Non-native Professors’ Adaption to Online Teaching during COVID-19: A Case Study

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Abstract. Because of the COVID-19 pandemic, countries ordered or suggested schools to close their buildings. International education exchange and cooperation have been disrupted. Academic exchanges program between professors, instructors, and students from different countries has been suspended. International education exchange and cooperation strategies need adaptation. This paper discusses how to effectively implement online teaching to adapt to the international education exchange under the epidemic, taking a non-native professor who participated in the international education cooperation program and taught online courses for Chinese students as a case. The study combined choosing an online course platform, identifying the teaching content with accommodating the teaching and learning strategy, and discussing learning outcomes of this case for international education cooperation. The results show that: adjusting the teaching content, teaching strategies, and choosing the appropriate online course platform, could promote students’ learning achievement of international online courses. This paper proposes that under the epidemic, higher education exchanges between countries could continue strong international cooperation through adjusting exchange strategy actively, and applying educational information technology effectively.

1. Introduction

The spread of the COVID-19 pandemic has fundamentally changed the form of international education cooperation. Due to the impact of the pandemic, the international education exchange and cooperation program, was also suspended. Recruitment Program of Foreign Experts (RPFE) is one of the projects of educational exchange between China and other countries. It aims to encourage high-level non-native professors to Chinese schools for scientific research cooperation and academic exchange. It is a project launched by the Chinese Education Ministry to introduce foreign intellectual resources, improve the quality of schools, and expand students' horizons.

"COVID-19 outbreak is forcing education to change its traditional teaching model and swift the offline courses to online courses," said Jim Schnell, visiting professor at the Cleveland State University.[1] International education from offline to online will bring multiple benefits. The epidemic situation suspended the original cooperation or exchange but stimulated the emergence of new working modes, learning modes, and communication, and cooperation modes. Remote offices, online meetings, and online courses have become important ways of education. These new technologies and new communication modes point out the solution direction for the international education exchange and cooperation under the epidemic. This paper proposes a solution to overcome the challenges brought by the suspension of international education exchange and cooperation due to the pandemic, by adjusting
teaching strategies actively, using specific online teaching platforms, and accommodating teaching content.

1.1. A Case Study
How to apply new technology to support international education cooperation and create international courses, so that learners can follow the course assignments and achieve teaching goals? This paper takes the course Applications of Mathematics (AM) as a case. From the perspective of using suitable online teaching platforms, accommodating teaching content, and adjustment of teacher-student interaction modes, we explore an effective strategy and make recommendations for online international education cooperation during the COVID-19 pandemic.

1.2. The Present Study
This article takes AM, which was developed by a non-native professor, as a case study for two reasons. The first, the reason is that the non-native professor knows learners' learning styles and habits. This mathematics professor is from the NHL-Stenden Applied Technology School in the Netherlands. Since 2017, he has given lectures on applied mathematics, taught elective courses on engineering technology, and compulsory courses on applied mathematics for students of Guangzhou College of South China University of Technology (GCU) in Guangdong, China. A total of nearly 200 students have enrolled in his courses. He has three years of teaching experience in GCU, and he is familiar with the learning modes, ways of thinking, and communication of GCU students. Second, the non-native professor has rich experience in developing online courses. Since 2016, a total of more than 10 online open courses have been developed by him, and his research focuses on data science and digital education. He is qualified as a senior evaluator for online courses in the Netherlands and is a senior lecturer in digital testing.

Therefore, non-native professors who are familiar with learners’ behavior, how to adapt to tasks, and have extensive experience in creating online courses are the foundation for this case study.

2. Methodology
This case uses a combination of qualitative and quantitative research methods. The questionnaire structure includes survey options and evaluation options. The survey options include three aspects: learning modes, engaged hours, and curriculum resources. Evaluation options include evaluations on online platforms and learning arrangements. Evaluation options are compiled regarding the Likert scale [2].

We distributed questionnaires to 119 learners who participated in the course, 94 students returned the results, and the response rate was 79%. Then we use Excel for statistical analysis of the data. Meanwhile, 18 students who participated in the AM curriculum were willing to be interviewed and share their experience about studying AM.

3. Case Description
3.1. Learners’ Needs
The extent to which learners adapt to changes in task and learning context is critical [3]. (Azevedo & Cromley, 2004; Hadwin, Nesbit, Jamieson-Noel, Code, & Winne, 2007) The AM course is an applied course that applies the knowledge of mathematical theory in a real situation. The medium of instruction is English. Before studying the curriculum, it is necessary to understand the students’ English proficiency and their mastery of the theoretical knowledge they have learned.

Learners’ English level. According to the Chinese National College English Test (CET), Level 4 is the basic level of college English. A total of 25.63% of students were at or above Level 4. Therefore, the tasks of learners to learn the AM online course are restricted by their English proficiency.
Academic challenges for learners. Before the AM course started, 24.47% of the students reported it was a challenge to apply the theoretical mathematic knowledge they had learned to a real situation. A total of 15.96% of students did not feel confident enough about their programming capability. A total of 12.77% of students reported that there were few opportunities for self-directed exercises.

In order to enable learners to follow the AM course assignments, the non-native professors adjusted the courses actively.

3.2. Choose a Suitable Online Course Platform

3.2.1. Online course platform. An online course platform is an important tool for online teaching [4]. If instructors use an online course platform in English, it will make it more difficult for students to familiar with the course. Students need to engage many hours in understanding the platform's functions, familiarizing themselves with the operation of the platform, and tapping the platform's personalized services. If non-native instructors adopt an all-Chinese online course platform, it will increase the difficulties of teachers in the teaching process of course preparation and course evaluation, preparation. Instructors need to engage a lot of time and energy to adapt the Chinese online learning platform, at the same time, is not conducive to students' English practice and cannot reach the goal of English and professional ability training. Therefore, finding a suitable online course platform is a key point in international exchanges and creating international online courses [5].

In this case, the non-native professor chose the Mobius online teaching and learning platform with Chinese and English versions. This online course platform uses big data software that is familiar to Chinese students, has powerful data analysis capabilities, and has more than a thousand data built-in calculation functions [6]. The interface is simple, friendly, and has a useful user experience. Questions which are created by this online teaching platform suit to the Chinese way of presentation, effectively reducing students' frustration and fear of difficulties.

3.2.2. Online assessment tool. The non-native professor chose the Mobius online evaluation platform, which can afford the system's automatic proposition, scoring, display of problem-solving steps and answers, and learners can get immediate feedback after-class exercises. For the questions that learners did not answer correctly, the system will redesign sample questions based on the knowledge points of the question, and provide students with repeated training until the students have thoroughly mastered the knowledge element. For students of different levels and different learning progress, instructors could choose the difficulty level of test questions differently, and adjust the teaching content according to the test results of learners.

3.3. Choose a Teaching Mode Suitable for Learners

3.3.1. Gradual teaching mode. The non-native professor adopted a "gradual" teaching mode to stimulate learners' interest in learning: choose classic textbooks in Chinese, so that students can focus on the acceptance of the knowledge system and the training of the thinking process; to implement practical teaching, the professor created several short videos (Screencasts), accompanied by English subtitles, to visually display the software calculation analysis. Integrate the Dutch education characteristic HNC (Half No Centre, that is, any mode such as classroom teaching and classroom discussion cannot be used as the center of the classroom—must be changed at any time). Before each chapter was taught, the professor listed the new knowledge points to be learned for students to preview, at the beginning of each lecture professor explained the important and difficult points online, and combined with a short explanation, data retrieval, group discussion.

3.3.2. Retrospective teaching content. To learn a mathematical application course, students need to apply the mathematical theory knowledge which students have learned before. For example, to measure the specific position of a drone, students need to learn about the position, direction, and vector distance. This knowledge needs to use the linear algebra learned in the first grade and the complex function learned in the second grade. The connection between old topics and new topics is crucial for retrospective learning. When receiving the notice of suspension of the offline course
issued by GCU; the non-native professor adjusted the course content the first time. Considering that during the epidemic, learners had more time at their disposal, the professor developed a "GCU-Pre" online course, which is presented in Figure 1. The previous knowledge points were refined, integrated, and summarized for students to learn before the course started.

![Figure 1. GCU Pre-course on Mobius Online Platform.](image)

3.4. An Emergency Plan

The quality of online teaching is also affected by network speed, hardware equipment, and platform performance. If the online teaching network is stuck, slow, or dropped, it will greatly reduce the learners’ experience and affect the teaching and learning effect of the course. In this case, the professor considered the stability of the online course platform into the quality of the course, and updated the emergency plan in time. In October 2019, the non-native professor came to GCU for giving a compulsory tradition course. When using the online platform during class, students could not log in due to the busy system. The professor immediately contacted the staff of Maple Headquarters in Canada, requesting an increase in capacity. After the course ends in November, to ensure the stability of the new semester course and smooth teaching, the professor negotiated with the company staff to adjust the system to the maximum capacity that allowed them to accept users. When COVID-19 out broke in China at the beginning of 2020, the carrying capacity of the online teaching platform was adjusted to the best level, and there was no feedback from learners that it dropped in sudden or could not log in.

3.5. Efficient Communication and Cooperation Mechanism

To establish an international affairs management organization with a clear structure and clear responsibilities, to create a system for non-native instructors to communicate with GCU teachers, staff, and students, and to create a multi-sectoral coordination and linkage mechanism are key factors for the completion of online courses. During the COVID-19, the International Education and Communication Center of GCU promptly delivered the message that instructors could convert offline courses to online courses. The academic service department assisted in creating a communication text group for students, instructors, and administrators. Textbooks, course content, tasks, and syllabus of the AM curriculum were released in a timely manner. The professor's colleagues in the same team and other students participated in the discussion and sought solutions to problems together. It showed the mechanism worked effectively way.
4. Results

Within two weeks after the end of the AM course, Academic Service Office created a retrospective survey on the course, and the results were analyzed:

4.1. The Online Course Platform

Learners used the Mobius online platform to follow AM courses, 79.8% of learners spent more than 2 hours a day on the platform. Table 1 shows that the Mobius online platform can realize multiple evaluation functions such as instructor’s evaluation, process evaluation, mutual evaluation, and final evaluation. The satisfaction rate of learners with online platforms accounts for 54.25%. It indicates that learners accepted the online course platform which was selected by the non-native professor.

4.2. Feedback of Curriculum Learning Style

According the result of questionnaire investigates, 53.19% of learners agreed that the original way of thinking had been changed and the proportion of autonomous learning had increased. It is known that one of the characteristics of online international education is to change the way of thinking and improve independent learning.

4.3. Recognized by Regional Educational Institutions

This case won the first prize of Online Excellent Teaching Cases in Guangdong Province, China. It is the only non-native professor who was solely responsible in an online course and received provincial awards so far, due to giving an effective online course. This online teaching case will be compiled into the collection at the end of 2020, and promoted to universities and colleges in Guangdong province.

5. Discussion

During the COVID-19 pandemic, traditional exchange activities of international education exchange and cooperation projects have been forced to suspend. The professional course taught by the non-native professor, in this case was not stopped under the epidemic, but converts the class from offline to online. In the process of the professor adjusting online international course, we made a questionnaire investigation of learners’ self-regulated ability and English proficiency. It was clear that the challenges of developing an online international professional curriculum were that learners’ English proficiency was not enough to cope with online learning. Consequently, aroused learners’ frustrated feelings. Furthermore, students were not confident enough to connect new and old knowledge topics. The non-native professor tried to deal with the challenges through choosing a suitable online teaching platform, accommodating teaching content, and teaching modes, and developing efficient cooperation with schools and teachers.

Firstly, non-native instructors could choose an online platform that combined interactive courseware, intelligent assessment, with data analysis. There are multiple versions except for Chinese and English version. It enhanced the confidence for instructors and learners to interact based on the existing curriculum resources under the COVID-19 pandemic. Due to teaching activity had not disrupted; cooperation and mutual trust were improved between the two colleges.

The second challenge is that the non-native professor incorporated the stability of the online course platform into the course quality and updates the emergency plan promptly. After finishing the first course in November 2019, the teacher engaged in reflection to fill in the shortcomings of the system's limit on the number of online people in a timely manner, proactive defense, preparedness, and without trouble. When COVID-19 out broke in sudden, the platform teaching operation was stable, and there was no system report caused by a surge in the number of logins.
The third challenge was international education cooperation needed to implement efficiently, and rapid cooperation mechanism involving colleges, instructors, staff, managers, and other stakeholders. The third challenge is the international education cooperation among colleges, instructors, staff, managers, and other stakeholders. An efficient and rapid cooperation mechanism should be established under the epidemic.

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