

# Investigation and Analysis of the Current Situation of MOOC Learning among University Students in the Post-epidemic Period --Xi'an Jiaotong University as an Example

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**Abstract.** MOOC, whose full name is Massive Open Online Course, usually refers to the free and open online learning platform for the whole society. MOOC has received a lot of recognition from the academic community for its advantages of course diversity, platform openness and learning autonomy. Nowadays, MOOC has entered the universities and become a platform for students to learn professional knowledge. The importance of MOOC in academics cannot be ignored, and it is imperative to understand the views of college students as the main audience group and make corresponding suggestions to optimize knowledge absorption.

## 1. Introduction and Review

The advent of the "Internet+" era has brought different new opportunities and challenges to many traditional industries. In the field of education, Internet technology has also brought many innovative new teaching methods, one of which is MOOC, which has attracted much attention in recent years.

Since the outbreak and rapid spread of the COVID-19 at the end of 2019, thanks to the characteristics of high efficiency, free and openness, coupled with various incentives from universities and governments, MOOC have gained the recognition of most students in a short period of time and have been widely used in many universities. And with the arrival of the post-epidemic era <sup>①</sup>, MOOC has inevitably become a pillar of higher education. As of November 2022, the number of MOOC in China has reached 62,000 courses, with 402 million registered users and 979 million learners, and 352 million students have been recognized as receiving MOOC credits, which makes the number of courses and learners the first in the world <sup>[1]</sup>. According to Coursera as well as Udacity and other platforms in the world, the use and the importance of MOOC also show rapid growth. Therefore, the investigation and analysis of the current situation of MOOC learning among college students in the post-epidemic period has become a major topic that has been widely discussed and researched.

In the world, research and reviews on MOOC have emerged since 2012. Among the many studies, most of the scholars give high evaluation and affirmation to the role

of MOOC. Typical examples are: in the literature <sup>[2]</sup>, Qing Li and Tao Wang summarize the main advantages of MOOC as easy to use, free, diversified resources, self-directed learning, and socially constructed; Jonatan Castaño-Muñoz and Margarida Rodrigues et al. refer to MOOC in the literature <sup>[3]</sup> as a reliable tool that is often considered it not only scale up education, but also provide job-related training. However, a considerable number of studies have also exposed many drawbacks of MOOC, mainly focusing on the high percentage of abandonment, lack of supervision of student learning, worrisome learning efficiency, poor evaluation system, and the existence of certain falsification and academic misconduct. For example, in a study in the literature <sup>[4]</sup>, Du Yan, Yu Yang et al. found that only about 10% of students actually completed the corresponding MOOC courses due to the lack of individuation and interactivity. In the literature <sup>[5]</sup>, Lingyao Li and John Johnson et al. concluded that MOOC is a highly controversial aspect of higher education nowadays based on sentiment analysis. By searching Elsevier and CNKI databases we found that questioning and rethinking of MOOC platforms are emerging in large numbers in the post-epidemic era.

In this research paper, we focus on the investigation and analysis of the current situation of MOOC learning among college students in the post-epidemic period through questionnaires and online interviews with undergraduate students and MOOC operation staff at Xi'an Jiaotong University, and try to give constructive suggestions to improve the effectiveness of MOOC learning among college students at the present stage.

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<sup>①</sup>Taking China's and the world's epidemic prevention policies and the direction of the world epidemic into account, we define June 2021 as the starting point of the post-epidemic era.

## 2. Survey Methodology

### 2.1 Survey Participants

In this paper, Xi'an Jiaotong University (XJTU), a representative university in China, is selected for this study because it has the highest level of undergraduate education in China, a high MOOC usage rate among students, and a large number of excellent MOOC producers and operators.

A total of 489 questionnaires were administered in this study. Excluding potential web crawlers, questionnaires with low completion rate or questionable authenticity, 449 valid questionnaires were obtained, including 292 males and 157 females. And the more detailed information is as follows

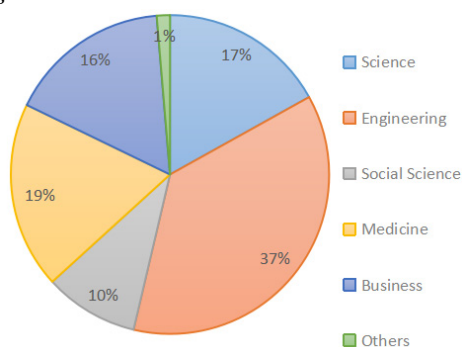


Fig. 1. Professional distribution of questionnaire participants

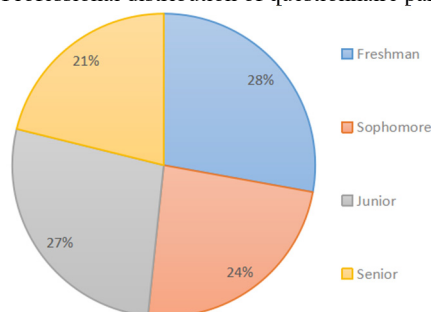


Fig. 2. Grade distribution of questionnaire participants

### 2.2 Survey Tools

#### 2.2.1 Questionnaire Content.

The name of the questionnaire is "MOOC Learning Status Questionnaire for College Students in Post-Epidemic Period". Based on the core viewpoints of behaviorism and humanistic learning theory, we divided the questionnaire into four dimensions of cognition, emotion, intention and behavior, and set about five multiple choice questions related to each latitude, with five options of strongly agree, agree, neutral (unclear), oppose and strongly oppose for selection. There are five options to choose from. The questionnaire was disseminated and distributed through social media and school forums between March 21, 2022 and September 22, 2022 using the Questionnaire Star App as a vehicle. After that we used SPSS 26.0 statistical package to summarize, sort, classify and analyze the valid questionnaires.

#### 2.2.2 Interview Content.

The interviews were conducted mainly through social media as well as emails, and were conducted in the fall and winter of 2022. The interviews were based on the results of the questionnaire survey and the content of the interviews was used as a supplement and corroboration of the questionnaire survey results. For the content of the interviews we referred to the literature [6] and the general framework is as follows.

Table 1. Interview Content Framework.

Interview Dimension	Content	Interviewee
platform construction	Platform construction, technical support, school-enterprise alliance	Administrators
Management for MOOC	Control and supervision of the teaching process	
Teaching aims	The setting of teaching aims	Teachers
Teaching ability	Content, methods, training	
Platform evaluation	Technical evaluation, functional evaluation	
Interaction and evaluation	Student's assessment, teacher's evaluation	

## 3. Survey Results and Analysis

### 3.1 Reliability and Validity of the Questionnaire

Reliability is an indicator of the reliability of the measured data. In this paper, Cronbach's alpha (Cronbach's coefficient method) is used to conduct reliability analysis and the results are as follows.

Table 2. Reliability Test of Questionnaire

Cronbach's alpha	0.924
Cronbach alpha based on normalization term	0.924
Number of questionnaires	449

Cronbach's alpha coefficient values in the range of 0.80 to 0.90 are generally considered to have excellent reliability, and 0.65 to 0.70 are the minimum acceptable values. This shows that the reliability of the questionnaire in this study meets the requirements.

The validity test is to test the validity of the questionnaire, which aims to measure the accuracy and validity of the question set. In this study, validity was verified using KMO and Bartlett's test, and the results of the analysis are presented in the following table

Table 3. Credibility Test of Questionnaire

<b>KMO</b>	0.867	
<b>Bartlett's sphericity test</b>	approximate chi-square	1833.4
	degrees of freedom	234
	conspicuousness	0.000

It can be seen that  $KMO=0.867>0.6$ , which can be considered that the validity of the study data is good and this questionnaire has a high degree of reasonableness.

### 3.2 Results of the Questionnaires and Interviews

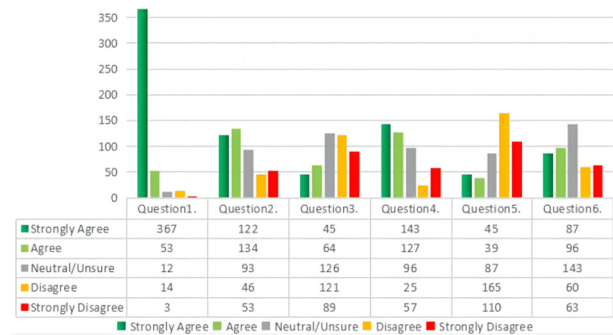
#### 3.2.1 Results of Cognitive Dimension.

There are six questions on this dimension, as shown in the table below

**Table 4.** Questions of Cognitive Dimension

Question content	Num.
Do you have a basic cognition of MOOC?	449
Do you think MOOC academic grades will be recognized by major universities?	448
Do you think the MOOC model will become the mainstream of teaching in your field?	445
Do you think learning a MOOC will help you with your major or general knowledge?	448
Do you think the MOOC online teaching model has no substantial overall impact on your learning?	446
Do you think the course you are taking is suitable to be recorded as a MOOC?	449

The statistics are visualized as



**Fig. 3.** Results of the Cognitive Dimension

This shows that XJTU students have a good basic perception of MOOC, which was explained by almost all respondents in the interviews as a result of the strong and in some ways almost mandatory implementation of MOOC at XJTU. In other aspects, such as the recognition of MOOC, the promotion of learning, and the existence of drawbacks, the questionnaire results are more scattered which reflect a certain controversy. This coincides with the assertion of Rodrigo Campos and Rodrigo Pereira dosSantos et al. in the literature [7] that the rapid and to some extent disorganized development of the MOOC poses some difficulties for the accurate perception and selection of students in the system.

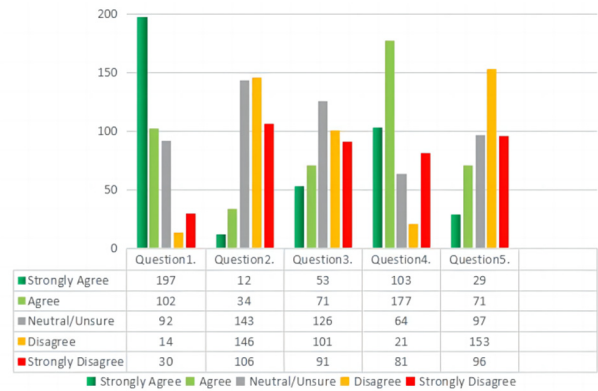
#### 3.2.2 Results of Emotional Dimension.

There are five questions on this dimension, as shown in the table below

**Table 5.** Questions of Emotional Dimension

Question content	Num.
Do you get bored and fed up while studying in a MOOC?	435
Do you think the knowledge gained from MOOC impressed you more than offline classes?	441
Can you adapt to the fragmented but frequent teaching of a MOOC?	442
Are you comfortable with courses that must be completed over a period of time but can be freely scheduled?	446
Are you satisfied with the teaching platform of the MOOC you have chosen?	446

The statistics are visualized as



**Fig. 4.** Results of the Cognitive Dimension

It is evident that XJTU students are still at a moderately low level of likability and adaptation to MOOC from the emotional aspect. This is consistent with many other surveys completed at universities in recent years [8-11]. In further interviews, more than five MOOC presenters speculated that this negative sentiment is closely related to the current XJTU mandatory inclusion of MOOC grades in many major course assessment systems.

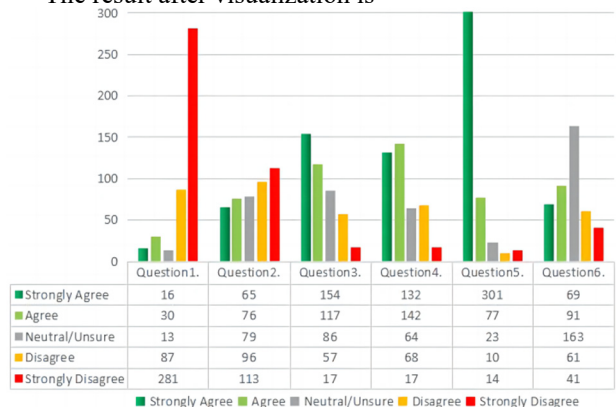
#### 3.2.3 Results of Intention Dimension.

There are five questions on this dimension, as shown in the table below

**Table 6.** Questions of Intention Dimension

Question content	Num.
Would you have taken the initiative to learn the MOOC without the teacher's requirements and incentives?	427
Continuation	
Even with adequate incentives, can you guarantee that a MOOC course will not be abandoned halfway through?	429
If there was an online dual degree MOOC, would you participate?	431
Will you take a MOOC when it can replace an existing course?	423
Will you take MOOC credit when it counts as optional course credit?	425
Would you recommend a MOOC to your friends?	425

The result after visualization is



**Fig. 5.** Results of the Intention Dimension

The attitudes towards questions one and five present a very contrasting picture, and the results of question five reflect the reality of XJTU. As Pedro Manuel Moreno-Marcos and Pedro J. Muñoz Merino argue in [12], MOOCs, because of their structural and systemic nature, inevitably have a very high abandonment rate, unless there is a reasonable incentive policy. The best incentive policy is one that is linked to the student evaluation system, but is relatively binding because of its mandatory nature, as shown by other issues. All interviewees said that there is no better incentive policy.

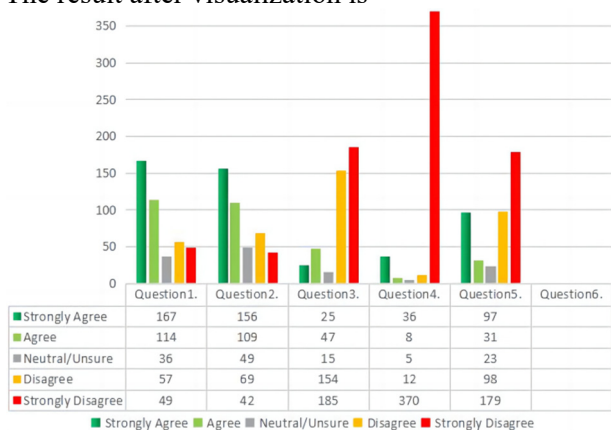
### 3.2.4 Results of Behavioral Dimension.

There are five questions on this dimension, as shown in the table below

**Table 7.** Questions of Behavioral Dimension

Question content	Num.
Are you satisfied with the course scores you received on the MOOC?	423
Are you completing enough exercises on the MOOC course?	425
Do you repeatedly watch important videos in the mooc?	426
Have you ever reached out to a lead instructor through a MOOC platform?	431
Have you participated in mooc's forum discussions?	428
Are you satisfied with the course scores you received on the MOOC?	423

The result after visualization is



**Fig. 6.** Results of the Behavioral Dimension

From the above data, it can be seen that most of the students can basically complete the corresponding MOOC study, but most of them only stay at the most basic completion and do not go further to use the MOOC platform to study or participate in some activities of the MOOC platform. In the interviews, more than half of the interviewees thought that this phenomenon was related to the specific course requirements. Most of the courses at XJTU only require the completion of the basic connections and exams to get the corresponding assessment marks, and only a small number of MOOC courses force students to participate in forums or watch learning videos. This is somewhat different from other related studies, such as the survey in the literature [13],

which is supposed to be due to the difference in policy orientation of different schools.

## 4. Conclusion

MOOC has become the world's largest online learning platform, providing many conveniences for college students' learning in the post-epidemic period. However, the results of this study still exposed many disadvantages of the current MOOC, which can be roughly summarized as the following points.

First of all, students do not have a high degree of completion of MOOC courses, and their motivation for MOOC learning is not high. And the problem has been glossed over in part by schools' mandate to push MOOC.

Second, the fragmentation of knowledge on the MOOC platform and the fundamental characteristics of online teaching objectively hinder the improvement of students' learning efficiency.

The third point is that most students have certain disadvantages in the methods and habits of using the MOOC platform, so that many functions and methods that are beneficial to learning have not been applied

Finally, and crucially, MOOC operators and school policies lack proper incentive policies and promotion strategies, and coercive means of questioning can only treat the symptoms but not the root cause

## 5. Recommendation

### 5.1 For Students

#### 5.1.1 Strengthen Self-control and Binding Force.

There is no face-to-face supervision from teachers in MOOC learning, and the randomness of MOOC learning locations makes students vulnerable to interference from external factors in the learning process, and their attitudes are negative and lazy. This is a structural defect of MOOC learning, but the root of it is actually the low self-control of students. Therefore, the most effective and fundamental solution is to strengthen students' self-control and willpower

#### 5.1.2 Try to Eliminate External Interference

Although the MOOC platform faces many problems, students should play their own initiative to a large extent, and offset the defects of MOOC itself through unexpected means of MOOC. For example, looking for a place to study with a learning atmosphere, seeking an efficient learning method, combining online and offline learning to complement each other, etc. to increase learning efficiency



## 5.2 For Universities

### 5.2.1 Improve the Incentive Mechanism

The incentive mechanism should be flexibly linked to the student evaluation system to increase the opportunities for students to choose their own courses and to give credit accordingly. At the same time, the way of awarding credits can be improved appropriately, instead of relying solely on written grades to define students' learning which consideration can be given to referring to papers or experiments with innovative ideas.

## 5.3 For MOOC Platforms

### 5.3.1 Improve the Examination System

Improve the examination procedures of the platform to avoid dishonest behaviors such as substitution and cheating, and make the examination process and results more open and transparent.

### 5.3.2 Follow up Course Learning Style

Increase the interactivity between students and teachers to further enhance the interest of the course and make students enjoy the learning process. After learning the course, the backstage teacher answering questions and solving problems should be timely, with questions on the spot and solutions on the spot.

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