positive effect on continuance intention. Our findings echoed the results confirmed by the previous studies (Alraimi

et al., 2015; Badali et al., 2022; Daneji et al., 2019; Joo et al., 2018; Ouyang et al., 2017; Zhou, 2017). When students are highly satisfied with their performance on MOOCs, gain benefits like learning honor, they are more willing to continue to use MOOCs.

Besides, the serial mediation effect of perceived usefulness and satisfaction (H4) was also confirmed in this study. That is to say, besides the significant effects of teacher influence on perceived usefulness and satisfaction on continuance intention, perceived usefulness was also found to have a significant impact on satisfaction, which is consistent with the results of Ouyang et al. (2017) and Joo et al. (2018), but conflicts with other previous studies (Alraimi et al., 2015; Daneji et al., 2019; Kim & Lee, 2020). Before the initial use of MOOCs, students will have their own and specific learning aims and motivations. When students believe that MOOC courses can achieve their purposes, such as to revise their learning skills, increase knowledge accumulation, improve learning performance or learning efficiency, they will be more satisfied with MOOCs, which will further lead to continuance intention.

6. Conclusion

This study explored the association between students' continuance using intention of MOOCs via satisfaction and perceived usefulness in the Chinese higher educational context. All in all, the proposed serial mediation model explained 65.8% of the variance of continuance intention. Specifically speaking, teachers' influence was not found to be directly related to continuance intention. However, perceived usefulness alone and the serial path of perceived usefulness and satisfaction are statistically significant in mediating the relationship between teacher influence and continuance intention.

6.1. Implications

This research has both theoretical and practical implications. Theoretically speaking, this study offers empirical evidence for serial mediating effects of perceived usefulness and satisfaction in the relationship between teacher influence and continuance intention. This study also offers a novel insight for future studies to further investigate and comprehend the complex mechanism behind the continuance intention of MOOC learning.

Practically speaking, this research provides valuable suggestions for schoolteachers, MOOCs platforms and MOOCs lecturers to effectively encourage their students to use MOOCs in the following ways. Firstly, MOOCs teachers should take measures to improve the quality of MOOCs so as to improve perceived usefulness. They can organize the language according to the students' age and understanding ability, and adjust the speed to ensure that students can hear clearly and follow. Besides, MOOCs should be concise, and teachers should highlight the key points by changing the tones of their voices, and reasonably organize the language. In addition, teachers are supposed to promote and encourage students to learn in MOOCs, but it will be useless to force students to use this MOOCs. Furthermore, students should turn perceived usefulness and satisfaction into their actual learning behavior. The MOOCs platform should provide high-quality and convenient services to improve students' satisfaction and perceived usefulness (Ouyang et al., 2017). And they can also make advertisements for MOOCs and praise users who completed the courses. Besides, MOOCs developers are suggested to collect feedback from learners to improve their service.

6.2. Limitations and Suggestions for Future Studies

This study has its limitations. First of all, this study used 166 responses from MOOCs users to test the research model. Although the sample size fully meets the statistical requirements, it is worth noticing given that the MOOCs platform has a huge market and thousands of users, the representativeness of the results is limited to some extent. In the future research, more samples need to be collected from more universities across the country to improve the credibility of the study. Second, this research mainly focuses on college students and does not consider other

MOOCs users, future studies can invite other user groups such as teachers to better understand continuance intention.

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