

## Case Study of Network Training Community Mode

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### Abstract

*To promote teacher's professional development, network training is proposed and served as an effective method with the help of information technology. Network training breaks through the limitation of time and space in the traditional teachers' training mode, and facilitates carrying out the learning and communication anytime and anywhere. This article constructs the "Double Teachers Teaching" mode based on the idea of community, which defines double teachers as "Excellent Teacher" from famous school and "Local Teacher" from experimental school. The whole training process is carried out on a network platform with two core modules called "double teachers' classroom" and "double teachers research". Centered on Local teacher' practical needs, high-quality condensed community learning resources are generated based on the double teachers' cooperation and communication. The "Double Teachers Teaching" mode integrates the advantages of famous teachers and network platform, facilitate effective online training using targeted community resources. We applied the designed mode to a middle school, attach importance on the strategies of people, platform, culture and evaluation, and used questionnaire survey to investigate teachers' competency. Results analyzed by SPSS demonstrates that this mode contributes to teachers' development, it improves teachers' ability of student analysis, teaching objectives, teaching process, and teaching methods.*

**Keywords:** Professional development; Network training; Information technology; Double Teachers Teaching; Community; Excellent teacher; Local teacher; Community resources.

### 1. Introduction

Teachers' professional development is currently paid great attention to, due to the rapid developments of educational informatization, the deepening of educational reform and the emergence of new educational teaching forms [1]. It is a process of mastering specific teaching skills and cultivating the ability to deal with professional problems through

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continuous learning and exploration. Network training provides teachers with multiple and free choices, and is convenient to carry out the learning and communication anytime and anywhere, with the help of information technology and network resources [2]. Since the capacity of teachers' traditional training mode is extended and widened, Network training becomes an effective way to boost teachers' development by way of network training activities. Teachers' network training activities refer to all kinds of formal or informal professional study activities that teachers in different areas participate in for their professional development. With the help of network study platform, Network training aims to enable teachers achieve their practical development, improvement and promotion of teaching behaviors. If designed well, the activities can closely combine the teaching practice, learning skills, research and discussion together [3]. But, it do not meet the expected goals.

Currently, network training has the following problems.

- The network training are loose.
- The network training mode did not establish sufficient management and evaluation documents. Teachers participating in the network training did not have the passions to participate in the activities, they needs more interactions and communications.
- The network training resources are not sufficient.
- Teachers had strong desire for the training, but the resources did not match their actual needs. If dedicated resources can be provided, the training would improve the effectiveness and usefulness by giving them practical guidance.
- The extent of teachers' development are not evaluated.
- Evaluation should be carried out along with the training. It will let us know about the network training effects and will give feedback to help improve the training mode.

To deal with the encountered problems, we designed a network training mode, applied it to a middle school, and then analyze the training results. Main contributions of this paper are summarized as follows:

- Establish network training community.
- The community consist of excellent teachers from famous school who demonstrate the class, and local learners from ordinary school who learn from the excellent teacher. They have the same goals of achieving professional development, and cooperate deeply during the whole training process.
- Carry in-depth Training.
- Through cooperation, the network platform generates highly condensed online resources, including the learning resources, the teaching ideas and methods. These guarantee the depth of the training.
- Analyze teachers' professional development.
- Design a questionnaire to investigate the teachers' competency. Distribute the questionnaire and use SPSS to evaluate the training effects and give feedback.

The rest of this article is organized as follows. Section 2 summarizes the existing research related to our work. Section 3 illustrate the core concepts. Section 4 designs the "Double Teachers Teaching" mode. Section 5 is the application of

the “Double Teachers Teaching” mode and analyze the effects. Next, we draw the conclusion and future work. The final part is our limitation and contribution.

## 2. Existing Research

Teachers training was attached significant importance in and out of China, and network training is served as an effective way. Most of the research starts from macro-view. They focus on platform Construction, activity design, pattern construction or strategies. This section will illustrate the existing researches.

Earlier work pointed out that “Virtual Teaching and Research” was the core concept, which was reckoned as network training. Currently, teachers training has been the primary way to boost teachers’ professional development. In china, the issued document “The National Outline of the Medium and long Term Plan for Education Reform and Development” [4] pointed out that, it was necessary to build a contingent of high-quality teachers who have been devoted to education, it was necessary to take strengthening the contingent of teachers as an important content, and it was necessary to improve the overall quality of the contingent of teachers, especially those in rural areas. The concept of “ Teachers’ Network Training Community” was clearly emphasized in “Standards for information technology application ability of primary and secondary school teachers”, and was defined as the important carrier to participate in professional development, as well as improving the ability of education and teaching, especially for the primary and secondary school teachers. The National Association of Teacher Education implements the pilot project of building teachers' network training research, and guides teachers to conduct network research and study activities. In developed countries, such as Europe and America, they also attached importance on teachers’ learning and development, especially USA established special teachers’ association to involve them in advanced studies. In 1999, USA launched the "Equip Tomorrow's Teachers With Technology" project, which provided a new mode for teachers’ professional development by utilizing the modern information network technology to improve the environment and quality of teachers’ network training. Ruth Brown divided the network training activities into three stages of different levels, name as online dating, community acceptance and community friendship.

The network training platform has been updated in recent years [5]. Many mature platforms are constructed for teachers to research and study, such as National Network for Continuing Education of Primary and secondary School Teachers<sup>1</sup> Chinese Teacher research and Study Network<sup>2</sup>, National Public Service Platform for Educational Resources.<sup>3</sup> Illinois University has developed a network training platform for 9th to 14th Grade Math Teachers called Math Teacher Link. SRI International create the network support platform, which provide the online teachers with learning material, good learning atmosphere, and download free learning resources. Teacher Net is the learning platform developed for teachers by DCSF (Department for Children, School, and Families).

<sup>1</sup>[Online]. Available: [www.teacher.com.cn](http://www.teacher.com.cn)

<sup>2</sup>[Online]. Available: [www.teacherclub.com.cn](http://www.teacherclub.com.cn)

<sup>3</sup>[Online]. Available: [www.eduyun.cn](http://www.eduyun.cn)

It can provide the network teachers with different types of resources of strict classification, so that teachers can quickly find and use what they want. Also, teachers can communicate and exchange ideas with other teachers of deep-level with regard to certain aspect of the content. California Virtual Campus aims to provide a comprehensive, timely and accurate online course and teaching resources for graduate teachers, so that teachers can conduct a simple search to find their own professional-related topics. Teachers can use the theory learning function to carry out lectures, case studies, thematic discussions and other training activities, so as to acquire relevant knowledge and skills.

The Ministry of Education issued the “Notice on the Launching Meeting of the Pilot Project of Teacher Network Research and Study Community Construction”, Entrusting the National Association of Teacher Education to carry out the pilot project of constructing the network research and study community [6]. Reference [7] discussed in detail how to construct the teachers’ learning space based on the practical experience from the platform development and application in network training. Reference [8] construct the network training platform using the pattern design and learner centered ideology. Hui yang demonstrated and analyzed the design method of on-line practice community research and training activities [9]. Reference [10] designed and implemented the On-line sharing activities of teachers' teaching strategy. Reference [11] put forward the training mode based on Network multimedia teaching, in order to monitor the learning task design, learning strategy training and process. Han proposed the network training based on WeChat platform and achieve good result [12]. Papadakis also investigated the use of learning services, he made a case study in Greece, evaluated pre-service teachers' acceptance of mobile devices with regards to their age and gender [13]. Kalogiannakis also discussed about the use of mobile application to promote steam activity [14], and historical analysis of the activities produced and developed by mathematics teachers of the Center for Teaching of Science of Bahia (CECIBA) of the Federal University of Bahia. Reference [15], [16] discussed about the use of tablets or “ScratchJr” into the teaching practice. Chitcharoen P discussed the ability of applying educational innovations and information technology by way of network training [17].

The detailed study in current literature shows that, the existing problems are summarized into the following aspects: First, the professional guidance needs to be carried out in-depth.

The three core elements in network training form a trinity relationship, such as the individual teachers, professional researchers and teachers' community. The individual teachers can learn expert lectures provided in ordinary online training, but the guidance are lacking from the professional researchers or called experts, since their scientific research task is relatively heavy. A few simple tutoring lectures and reports only plays a small role in increasing the professional ability of teachers. This did not contribute to form teachers' community, or achieve good training results, so in depth professional guidance are needed.

Second, targeted online resources needs to be established according to the practical needs. Online training resources usually contain some policy documents to tell teachers about the trends and focal points. They also provide network videos of excellent professional teachers, which is convenient for teachers to learn the teaching experiences and teaching methods. But the training contents are not designed to match the teachers’ practical needs, which results in the disconnection between the theoretical training content and the practical teaching content. This kind of online resources cannot provide solid supports for teachers' online training, and is not conducive to improving teachers' education and

teaching ability. In addition to that, the network training effects are difficult to control when applied in the actual teaching practice. Lacking of targeted online resources makes the tradition network training become a mere formality with no or little effects.

Third, the interaction is not sufficient with respect to the depth and the width. There exists a weak cooperation atmosphere in traditional network training, which makes it difficult to mobilize the enthusiasm of teachers participating in the training process. The main reason for this phenomenon is the lacking of good communication among teachers. Teachers are not aware of the necessity of communicating with other network learners, but only obtain information and training resources from the website, such as downloading the required teaching design, teaching cases, teaching courseware, test questions, etc. Teachers needs opportunities and time for cooperation and exploration, which calls for the interactions among them with depth and width. Otherwise they cannot feel the impacts of information-based teaching and network training by the help of modern information technology.

Fourth, suitable evaluation and management are far from satisfactory in network training. In traditional network training, there is no clear and standardized evaluation system, no management restraint and binding force, which greatly reduced the effects of all the network training activities. The lacking of learning motivation and mutual encouragement among teachers fails to inspire learners' sense of achievement and satisfaction while completing the online network training. To boost the effects of network training, proper and reasonable evaluation and management system should be designed by means of supervision, evaluation and encouragement.

### **3. Brief Summary of Core Concepts**

Network training is produced under two main reasons. One is the teachers' professional development needs and the other is the continuous progress of network information technology. Network training are carried out in many places. Its frame mainly consists of five parts, where the network platform is designed as the technical support, the learning community is reckoned as the main body, resources and interactions are defined as the important factors, the hybrid learning is served as the main way, and the evaluation management is the guarantee mechanism [18]. Brief summary of the core concepts were illustrated in this part.

#### **3.1 Main Purpose of network training**

Network training strives to achieve the main purpose of promoting teachers' professional development, improving the teaching behaviors with the help of an open and interactive network training platform. Teachers are organized to participate in the independent training, discuss education and teaching issues with experts and other teachers, share the online resources and exchange emotions, as well as combine the teaching practice with learning skills.

#### **3.2 Advantages of network training**

Network training is the expansion, extension and development of traditional training. It has the advantage of breaking through limitation of the time and space under traditional training activities, provide convenience for teachers to learn and communicate with the help of network resources and information equipment anytime and anywhere. Network

training provides teachers with multiple and free choices, and has become an effective means of distance training for teachers and promoting professional development.

### **3.3 Mechanism of network training**

Network training uses deconstructionism as the theory foundation, works in the form of learning community, and reckon the online training as the medium. Members in this mode achieve the learning tasks by way of hybrid learning through the help of the network platform to build and share the online resources. During the learning process, the evaluation index system is designed to stimulate the teachers' enthusiasm, in order to better achieve the goal of promoting the professional knowledge construction and development of teachers, as well as enhancing the team cooperation and communication.

### **3.4 Network training mode**

According to many scholar's opinion, the traditional network training mode consists of five parts. The first is the study and training platform, which is established as the technical support. The second part is the learning community, which is served as the main body. The third part is the hybrid learning, which works as the main way. The fourth part includes the resources and interaction, which are defined as the important factors. The final part is the evaluation and management system, which is established as the guarantee mechanism.

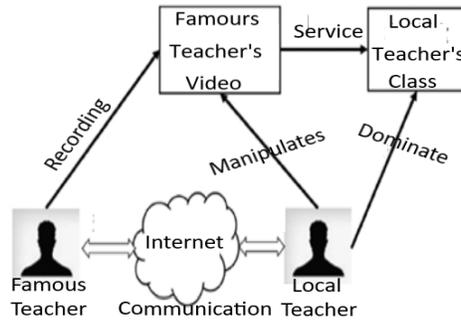
### **3.5 Network training community**

Network training community refers to the group of teachers who participate in the network training, and is usually constructed through certain organizational procedures with the support of superior departments [19]. This kind of learning organization is usually formed by some voluntary teachers with common interests, needs, purposes and concerns, who have strong aspires for the professional development and are combined together in this group. The participants in this learning community do not have any restriction with respect to the region, discipline and education level, and they are divided into organizers, teachers, instructors and other learners according to the roles they play. Choosing the right learning theme, the network platform is utilized to carry out the topic discussion, class observation, lesson preparation, and class evaluation by the cooperation and collaborative communication between learners, subject experts and other members. The training activities are designed and optimized, the ideology are shared freely without any time delay, the learning process is carried out under the tutors' guidance and the enterprise's assistance [20].

## **4. Double Teachers Teaching Mode**

This part designs a "Double Teachers Teaching" mode. With the development of educational information technology, "Double Teachers Teaching" has been proposed out as a collaborative teaching mode, which becomes a leading mode in online education and is conducive to liberating the educational productivity and enlarges teachers' productivity. "Double Teachers Teaching" has solid theoretical foundations of group dynamics, education equity and constructivism, whose connotations are rich and characteristics are distinct [21]. This mode combines the advantages of two classrooms, where the city's first line excellent teachers' provides the teaching contents through the internet platform for distance learning in online classroom, and the local teachers manage and instruct the offline classroom by carrying out communication and personalized interpretation. As an innovative teaching mode under the background of "Internet + " , double-teacher

teaching introduces two teachers into the original stable teaching structure to change the relationship between teaching factors under the traditional teaching pattern To make it possible for students of traditional weak schools to receive the education of famous teachers is conducive to the balanced development of urban and rural education[22]. From this perspective, "double teachers teaching" is a branch of collaborative teaching model, its essence lies in the integration of the advantages of teaching resources. The mode is an innovative teaching mode under the background of "Internet + ", its mode is illustrated in Fig. 1.



**Fig. 1.** Double teachers teaching mode.

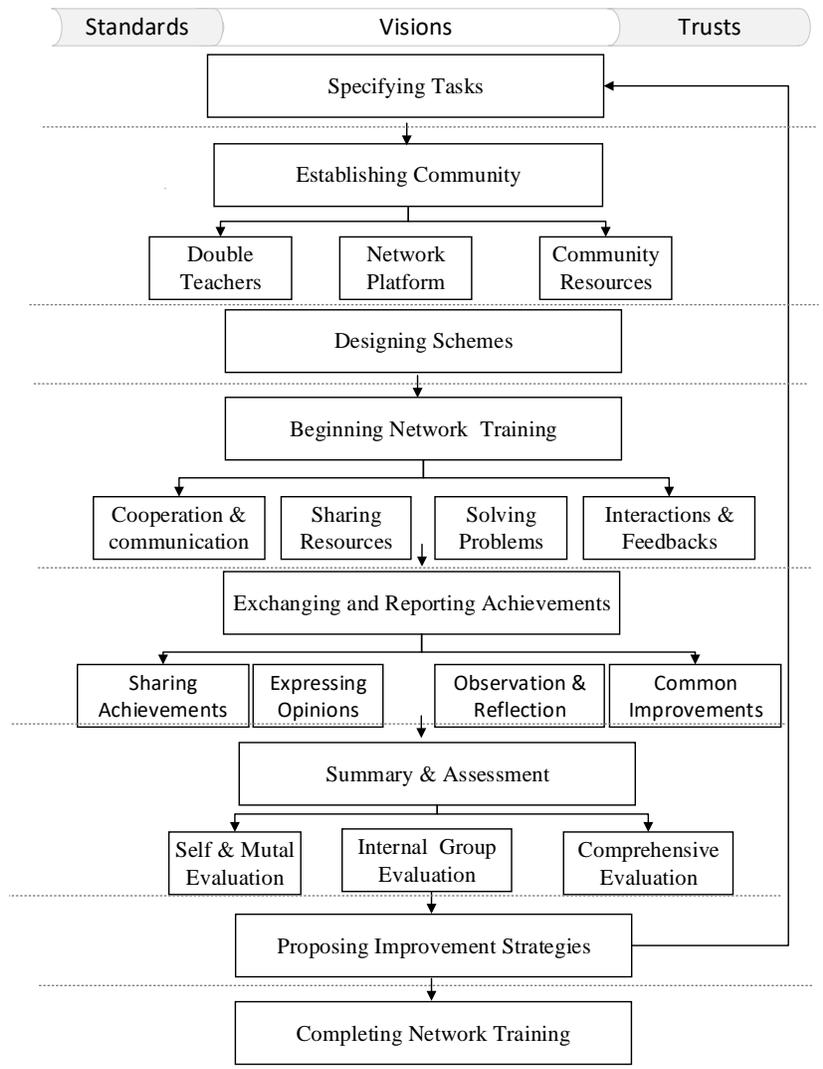
"Double Teachers Teaching" can make up for the shortage of rural high-quality education resources to a certain extent by co construction and sharing, realize the mutual accommodation and assistance of urban and rural education, and then promote the high-quality and balanced development of regional basic education. From the perspective of community, this paper constructs the "Double Teachers Teaching" mode which defines the network training community as the union of double teachers, universities scholars, education enterprises and community resources. Under the proposed mode, excellent teacher and local teacher carry out the collaborative teaching with the help of information technology, finish the study and training activities through network platform, and generate the online education community resources. "Double Teachers Teaching" plays an important role in boosting teachers' professional development, and can provide reference for network training teachers and other researchers.

We design the "Double Teachers Teaching" mode from the perspective of community under the frame of the network training, which consists of eight stages. Specifically, we determine the tasks in network training, establish the learning community, design the learning themes, begin the training activities, exchange and report the achievements, summarize and assessment, propose improvement strategies and then complete the training process. The sequences of corresponding stages are illustrated in Fig. 2, with the detailed contents given. To gain good training results, the "Double Teachers Teaching" mode attaches importance on four aspects: people, platform, culture and evaluation. The strategies are pointed out in real applications with respect to the people participating in the community, the network platform designed for the study and training, the construction of community culture, as well as the evaluation system and mode.

#### 4.1 The strategies of people

People participating in the "Double Teachers Teaching" mode is from multi-sources, they include learners from experimental school teachers, experts from prestigious school current excellent teachers, scholars from institutions of higher learning, and well-known education enterprises. Learners are mainly subject teachers, who have practical needs

to improve their professional level, as well as strong willingness to finish the advanced study online. Experts are excellent teachers who are selected from the top teachers in prestigious school to demonstrate the excellent class. Scholars are from colleges and universities who have rich theoretical knowledge and scientific research experience. They play the role of helpers who assist the learning by providing consultation, feedback and guidance for the whole teachers' research activities. To guarantee the smooth operation of the whole advance study and training, well-known education enterprises are involved to furnish technical support and also act as coordinators to deal with the needs of members from various parties. Communication among all those people are recommended in advance to enhance mutual understanding, cooperative exchanges, and facilitate subsequent research activities.



**Fig. 2.** Network training community mode.

According to the actual teaching and research needs, the experimental teachers and the excellent teachers participate in the network training process and dynamically adjust the pace. They cooperate openly, regularly carry out the online research and offline discussion, such as observing the famous teachers' class, sharing the teaching ideas and experiences, as well as discussing about the teaching management, content design and teaching feedback evaluation. The "Double

Teachers Teaching" mode will carry out the mixed training throughout the whole process, by way of "asking in class, learning through asking, doing in learning, and changing in doing".

#### 4.2 The strategies of platform

The network platform is the key factor in the network training process, which generates and accumulates the training resources to help teachers in carrying out various teaching activities around some pre-specified learning theme. Technical learning tools and research resources are the important guarantee for carrying out all the study activities, which are provided by helpers in time to solve the technical difficulties encountered in the process and ensure the learners to finish the study in an efficient manner. The resources provide directional guidance for the design of learning themes, they are developed around some specific problems in the teaching practice, in order to enhance the subjectivity and enthusiasm of teachers in the learning process. According to the actual teaching and research needs of teachers, the learning themes are dynamically adjusted and updated.

The platform of "Double Teachers Teaching" mode has two core modules called "Double Teachers Classroom" and "Double Teachers Research", through which the learners and first-line excellent teachers share and communicate with each other in different places at the same time online. During the whole process, experts and scholars from colleges and universities give professional advices, and the educational enterprises provide full assistance of online training. "Double Teachers Classroom" module focuses on the key teaching skills of excellent teachers' demonstrating class through online live broadcast, and it delivers the experiences of subject knowledge, teaching concepts, teaching methods and contents design to experimental teachers. "Double Teachers Research" module provides conveniences for the backbone teachers from experimental school in establishing their own school team with young teachers as the core members; also it facilitates teaching and research activities like collecting data, preparing lessons, attending classes, evaluating and feedback under the guidance of famous teachers.

#### 4.3 The strategies of culture

The network training has the cooperation mode of double teachers' participation; whose quality is affected by the standard vision, quality online resources and interaction depth. The culture construction focuses on enhancing members' community awareness. To better cohere and continue the community, members should trust each other, set up a sense of identification and belonging, and feel the value and significance of them to their own groups. Culture construction also lays particular stress on building community standards, and gradually internalizing them into the psychological scale of community members, restricting words and deeds, and becoming the rules for judging various behaviors. The interactions among community members is also a part of culture construction, which achieve the purpose of knowledge construction and sharing by information exchange through continuous and hard-working learning activities, thus met the needs of self-esteem.

#### 4.4 The strategies of evaluation

Effective evaluation strategy is the support of a perfect network training mode, which includes comprehensive evaluation system and effective evaluation mode. The evaluation system can be designed based on Coriolis four level evaluation method, under which the learning effects of teachers are evaluated using the reaction evaluation, learning evaluation,

behavior evaluation and achievement evaluation. The design of the evaluation mode follows the principles of individuation, moderation and fairness. For example, means of points, grades and rankings can be established to stimulate the enthusiasm of the study teachers. In addition to that, the learners' self and mutual evaluation is combined with the comprehensive evaluation of the experts, so that teachers participate in the training can find their own gaps and shortcomings through evaluation.

"Double Teachers Teaching" mode cultivates the three-step learning process of finding problems, solving problems and avoiding problems. The teachers are required to submit a report to summarize and evaluate the online training results, so as to better improve their education and teaching skills as well as basic teaching literacy. After the self-evaluation, the learner teachers evaluate each other to select the best report and the most hardworking, active and progressive learners. By comparing with others' summary reports, the teachers learn shortcomings of their own and advantages of others. The excellent teachers act as tutors, they shall conduct a comprehensive evaluation on all the teachers from a fair and objective point of view. They sifting the submitted reports, select the excellent works, analyze the causes of the problems in the network study and provide professional solutions.

## **5 Application of Double Teachers Teaching Mode**

The proposed "Double Teachers Teaching" mode is applied in one middle school. It is difficult to recruit excellent teacher as well as high-quality education resources, which lead to the limited improvement of the school students' academic level and the serious loss of high-quality students. This school specified Chinese course as the training task and established the community, then teachers begin training activities, exchange ideas and complete subsequent stages network training.

### **5.1 Establishing community**

The community includes excellent teachers from famous middle school, local teachers from experimental school, scholars from Universities and some well-known education enterprises. Members in the community take the initiative to get familiar with each other before the training activities, strives to construct a collaborative atmosphere of democracy and equality.

### **5.2 Beginning network training**

The network training are carried forward by collaborative teaching of double teachers following the predefined training themes through the network platform. The excellent teachers firstly conducted the field research to master the teaching ability and practical needs of local teachers, and then generated targeted and highly-condensed training resources of high-quality, such as teaching plans, coursewares, teaching philosophies, teaching cases, etc. The local teachers presented the demands and problems encountered, so as to get timely feed backs from experts. The network platform provided "Double Teachers Classroom" and "Double Teachers Research" modules to facilitate the training process. The excellent teacher demonstrated standards of the excellent classroom for the local teachers to observe, learn and imitate, and the local teacher applied what they learned to boost their professional development. Double teachers carried out research and finished all training activities through communication and interaction.

### 5.3 Questionnaire design

We apply questionnaire survey to prepare and collect data. The questionnaire is designed based on "Teaching competence assessment scale for compulsory education teachers" by Miryam [23], and "assessment index of professional competence of Chinese teachers" designed by Nippe [24]. The questionnaire consists of ten questions, and the answers to them are rated to five levels, such as perfectly match, very match, generally match, not very match and do not match. We outline the ten questions and that are as follows. (1) Read the curriculum standards, analysis of the teaching materials; (2) Familiar with students' knowledge, ability level, learning interest and style; (3) Master the characteristics of students' psychological and cognitive development; (4) Design targeted teaching goals; (5) Grasp the key points and difficulties of a class; (6) Create or choose a representative teaching resource that is relevant to the student's life; (7) Focuses on the subjectivity and creativity of both teachers and students; (8) Face the course, dynamic lesson preparation, pre-set class; (9) Understand the diversity of teaching methods, teaching skills, teaching strategies; (10) Properly choose teaching strategies, methods, innovative teaching methods.

### 5.4 Validity analysis

We encode the test questionnaire, and uses SPSS to make the validity analysis. The CRONBACH's Alpha Coefficient of the questionnaire is more than 0.860, which is up to the evaluation standard. It shows that the reliability of the questionnaire is good. Then the questionnaire was tested by KMO test and Bartlett Spherical Test, KMO = 0.890; the significance of Bartlett Spherical test ( $p = 0.000 < 0.001$ ). The results showed that the questionnaire was suitable for factor analysis.

## 6. Results

This study focuses on the development of teachers' professional competence in "Double Teachers Teaching". In order to verify the effect of the network training mode, the "paired sample test" is introduced to demonstrate the learning effects. 32 teachers participate in this training program, including Chinese, mathematics, physics and chemistry teachers in the second semester of the 2019-2020 school year. We distribute questionnaires to those teachers before they begin the training, and distribute again after they finish the training. Using the pre-test and post-test quasi-experiment design, the paired sample t test was carried out on the pre-test and post-test data of teachers in double teachers teaching. The results are shown in Table 1.

**Table 1:** Pre-Test and Post-Test Results.

Aspects	Analysis Results			
	Pre Test	Post Test	t	Sig
Curriculum Standards	4.34±0.90	4.38±0.94	0.372	0.712
Students Analysis	4.16±0.86	4.38±0.86	3.279**	0.003
Teaching Objectives	4.21±0.82	4.48±0.83	3.266**	0.003
Key Teaching Points	4.45±0.95	4.48±0.95	0.441	0.663
Teaching Process	4.19±0.81	4.41±0.95	2.546**	0.017
Teaching Methods	4.16±0.80	4.45±0.84	4.047***	0.000

According to results in the above table, we made the following conclusions.

- There were significant differences in the student analysis, teaching objectives and teaching methods, and the mean value of the post test was higher than the pre-test.
- There was significant differences in the teaching process before and after the “Double Teachers Teaching”, and mean of the post test was higher than that of the front.
- The differences are not significant before and after the implementation of double-teacher teaching, in the interpretation of the curriculum standards and key teaching points.
- The mean value of the back side was slightly higher than that of the front side, offline teachers in the curriculum interpretation, teaching difficulties did not change significantly, but the mean slightly increased.

### 6.1 Evaluation

To further investigate the teachers’ sense of satisfaction and the degree of achieving the training goals, we also interviewed four teachers in the off-line experimental group, two on-line teachers and two leaders of the experimental school. Generally speaking, more than 95% teachers are satisfied with this training mode in a very positive way, where they learn excellent cases, advanced teaching concepts and methods, effectively improve their learning abilities and professional knowledge. Also, they take on good environments of collaborative communication and knowledge sharing, which give them opportunities to focus on problems needing to be addressed and find the corresponding strategies.

### 7. Discussion

Existing research laid emphasis on the activity design or strategies, such as Papadakis’ investigating of pre-service teachers’ acceptance of mobile devices with regards to their age and gender, or Kalogiannakis’ discussion about the use of mobile application to promote steam activity by mathematics teachers, or the use of tablets or “ScratchJr” into the teaching practice. Unlike the above researches which are done from the macro-view, our “Double Teachers Teaching” is designed from the micro-view, its main aim is to promote teachers’ professional development. Our research give a detailed and imitable training mode, and achieves good results in promoting teachers’ competency. The teachers can make a better analysis of the students, improve their ability of grasping the key points and methods during the teaching.

### 8. Conclusion

An effective network training mode can boost teachers’ professional development. It can stimulate the enthusiasms of teachers, have them involved in all the training activities, and give them in-depth guidance and training. The “Double Teachers Teaching” mode is designed from the perspective of community, the excellent teachers from famous school and the local teachers from ordinary school cooperate openly and receive timely feedback in the whole teaching process. The excellent teachers demonstrate the lessons, and introduce advanced teaching ideas; the local teachers learn from the excellent teacher, and consult their puzzles whenever needed. The community mode of “Double Teachers Teaching” achieves the goal of promoting teachers’ teaching ability and professional development under the framework of network training community. The people participated has enthusiasm for their development and get familiar with each other before the training process by communication. The network platform not only provide teachers with practical and targeted online resources, but also carry out regular teaching discussion and research through “double teacher research”

module. In the meantime, “double teacher classroom” by the excellent teachers can give local teacher a detail demonstration of a success class, teach local teachers about the teaching strategies and methods. Double teachers cooperate together to make the teaching plan, prepare lessons for the teaching research, testing after class and evaluating feedback.

Comparing with traditional network training mode, the proposed community mode is more open, more interactive and more sharing. The circumstances of collaboration and sharing resources are ideal for teachers’ ability improvement. Through this training mode, the excellent teachers’ classroom styles can be imitated by the local teachers. By way of companion-style training, a targeted training mode will be formed, that is "famous teachers of famous schools lead participating teachers of the school". By conducting on-line and off-line subject lectures, innovative activities and project research, teachers achieve professional development and subject competence. We applied this mode into a middle school, and design a questionnaire to investigate the extent of teachers’ professional development using ten questions. The questionnaire is distributed to and collected from the teachers involved in the training. The answers are encoded and then analyzed by SPSS. Analysis results show that the implementation of “Double Teachers Teaching” has a concrete impact on the local teacher’s development. It significantly improves their ability of student analysis, teaching objectives, teaching process and teaching methods.

## **9. Contribution**

The “Double Teachers Teaching” mode proposed in this article can also be used by the other organization to carry out network training and evaluate the professional development. This paper has three main contributions. First, it proposes a new network training mode, which is easy to implement, and only require the recording and live broadcast devices. Second, it illustrates the strategies of community contributing to the in-depth guidance during the training process, with talented people, useful platform, encouraging culture and valid evaluation. Third, it contributes the questionnaire which lay emphasis on the teaching design, and reckon it as the main index of teachers’ competency. As is stated in this article, this mode is applied only in one middle school, so the results analysis is only suitable only for this school. So, this is the limitation of this article.

## **10. Consent for Publication**

All the material in this paper had written informed consent for publication, which was obtained from all participants.

## **11. Conflicts of Interests**

The authors declared that they had no conflicts of interest.

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