

A STUDY ON SYNCHRONIZED CLASSROOM OF NATIONAL UNION OF NETWORKED TEACHER EDUCATION IN CHINA

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ABSTRACT

Synchronized Classroom of National Union of Networked Teacher Education (NUNTE) is an online education model which breaks through the barriers of relatively closed traditional university teaching methods and makes it possible to share high-quality teacher education resources among universities in China. Under this new model, unified standards for shared courses management, technical supports, and teaching resource services have been set up, and the interscholastic curricula-selecting and the credit mutual-recognition are also accomplished. A questionnaire survey by NUNTE shows that the students generally regard the Synchronized Classroom as a very creative online education model and expect that it can be applied to more students by further improvement.

Keywords: Synchronized Classroom, National Union of Networked Teacher Education, Teacher Education Resources, Teaching Model, Interscholastic Study

INTRODUCTION

During the Period of the Tenth Five-year Plan, China's higher education gross enrollment rate reached over 15%, which indicated that the China's higher education had entered the stage of mass education (Maoyuan PAN, Haitao XIAO, 2008). In 2015, the total scale of higher education in China reached 36.47 million with the gross enrollment rate of 40% (Ministry of Education of China, 2016). However, with the continuous scale expansion of higher education, there are two problems which need to be solved. The one is that the increase of education resources cannot keep pace with the massive growth of higher education scales, resulting in a declined tendency of the per capita hold of education resources of students. The other one is the uneven allocation of education resources due to the factors such as economy, culture, history and geography. These two problems adversely affect the quality of higher education. Therefore, how to make more efficient use of the limited education resources (especially high-quality education resources) is an important issue for the health development of the higher education in China.

In 2003, 14 members including national wide normal universities and related educational institutions joined efforts together and set up the National Union of Networked Teacher Education (NUNTE). As a collaborative association of sharing high-quality education resources with a set of teacher education system, satellite television and the Internet, NUNTE is committed to break through traditional self-sufficient educational condition, to improve the quality of talent training and to balance the allocation of higher education resources by sharing the high-quality teacher education resources among universities (Huaying BAO, Wenfeng HUANG, 2012).

As a significant trial to sharing the higher education resources, NUNTE initiated Synchronized Classroom within 8 normal universities for full-time students (among these students, 94% were Tuition-Free Normal College Students) since the fall semester of 2012.

BASIC SITUATION OF SYNCHRONIZED CLASSROOM OF NUNTE

The Model of Synchronized Classroom of NUNTE

The Synchronized Classroom is a kind of teaching model which is carried out based on Internet and satellite transmission, using multiple internet technologies including live video, bidirectional interaction, cloud computing service, etc. In the implementation process, Synchronized Classroom captures video frames from live broadcast classroom in one university, and then pushes the video frames to the cloud servers. The cloud servers finally deliver these video resources synchronously to the long-distance classrooms located in other 7 normal universities. This model is a creative teaching paradigm by which multi-universities can have the same class at the same time.

As a new teaching model, the Synchronized Classroom combines traditional classroom teaching with long-distance education and thus requires higher standards for the equipment of live broadcast classroom, teaching teams, educational management, and the technical supports. The live broadcast university not only has to pay attention to the response from the students in the live broadcast classroom, but also pay attention to the feedback from the students of other 7 long-distance classrooms.

Technical Architecture and Implementation Process of Synchronized Classroom of NUNTE

The technical architecture of Synchronized Classroom of NUNTE is shown in Figure 1. The live broadcast classroom pushes video frames to the cloud platform through the Internet or bidirectional satellite. The cloud platform then distributes the same captured video frames to the long-distance classrooms. This technical architecture enables the teacher in the live broadcast classroom to have interactions with the students in the long-distance classrooms.

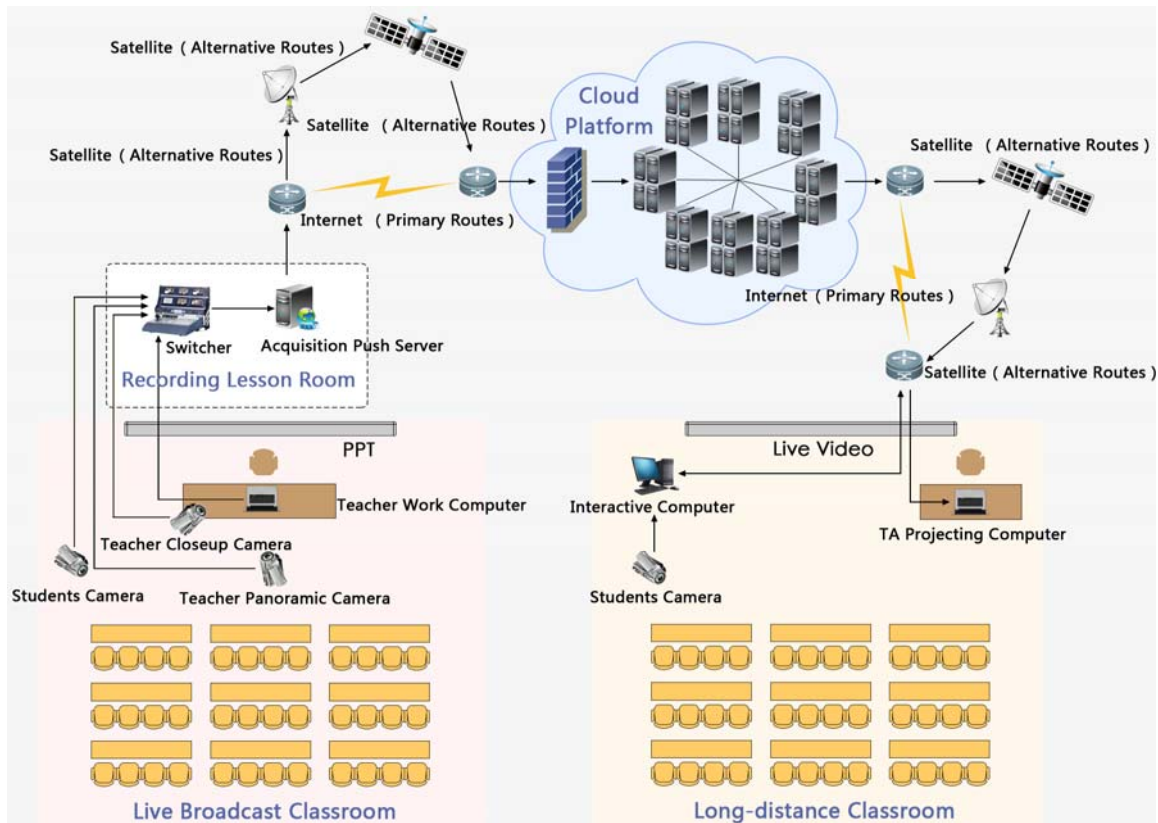


Figure 1: Technical Architecture of Synchronized Classroom of NUNTE

The implementation of Synchronized Classroom contains three stages: Preparation Stage, Teaching Stage and Feedback Stage. In the Preparation Stage, teachers need to prepare the teaching materials. Technicians need to debug live broadcast classroom equipment, as well as other tutors and educational personnel are responsible for providing supports. In the Teaching Stage, Video Acquisition Push Servers start operating while the teacher in the live broadcast classroom gives the lessons. The long-distance interaction is also available in this stage. The Feedback Stage is to provide teaching supports of video playback, to collect students' questions and then to organize further discussion. The implementation process of synchronized classroom of NUNTE is shown in Figure 2.

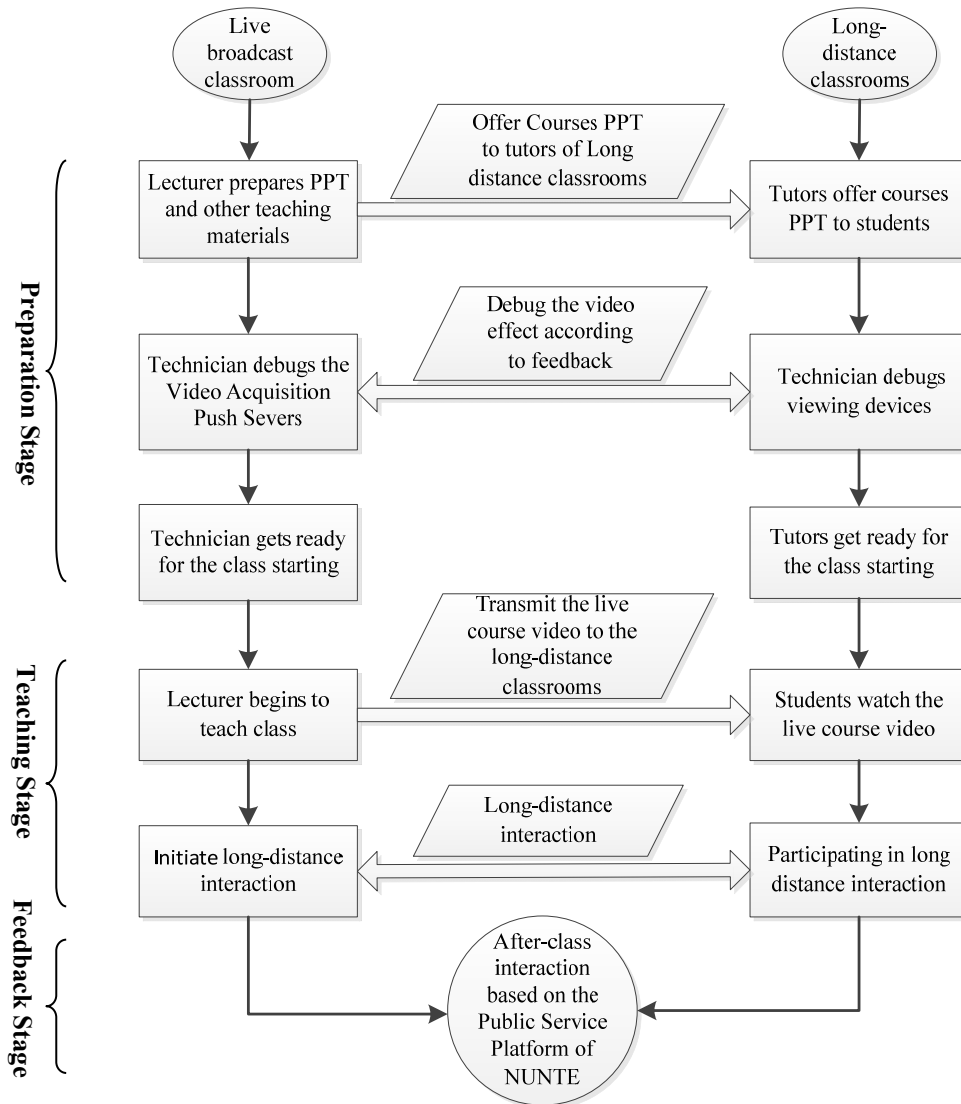


Figure 2: Implementation Process of Synchronized Classroom of NUNTE

Interscholastic Curricula-selecting of Synchronized Classroom of NUNTE

Through the Synchronized Classroom NUNTE opened 10-12 shared courses every year in the School Year from 2012 to 2015. Within 6 semesters, there were 14,823 students who selected shares courses. Taking the 2012-2013 School Year for example, the interscholastic shared courses and the number of students who selected the courses are listed in Table 1. It is clear that among the total of 4,065 students who participated in the shared courses, 74% of them selected the courses that were opened by other universities. The total number of students who selected the 2013 Spring Semester courses increased 46.7% compared to the number of students who selected the 2012 fall semester courses.

Table 1: Interscholastic Shared Courses and the Number of Students of Synchronized Classroom of NUNTE in 2012-2013 School Year

Semester	Universities* as Live Broadcast Classroom	Shared Courses	The Number of Students Selecting Shared Courses**	
			Total Numbers	The Number of Students Selecting Courses from Other Universities
2012 Fall Semester	ECNU	Classroom Management	380	365
	NENU	Educational Psychology	445	295
	CCNU	Household Pedagogy	202	172
	SNNU	curriculum and teaching theory	331	291
	SWU	Technique and Art of Teaching Behavior	290	112
	Semester Total			1648
2013 Spring Semester	BNU	Pedagogy	349	232
	ECNU	Aesthetics of Teacher	392	353
	NENU	Sociology of Education Study	391	248
	CCNU	Household Pedagogy	242	206
	SNNU	Psychology	466	326
	SWU	Class Construction and Management	577	403
	Semester Total			2417
Total in 2012-2013 School Year			4065	3003

Note: *BNU-Beijing Normal University, ECNU- East China Normal University, NENU- Northeast Normal University, CCNU-Central China Normal University, SNNU-Shaanxi Normal University, SWU- Southwest University, SCNU-South China Normal University, FJNU-Fujian Normal University.

**The numbers include 249 students from SCNU and FJNU.

CHARACTERISTICS OF THE SYNCHRONIZED CLASSROOM OF NUNTE

As an innovative teaching model, the Synchronized Classroom effectively breaks the self-enclosed traditional teaching of universities and promotes the bidirectional interaction among universities. The characteristics of Synchronized Classroom model are as follows.

Specifications of Shared Courses Management

High-quality course resources crucially guarantee the sustainable development of Synchronized Classroom of NUNTE. The shared courses of Synchronized Classroom are firstly recommended by universities with the live broadcast classroom and then accredited by NUNTE before being brought into the coming semester's curricula selecting plan of universities. Meanwhile, the universities are responsible for organizing students to select the shared courses especially the interscholastic courses. Thus, NUNTE made the unified specifications on high-quality course resources, including teaching team, basic resources, curricula time, curriculum categories and credit transfer, etc. (Table 2).

Table 2: Unified Specifications of Shared Courses of Synchronized Classroom of NUNTE

Items	Specifications
Teaching Team	<ul style="list-style-type: none"> Organize the rational structure of teaching team which consists of lecturers, 1-2 tutors as well as technicians in each class. Select the lecturers who should be competent in academic foundations and have rich experience in teaching skills.
Basic Resources	<ul style="list-style-type: none"> Include curricula description, syllabus, teaching plan (or PPT), key points elaboration, question explanations, assignments, reference material, live broadcast classroom video, etc., which should be timely released on the Public Service Platform of NUNTE for students.
Curricula Time	<ul style="list-style-type: none"> Unify the time of the first live broadcast class on the consideration of different curricula time among universities.
Curriculum Categories and Credit Transfer	<ul style="list-style-type: none"> Give priority to 1-2 credit courses and characteristic courses to be as the shared courses. Account 1 NUNTE credit to 15-18 study hours. Transfer and recognize credits of shared courses mutually among the participated universities.

Unified Technical Standards

The technical supports play an extremely important role in the success of the innovative practice of the Synchronized Classroom of NUNTE. Therefore, NUNTE established a series of technical standards for the implementation of Synchronized Classroom as follows:

- Live broadcast classroom standard
- Long-distance classrooms standard
- Video acquisition and push sever standard
- The hardware and software standards of classroom
- Other standards for cloud service technical supports from technicians.

NUNTE regulated that for the live broadcast classroom, the video acquisition and push sever should have a fixed public IP, and the classroom should possess above 2M bandwidth of independent TDD (non-shared) to ensure that the network speed could satisfy the smooth broadcasting. The long-distance classrooms should possess above 1M Network access speed which enables students to visit video website and to watch live broadcast classroom video smoothly. Every single classroom has an independent QQ account (one of the popular instant messenger tools developed by Tencent Ltd. in China) for the online interaction. NUNTE supports the universities' hardware environments by distributing the video acquisition push sever and installing bidirectional satellite stations for 8 classrooms. NUNTE also constitutes a central technician team to monitor the implementation process of the Synchronized Classroom, collect the effective feedback of live broadcast video and deliver the results after each class on time.

Well-established Teaching Support Services

NUNTE has set up requirements and clarified responsibilities for classroom tutors to ensure the teaching quality. There is at least one tutor to work as teaching assistants in every classroom. The tutor in the live broadcast classroom is responsible for preparing the teaching materials for the lecturer, promptly conveying the feedback and suggestions from the long-distance classroom students to the lecturer, and collecting students' questions in the long-distance interaction period. The tutor in the long-distance classroom is responsible for the classroom management, assessment and evaluation, and teaching resource services. The students who are absent from the classroom due to some special reasons are allowed to watch synchronized classroom video via laptop, iPad, smart phone and other mobile devices under the teacher's authority.

More than just providing synchronous interactions between live broadcast classroom and audience classroom, the Learning Management System (LMS) module on the Public Service Platform of NUNTE is also available for after-class interactions and constant learning activities. The tutor and the teacher of live broadcast classroom can upload the teaching resource and answer questions through the LMS. Generally, synchronized classroom video is supposed to be retained on the LMS for at least two weeks. In this way, students can login to the LMS and watch live broadcast classroom video, post questions and participate in online learning activities. Under the learning through the Synchronized Classroom and the participation on the LMS, teachers and tutors can evaluate their students on the use of both process and summative assessment.

QUESTIONNAIRE SURVEY ON THE IMPLEMENTATION OF SYNCHRONIZED CLASSROOM OF NUNTE

At the end of June 2013, NUNTE initiated an anonymous questionnaire survey among the students who selected courses of the Synchronized Classroom in 2012-2013 School Year. 130 valid questionnaires have been received.

The statistical results showed that 82.5% of the students agreed that “Synchronized Classroom reflects an innovative approach to sharing high-quality educational resources”. Furthermore, 81.7% of the students agreed that “Synchronized classroom enables us to experience varied teaching styles and to develop the interscholastic academic exchanges”.

In terms of the evaluation on teachers, 90.1% of the students satisfied with the teachers’ professional ethics, and 91.4% of the students approved the teachers’ academic proficiency.

For the evaluation related to the class teaching, the satisfaction rates of the course contents and teaching methods are 82.4 % and 85.6 %, respectively. Whereas nearly half of the students did not satisfy with the Synchronized Classroom interaction which means that the long-distance interaction needs to be enhanced.

On the aspect of the evaluation of teaching services, the tutor supports were praised by 77.1% of the students, while the satisfaction rates related to the tutor’s learning guidance and class-assignment evaluation are both only 67.2%.

The survey also showed that the top four items among all the question selective items which are network speed, live video technology, course resources and learning guidance, need to be improved. The specific findings are represented in Figure 3.

Obviously, the technical support service is the most important factor that affects the performance of the Synchronized Classroom and the outcomes on the overall assessments of the Synchronized Classroom. Moreover, the immature mode of interscholastic course-selecting also tends to result in problems, including the difficulties in the sharing of the course resources and the ineffectiveness of learning guidance.

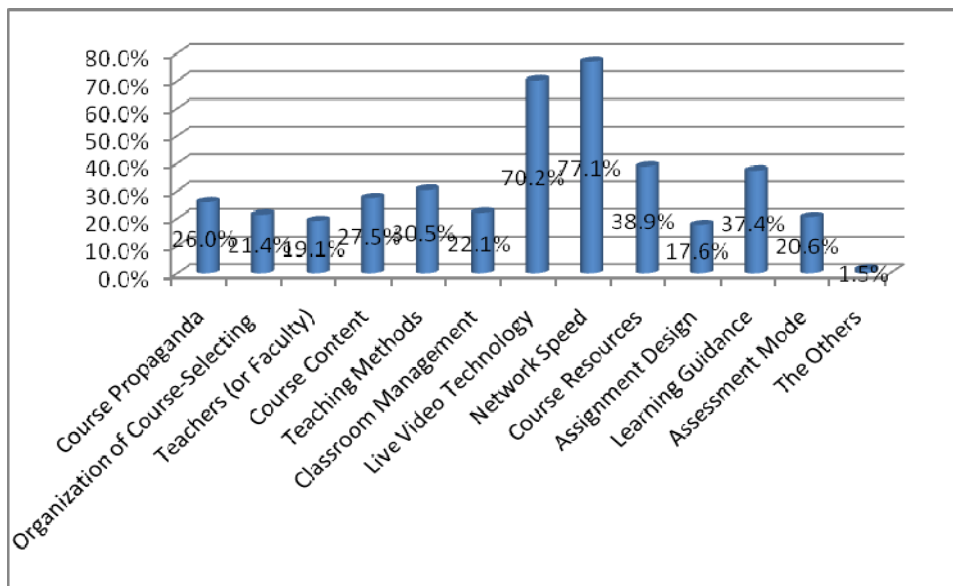


Figure 3: Results of the Survey for the Items that Should Be Improved

Furthermore, the questionnaires survey collected students’ suggestions and expectations such as (1) enhancing long-distance interactions and after-class communication, (2) improving the function of switching frames of the live classroom video, (3) and optimizing the network environment. One student mentioned that “the Synchronized Classroom is very creative. It could make possible for education resource sharing and information sharing if applied properly. I hope that the network technique will become more mature and achieve smooth and stable visual effects, enabling more students to experience various learning in different atmosphere”.

CONCLUSIONS

Synchronized Classroom of NUNTE is an innovative teaching model for boosting the sharing of higher education resources. It breaks through the barriers of relatively closed traditional teaching methods among universities, and sets up the unified standards for shared courses management, technical supports, and teaching resource services, achieving the interscholastic curricula-selecting and the credit mutual-recognition in practice. However, at the present stage, the level of technical supports is still the crux of the effective implementation of the Synchronized Classroom of NUNTE.

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