Rural Teacher ICT Literacy Professional Learning and Teaching Practice in China: A Multiple Case Study Investigation

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Abstract: China is currently vigorously developing educational information, and implementing nationwide projects to improve teachers' ICT literacy. However, the progress of such projects is significantly unbalanced between the rural and urban areas. This study uses a multi-case study approach to investigate the approaches and effectiveness of ICT professional learning programs received by seven rural teachers in the past decade. The study suggests that regardless of those programs, rural teachers' teaching practice and professional development, as well as the student's academic results remain limited due to the flawed local educational environment. The study examines the professional learning approaches applied in rural ICT professional learning programs and identifies both the effective ones and the barriers.

Keywords: Rural teacher, ICT literacy, teaching practices, teacher professional development

1. Introduction

The sustained development and popularization of information and communication technology (ICT) have great potential to accelerate social development, bridge the digital divide, and support the development of an inclusive knowledge society (OECD, 2015). In recent years, China has attached great importance of ICT to its educational system. The Ministry of Education of China proposed the comprehensive implementation of the National Primary and Secondary School Teachers' Information Technology Application Ability Promotion Project in 2013 and 2018 (respectively, Promotion Project 1.0 and 2.0). These projects aim to comprehensively improve the ICT-based teaching ability of primary and secondary school teachers and promote innovation and increase the use of ICT in teaching before 2022. In addition, Promotion Project 2.0 proposed the Development Framework of Information Education and Teaching Ability of Primary and Secondary School Teachers (DFIETAT) (MOEC, 2021).

ICT in education is a vital measure to bridge the gap between urban and rural education development (Wu & Lu, 2020). It is found that compared with urban teachers in China, the ability and creativity of rural teachers in applying ICT in their teaching are still at an unsatisfactory level (BNU, 2020). Therefore, understanding and developing the ICT literacy of rural teachers is an urgent need to be achieved. High-quality professional development plays a crucial role in improving the quality of teachers' classroom practice, which will influence the overall quality of students' learning (Eliahoo, 2016; Vangrieken et al., 2017). However, few studies investigate how professional learning affects teachers' subsequent teaching practice in rural areas in China.

The purpose of this study is to explore rural teachers' views on the potential benefits to themselves and their students from their participation in ICT literacy professional learning activities. This study aims to provide an in-depth overview of how rural teachers engage in ICT learning, and how their learning is disseminated to their students from professional development projects. It was hoped that this study will provide evidence for understanding which methods hold promise, identify barriers to success, and provide information for future implementation of rural teacher professional development.

2. Methodology

This study adopted the multi-case study method to investigate the phenomena of ICT learning and the practice of rural teachers. It aimed to explore mechanisms related to rural teachers' ICT literacy professional learning and teaching practice development through the viewpoints of the participants. The interview protocol in this study was designed according to the effective teacher professional development framework proposed by Desimone (2009). The framework consists of four dimensions: core features of professional development, increased teacher knowledge and skills, change in attitudes and beliefs, change in instruction, and improved student learning.

This study used semi-structured interviews as the main data collection technique. Purposive sampling technique is adopted in this study to identify respondents to participate in the cases. This study ended up with seven participants who volunteered to participate in the interviews. They all come from different cities and teach different subjects.

For data analysis, in the first step, this study adopted a relying on theoretical proposition analytical strategy (Yin, 2018) to conduct a deductive analysis of the data. This was then followed by the "Grounded up" analysis as proposed by Yin (2018). The inductive analysis method was used to re-analyze the data line by line. Label the data source that has not been encoded, and discover new categories. Third, analyze all themes and categories, looking for core types and associating categories to determine the relationship between each category and theme and draw the internal logical relationship between them.

3. Findings

Four themes and 13 categories were obtained by a cross-case analysis in this study. The conceptual model is shown in Figure 1. It also demonstrates the four synthesized findings of this study.
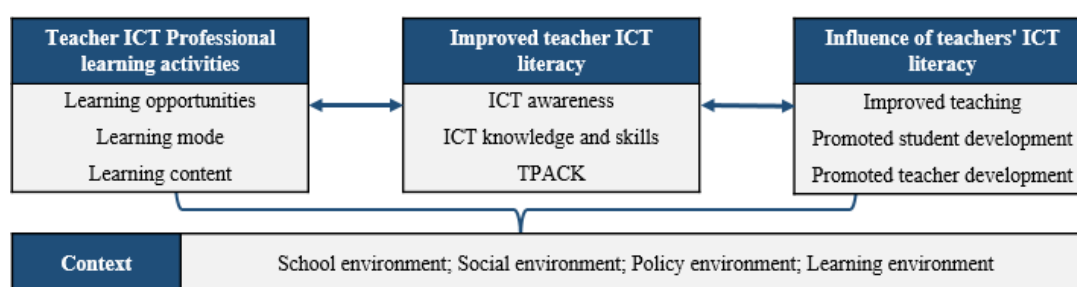

Figure 1. A conceptual Model of ICT Literacy Professional Learning and Teaching Practice for Rural Teachers

Finding 1: Rural teachers expect access to high-quality and tailored ICT professional learning programs.

Although Chinese education authorities emphasize that all primary and secondary school teachers must participate in ICT professional learning, rural teachers have fewer opportunities than their urban counterparts, especially for face-to-face learning. Online learning is less efficient than online ones in improving rural teachers' ICT competencies. They need high-quality blended training. In addition, not all rural teachers are interested in advanced technologies such as artificial intelligence, they prefer those that can be applied to daily teaching practice in their schools.

Finding 2: The improvement of rural teachers' TPACK requires continuous follow-up instruction. Constant follow-up instructions are needed to …

ICT training programs have been proved to have improved teachers' ICT awareness, knowledge and skills, but they cannot access the needed resources to successfully incorporate ICT into their classrooms. They need preparation time and continuous practical guidance from experts in the field of technology and primary and secondary school teachers with extensive practical experience.

Finding 3: Rural teachers are less confident and motivated than urban teachers in using ICT for instructional innovation.

The improvement of rural teachers' ICT literacy has contributed to changing classroom teaching, enriching students' knowledge and promoting students' development. Better ICT literacy

helps to transform/facilitate classroom teaching and achieve better teaching results. At the same time, it has contributed to their professional development, especially in multidisciplinary teaching skills. However, they mostly showed low confidence in using ICT to continuously assess and reflect on professional practice for innovation and improvement.

Finding 4: Multiple factors influence rural teachers' teaching practice and professional development

Rural teachers' ICT literacy professional learning and teaching practices are primarily influenced by their school environment, social environment, policy environment, and learning environment. The impact of school resources and leadership support is particularly evident. In addition, they especially need a close-knit community of teachers to interact and collaborate with each other.

4. Conclusion and Limitation

With the increasing influence of technology on social development, the Chinese government attaches more and more importance to the application of ICT in education. Even in economically underdeveloped provinces, the construction of school information facilities and ICT training of teachers have been guaranteed to a certain extent. This study believes that the blended professional learning model may provide more learning opportunities for rural teachers and improve their sense of participation and confidence in practice. However, how to better integrate online and offline learning needs further discussion. In addition, rural teachers face a more complicated teaching environment than urban teachers. Therefore, building a blended learning model and professional development community for rural teachers has become an issue that researchers need to study further. The learning model and community should combine online and offline and on-campus and off-campus. It is also an important means to promote the professional development of rural teachers and the equity of urban and rural education.

The main limitation of this study was the sample size. However, these participants teach almost all subjects in Chinese primary schools, and multidisciplinary teaching is common among teachers in rural schools in China (An & Yin, 2017), so the results of this study have general implications for the study of rural teachers in China.

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