

A Research on the Promotion Effect of SPOC-based Flipped Classroom Teaching on Rural English Education

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Abstract. Since the 21st century, with the rapid development of modern information technology, especially the popularization of the Internet, education informatization has become the mainstream trend of education reform. At present, research on the construction of SPOC-based flipped classroom teaching has gradually become the focus of education. From the perspective of research direction, it focuses on the teaching model's characteristics such as small-scale and private, but there are few targeted research associated with specific disciplines, especially for the subject teaching in rural areas with special lack of educational balance. Therefore, this study makes an in-depth analysis from the perspectives of four elements of education, i.e. educational subject dimension, educational object dimension, educational content dimension and educational environment dimension, aiming to propose a realistic plan for the realization of SPOC-based flipped classroom teaching model in promoting rural English education.

Keywords: SPOC, Flipped Classroom Teaching, English Education, Rural Education.

1. Introduction

At present, in China, rural revitalization has become a major strategy of rural development. And Rural education plays a fundamental, leading and overarching role in rural revitalization. It is an integral part of rural revitalization and can help rural areas achieve economic, industrial and cultural revitalization, making rural areas more beautiful and farmers more prosperous. Therefore, the implementation of rural revitalization strategy should be combined with the revitalization of rural education to achieve the interactive cooperation between the revitalization of rural education, the revitalization of rural industries, and the revitalization of culture, so as to support the future of rural areas as a whole. The modernization of rural education is the modernization of the contents of multi-disciplinary education and teaching. From the practical effect, rural English education contributes to the development of rural society. The development of English education in rural areas is related to the development of English education, but also to educational equity and social equity. Obviously, in China, improving the quality of English education in rural areas is related to the requirements of national literacy for national strategies such as the basic national policy of reform and opening up.

Nowadays, application of modern information technology in rural education development with high efficiency of education, easy to use and the advantages of small space difference, is the effective means to improve the rural students' academic performance and speed up the rural human capital accumulation. Internationally, policymakers are also increasingly recognizing the importance of modern information technology in educational development and in bridging the urban-rural gap. Based on this, this study focuses on rural English education and discusses how SPOC-based flipped classroom teaching in information technology can help rural English classroom from four dimensions of education.

2. Current situation and problems of rural education enabled by science and technology

2.1. Current situation of rural education in China

(1) Realistic difficulties

First of all, in China, the economic development level of rural areas is relatively backward compared with that of urban areas, which leads to a particular shortage of teaching facilities and teaching resources, which further makes the teaching method single and many modern teaching activities difficult to carry out, the education level is low, and the gap between urban and rural education is widening. Secondly, due to the low salary of rural schools, rural schools in some areas can not even pay salaries on time, there will be the phenomenon of teacher loss, resulting in uneven allocation of rural teachers, if this goes on for a long time, heavy teaching work may fall on one or two teachers, which will weaken the willingness of teachers to stay, and further aggravate the imbalance of teacher supply and demand. Thirdly, the development of rural education is restricted by the limited educational level and backward concepts of farmers. Due to the lack of their own educational awareness, farmers do not pay enough attention to the education of students and neglect management, which is not conducive to the completion of students' homework, and the learning effect will also be affected [1].

(2) Policy promotion

Based on the above problems, Chinese government has increased its support for rural education, adjusted the proportion of educational investment in the economy, and tilted fiscal funds toward rural areas. For example, in 2020, the total funding for preschool education in China will reach 420.463 billion yuan, half of which will be invested in rural areas [2]. This policy has significantly improved the conditions of rural education, and the diversity of educational equipment has promoted the development of teaching activities. In terms of teachers, all regions have increased the recruitment of special teachers, and schools with advanced education level at the county and municipal level have provided matching support to rural schools, transferring experienced and excellent teachers to rural areas to promote balanced allocation of teachers. In terms of family education, rural schools carry out home-school cooperation. Through online "home-school group", teachers report students' learning results to parents, so as to arouse parents' attention to education. In addition, with the call of the state, more and more young people are willing to go back to the village to start businesses, which can promote the growth of the rural population's cultural level to a certain extent, change the backward and conservative cultural concepts of farmers, and form a virtuous circle in which everyone attaches importance to education.

With the support of policies and the efforts of governments at all levels and the Department of Education, many problems in rural education have been solved and continue to improve, but there are still some problems that cannot be ignored in rural English teaching.

2.2. Application of information technology in Chinese rural education

(1) Multimedia teaching has been widely promoted in Chinese education and teaching, especially in rural education in recent years. Teachers use pictures, videos, texts and sounds to assist teaching and form an interactive learning environment.

(2) During the COVID-19 pandemic, traditional offline school classes were no longer able to cope with such emergencies, as person-to-person contact increased the risk of infection, and most schools closed. Relying on the development of network technology, teachers can realize online teaching through Internet platforms such as Tencent Conference, QQ conference and so on, which can not only effectively fight against the adverse impact of the epidemic, but also free from restrictions on teaching places and forms. From this point of view, in the face of the basic status quo of vast rural areas and sparse population, the application of information technology in rural education helps to achieve the balance of educational effects, reduce the level gap of education, and achieve a higher level of "educational equity".

(3) Family education is also a special part of rural education. In rural areas, parents have their own work needs, so they cannot pay close attention to students' learning conditions at all times. Moreover, parents' meetings are held less frequently, only once or twice a semester, which cannot encourage parents to participate in students' learning process. Therefore, schools at all levels begin to form online "home-school groups", through which teachers report students' learning results to parents every day, so that parents can have a better understanding of students' learning, so as to follow up students' learning progress and effectively supervise students' family learning.

However, even under the help of such science and technology, there are still backward, teaching mode of traditional education ideas. Therefore, there should be a different technology-based teaching model to fundamentally change the rural English education, and to avoid it up in the rural English education "dumb" education, "cramming" teaching and "indifference" education.

2.3. Foreign cases of SPOC application

In 2012, Harvard University actively joined the construction of "MOOCs" and established its own online learning project---HarvardX, hoping to improve the teaching effect by integrating online courses organically into campus teaching. In 2013, Armando Fox, a professor of computer science at the University of California, Berkeley, proposed small-scale proprietary online courses (SPOC) and advocated SPOC blended learning. Some colleges of Harvard University conducted a series of trials of small-scale proprietary online courses (SPOC) and carried out flipped classroom. Let the students choose the time and place to watch the video independently, and strengthen the question answering in class, so as to provide more efficient learning experience for learners. The University of California at Berkeley introduced SPOC for the first time in the course Cloud Computing and Software Engineering. The University of Carlos III in Madrid, Spain, launched a five-week SPOC pilot course called Project Genghis in the summer of 2012. Leiden University in the Netherlands launched the SPOC pilot course on Islam in the West in 2014; MIT is also experimenting and promoting SPOC courses and flipped classrooms [3-5].

The reality shows that SPOC-based Flipped Classroom teaching is one of the advanced educational experiences in foreign countries, which helps us to open up new educational ideas. Similarly, this paper believes that such educational technology and teaching methods can solve the deficiencies and defects in rural English education.

3. Feasibility analysis of SPOC-based Flipped Classroom teaching

3.1. SPOC and Flipped Classroom

SPOC is short for Small Private Online Course. In essence, SPOC is a teaching model that combines online autonomous learning with offline physical class, designed for learners' individual differences. Flipped Classroom is the integration of "student-oriented autonomous learning (knowledge transmission)" and "teacher-student interactive classroom learning (knowledge internalization)" [6]. And there are two types of SPOC courses. One is that teachers set admission conditions and select qualified learners from applicants to participate in SPOC courses. Students complete online learning and online tests through the network platform, which does not require teachers' offline help [5]. Another learning model is the SPOC-based flipped classroom teaching model, which requires teachers to guide students offline [7].

3.2. SPOC-based flipped classroom teaching model

This study focuses on the second teaching model mentioned above---SPOC-based flipped classroom teaching model. First of all, the SPOC teaching platform needs to be built. When developing SPOC online resources, we can not only directly introduce high-quality MOOC resources online but also make micro-courses and upload them to the SPOC platform by analyzing learners' characteristics and teaching content. Before class, teachers upload micro-videos, relevant materials, task lists, etc., on the SPOC platform. Students learn independently and communicate with teachers

and classmates through the SPOC platform. In the class, the teacher commented on the online work, answered questions and clarified doubts, and summarized the knowledge points. After class, teachers assign homework and tests on SPOC and give timely feedback on students' knowledge mastery. Students can get feedback from teachers and reflect deeply to consolidate their learned knowledge. The teaching model is shown in Figure 1.

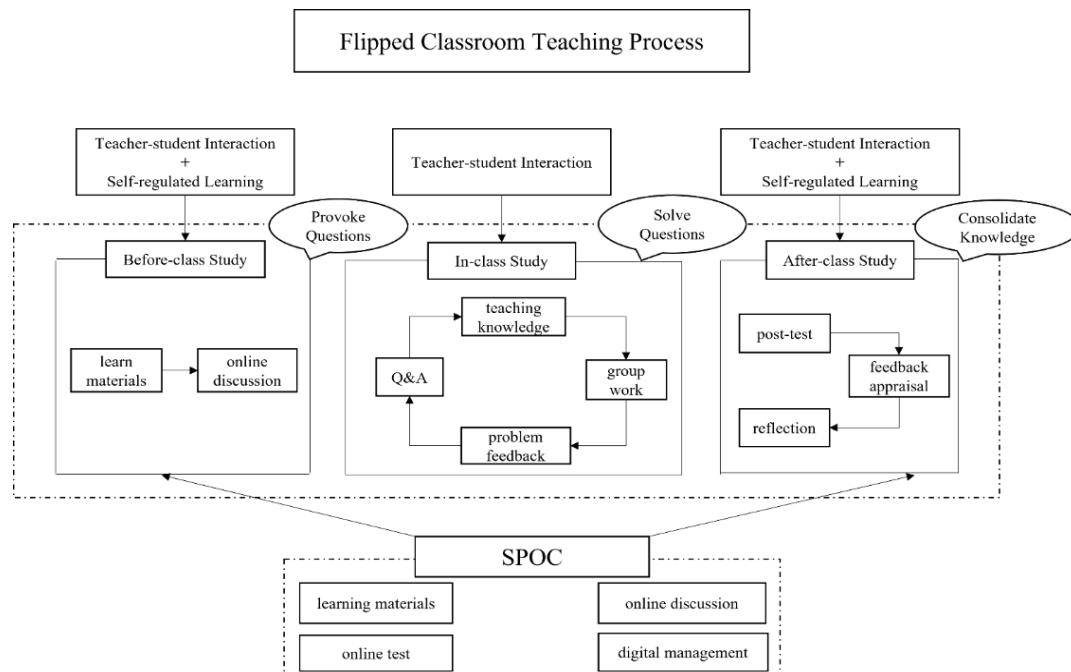


Figure 1. SPOC-based flipped classroom teaching model

It can be seen that the SPOC-based flipped classroom teaching model can organically integrate the advantages of face-to-face classroom teaching (offline learning) and online learning (SPOC-based learning), and as a new form of teaching, it plays a significant role in promoting rural English education.

3.3. Feasibility analysis of SPOC-based flipped classroom teaching

(1) Internal feasibility condition

SPOC, as a high-quality open education resource, plays a very good role in supporting flipped classroom teaching. The "small-scale" and "exclusive" nature of SPOC are also favorable conditions for flipped classroom teaching. The idea of MOOCs is implanted into flipped classroom, and the flipped classroom is implemented with the help of MOOCs teaching platform, so as to realize the sharing of high-quality resources and optimize the teaching effect. Therefore, it is inevitable to carry out the flipped classroom teaching practice based on SPOC [4].

(2) External feasibility condition

➤ National support

In China, on April 16, 2018, the Ministry of Education issued the notice of "Education Informatization 2.0 Action Plan", which clarified the new direction of "Internet +" rural education. In 2019, "Internet + education" and its broad prospects are also discussed in the annual "two sessions" of the NPC and Chinese People's Political Consultative Conference. The development of "Internet + education" has been written into the government work report and the sharing of high-quality education resources has become a hot word in the two sessions. On February 11, 2022, The State Council issued the 14th Five-Year Plan to promote the modernization of agriculture and rural areas. In the document, it proposed to accelerate the construction of digital countryside, strengthen the construction of rural information infrastructure, improve the quality of rural education, and accelerate the development of rural-oriented online education. A series of documents, such as the Opinions of the CPC Central Committee and The State Council on Comprehensively Promoting the Key Work of

Rural Revitalization by 2022 and the Outline of the Strategy for the Development of Digital Countryside, demonstrate the state's support for the application of information technology in rural education. With this support, SPOC-based flipped classroom teaching can optimize the construction of the platform for sharing education resources between urban and rural areas and enrich the supply of high-quality online education content according to the current situation of rural online education.

➤ Resource guarantee

On May 8, 2014, the MOOC platform of Chinese universities was launched. According to the survey, by February 2015, more than 300 MOOC courses from 121 partner universities had been launched, and the number of users exceeded one million. The emergence of MOOC platform provides SPOC with high-quality online course resources. MOOC platforms have also begun to add "SPOC zones" to support the sharing of high-quality educational resources between schools, optimize teachers' classroom teaching in an online way, and allow students to learn freely according to the course schedule.

➤ Extensive experience

Under the influence of foreign SPOC platform applications, 85 SPOC courses were launched by 51 universities on Chinese MOOC platforms by the end of February 2015. While "Xuetang Online" founded by Tsinghua University opens educational resources to the outside world, it also uses this platform to experiment the flipped classroom teaching mode of two courses, C++ Programming and Cloud Computing and Software Engineering, turning MOOCs into small-scale proprietary online courses (SPOCs) with dozens of students. The teaching practice at home and abroad provides rich experience for constructing SPOC-based flipped classroom teaching to promote rural English education.

4. Analysis of promotion effect of SPOC-based flipped classroom teaching applied in rural English education from the perspective of four elements of education

4.1. Educational subject dimension

At first, SPOC-based flipped classroom teaching enables teachers to find common difficult problems in the collective according to students' learning situation and questions raised through the SPOC platform, and meanwhile, to accurately grasp the personalized problems. Based on these, teachers can focus on the collective problems in class, and also provide individual guidance for personalized problems, so as to avoid "undifferentiated" education.

Secondly, the enlightening teaching brought by SPOC-based flipped classroom teaching enables teachers to understand and meet the actual needs of students, avoiding "cramming" education.

4.2. Educational object dimension

Firstly, SPOC platform makes knowledge more vivid through pictures, audio and video, improves students' learning interest and enthusiasm, and avoids the "imaginary" education caused by backward teaching facilities in rural English education.

Secondly, SPOC-based flipped classroom teaching better promotes students' personalized learning and inquiry learning, making students' knowledge transfer, knowledge internalization and knowledge consolidation more efficient and improving learning efficiency. To be more specific, in pre-class video learning, students can pause and replay the video according to their own level, and use the teaching video repeatedly to complete the primary teaching objectives such as knowledge imparts and memory. Then, in class, according to students' learning situation and questions raised through the SPOC platform, teachers will give targeted explanations and provide personalized tutoring. Furthermore, students realize the internalization, transfer and application of knowledge in the teacher's answer and cooperative inquiry. After class, knowledge is consolidated through after-class tests, teachers' feedback and evaluation, and deep reflection.

Thirdly, SPOC-based flipped classroom teaching has transformed students from passive receivers of knowledge into active explorers, discovering knowledge through exploration and cooperation, and better improving their autonomous learning ability. Before class, students are the masters of the learning process, learning independently and spontaneously finding and discussing problems; In class, students are the inquirers in class, internalizing knowledge in solving puzzles; After class, students are the summarizers of learning, consolidating and applying knowledge through homework.

4.3. Educational content dimension

Firstly, SPOC platform expands the teaching resources of rural English education. For example, due to the influence of hardware and teacher conditions, English courses in rural schools start late or pay less attention to oral English ability training. Relying on SPOC platform, rural English teachers can use foreign teachers' oral teaching videos to create English environment, cultivate students' language sense, and improve students' oral ability.

Secondly, SPOC-based flipped classroom teaching enables teacher-student interaction to run through the whole teaching process. While increasing teacher-student interaction, it also increases the opportunity of language output for students, which to some extent changes the common lack of "speaking" teaching in rural English education.

4.4. Educational environment dimension

Disembodied cognition represented by Descartes rejects the interaction between the body and the environment, and unilaterally emphasizes the mastery of knowledge by the mind and the indoctrination by the educator, and ignores the activities and characteristics of human cognitive process. Embodied cognition is a brand new cognitive theory, which believes that cognition and body are not opposed to each other, but integrated. Through changing the body and environment, thinking cognition can be improved. In embodied cognition theory, people connect with the external world through the way of the body rather than the way of consciousness, and the interaction between the body and the world contributes to the generation of perception and cognitive function [8]. Therefore, "embodiment" education emphasizes the full release of students' bodies, and requires teachers to give full play to students' subjectivity, enthusiasm and creativity in the teaching process, so that students can experience and feel freely in participating in various activities [9].

The SPOC-based flipped classroom gives full play to students' subjectivity, enthusiasm and creativity in learning, promotes the traditional "cramming" education in rural English education to the heuristic education, enhances the interaction between teachers and students, improves the relationship between teachers and students, and creates a harmonious and equal educational environment. Improve rural English education environment affinity.

Moreover, SPOC-based flipped classroom teaching reconstructs the learning space of rural students. A learning space is a place for learning. In traditional rural school education, rural students' learning is mainly confined to the field where teachers are, so their learning space is mainly limited to traditional physical fields such as classrooms, laboratories and libraries. SPOC-based flipped classroom teaching makes the learning space no longer limited to offline, distance learning is possible, and also makes the learning space more interactive and collaborative.

5. Conclusion

From disembodied cognition to embodied interaction, in essence, educators return to the concept of "student-oriented" education and stimulate the endogenous motivation of students. SPOC-based flipped classroom teaching puts the initiative of learning in the hands of students and creates the embodied situation of teacher-student interaction. From "cramming" education to heuristic education, the SPOC-based flipped classroom teaching model enhances the interaction between teachers and students, improves the relationship between teachers and students, creates a harmonious and equal educational environment atmosphere, enhances the affinity of the educational environment, and

avoids Chinese traditional classroom atmosphere in the creation of embodied scenes of teacher-student interaction.

However, in the process of SPOC-based flipped classroom teaching practice, students' learning behavior is the core of the overall effect. Only in-depth studies of the factors influencing students' learning behavior in SPOC-based flipped classroom teaching mode can better improve the construction of flipped classroom and meet the needs of students' learning development. Therefore, follow-up researches are expected to integrate Theory of Reasoned Action, Technology Acceptance Model and characteristics of flipped classroom teaching mode to conduct relevant empirical researches and establish a model about the learning behavior of students in flipped classroom. Meanwhile, follow-up studies can also explore students' learning motivations and behavioral characteristics in SPOC-based flipped classroom teaching from more behavioral perspectives, such as Peter Blau's Theory of Social Structure and Richard Emerson's Social Exchange Theory.

As a forward-looking educational thinking, only by continuous researches can we continuously enhance the promotion effect of technological change on rural English education, and finally achieve the fundamental goal of improving the quality of talent training.

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