

New Pathways for Rural Teacher Training in the Digital-Intelligence Era: The Construction of the "Panoramic Six-Stage" Training Model

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ABSTRACT

Accelerating the construction of an education powerhouse requires the cultivation of a high-quality teaching workforce, with teacher training serving as a core component. This paper reviews existing training models and identifies their theoretical foundations, which include Activity Theory, Teacher Community Theory, Experiential Learning Theory, and Connectivism. Currently, rural teacher training faces practical challenges such as insufficient expert guidance, lack of peer collaboration, and low levels of in-depth participation among teachers. Based on the aforementioned theories, this study adopts literature research, interviews, and field investigations to construct a "Panoramic Six-Stage" teacher training model, providing references for enhancing teacher competencies and transforming teaching research methods.

KEYWORDS

Teacher training; Digital transformation of education; Rural teachers; Training model; Panoramic six-stage

1 Introduction

Some scholars have pointed out that building an education power urgently requires promoting systematic educational reforms, and the digital transformation of education has become a key driving force for achieving this goal ^[1]. In the context of building a robust education system, revitalizing rural education is not only fundamental to achieving balanced educational development but also a key component ^[2]. To effectively improve the quality of rural education, the professional growth and capacity building of rural teachers must be regarded as the core entry point. With the accelerated digital transformation of education, efforts should be based on teachers' existing digital literacy and developmental potential, deeply understand their learning needs, explore new teacher learning models adapted to the digital era, and construct a more flexible and efficient system for teacher professional development. Against this backdrop, this study clarifies the theoretical foundations for constructing new teaching research models in the digital-intelligence era, analyzes the practical challenges faced by rural teachers in teaching research, and proposes corresponding solutions.

2 Theoretical Foundations

Many scholars have explored rural teaching research models based on Activity Theory, Community Theory, and Experiential Learning Theory. For example, Liu Xuan and Zheng Yanlin constructed a teacher community-based teaching research model by integrating Activity Theory and Community Theory to address issues in teacher training ^[3]. Zhang Ni et al. developed a teacher workshop training model based on Community Theory to tackle the problem of insufficient teacher resources in underdeveloped areas ^[4]. Relying on Activity Theory, Liu Qingtang et al. proposed an innovative regional peer-based training model that adapts to the organizational needs of different schools and regions ^[5]. Feng Xiaoying et al. built a "Three O Integration" training model based on Community Theory to solve difficulties in online and offline training ^[6].

The construction of training models in the digital-intelligence era requires the integration of online and offline approaches, which inevitably relies on Connectivism Learning Theory. Zhao Xinglong, combining Deep Learning Theory and Connectivism, proposed an in-depth training model for rural teachers, leveraging internet technology to integrate resources and construct a "one-on-one" community space ^[7]. From the perspective of Connectivism, Zhang Wenmei and Wang Cixiao studied the factors influencing group collaborative problem-solving, taking internal group characteristics and external teaching interventions as antecedent conditions, and group collaboration performance and interaction levels as outcome variables ^[8].

In summary, the teaching research model for rural teachers in the digital-intelligence era should be based on the following four core theories, with their key connotations outlined below:

Activity Theory: Originating from the research of Soviet psychologist Lev Vygotsky in the 1920s, it posits that human learning is an indirect process mediated by tools. The activity system consists of three core elements—subject, object, and community—and three supporting elements—tools, rules, and division of labor ^[9].

Teacher Community Theory: Derived from sociological and educational discussions on the concept of "community", it emphasizes collaboration, communication, and professional development among teachers. The Canadian educational scholar Fullan noted that teachers often acquire new knowledge and skills through the exchange of ideas, support, and positive emotions with peers ^[10].

Experiential Learning Theory: Argues that knowledge is derived from the transformation of experiences through interactions between individuals and their environment, emphasizing active participation and reflection. Through practical exploration and the analysis and integration of experiences, it not only helps teachers acquire knowledge and skills but also deepens their understanding of the learning process, thereby enhancing their cognitive development and problem-solving abilities ^[11].

Connectivism: Proposed by the Canadian scholar George Siemens in 2004, it focuses on learning environments in the digital era and the development of network technologies. It emphasizes the importance of networks and connections in learning, where digital technologies and network tools help learners establish connections, share resources, and facilitate the flow of knowledge, with a focus on constructing personal learning environments and networks ^[12].

3 Practical Challenges

3.1 Insufficient Expert Guidance

Experts play a crucial role in the teaching research of rural teachers. However, current expert-led teaching research activities suffer from problems such as short guidance duration, inefficient communication between teachers and experts, and lack of feedback on raised issues. This not only hinders the direction and pace of teachers' professional growth but also limits the depth and breadth of teaching research. As a result, rural teachers struggle to update their teaching concepts and master advanced teaching skills in a timely manner, which adversely affects teaching quality and students' learning outcomes. Additionally, rural teachers feel isolated and unsupported in their teaching research endeavors ^[13-14].

3.2 Lack of Peer Collaboration

The decline in the number of students in rural areas has led to smaller class sizes, making it difficult for rural schools to implement parallel class teaching models. Consequently, teachers often have to teach across multiple grades, which directly reduces opportunities for teaching research collaboration among teachers of the same grade or subject. This deprives rural teachers of platforms for communication and cooperation in their professional development, weakens the mutual support and motivation in teaching and training activities, and increases their workload pressure. Furthermore, due to the lack of peer recognition and feedback, rural teachers' enthusiasm and initiative for teaching may gradually decline, and they may even experience professional burnout in the long run.

3.3 Low Level of In-Depth Participation by Teachers

Domestic and international educational research and practice have shown that the success of teacher professional development programs largely depends on teachers' active learning and in-depth participation. As the main participants in training activities, teachers' initiative is the core driving force for their professional growth and knowledge internalization. However, many current teaching research activities adopt a passive participation model, where only designated teachers prepare and present, while other teachers act as "spectators," resulting in a phenomenon of "one person performing while the rest watch". This makes it difficult to stimulate teachers' initiative and enthusiasm.

4 Pathway Exploration: Construction of the "Panoramic Six-Stage" Model

4.1 Construction of the 1.0 Model

Based on the current status and needs of rural teachers' teaching research in the digital-intelligence era, relying on the aforementioned theories and supplemented by field investigations, this study constructed a 1.0 version of the "Panoramic Six-Stage" training model, covering the entire process from observation and learning to teaching practice and reflective summary. After nearly a year of follow-up research, this model has played a positive role in improving rural teachers' participation and sense of group identity. However, through in-depth interviews, several issues requiring urgent resolution were identified, as shown in the table below:

Table 1 Problems and Proposed Solutions

Stage	Problem	Proposed Solution
Observation	Courses feature only expert teachers, creating a gap with actual teaching practices	Allow teachers to select courses based on themes, with collective evaluation
Analysis	Analysis time is too long, with repetitive content	Reduce analysis time; have teachers analyze from different angles to minimize repetition
Lesson Plan- ning	Lottery system results in only one teacher fully preparing lessons, lacking collective lesson preparation groups	Abolish the lottery system; connect rural and urban schools via online platforms to form lesson preparation groups
Lesson Refine- ment	Lottery system leads to only one teacher preparing	Abolish the lottery system; require all teachers to upload lesson refinement videos
Demonstra- tion Lesson	Only selected teachers participate; others lack engagement	Select the best candidate from the lesson refinement videos for the demonstration lesson
Reflection	Only selected teachers are required to write reflections	Require all teachers to write reflections

4.2 Construction of the 2.0 Model

To address the issues identified in the 1.0 model, this study designed a new blended training program that integrates online and offline elements, creating a platform for teacher interaction and communication. Through four stages—observation and learning, development and design, practice and summary, and panoramic reflection—teachers are encouraged to participate in-depth throughout the process, integrating theory with practice and resolving the dilemmas in rural teacher training. This model fully leverages the power of networks to disseminate high-quality educational concepts and methods to rural areas. Through the continuous cyclic development of this model, the comprehensive capabilities of rural teachers can be enhanced.

4.3 Core Components

4.3.1 Observation and Learning

Its core goal is to help teachers clarify the direction of teaching research, identify their own strengths and weaknesses as well as those of their peers, and stimulate their internal motivation for learning. It consists of two parts: lesson observation and analysis. Before lesson observation, urban and rural lesson preparation groups jointly determine the training theme through online platforms. The content for observation includes exemplary lessons by renowned teachers and courses collected or recorded by teachers based on the training theme. During the analysis stage, teachers share their insights, engage in in-depth learning, and conduct critical evaluations. Urban and rural teachers discuss their understanding of curriculum standards and the flexibility of teaching strategies, while providing detailed feedback on teaching videos to highlight strengths and identify shortcomings.

4.3.2 Development and Design

Composed of online lesson preparation and offline lesson refinement. Rural teachers, urban teachers, and expert researchers collaborate in lesson preparation through online training platforms. The lead teacher presents the results of lesson preparation, interprets teaching materials in depth, and accurately analyzes student contexts, while participants deepen and refine the lesson content through questions and discussions. This cross-school and cross-regional lesson preparation model breaks geographical and institutional barriers, promoting the balanced distribution of educational resources and the overall improvement of teaching standards. In the offline lesson refinement stage, teachers conduct teaching demonstrations in their own schools and record teaching videos. These videos serve as resources for the observation stage of the "Panoramic Six-Stage" teaching method, helping teachers deepen their understanding of teaching content, promote peer communication, and drive innovation in teaching methods.

4.3.3 Practice and Summary

This is the core link where teachers transform theory into classroom practice. It not only allows teachers to test and apply what they have learned in real teaching environments but also promotes their professional growth through feedback and evaluation. Organizing demonstration lessons in urban community schools provides rural teachers with a broader platform to showcase their skills, attracting more experts and peers to participate and offer comprehensive feedback and suggestions. Inviting experts to provide on-site comments helps teachers identify their strengths and weaknesses and improve their teaching skills in a targeted manner. Post-lesson summary and reflection are indispensable; teachers are required to document their gains, insights, and expert feedback in writing, which not only facilitates their own reflection and growth but also provides valuable learning resources for other teachers.

4.3.4 Panoramic Reflection

A key element in teachers' professional growth, involving in-depth review and critical thinking about their teaching practices. Teachers proactively identify and address problems encountered in teaching, optimize teaching methods and strategies through critical analysis and creative thinking, and re-examine and reconstruct their teaching experiences to continuously improve the quality of their teaching. First, experts conduct a comprehensive review and summary of the entire training activity, extracting excellent teaching practices and results to provide learning and reference resources for teachers. Subsequently, teachers report their training achievements and insights in their own schools and document their gains and reflections. This open and collaborative atmosphere stimulates teachers' innovative thinking, lays a solid foundation for the next round of training activities, and promotes the continuous progress of the teaching team and the improvement of teaching quality.

5 Conclusion

This study deeply explains the theoretical foundations and practical challenges of new teaching research models in the digital-intelligence era, and constructs a "Panoramic Six-Stage" implementation pathway covering four dimensions: observation and learning, development and design, practice and summary, and panoramic reflection. To a certain extent, this pathway addresses the problems of insufficient expert guidance, lack of peer collaboration, and low in-depth participation of teachers. However, it should be emphasized that teacher training is a process of continuous development and iterative optimization, which requires long-term attention from multiple stakeholders and constant updates to the model content. The theoretical exploration and practical approaches in this study are still in their initial stages and need to be tested through continuous implementation. Further optimization of its structure and content is necessary to provide stronger support for the professional growth of rural teachers.

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