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Problems and Optimization Strategies in the Construction of MOOC Quality Courses in Universities under the Perspective of Online Education

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Abstract: - With the widespread popularity of the internet and smart electronic devices in China, the construction of MOOC quality courses in Chinese universities has developed rapidly with significant achievements. However, in the swift advancement of MOOC quality course construction in Chinese universities, some problems have gradually surfaced. This paper takes the "Chinese University MOOC" platform course "Performance and Appreciation of Chinese National Female Soprano Works" as a research case to discuss the existing problems in the construction of MOOC quality courses in Chinese universities. The results indicate that low registration numbers of learners, a student structure dominated by students from the host university, low participation in tests and assignments, and unsatisfactory interactive communication are the main existing problems. The primary causes of these issues include the focus of MOOC quality course construction primarily on students from the host university, neglecting social learners; an emphasis on construction over management, neglecting the organization and management of the teaching process; and excessive reliance on the MOOC platform for course promotion. Based on this, optimization suggestions are proposed, mainly to enhance the integration of MOOC course content, strengthen the organization and management of the MOOC course teaching process, innovate MOOC teaching models combining online and offline methods, and promote MOOC courses through multiple pathways and channels.

Keywords: University MOOC Construction, MOOC Quality Course Construction, Online Education, Online Courses.

I. INTRODUCTION

Massive Open Online Course, abbreviated as MOOC, was first introduced by Canadian scholars Stephen Downes and George Siemens in 2008, sparking a research frenzy worldwide. Countries globally have considered MOOC project development as an important direction for higher education reform in the network era. During 2012-2013, countries such as the United States, the United Kingdom, Europe, and Australia launched their MOOC platforms, with prominent and influential ones including Coursera, edX, FutureLearn, OpenupEd, and Open2Study projects[1,2]. The rapid global development of MOOCs has received significant attention from Chinese universities. In October 2013, Tsinghua University launched the localized MOOC platform "XuetangX," and in January 2014, Shanghai Jiao Tong University, in collaboration with other C9 and some 985 universities, introduced the "Chinese University MOOC" platform[3]. That same year, NetEase, in partnership with the Higher Education Press of China, launched the "Chinese University MOOC" platform, undertaking the Ministry of Education's task of national quality open courses, offering MOOC courses from renowned Chinese universities. As of 2022, "Chinese University MOOC" has hosted over 10,000 open courses and more than 1,400 national quality courses, collaborating with 803 universities, becoming the largest Chinese MOOC platform.

As of December 2023, China's internet population reached 1.092 billion, with a year-on-year increase of 24.8%, and an internet penetration rate of 77.5%; the total scale of mobile internet users in China reached 1.227 billion, maintaining a stable growth rate of 2% throughout the year[4]. The large population base and high internet penetration rate provide a solid foundation for China's online open education. Relying on MOOC platforms, Chinese universities have formed a comprehensive multi-level construction system of school-level, provincial-level, and national-level quality courses. The construction of MOOC quality courses in universities has shown explosive growth, with all major universities actively engaged in various MOOC quality course projects under the promotion of relevant policies. However, while the construction of MOOC quality courses in universities is flourishing, some problems have gradually emerged. This paper, based on the relevant policies and guidelines for the construction of MOOC quality courses in Chinese universities, takes the construction of the "Performance and Appreciation of Chinese National Female Soprano Works" MOOC quality course at Jiangxi University of Finance and Economics as an example to discuss the existing problems and optimization strategies in the construction of MOOC quality courses in Chinese universities.

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II. Current Status of MOOC Quality Course Construction in Chinese Universities

In July 2017, the Ministry of Education of China issued the "Notice on Carrying out the Accreditation Work of National Quality Online Open Courses in 2017," and on January 15, 2018, the first batch of 490 "National Quality Online Open Courses" was launched[5]. In 2019, the Ministry of Education released the "Implementation Opinions on the Construction of First-Class Undergraduate Courses," establishing five basic principles and seven major construction contents for China's MOOC development[6]. In 2020, the Committee on Informatization and Innovative Teaching Methods in Higher Education of the Ministry of Education issued the "Standards and Application Guide for MOOC Construction in Higher Education Institutions," proposing MOOC terminology standards, basic and excellent standards for MOOCs, basic and excellent standards for MOOC-based blended courses, and MOOC platform standards. It provided basic and excellent standards for MOOC-based blended courses from six aspects: course positioning and value, MOOC application methods, blended teaching design, blended teaching implementation, course teaching team and teaching service, and blended course evaluation/course characteristics and promotional application[7,8].

The types of MOOC quality course construction in universities mainly include general education courses, public basic courses, professional basic courses, and specialized courses, with the majority of MOOC resources in most universities being applied to public courses, elective general education courses, and professional basic courses.

III. Research Case Overview

"Performance and Appreciation of Chinese National Female Soprano Works" is an online vocal music course launched by the Music Department of the School of Arts, Jiangxi University of Finance and Economics. The course construction team consists of 5 members, including 2 professors and 3 lecturers. The course construction project received school funding of 150,000 yuan. The course was launched on the iCourse platform (Chinese University MOOC platform) on October 8, 2020, and has been cycled through 7 terms (with 6 terms completed as of the time of writing), becoming an important online quality course for general aesthetic education for non-music major students at the university. Table 1 summarizes the basic operation status of the course on the Chinese University MOOC platform.

Table 1: Basic Online Operation Status of the Course [n(%)]

Term	Duration	Number of Registrants	Test and Assignment Participation Rate	Examination Participation Rate	Examination Passing Rate
1	2020-10-08~ 2021-02-01	462	189(40.91)	359(77.71)	281(78.27)
2	2021-03-29~ 2021-06-06	362	212(58.56)	317(87.57)	288(90.85)
3	2021-09-10~ 2021-12-31	538	232(43.12)	427(79.37)	341(79.85)
4	2022-03-03~ 2022-06-05	345	115(33.33)	262(75.94)	222(84.73)
5	2022-09-05~ 2022-12-31	747	245(32.80)	631(84.47)	527(83.52)
6	2023-02-20~ 2023-06-30	364	139(38.19)	260(71.43)	184(70.77)

IV. Problems in MOOC Course Construction

A. Issues with the Number of Registrants in MOOC Courses

As seen in Table 1, the total registration for the online course "Performance and Appreciation of Chinese National Female Soprano Works" over six terms is 2,818, averaging 469.7 registrants per term. Given the open nature of MOOCs, the number of registered students is obviously low. Using "vocal music" as a keyword, the author conducted a course search on the "Chinese University MOOC" platform and selected three similar national quality-certified courses and two non-national quality courses for a comparison of the number of registered students, as shown in Figure 1.

Figure 1 shows that the number of registered students for vocal music MOOC courses on the Chinese University MOOC platform generally exhibits a downward trend from terms 1-10. The fluctuation in the number of registered students is larger in terms 1-5 for all five courses, with a significant drop in terms 6-7, stabilizing in a relative range (between 1,000-2,000) from terms 6-10, but still showing a slow decline. The two non-national quality courses

exhibited a “high start, low continuation” trend, with the number of registrants falling below 1,000 after term 6 (one of the courses was only offered up to term 6, but its number of registrants had already dropped below 1,000). Looking at the data changes, terms 6-7 were the critical points for changes in MOOC registrant numbers. Afterward, the number of registrants per term became relatively stable, with national quality courses maintaining about 1,000-2,000 registrants (the national quality course 3 has been offered for 15 terms, maintaining a higher registration number in terms 7-10, but the number fell below 2,000 in terms 11-15). The stable number of registrants for non-national quality courses was below 1,000, consistent with the registration numbers in this study case. Therefore, for vocal music MOOC courses on the Chinese University MOOC platform, once they enter a stable operational phase, each term’s number of registrants is around 1,000, which is clearly low for a massive open online course.

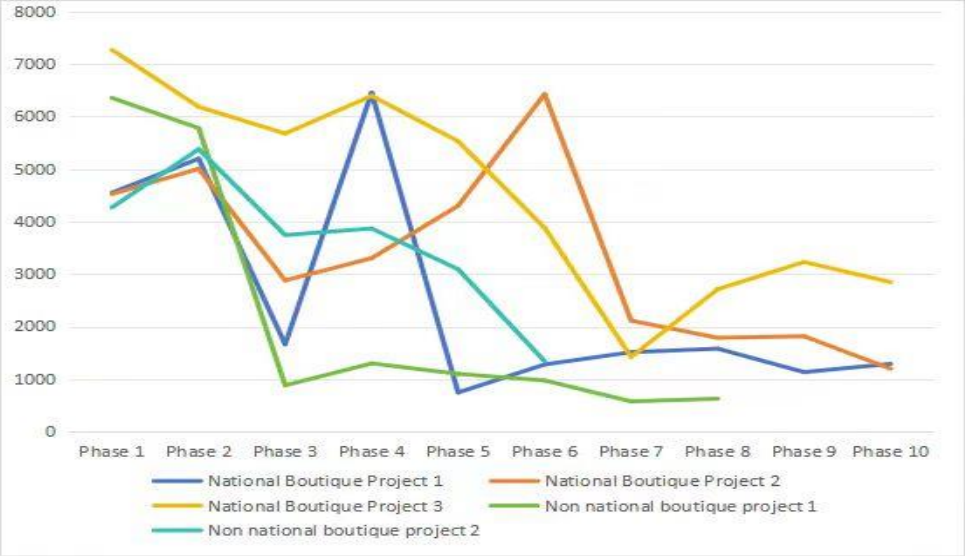

Figure 1: Comparison of Registrant Numbers for Vocal Music MOOCs on Chinese University MOOC Platform

B. Issues with the Composition of MOOC Course Registrants

For MOOC quality course construction in Chinese universities, learners are mainly categorized into three types: 1) students from the host university, whether specialized or non-specialized; 2) students from other universities; 3) social learners from various sources. Providing online courses to students from the host university is the primary task of MOOC quality course construction in universities, significantly influencing the content design, course management, and teaching methods of MOOC quality courses in Chinese universities. Table 2 shows the composition of registrants per term for the case study course on the Chinese University MOOC platform.

Table 2: Composition of MOOC Registrants by Term [n(%)]

Term	Total Registrants	Host University Students	Non-Host University Students
1	462	285(61.69)	177(38.31)
2	362	289(79.83)	73(20.17)
3	538	346(64.31)	192(35.69)
4	345	215(62.32)	130(37.68)
5	747	524(70.15)	223(29.85)
6	364	189(51.92)	175(48.08)
Total	2818	1848(65.58)	970(34.42)

Data from Table 2 indicates that students from the host university constitute the majority of the total number of registrants for each term of the case study course, with the highest term proportion reaching 79.83% and the lowest at 51.92%, averaging 65.58% over six terms. Clearly, host university students are the main component of the enrollment for online open courses, while the proportion of students from other universities and social learners is relatively low. This reflects the limited social impact of the course, which is also a significant reason for the low number of course registrants.

C. Issues with Completion Rates of MOOC Course Registrants

The course completion rate is primarily reflected by the number of participants in assessments (exams) and the number of students passing the course. As shown in Table 1, the overall course completion rate for the case study is high, but this is closely related to the low number of registrants per term, primarily consisting of students from

the host university. Table 3 presents the completion rate statistics for host university students versus non-host university students.

Table 3: Completion Rate Statistics for Host and Non-Host University Students

Term	Host University Students			Non-Host University Students		
	Number	Exam Participation Rate	Exam Passing Rate	Number	Exam Participation Rate	Exam Passing Rate
1	285	277(97.18)	275(99.28)	177	82(46.33)	6(7.32)
2	289	285(98.62)	284(99.65)	73	32(43.84)	4(12.50)
3	346	337(97.40)	333(98.81)	192	90(46.88)	8(8.89)
4	215	210(97.67)	209(99.52)	130	52(40.00)	3(5.77)
5	524	518(98.85)	515(99.42)	223	113(50.67)	12(10.62)
6	189	181(95.77)	179(98.90)	175	79(45.14)	5(6.33)
Total	1848	1808(97.84)	1805(99.28)	970	448(46.19)	38(8.48)

Table 3 shows that the exam participation and passing rates for host university students remain at a very high level, with only a few not participating in the course exam and very few failing the term assessment. However, the exam participation rate for non-host university students is lower, with an average of 46.19% over six terms, and the average passing rate is 8.48%. This aligns with the findings of related studies, which indicate that the overall exam passing rate for MOOC courses is relatively low[9,10].

D. Issues with Learning Efficiency and Quality in MOOC Courses

As indicated by the statistics in Table 1, the completion rates for tests and assignments across the six terms are relatively low, suggesting a lack of interest and motivation among students in completing educational tests and assignments. Table 4 shows the statistical results of interaction and communication for the six terms of the case study course, revealing that the interaction during the course offerings was not ideal. Both the number of posts made by teachers and students on the MOOC platform and the number of students participating in interactions were at a lower level, reflecting to some extent that the course management and student learning quality were not very high.

Table 4: Interaction and Communication Statistics

Term	Total Registrants	Total Posts	Teacher Posts	Participants in Interaction
1	462	53	10	80
2	362	333	10	36
3	538	422	15	225
4	345	288	10	128
5	747	640	20	484
6	364	221	20	175

V. CAUSE ANALYSIS

The problems encountered during the course offering in the case study are strongly interconnected, particularly the prominent issue of low student registration numbers, which is closely related to the composition of registered students.

From the course offering situation of this case study, combined with the investigation of other similar courses on the Chinese University MOOC, it is a common phenomenon that other universities and social learners account for an insufficient proportion of course registrants. This is a significant reason for the low or declining registration numbers for such courses. The deeper causes are more complex and mainly stem from the following aspects: firstly, the construction of MOOC quality courses in universities overly relies on course operation platforms, especially in terms of promotional reliance on the platform's traffic. Many course creators pay little attention to the promotion and publicity of the course after uploading it, leaving this task entirely to the MOOC platform. Clearly, this passive promotion has significantly impacted the number of student registrations for MOOC courses. Compared to international mainstream MOOC platforms, achieving a registration number exceeding ten thousand for a course is relatively feasible[11]. Secondly, the construction of MOOC quality courses in universities has poor integrative content for learners of different types and needs. MOOC registrants are characterized by broad geographical, age diversity, and various professions. In-school learners and social learners have different acceptances and demands for course content and teaching methods. In the construction of the course in this case study, it clearly tends to serve the aesthetic education needs of non-music major students from the host university, and the organization and design of course content are evidently not very friendly to social learners. This indicates that the course did not create a diffusion effect among early learners, and the main support for the number of course learners later on was

the host university's registered students, who have distinctly different motivations from other social learners. In this case study, obtaining 1.5 course completion credits is the main motivation for their registration, and the situation is similar for other similar courses at different universities. On the Chinese University MOOC platform, individual music courses with registrations exceeding 10,000 have clear general education characteristics in their content. This is the main reason for attracting social learners to participate in the course, maintaining high learning interest, forming social diffusion and impact, and thus sustaining a high number of registrants.

The overall completion rate of the case study course is high, which is also directly related to the structure of the registered students. With a composite ratio of 65.58% of host university students registering, it is not surprising that the overall completion rate is high when motivated by obtaining credits. However, the average exam participation rate of non-host university students over six terms is only 46.19%, indicating a lack of emphasis on completing the course by students and also showing the course's lack of appeal. The reasons for this situation, besides the course content design primarily serving host university students as mentioned above, include a lack of attention by teachers to the organizational aspect of MOOC teaching. In fact, many universities' construction of MOOC quality courses exhibits a degree of formalism and a "build-neglect-manage" issue, with teachers focusing extensively on video production[8], and not sufficiently considering MOOC teaching characteristics in teaching content design, course organization management, and teaching strategies. Post-launch optimization adjustments based on feedback and effective interaction with course learners are significantly delayed, which greatly impacts the overall quality of MOOC courses.

VI. Optimization Suggestions

A survey on MOOC construction in Chinese universities shows that the motivation for MOOC development in Chinese universities mainly lies in "promoting internal teaching and reform" and "improving the quality of talent training"[12]. In contrast, a survey report from Columbia University in the United States indicates that the primary motivations for MOOC construction in foreign universities are "expanding the school's influence" and "enhancing the school's reputation"[13].

A. Enhancing the Integration of MOOC Course Content

In organizing and designing classroom content for university MOOCs, there should be a focus on the diverse learners the course aims to reach, considering their learning abilities and needs in the selection and organization of course content[14]. In the internet era, learners have multiple ways to acquire knowledge, and for open online education MOOCs, the shift should be from "knowledge-centered" to "demand-centered" content organization, meaning the course content should meet the learners' needs. What content is chosen for the course, and in what sequence and logic it is presented, should depend on the abilities the course aims to develop in students, the learning motivations and needs of different learners, and what content selection and organizational plan can satisfy most learners' needs. Addressing these issues is crucial for making course teaching attractive, essential for maintaining learners' interest and ensuring successful course completion[15,16]. From this perspective, optimizing the integration of MOOC course content is a dynamic process, requiring continuous feedback-based adjustments during course teaching, which evidently involves issues of organizational management.

B. Strengthening the Organization and Management of the MOOC Course Teaching Process

An excellent quality MOOC is not merely about producing high-quality teaching videos for learners to study. Effective organization and management of the entire course teaching process, or the learning process of learners, is to some extent key to achieving successful course teaching outcomes[16]. Research findings indicate that the biggest factor influencing learners' completion of MOOC courses is their self-directed learning ability and self-discipline, especially for social learners[17,18]. Effective organization of MOOC teaching activities by course managers, through full interaction between teachers and students, can bring a certain order to open online teaching, enabling learners to complete their studies as planned. Improving learners' responsiveness to online learning undoubtedly plays a significant role in enhancing participation and completion rates in MOOC course tests, assignments, and examinations[19].

C. Innovating MOOC Teaching Models through Online-offline Integration

Currently, after launching MOOCs, most university MOOC creators primarily rely on online tests and assignments according to the course schedule, resulting in low participation and completion rates. There are even instances where students from the host university enlist others to complete elective courses on their behalf[20]. Therefore, there is a need to change the current singular form of course testing through a combination of online

and offline methods. For example, in terms of testing and assignment completion, a combination of practice exercises and video assignment submissions can be used; to address the issue of large numbers of learners, grouping learners and facilitating self-management and collaborative learning among students can be an effective solution. In essence, the core of online-offline integration is not necessarily organizing and planning offline activities, which is impractical for MOOC learners spread across different regions. However, influencing learners' offline studies through online organization is entirely feasible.

D. Multi-pathway and Multi-channel Promotion and Publicity of MOOC Courses

In the internet era, "traffic is king" has become an unassailable truth, which also applies to the construction of quality MOOC courses in universities. MOOC platforms have their own traffic distribution mechanisms, which are not transparent for courses of different levels, making it insufficient to rely solely on MOOC platforms for gaining learners' attention. The number of registered learners is a key indicator of a MOOC's excellence, and should be a focal point during the course construction process in universities, necessitating multi-pathway and multi-channel promotion and publicity of MOOC courses. For instance, leveraging the influence of universities to promote and publicize MOOC courses on their information platforms; establishing WeChat public accounts for MOOC course promotion, regularly posting relevant announcements and activities; using social media like Weibo to promote MOOC courses and initiate related topics; posting short videos on platforms like TikTok or Kuaishou to increase social awareness. MOOC course promotion and publicity should not be isolated but integrated with content construction, organizational management planning, and the display of assessment and evaluation results.

VII. CONCLUSION

The rapid development of information technology and industry in China has provided a favorable environment for online education, leading to the swift growth of MOOC platforms and quality course construction. The construction of MOOC quality courses in universities is a multi-level, continuously advancing process, from school-level quality courses to provincial-level and then to national-level quality course recognition, constantly improving the quality of course construction and addressing practical issues and deficiencies. However, a question that needs to be continuously considered in this process is: what is the core value of MOOC course construction? Only by focusing on this core question and evaluating the achievements and shortcomings in the MOOC construction process can the true essence and characteristics of MOOC course construction be realized.

REFERENCES

[1] Li Yan, Zhang Muhua. Comparative Study of Representative MOOCs Projects at Home and Abroad. Open Education Research, 2014, 20(03):53-62.

[2] Wang Peng, Ke Wenli. Development and Operational Status of MOOCs at Home and Abroad. Education Teaching Forum, 2019(13):51-52.

[3] Li Fei, Huang Mingdong. Opportunities and Challenges Brought by MOOCs to Universities. China Higher Education, 2014(07):22-26.

[4] National Library Research Institute. China Internet Network Information Center released the 52nd "Statistical Report on Internet Development in China". Journal of the National Library, 2023, 32(05):13.

[5] Xiong Xiaojin, Xie Dingyuan. Analysis of the Practice and Development Strategy of MOOC Localization in China. China Educational Technology, 2018(13):10-13

[6] Zhan Dechen, Xu Xiaofei, Zhang Long. Deep Understanding of University MOOC Guidelines, Build Online and Offline Blended Courses. Computer Education, 2021(10):1-6.

[7] Xu Xiaofei, Zhan Dechen, Zhang Ce. Reflections on the Construction Standards and Applications of University MOOCs. China University Teaching, 2021(05):85-91.

[8] Li Zhenghui, Sun Jing. Study on the Operation Model and Countermeasures of Blended Teaching in China – Based on 44 Universities in the China Finance MOOC Alliance. China University Teaching, 2022(Z1):88-95.

[9] Liu Yang, Huang Zhenzhong, Zhang Yu et al. Report on the Participation of Chinese MOOCs Learners. Tsinghua University Education Research, 2013, 34(04):27-34.

[10] Chen Zhansheng, Liu Xiaoyu. Research on Learner Characteristics and Effects under MOOCs Teaching Model. China Information Technology Education, 2017(23):110-112.

[11] Guo Baolong, Zhang Shuling, Zhang Pingping. Research and Analysis on the Construction and Application of MOOCs in Chinese Universities. Higher Education in Science, 2021(03):36-42.

[12] Cui Can, Liu Yu, Wang Qiong. Survey on the Construction of MOOC Courses in Mainland China's Universities in 2014. China Educational Technology, 2015(07):19-24.

[13] Hollands F M, Tirthali D. MOOCs: Expectations and Reality. Full Report. Online Submission, 2014.

[14] Liang Linmei. MOOCs Learners: Classification, Characteristics, and Persistence. Comparative Education Research, 2015, 37(01):28-34
[15] Kan Wei. Overcoming the Dilemma of MOOC Learning: From Simple Knowledge Sharing to Knowledge Internalization Enhancement Model. Exploration of Higher Education, 2021(01):57-62+69.
[16] She Wenying. Issues and Solutions in University MOOC Construction. Comparative Research on Cultural Innovation, 2020, 4(32):83-85.
[17] Song Yunjuan. Survey and Reflection on University Computer MOOC Teaching. Computer Knowledge and Technology, 2021, 17(01):176-177.
[18] Li Yan, Zhang Muhua. Empirical Study on University Students' Experience of MOOCs and Flipped Classrooms – Based on the Analysis of 231 Online Learning Logs. Modern Distance Education Research, 2015(05):73-84+93.
[19] Peng Yanqiong. "MOOC" Challenges and Countermeasures for University Teachers' Teaching Abilities. Education Modernization, 2017, 4(41):100-101
[20] Xu Hong, Liao Ye, Zhou Yangfan et al. Survey and Research on the Learning Efficiency of Online MOOCs – Taking the Superstar Erya and Chinese University MOOC Platforms of Xinjiang Agricultural University as Examples. Computer Knowledge and Technology, 2021, 17(12):66-68.