



REVIEW ON CREDIT RECOGNITION AND TRANSFER FOR MOOC AT HIGHER EDUCATION IN MALAYSIA

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Abstract—

With the continuous growth of the number of courses and learners, MOOC provides an option for new online learning platforms used in higher institutions. MOOC is recognized as an approach that can realize high-quality educational resources. By comparing the MOOC credit recognition and transfer strategies in various countries around the world, this study finds that the development stage and objectives of higher education in different countries lead to different modes of MOOC credit recognition and transfer. Among them, few of the most prominent is Malaysia's MOOC credit recognition and transfer model. Malaysia is the country with the best development momentum in the field of MOOC in Southeast Asia, and it is also one of the few countries in the world that formulate MOOC credit transfer policies at the national level. Malaysia's higher education MOOC credit recognition and transfer has the characteristics of government leadership, clear principles and quality first, which has brought many enlightenments to the development of higher education and the construction of MOOC credit recognition and transfer system in other countries. In the future, the field of higher education still needs to continue to actively explore new methods and ways of MOOC credit recognition and transfer, control the quality and standard of MOOC credit recognition and transfer, and give full play to the value of educational resource sharing to promote the balanced, high-quality and innovative development of higher education.

Keywords—MOOC, credit recognition and transfer, higher education, Malaysia

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DOI: - 10.48047/ecb/2023.12.si5a.0149

I. INTRODUCTION

In the history of world education, MOOCs are undoubtedly a legendary story. MOOCs is short for Massive Open Online Courses. With the characteristics of new flexibility, strong adaptability and efficient sharing, it has created opportunities for tens of millions of people to receive high-quality higher education. During the COVID-19, the practical application of MOOC in suspension of classes without suspension of school has well confirmed this point. With the increasing number of MOOC courses and learners, how to provide learners with socially recognized credits or degrees has become a key problem to be solved for the sustainable development of MOOC in the future. Because only when MOOC credits are recognized and transferred and incorporated into the current higher education credit management system, can students' enthusiasm to learn MOOC be fully mobilized, MOOC be effectively promoted from construction to application, and the contradiction between "rich resources" and "limited use" be eliminated, so as to promote the sustainable and healthy development of MOOC.

As one of the few countries in the world to formulate MOOC credit transfer policies at the national level, Malaysia's experience in MOOC credit transfer has brought a lot of enlightenment to the construction of MOOC credit transfer system in other countries. In 2015, the Malaysian Ministry of Higher Education formulated the Malaysia Education Blueprint 2015-2025 (Higher Education) (Malaysia Higher Education Ministry, 2015), The core idea of the blueprint includes online learning under the 9th shift Globalised Online Learning and the 10th shifts Transformed Higher Education Delivery (Safri, S. N. W., Mohi, Z., & Hanafiah, M. H., 2020). The goal of Globalised Online Learning is to improve the quality of curriculum supply, reduce the cost of curriculum supply, recommend Malaysian experts to the world, improve the brand and visibility of Malaysian higher education, and cultivate a group of lifelong learners. MOOC credit transfer not only supports Globalised Online Learning, but also effectively promotes the development of MOOC credit transfer standards, which is undoubtedly a win-win situation. However, it is a certain challenge for the Malaysian Qualifications Agency and the Ministry of Higher Education, because Malaysia is the first country to introduce MOOC credit transfer policy. Before the emergence of the Malaysian MOOC credit transfer guide, there has not been a similar national MOOC credit transfer guide in the world. In September 2016, under the guidance of the

Malaysia Education Blueprint 2015-2025 (Higher Education), the Malaysian Qualifications Agency and a number of Malaysian universities jointly formulated the Guidelines on Credit Transfer for MOOC (MQA, 2017), It is based on the credit transfer policy of the Malaysian Ministry of Higher Education and the Malaysian Qualifications Agency and the Accreditation of Prior Experience Learning for Credit award (APELC). It is a mechanism to recognize learners' learning through MOOC. Guidelines on Credit Transfer for MOOC is a guiding document for higher education providers on how to conduct credit transfer after students finish MOOC. Credit transfer is used for the graduation needs of learners' relevant project learning.

II. MOOC CREDIT RECOGNITION AND TRANSFER MODE OF INTERNATIONAL HIGHER EDUCATION

At present, more and more universities have begun to launch MOOC that can enable learners to obtain college credits (Salisbury, 2015). MOOC credits can enable college students to have more course choices, and also open up a new path to a university degree for social learners. Awarding credits to MOOC will eventually break the barriers of universities and change the competitive pattern of higher education market. Next, the research will analyze the typical MOOC platform credit recognition and transfer mode in the world and compare it with the MOOC credit recognition and transfer mode in Malaysia, so as to better analyze the recognition and transfer of MOOC credits in Malaysia.

A. MOOC credit recognition and transfer mode in the United States

Since the birth of MOOC, people have been very concerned about whether they can obtain credits by studying MOOC. As the birthplace of MOOC, the United States is also the first country to try to grant credits to MOOC. The United States grants credits to MOOC mainly through the recommendation of authoritative institutions and the cooperation of platform colleges and universities. The American Council on Education (ACE) is a certification body providing credit recommendation services, which aims to convert learners' learning experience outside the traditional classroom into college credits. Students who complete the learning requirements can obtain the credit recommendation certificate of ACE, but whether to recognize the credit is up to the University. In February 2013, less than a year after the establishment of Coursera, five courses passed ACE assessment and received

credit recommendation (Blog, C., 2013). At the same time, Udacity also received ace credit recommendation for five courses. ACE established the Alternative Credit Project in 2014, which provided credit recommendation for 104 online courses, and three courses were selected by edX (Steele, 2018).

In addition to seeking credit recommendation, the three major MOOC platforms in the United States have launched project courses one after another, aiming to cooperate with the world's top universities and enterprises to provide learners with more valuable course certificates and online degrees. In April 2015, edX and Arizona State University launched the Global Freshman Academy by means of self granting credits. Through the study of credit courses, learners who have obtained credits from Arizona State University can also transfer credits to other universities that recognize the credits of the University (edX, 2015). In October 2015, edX and MIT launched the MicroMaster Program. The world's first MicroMaster Program consists of five master's courses in supply chain management at MIT. After completing five courses and passing capstone exam, learners can obtain the MicroMaster Certificate (MIT, 2016). Recipients of the micro MicroMaster Certificate can also apply to other universities willing to grant credits for the certificate, such as the University of Queensland and Curtin University in Australia, which recognize the MicroMaster Certificate in supply chain management of MIT. At the same time, the Artificial Intelligence MicroMaster Program offered by Columbia University provides MicroMaster Certificates for learners who have completed four courses and passed the examination. The certificate winner can apply for the master's degree in computer science of Columbia University. The MOOC of the enrolled can be converted into 7.5 credits, and the total credits of the master's degree of the university are 30 credits. Coursera and Udacity also launched Specialization and Nanodegree respectively. Coursera and Udacity have achieved great success in the professional MOOC market, thanks to the high-quality courses they have developed in cooperation with AT & T, Google and other famous companies to help learners obtain high paid employment opportunities.

Although the higher education management system of federal legislation and university autonomy in the United States endows colleges and universities with autonomy, it also hinders the development of MOOC credit recognition and transfer mechanism at the national level. The U.S. government has set up higher education

certification and evaluation institutions at all levels, credit transfer coordination institutions and information platforms to ensure the teaching quality of colleges and universities and the smooth progress of credit transfer.

B. MOOC credit recognition and transfer mode in Europe

The development of MOOC in Europe has also made significant progress. The European Credit Transfer and Accumulation System (ECTS) provides an institutional guarantee for MOOC credit flow. ECTS is a credit transfer system formulated by the European Commission to deal with student mobility. It is the cornerstone of the integration of European online education and traditional university education. Under this system, students can realize credit transfer and accumulation in 53 countries that have recognized the Lisbon Recognition Convention, which plays an important role in promoting the integration of European Higher Education (European Commission, 2015). ECTS applies to all courses, whether traditional face-to-face or online, full-time or part-time students, formal or informal learning. The ECTS Users' Guide clearly defines key concepts such as learning outcomes, credit allocation, credit granting, credit accumulation, credit transfer and supporting documents.

The German MOOC platform iversity first tried to cooperate with Fachhochschule Lübeck to grant 5 ECTS credits to learners who completed the course of principles of marketing and passed the online examination (iversity, 2013). In May 2016, Futurelearn, in cooperation with the University of Leeds and the Open University of the UK, launched a similar online course project that allows learners to obtain University credits. For example, the University of Leeds' environmental challenges program includes five courses (£59 each) and one Final Assessment Course (£250). After paying for all courses, learners can get 10 credits from the University of Leeds (Futurelearn, 2016a). The Business and Finance Fundamentals program of the UK Open University includes eight courses and one Final Assessment Course. After completion, learners can obtain 30 credits from the UK Open University (Futurelearn, 2016b).

Due to the different curriculum and credit evaluation systems in different European countries, MOOC credit transfer has some practical difficulties. First, traditional classroom quality standards are not applicable to MOOC. Secondly, there are differences in credit system. For example, Italy has a maximum of 12 ectsmooc credits per university degree, but this is

far from meeting the needs of learners. Finally, the financial allocation system is not perfect. Some institutions worry that large public elective MOOC will replace campus teaching, and the government's financial allocation model is based on the number of full-time students (Jiang Yan, Ma Wulin, Xiang Yali, 2019).

C. MOOC credit recognition and transfer mode in India

In August 2016, SWAYAM, the national MOOC platform built by the Ministry of Human Resources Development of India, was officially launched. There are 900+ free online courses starting January 2022 onwards (Shah, 2016), the online courses provided by SWAYAM platform cover all courses from high school to graduate school. The Guidelines for Developing Online Courses for SWAYAM provides a basis for the preparation of online courses on SWAYAM platform. First, select courses according to the national syllabus, select the best teachers nationwide as the "Principal Investigator" or "Subject Matter Expert" of the course, and then select competent teachers to form teams and assign course modules. If necessary, selected teachers will be trained. Secondly, the preparation of course content must comply with the "four quadrant approach", that is, the four quadrants of electronic tutorial, electronic content, network resources and self-study evaluation. Finally, the course construction team records according to the demonstration courses given by the regulatory authorities. The recording and post video production level must meet the highest standards in the industry. In addition, the copyright of all achievements belongs to SWAYAM (University Grants Commission, 2016).

The credit management of MOOC in India belongs to the "Government Led Credit Certification Model". The University Grants Commission (UGC) of India issued the Credit Framework for Online Learning Courses in July 2016, which specifies the MOOC credit transfer rules and requires universities to recognize students' MOOC scores and grant equivalent University credits (UGC, 2016). The MOOC National Committee established by the Ministry of Human Resources Development is responsible for approving MOOC construction projects proposed by discipline experts, determining the number of MOOC credits, and supervising the quality, implementation and assessment of MOOC. The framework points out that on June 1 and November 1 of each year, SWAYAM platform needs to publish the online course catalogue of this semester. All colleges and

universities must decide the courses to be approved for credit transfer within four weeks, and the selected courses shall not exceed 20% of the number of courses in the semester. Each university must appoint a course coordinator for each MOOC introduced to guide students to study and carry out the experiments, exercises and tests required by the course. The Indian government sets up 1000 examination centers to supervise offline examinations for learners applying for study. Indian universities offering MOOC courses are required to include the MOOC scores of the learners who have passed the examination into the transcript. Within 4 weeks after the end of the final examination, the Principal Investigator responsible for each MOOC will inform the students and their universities of the results. Colleges and universities shall evaluate the results and grant students the same credits for online courses. No college shall refuse MOOC credit mobility.

India's national MOOC platform, online credit framework, online course development guide and supporting examination center have formed a relatively perfect MOOC credit transfer system, which is an excellent case for developing countries to improve the quality of higher education through online education.

III. MOOC CREDIT RECOGNITION AND TRANSFER MODE OF HIGHER EDUCATION IN MALAYSIA

A. Characteristics of MOOC credit recognition and transfer of higher education in Malaysia

1) Government led, clear division of labor and roles of various stakeholders

In order to ensure the smooth progress of MOOC credit transfer, in the process of promoting the construction of MOOC in Malaysia, the Ministry of Education and colleges and universities have clear division of labor and clear boundaries of functions and powers. All stakeholders perform their respective duties, develop their own strengths and get what they need:

a) Malaysian Qualifications Agency: MQA encourages the provision of a dynamic learning environment, rewards various learning opportunities, and plays the following roles: providing credit transfer standards for higher education providers; Evaluate the efficiency of the standards with higher education providers and update the credit transfer standards if necessary to ensure their effective implementation; Respond to different stakeholders and put forward opinions and suggestions to ensure the smooth development of MOOC (MQA, 2017).

b) MOOC providers: MOOC is generally provided by colleges and universities, but government agencies, vocational education institutions and corporate organizations can also become partners of MOOC (MQA, 2017). Make full use of the advantages of MOOC and make the best MOOC by MOOC providers, so that credit transfer can benefit more applicants. MOOC providers are also encouraged to retain learners' learning data for future authenticity verification.

c) Higher education providers: the credit transfer courses provided by higher education providers must be consistent with the standards specified in the Guidelines on Credit Transfer for MOOC, and appropriate credit transfer documents must be provided. The highest official academic institution of the university must clarify all policies, processes, assessments and results related to credit transfer and form a written description. Information and availability must be clearly presented to the applicant throughout the credit transfer process, who is responsible must be identified, and the data must be audited. In the process of credit transfer, the integrity, transparency, consistency, reliability and measurability of credit transfer must be guaranteed, and this process should be monitored by a third party. In order to maintain the quality and standards of learning programs, it is the responsibility of higher education providers to decide which courses can be converted (MQA, 2017).

d) Professional body: its role cannot be ignored. Its responsibility is to formulate appropriate practical standards in their respective fields for credit transfer.

e) MOOC learners: in Malaysia, learners are encouraged to gain rich learning experience and broaden their learning horizons through MOOC courses. When learners want to transfer MOOC credits, they are often encouraged to study MOOC courses related to their major. When learners want to register for MOOC credit transfer or have completed the registration, they have the right to ask MOOC higher education providers to provide corresponding consulting services. When applying for credit transfer, applicants are obliged to provide learning evidence and explain to higher education providers how they have previously obtained credit through MOOC. Higher education has the right to reject the applicant's MOOC credit transfer application when the applicant is

unwilling to disclose or even forge learning evidence.

2) Clear principles to ensure the integrity and credibility of credit recognition and transfer

The Guidelines on Credit Transfer for MOOC stipulates that the learning obtained by individuals through MOOC and credit transfer must have the same learning value as the courses to be replaced by MOOC (MQA, 2017). In order to ensure the integrity and credibility of MOOC credit evaluation system, colleges and universities must abide by the following principles when conducting MOOC credit transfer: first, authenticity. It can be proved by any form of evidence that the completed MOOC learning is the result of learners' own efforts. The applicant's evidence must be unique, authentic and valid so that it can be verified by higher education providers. Second, adequacy. The applicant must be able to describe the breadth and depth of MOOC learning and provide supporting evidence-including the presentation of MOOC learning results and course capabilities. Third, relevance and immediacy. Relevance refers to the consistency between the learning results obtained through MOOC and the courses to be transferred credits in terms of learning results and course abilities; Immediacy means that the learning obtained through MOOC must be consistent with the current learning results of relevant courses. Fourth, fairness and equality. For learners with different gender, skin color and cultural differences, the whole process of credit transfer is the same and will not be treated differently.

3) Quality first, all-round guarantee MOOC credit recognition and transfer

Malaysia has taken various effective measures to ensure the quality of MOOC credit recognition and transfer. MOOC credit recognition and transfer refers to that students have obtained high-quality learning through MOOC and obtained corresponding credits. Specific quality assurance measures mainly include: fully implement MOOC credit transfer in all education stages; Establish a quality assurance system to consolidate credit recognition and transfer; Take multiple measures to ensure the quality of MOOC courses; Strictly verify and evaluate the identity of applicants (Fang Xu, Wang Juan, 2017).

Malaysian universities have fully implemented mixed teaching. According to the Malaysia Education Blueprint 2015-2025 (Higher Education), ordinary undergraduate courses in Higher Education in Malaysia are offered in the form of MOOC, and 70% of projects use mixed

teaching. MOOC credit transfer can be carried out from the acquisition of educational background and bachelor's degree to the acquisition of master's and doctoral degrees, indicating that the coverage of MOOC credit transfer in Malaysia is relatively complete; Moreover, all kinds of Education (including general undergraduate education, vocational education, etc.) can also carry out MOOC credit transfer - which is related to the high degree of internationalization of Malaysia. Credit transfer is available for all projects within the Malaysian Qualifications Framework (MQF). However, the minimum

credits required for graduation are different for different levels of programs, and the previously converted credits cannot be repeatedly converted in higher-level programs - if 30% of the total credits of a degree program applied by a student have been converted by other formal or informal studies, the rest of the credits in the program can no longer be transferred from MOOC credits. In general, the total academic score of a student's MOOC credit transfer course cannot exceed 30% of the minimum credits required for graduation (MQA, 2017), as shown in Figure 1.

	MQF Level	Minimum Graduating Credits*	30% of total graduating credit of a specific programme of study
8	Doctoral Degree (Applicable only to coursework or mixed mode programmes)	Based on the approved credits of the coursework component OR 80	24
7	Master's Degree (Applicable only to coursework or mixed mode programmes)	40	12
	Postgraduate Diploma	30	9
	Postgraduate Certificate	20	6
6	Bachelor's Degree	120	36
	Graduate Diploma	60+6 (MPU**)	20
	Graduate Certificate	30+6 (MPU**)	11
5	Advanced Diploma	40	12
4	Diploma	90	27
3	Certificate	60	18

*The actual credit for graduation for a particular programme may be higher and varies from the minimum graduating credit.

**MPU: Mata Pelajaran Umum (General Education Courses)

Fig. 1. Malaysian Qualifications Framework and Total Credit Points Available for MOOC Credit Transfer.

In order to consolidate the MOOC credit transfer, Malaysia has established a quality assurance system, which is robust, dynamic and responsive. Its role is to ensure that the MOOC credit transfer meets the standards of academic awards and the requirements of the Malaysian Qualifications Agency. In order to enable all stakeholders to better implement the credit transfer policy and continuously improve the credit transfer process, the quality assurance system strictly follows the following principles: first, openness. In order to improve openness, MOOC credit transfer must be transparent; In order to save the credit transfer rate of MOOC in the current education system, it is necessary to have more flexibility for the successful transfer rate of MOOC. Second, Continuous quality improvement. In order to

make MOOC credit transfer develop continuously and maintain a high standard, the first five years of credit transfer implementation will be reviewed. The quality of MOOC will be continuously improved to ensure immediacy and relevance and highlight the value of MOOC.

Malaysia has taken many measures to ensure the quality of MOOC courses. First, MOOC courses for credit transfer shall be recognized by the Ministry of Higher Education of Malaysia or other international organizations, or have some other conditions. For example, MOOC courses for credit transfer shall be consistent with the corresponding replacement courses in terms of course content and objectives, and at least 80% of MOOC course content shall have the same learning value as the course description to be

converted. Specifically, course learning results, topic list, course persistence and other materials can be used to compare MOOC with courses that will undergo credit transfer-the comparison materials between MOOC courses and original courses are called "Mapping" in Malaysia and are used to determine the consistency between MOOC courses and original courses. Second, applicants for credit transfer need to submit application materials to higher education providers, including course description, course learning results, etc; These materials need to be verified, including review and additional evaluation of materials.

Another prominent feature of Malaysia's MOOC credit transfer mechanism is that it will verify the identity of applicants and evaluate them. Generally speaking, it will confirm the authenticity of learners' MOOC learning achievements and learning participation. Only when it is confirmed that learners have indeed participated in MOOC learning and achieved corresponding results can MOOC credit transfer be carried out. How to verify the identity of the applicant and evaluate it? In order to prove that the applicant has indeed completed MOOC learning, the applicant must submit the course construction and evaluation documents, and provide the evidence that the applicant is a registered user to prove that the registered user and the user who has completed the course are the same person. The confirmation methods mainly include: webcam supervision, face-to-face supervision, key analysis or biological statistical technology, learning analysis, etc. There are three main situations that applicants need to prove: first, On-site Proctoring, that is, the applicant participates in the on-site test in the test center, and the test questions are provided by MOOC providers or third parties. The MOOC providers must appoint a special person to manage the examination. The identity of the learner needs to be confirmed by photos, and the academic integrity and examination standards must be observed. On site proof can be automatically considered for credit transfer. Second, Online Proctoring. Online Proctoring can take the following methods: using software to submit the applicant's identity documents to the camera for remote monitoring of students, webcam management of the classroom, verification through fingerprint biometric technology, etc. Since the Online Proctoring still lacks excellent evidence in identifying the authenticity, the applicant needs to provide further evidence to prove the authenticity of his completion of MOOC learning. Third, Non-verified Course. The

certification that cannot be verified includes the following forms: achievement certification, completion status, participation status, completion of certification and honor code certification.

However, credit transfer cannot be carried out only with the above certification. In order to ensure that students' learning effectiveness is reliable and credible, it also needs to be evaluated by discipline affairs experts. There are several forms of evaluation: first, oral evaluation can take the form of some media technology (such as online conference), structured oral test or one-to-one face-to-face interview /interview group. Second, written evaluation, open or closed written evaluation through on-site or online. Third, product evaluation is conducted in the form of oral questions or test of the applicant's remanufactured products; Products refer to the software, paintings, work samples, published papers, etc. related to the course and reflecting the learning harvest of the course. The document package is submitted as evidence, but the higher education provider must ensure that the product is the applicant's own achievement. Fourth, performance evaluation, through on-site performance, role play, other appropriate instructions, skills or knowledge instructions and other forms of evaluation; Other means may also be applied to achieve the purpose of audit and quality improvement. If the applicant's assessment is sufficient to reach an acceptable level, the higher education provider will provide him with MOOC credit recognition and transfer (MQA, 2017).

B. Shortcomings of MOOC credit recognition and transfer in higher education in Malaysia

Although Malaysia's MOOC credit recognition and transfer policy is progressiveness and unique, it still needs to be improved:

1) The recognition of MOOC course quality needs to be strengthened

Although Malaysia has made some provisions on MOOC courses for credit recognition and transfer, for example, they need to be recognized by the Malaysian Qualifications Agency, and they need to be consistent with the replaced school courses, the provisions on MOOC quality are still not specific and detailed, and need to be further clarified and refined. For example, the Malaysian Qualifications Agency will review the aspects of MOOC to determine whether it is suitable for credit transfer, and from which aspects to identify the consistency between MOOC courses and replacement courses. Various problems may be encountered in the specific implementation

process, and further clarification and refinement are needed in the formulation and implementation of relevant policies and measures in the future.

2) The relevant financial support is unclear

Although Malaysia has a clear division of labor and clear roles for all stakeholders in MOOC credit recognition and transfer, there are no clear provisions on the construction cost, personnel cost and verification cost of MOOC. In the future, if they can refine the provisions in this regard and clarify the financial support and details in the process of MOOC credit recognition and transfer, we believe it will promote the further development of MOOC credit recognition and transfer.

3) Insufficient support for students in MOOC learning process

In the process of MOOC learning, Malaysia has no clear regulations on how to ensure students to successfully complete MOOC learning and whether to equip face-to-face teachers.

4) Inadequate evaluation of the participatory process

Malaysia MOOC credit recognition and transfer mechanism pays more attention to the verification of students' identity, especially the verification of students' examination results or learning results, while the certification of students' learning process (such as whether students have seen all videos, the completion of students' usual homework and tests, etc.) is insufficient. In the future, relevant detailed regulations should be issued in these aspects to strengthen the investigation of students' learning process, so as to ensure that the recognition results are more comprehensive, objective and accurate.

IV. ENLIGHTENMENT

There is no doubt that awarding credits to MOOC has become the future development trend of international higher education. MOOC based certificates and degrees can meet the diverse needs of learners in the Internet era and turn the potential of MOOC to improve the quality of higher education into reality. In the future, colleges and universities need to continue to actively explore new methods and ways of MOOC credit recognition and transfer, control the quality and standards of credit recognition and transfer, and give full play to the value of educational resource sharing to promote the balanced, high-quality and innovative development of higher education. Next, based on the advanced experience at home and abroad, the

following suggestions and enlightenment are put forward:

A. Policy formulation at the national level

At present, although many colleges and universities have begun to try to recognize and transfer MOOC credits, they still lack corresponding policies and safeguard measures at the national level. Relevant policies issued at the national level are conducive to the implementation of MOOC credit recognition and transfer, and ensure the good quality of MOOC credit recognition and transfer. Specifically, It can refer to Malaysia's advanced experience in this regard. The development plan and credit transfer policy of MOOC are clearly put forward in the Malaysia Education Blueprint 2015-2025 (Higher Education) and the Guidelines on Credit Transfer for MOOC, which can provide a basis for countries to formulate MOOC credit transfer guide for MOOC credit transfer of higher education nationwide. In the process of promoting MOOC, Malaysia clarified the division of labor and responsibilities of all parties involved in the construction and management of MOOC, and urged all parties to cooperate closely to do a good job in MOOC credit recognition and transfer. Malaysia has also established a unified national MOOC platform Openlearning.com, which has issued relevant MOOC standards to ensure the smooth progress of MOOC credit transfer in Malaysia. As for MOOC standard, it refers to the chapters, objectives, assessment methods, etc. contained in a complete MOOC. At the same time, the process and principles of MOOC credit recognition and transfer in Malaysia also fully ensure the authenticity, adequacy, relevance, immediacy, fairness and equality of MOOC credit recognition and transfer, which has high reference value.

B. Establish MOOC course quality assurance system

The quality of MOOC courses is uneven, which brings challenges to the recognition and transfer of MOOC credits. In terms of MOOC course quality assurance, Malaysia's practice is also worth learning from. The MOOC quality monitoring and evaluation system composed of the Malaysian Ministry of Education, the Malaysian Qualifications Agency, colleges and universities is becoming more and more perfect. Controlling quality, promoting evaluation, bridging differences and promoting fairness are a major feature of the quality assurance of MOOC courses in Malaysia. It is suggested that the competent national education department

formulate the national standards or guidance for MOOC courses, stipulate the basic standards for different levels and types of MOOC courses, and make principled provisions on course credits, course objectives, course content, assessment methods, teaching staff, learning support, etc; It is suggested that MOOC curriculum construction colleges and universities and MOOC curriculum platform improve the curriculum development and evaluation mechanism, control and supervise all links of MOOC course production, submit it to the competent department of the school to organize experts for review before going online, and arrange special teaching assistants to be responsible for learning support and technical support, and conduct real-time, dynamic and continuous observation and improvement of MOOC curriculum construction; The University applying for MOOC courses shall recommend MOOC courses that meet the national quality standards to students, or establish MOOC curriculum quality certification system based on the actual situation of the University, and identify high-quality MOOC courses in combination with expert evaluation, student evaluation and comprehensive evaluation, so as to ensure the quality of MOOC courses that can be recognized and transferred, ensure the scientificity and authority of credit recognition and transfer.

C. Strengthen the supervision and assessment of learners

The lack of supervision of learners' learning and examination process of MOOC course is a major problem faced by the development of MOOC at present. Malaysia's verification of learners' identity is one of the core initiatives in its credit transfer system, including confirming that learners have indeed participated in MOOC learning and achieved corresponding achievements, and subject affairs experts are responsible for the evaluation-the evaluation can be carried out in many forms, such as oral evaluation, written evaluation, product evaluation and performance evaluation, and the specific evaluation form can be determined according to the specific situation of the course. MOOC platform can establish learners' identity authentication system by using face recognition, speech recognition, signature track technology, typing recognition and other technologies to ensure that learners themselves participate in MOOC learning; Develop anti-cheating algorithm, find cheating evidence from homework, reports and answers submitted by learners, and punish cheaters; For the assessment of MOOC learning results, curriculum application

colleges and universities can also build a hybrid teaching model based on MOOC curriculum platform, including face-to-face in class tests, unit assignments, topic discussion, forum Q & A and other links, mix online learning and offline assessment, and comprehensively consider the learning effectiveness of learners.

D. Develop third-party credit evaluation and recognition

It is a challenge for every school to determine which MOOC meet the standard of granting credits and are worth introducing. There are many international experiences worth learning from on how to solve this challenge. It is very important to develop third-party credit evaluation, and judge and recommend the credit value of MOOC courses through third-party evaluation agencies. For example, some MOOC courses in the United States (including courses on Coursera, Udacity and edX) were recommended by the American Education Commission, a third-party evaluation organization, shortly after they were launched. It is recognized that colleges and universities certified by the American Education Commission can directly grant corresponding credits to MOOC learners; In July 2016, the University Grants Commission of India issued the credit framework for online learning courses, requiring all universities to recognize the MOOC scores obtained by students from SWAYAM, the national MOOC platform built by the Ministry of Human Resources Development of India, and grant equivalent University credits. Before the establishment of the third-party evaluation institution, education authorities in various countries can entrust professional teaching steering committees to strictly review MOOC courses of various specialties, evaluate MOOC quality and identify MOOC credits, so as to reduce the workload of colleges and universities in MOOC quality evaluation and credit identification and realize a virtuous circle.

E. Optimize MOOC data information service

Thanks to the rapid development of educational technology, MOOC course materials, teaching process and learning process will leave data records on the MOOC platform. MOOC platform can give full play to its technical advantages, establish a data mining department, and cooperate with universities to convert data into valuable information. Based on this information, universities and learners introducing MOOC can accurately judge the course quality, build MOOC universities and teacher teams can improve the course and teaching effect more pertinently, and

teachers can also make a more objective evaluation of learners' achievements. On the one hand, the MOOC platform can analyze the evaluation data of MOOC courses according to the data information service. For example, make statistics on the number and type of universities introducing the course, the number and composition of learners taking the course, and the score distribution of learners. Invite University experts and scholars and MOOC learners to give quantitative scores on the knowledge content, difficulty, interest and overall satisfaction of the course. With the help of high-quality data and information services, MOOC can be displayed in multiple directions, prompting the MOOC development team to reflect and improve the quality of MOOC courses in time; On the other hand, MOOC platform can also analyze learners' learning data and generate MOOC learners' portraits according to data information services. For example, track learners' time investment, learning resource use, homework completion rate, discussion participation, examination performance and other data in each unit knowledge point, so as to let each learner know their learning status, learning habits and effort, so as to optimize their learning behavior. Statistical analysis of these data can present learners' mastery of knowledge points, help MOOC curriculum development team master the key and difficult points of teaching, and improve MOOC curriculum design and teaching methods. These data and information can also be fed back to the universities introducing MOOC in time. The teachers in charge of offline teaching can take necessary intervention measures to ensure the teaching effect of MOOC.

REFERENCES

1. Blog, C. (2013). Five Courses Receive College Credit Recommendations. Coursera, Retrieved from.
2. edX. (2015). Start Learning with Global Freshman Academy. Retrieved April 16, 2022, from <https://www.edx.org/gfa>.
3. edX. (2022, June 19). Earn University Credit on edX. <https://www.edx.org/credit>.
4. European Commission. (2015). ECTS users' guide. Publications Office of the European Commission.
5. Fang Xu, Wang Juan. (2017). The Credit Transfer for Higher Education MOOC in Malaysian. *Modern Educational Technology*, 11, 85-91.
6. FutureLearn. (2016a). Environmental Challenge. Retrieved May 1, 2022, from <https://www.futurelearn.com/programs/environmental-challenges>.
7. FutureLearn. (2016b). Business and Finance Fundamentals. Retrieved May 1, 2022, from <https://www.futurelearn.com/programs/business-finance>.
8. iversity. (2013). ECTS credits for MOOCs on iversity. Retrieved June 1, 2022, from <https://iversity.org/en/pages/moocs-for-credit>.
9. Jiang Yan, Ma Wulin, Xuan Yali. (2019). Research on MOOC Credit Recognition and Transfer System in China: A Case Study of College English Curriculum. *Foreign Language and Literature (bimonthly)*, 4, 129-137.
10. Kolowich, S. (2013). American Council on Education recommends 5 MOOCs for credit. *The Chronicle of Higher Education*, 7.
11. Malaysia Higher Education Ministry. (2015, May 4). Malaysia Education Blueprint 2015-2025 (Higher Education). https://www.Kooperation.international.de/uploads/media/3_Malaysia_Education_Blueprint_2015-2025_Higher_Education_.pdf.
12. Malaysian Qualifications Agency (MQA). (2017). Guidelines on credit transfer for massive open online courses (MOOC). Retrieved June 2, 2022, from <https://www2.mqa.gov.my/qad/garispanduan/2017/MOOC.pdf>.
13. MIT. (2016). Supply Chain Management Blended Program. Retrieved May 8, 2022, from <https://scm.mit.edu/program/blended-masters-degree-supply-chain-management>.
14. Safri, S. N. W., Mohi, Z., & Hanafiah, M. H. (2020). Massive Open Online Course (MOOC): Our saviour during COVID-19 pandemic. *Journal of Tourism, Hospitality & Culinary Arts*, 12(3), 120-128.
15. Salisbury, A. D. (2015). edX stays committed to universities, offering credits for MOOCs. edSurge.
16. Shah, D. (2016). A complete list of SWAYAM MOOCs. Retrieved June 2, 2022, from <https://www.classcentral.com/report/swayam-moocs-course-list/>.
17. Steele, P. (2018). American Council on Education (ACE) Alternative Credit Project: Final report.
18. Suparn Patra. (2022, June 22). SWAYAM + NPTEL Courses Full List, From <https://www.classcentral.com/report/swayam-moocs-course-list/>.
19. UGC. (2016). Credit framework for online learning courses through SWAYAM..

- Retrieved June 2, 2022, from http://www.ugc.ac.in/pdfnews/0272836_moocs.pdf.
20. University Grants Commission. (2016). Guidelines for Developing Online Courses for SWAYAM.. Retrieved May 6, 2022, from [https://www.ugc.ac.in/pdfnews/3885329_MOOCs-Guideline-\(Development --Funding\).pdf](https://www.ugc.ac.in/pdfnews/3885329_MOOCs-Guideline-(Development--Funding).pdf).