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Digital Transformation of Teacher Studio: Connotation Logic, Real Challenges, and Breakthrough Paths

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Abstract. Teacher Studio is a unique teacher professional development model in China. The digitalization of education is a strategic initiative of the Chinese government to realize its goal of becoming an education powerhouse. Under this policy guidance, Teacher Studio have also gradually embarked on the path of digital transformation, with traditional offline activities transitioning towards a blended online and offline approach. However, existing research has primarily focused on the effectiveness of offline Teacher Studio, neglecting the exploration of the essence and process of digital transformation in these studios. From the perspective of organizational change theory, the study firstly answers the questions of "what" and "how" regarding the digital transformation of Teacher Studio at the theoretical level. It then elucidates four major issues encountered during the practical implementation of digital transformation in master Teacher Studio: vague and broad transformation goals, alienation and obsolescence of transformation promotion mechanisms, substitution and replication of transformation models, and doubts and biases in the conception of digital education. Lastly, targeted improvement strategies are proposed: establishment of a "1+X" digital transformation goal system, the design of a transformation promotion mechanism based on "triple recommendation, government empowerment, teacher responsibility, and project-based management", the construction of a symbiotic professional development model supported by a tripartite integration space represented as "1+1+X+XN", and the development of simplified training courses to enhance information literacy represented as "2×N". This study can effectively guide the digital transformation of Teacher Studio and also showcase China's practical wisdom in utilizing information technology to promote educational equity, serving as a valuable reference for other countries.

Keywords. Teacher Studio; Digital Transformation; Online Professional Development; Urban-Rural Teachers; Integrated Development

1. Introduction

The report of the 20th National Congress of the Communist Party of China proposes to "accelerate the development of high-quality and balanced compulsory education and the integration of urban and rural education, and optimize the allocation of regional educational resources", and "promote the digitization of education". Under the given conditions, teachers are the core factor in the quality of education and student

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development. The core and key to the high-quality and balanced development of compulsory education and the integration of urban and rural areas lies in the balanced supply of high-quality teachers. Teacher Studio are educational professional organizations that integrate teaching, research, study, and training. They can effectively demonstrate, lead, and radiate the effects of high-quality teaching staff[1]. Teacher Studio are teacher research organizations with Chinese characteristics and play a significant role in the professional development of teachers at the basic education stage. In traditional environments, Teacher Studio are influenced by various factors, and their coverage is limited to neighboring schools of the master teachers' own schools. The source of Teacher Studio is also limited to the local area, severely hindering the value and role that Teacher Studio should have. To further expand the influence of Teacher Studio and radiate and lead more teachers to grow into outstanding teachers or expert teachers, Teacher Studio across the country have leveraged digital technologies such as the Internet to establish online platforms for Teacher Studio through specialized websites, blogs, WeChat public platforms, and other means. They conduct online training activities, forming a practice model called "master teacher-led online training". This represents the early stage of the digital transformation of Teacher Studio. Currently, research and practice on the digital transformation of education in China are still in their exploratory stage[2] . Previous studies have explored the goals, values, operational status, constituent elements, and operating mechanisms of Teacher Studio. However, these studies primarily focus on face-to-face offline studios, with limited research on the digital transformation of Teacher Studio. This article first delves into the essence of the digital transformation of Teacher Studio from a theoretical perspective, addressing the aspects of "what to transform" and "how to transform". This addresses the normative aspect of Teacher Studio. Subsequently, it identifies the issues that arise in the practical implementation of digital transformation in Teacher Studio, addressing the empirical aspect and highlighting the gaps between the normative and empirical aspects. Based on this analysis, strategies for resolution are proposed. Clarifying these issues holds significant significance for the digital transformation of Teacher Studio. On one hand, it provides a reference for the development of teacher learning communities. On the other hand, it showcases China's practical wisdom in utilizing information technology to promote educational equity to other countries.

2. The Connotation Logic of the Digital Transformation of Teacher Studio

All collective human actions must be carried out in an organized form. Organization refers to the combination of people's beliefs, ideals, attitudes, knowledge, skills, and other elements, mutually collaborating, and forming a collective or group with certain boundaries in order to achieve specific goals. The digital transformation of education refers to the comprehensive and in-depth use of digital technology to promote the digitization of all elements, processes, business, and fields in education. It is a process of reshaping the entire educational ecosystem[3]. Teacher Studio are not only a unique teacher training model with Chinese characteristics but also a teacher learning organization with Chinese characteristics. Empowered by the educational administrative departments, they can fully leverage the leading, exemplary, and radiating roles of master teachers to drive the learning and self-reflection of member teachers, share professional knowledge, experiences, and resources, and ultimately achieve the professional development of master teachers and member teachers[4]. Therefore the digital

transformation of Teacher Studio is a process of organizational change. It is a stage of dynamic equilibrium in response to new challenges and self-renewal. It has both the general characteristics of organizational change and the individual characteristics of teacher professional development organizations. Organizational Change Theory explains how organizations undergo and manage change. It highlights the drivers, processes, and outcomes of change, acknowledging the importance of communication, leadership, and employee involvement. This theory helps organizations adapt, improve performance, and stay competitive in a dynamic business environment. By utilizing organizational change theory, we can clarify the fundamental questions of "what to transform" and "how to transform" at a theoretical level, which is essential for effectively guiding the digital transformation of Teacher Studio.

2.1 "What to change": The Key Elements of the Digital Transformation of Teacher Studio

The content of change is a key issue in the process of organizational change. Leavitt believes that an organization is a complex system, and in a planned organizational change process, four elements play a significant role: tasks, structure, technology, and people. These four elements are highly interdependent, and a change in any one element can lead to compensatory or retaliatory changes in other elements. Organizational change is the process of coordinating and advancing changes in these four elements[5]. The task element refers to the organization's goals, including overall objectives and specific tasks. The structure element refers to the organizational mechanisms for implementation. The technology element refers to the operational models of the organization, encompassing material technologies (hardware, software, and internet technologies) and intellectual technologies (theoretical knowledge). The people element refers to the members' capabilities, attitudes, motivations, and values. Thus, the digital transformation of Teacher Studio also involves the transformation of tasks, structure, technology, and people. It includes the goals of Teacher Studio and the tasks undertaken by each member, incentive mechanisms, safeguard mechanisms, and evaluation mechanisms. It also involves a blended model of online and offline training, the digital leadership of master teachers and core members, and the digital teaching capabilities of master teachers and members.

2.2 "How to Transform": Three Steps of the Digital Transformation of Teacher Studio

Organizations follow specific steps for transformation and development[6] Based on Lewin's theory of organizational change process, the digital transformation of the Teacher Studio can be divided into three steps: unfreezing, changing, and refreezing[7]. Unfreezing is the preparatory stage before the transformation, mainly including goal determination, establishment of mechanisms, construction of operation modes, enhancement of personnel's professional ability, motivation for reform readiness, and elimination of obstacles hindering reform. Changing is the stage of behavioral transformation, including further refinement of goals and tasks, improvement of promotion mechanisms, iterative upgrading of operation modes, further enhancement of personnel's professional ability, systematic implementation of change, and formation of a new organizational form. Refreezing is the stage of behavioral reinforcement, mainly including continuous consolidation and strengthening of personnel's psychological state, behavioral norms, and behaviors, enabling the new organizational form to operate stably.

In the process of digital transformation of the Teacher studio, the main tasks in the unfreezing stage are to determine transformation goals, establish promotion mechanisms, construct operation modes, and enhance personnel's leadership in informationization and teaching abilities. The main tasks in the changing stage are to decompose transformation goals into actionable tasks, improve evaluation mechanisms and guarantee mechanisms, iteratively upgrade training modes, further enhance personnel's leadership in informationization and teaching abilities, and systematically implement change. The main tasks in the refreezing stage are to consolidate the achievements of change, further expand the coverage of change results, and promote the digital transformation of more teacher training modes.

Based on the analysis of the logical actions of the digital transformation of the Teacher Studio mentioned above, a digital transformation model of the Studio can be constructed, as shown in Figure 1.

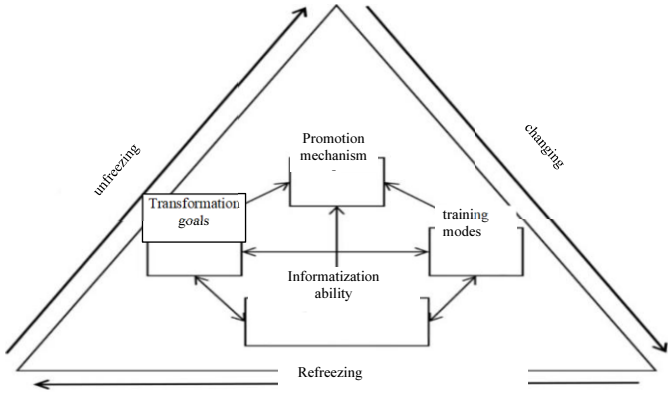

Figure 1. Digital Transformation Model for Teacher Studio

3. The Real Challenges of Digital Transformation in Teacher Studio

According to the digital transformation model of the Teacher Studio, the digital transformation of it is a dynamic and complex system change process that goes beyond the scope of simple digital technology application. It is achieved through coordinated changes in tasks, structure, technology, and people, and requires going through the three steps of unfreezing, changing, and refreezing. This study selects typical cases for research. The cases must meet the following selection criteria: firstly, they should focus on compulsory education stage rather than high school or other stages; secondly, the practice activities of the Teacher Studio have been in operation for more than 1 year and have a certain influence locally; thirdly, the Teacher Studio has started its digital transformation with some planning and operational regulations; fourthly, the Teacher Studio is genuinely engaged in online training activities, rather than simply sharing digital resources. The sources of the cases mainly include: first, typical cases of Teacher Studio selected by the Ministry of Education and the Central Institute of Educational Technology; second, Teacher Studio that have received recognition from local educational administrative departments for their excellent results and strong impact on

teaching practices; third, conference reports related to educational informatization. The researchers fully participated in and meticulously documented and organized the relevant cases. Based on the above sources, a total of 19 relevant typical cases were collected in this study, covering different regions in the east, central, and west of China. This article analyzes the selected cases from four aspects: transformation goals, transformation mechanisms, online training models, and digital education concepts. The study found that challenges of digital transformation in the Teacher studio mainly lie in the resistance encountered during the unfreezing and changing stages of the four elements. The refreezing stage involves the continuous consolidation of the results of the changes in the four elements and is relatively less resistant. In the current practice of digital transformation in Teacher Studio in China, there are four main challenges: vague and broad transformation goals, heterogeneity and obsolescence of transformation promotion mechanisms, substitution and replication of online training modes, and skeptical and biased views on educational digitization concepts. These challenges are intertwined and affect the efficiency and effectiveness of digital transformation in the Teacher Studio.

3.1 Vague and Broad Transformation Goals

Clear transformation goals and a clear implementation path are prerequisites for promoting the digital transformation of the Teacher Studio. In the unfreezing stage, some of the digital transformation goals of the Teacher Studio are relatively vague. They are unsure of the characteristics of the desired state of transformation, how to achieve transformation, and what benefits they and their members can obtain after transformation. In the changing stage, some of the goals of the Teacher Studio are too broad. They have not broken down the goals into specific tasks and have not focused on the individual expertise of the master teachers and the personalized needs of each member, making it difficult for the systematic transformation of the Teacher Studio to be carried out in depth.

There are two main reasons for the above-mentioned problems. Firstly, educational digital transformation is still in its early stages, with few mature practical cases and a lack of theoretical attention to the digital transformation of the Teacher Studio. This leads to a lack of intuitive and rational understanding of digital transformation among the master teachers and members. Secondly, the master teachers do not have a deep understanding of the mission of the Teacher studio in the new era. They still regard it as a conventional teaching and research model, lacking attention to the integrated development of urban and rural teachers.

3.2 Deformed and Outdated Transformation Promotion Mechanisms

The promotion mechanism is the fundamental guarantee for the digital transformation of Teacher Studio and is specifically manifested in incentive mechanisms, guarantee mechanisms, and evaluation mechanisms. During the unfreezing stage, some regions only motivate studio members through single spiritual incentives such as certificates, neglecting the efforts and compensation of master teachers and members in their training activities. This makes it difficult for master teachers and members to generate sufficient and long-lasting motivation, leading to opportunistic behaviors such as “focusing on the appearance of learning while pursuing the certificate”. During the transformation stage, the evaluation and guarantee mechanisms of Teacher Studio in some regions are outdated. On the one hand, the tension of the value of institutional tools has an immediate effect in regulating the order of the studio activities[8]. However, while pursuing the high

efficiency of institutional enforcement, managers overlook the personal will and personalized needs of master teachers and members. On the other hand, by using evaluation indicators from other forms of training, Teacher Studio become overly bureaucratic and lose their characteristic of "autonomous space". From the perspective of guarantee mechanisms, on the one hand, selection mechanisms dominated by administrative means are difficult to select true master teachers, and on the other hand, they can lead to the loss of master teachers' discourse power. In addition, limited funds make it difficult to support the construction of the three-dimensional integration space (social space, physical space, information space) needed by Teacher Studio in the transformation process, as well as activities such as hiring subject experts, outbound learning, and in-school guidance.

The main reasons for the above issues are as follows: Firstly, the government-led "top-down" promotion mechanism easily achieves economies of scale in the short term. However, incentive mechanisms and evaluation mechanisms dominated by administrative power tend to overlook the intrinsic demands of members in Teacher Studio. This easily leads to contradictions between external and internal motivations, and as a result, the autonomy and creativity within Teacher Studio are not sufficiently stimulated. Secondly, the regional educational management system and mechanisms are outdated, and an innovative management system and mechanism driven by technology for regional educational reform have not been established. This makes it difficult for grassroots managers and teachers to carry out various educational innovation practices.

3.3 Substitution and Reproduction of Online Training Models

The online training model is the organizational method and value representation approach of Teacher Studio, and it is also the core content of the digital transformation of the Studio. The online training model aims to break the limitations of time and space in traditional research and training activities, as well as the restrictions on resource exchange. It combines face-to-face training activities with remote training activities, and integrates virtual and real training environments, providing teachers with more diverse and free development options[9]. During the unfreezing stage, due to factors such as distance, limited funding, and epidemic prevention and control, online training exists as a "substitute" for offline training. During the transformation stage, the online training models of some Teacher Studio are merely replicas of offline training models. Without theoretical support, the training models were not optimized and reconstructed based on the characteristics of online training, resulting in a low sense of achievement for both the master teachers and members.

There are four main reasons for the phenomena of substitution and replication in the online training model of Teacher Studio. First, the existing online training has been disconnected from innovative practices in digital teaching. Currently, the level of information technology teaching innovation in basic education schools varies greatly among different levels and regions[10]. The online training of Teacher Studio, which serves as an important means to bridge this imbalance, is not guided by the normalization and scaled innovation practices of regional information technology teaching. Consequently, it is difficult for it to effectively drive the innovation of information technology teaching and achieve its own leap and reconstruction. Second, the theoretical research on online training lags behind grassroots practice. As a rapidly developing practice of "Internet + education", the practical scenarios, forms, and strategies of online training continue to iterate and evolve. Traditional educational theories are insufficient

to support and guide the innovative practices of online training in Teacher Studio. Third, the level of technical simplicity is not high enough. Applications such as simplified video conferences have single-dimensional data and incomplete training functions, while education cloud platforms with rich functionality and multi-modal data collection and analysis have complex operations. Fourth, there is a lack of theoretical guidance and practical supervision from experts. Master teachers and members have abundant practical experience and often engage in skill-oriented and experiential training activities. The training content is context-dependent and lacks strong transferability. There is a lack of in-depth reflection and processing of experiences, making it difficult to effectively promote regional innovation in information technology teaching[11].

3.4 Doubt and Biased Notions of Educational Digitization

The concept of educational digitization refers to the understanding and views of managers and teachers regarding fundamental issues such as the functions, targets, content, and processes of educational digitization. Undoubtedly, it is the proactive and innovative digital concepts and behaviors of master teachers and members that can effectively promote the successful digital transformation of Teacher Studio. As the transformation of Teacher Studio deepens, the inherent contradictions between educational digitization concepts and organizational changes become increasingly prominent. During the unfreezing stage, some master teachers and members hold skeptical, negative, and resistant attitudes towards digital transformation. They believe that the ideal state of transformation is “not practical” and that it is difficult to bring sufficient benefits to themselves. They tend to see transformation as a burden and an unavoidable task. During the transformation stage, some master teachers and members simplify digital transformation to the provision of digital devices, physical environment construction, and network infrastructure, while neglecting educational principles. They blindly cater to the functional features of technical tools, turning technology-enabled education into a “technological trend”, leading digital transformation to fall into the trap of “technologism”[12].

The main reasons for the above problems are threefold: firstly, experienced teachers and members lack direct experience in information-based teaching and online training, especially those who have grown up with conventional teaching and training methods. As these teachers tend to be older, they have not fully realized the potential value of information technology in education. Secondly, digital transformation is an innovative and exploratory undertaking, in which the benefits may not manifest in the short term. Teachers and members may have a fear of difficulties, worried that the effort they put in may not be proportionate to the rewards. They are afraid that the failure of transformation may affect their reputation as accomplished teachers, resulting in insufficient motivation to engage in digital transformation exploration and practice.

4. The Breakthrough Path for the Digital Transformation Dilemma in Teacher Studio

Organizational change is a process of “out with the old, in with the new”, which inevitably breaks the systemic form of the original organization, touches upon the interests within the organization, and changes the existing operating mechanisms[6]. In order to effectively break through the dilemma of digital transformation in Teacher

Studio, we take a problem-oriented approach and combine practical experience to propose four breakthrough paths that can provide reference for regional promotion of digital transformation in Teacher Studio. These paths include: establishing a "1+X" digital transformation goal system, establishing a transformation promotion mechanism of "triple recommendation by the region, empowerment by the government, responsibility of master teachers, and project-based management", constructing a collaborative training model of "1+1+X+XN" supported by a three-dimensional integration space, and building a "2×N" minimalistic training course for the enhancement of information technology capabilities, as shown in Figure 2.

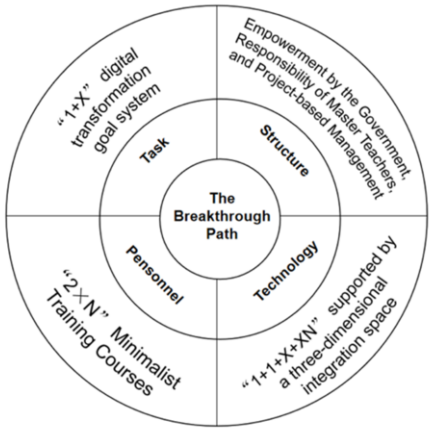

Figure 2. Breakthrough Paths for the Digital Transformation Dilemma in Teacher Studio

4.1 Establishing a "1+X" Digital Transformation Goal System

Under the strategic guidance of quality and balanced development of compulsory education and urban-rural integration, Teacher Studio should promote the integrated development of urban and rural teachers and the innovation of information-based teaching to enhance the quality of education and teaching. "1" refers to one core goal. Under the call of the mission and with the support of experts, master teachers, based on the needs of regional education reform, establish a forward-looking, operational, and inspiring digital transformation goal that can fully stimulate teachers' intrinsic motivation. This goal serves as the core objective. "X" refers to the decomposition of the core goal into X specific sub-goals. X represents the number of core members in the Teacher studio. Each core member leads a group of ordinary members to conduct in-depth research on a sub-goal, forming research outcomes that are replicable and generalizable. By decomposing the core goal into X sub-goals, it ensures the effective implementation of the core objective, provides personalized development space based on the individual strengths of core members, and meets the personalized development needs of both core and ordinary members. After achieving the goals, the research outcomes can be decomposed into different knowledge points and used to develop minimalistic training courses for promotion within the region.

4.2 Establishing a Transformation Promotion Mechanism of "Triple Recommendation by the Region, Empowerment by the Government, Responsibility of Master Teachers, and Project-based Management"

In order to effectively promote the digital transformation of Teacher Studio, the region should establish a transformation promotion mechanism of "triple recommendation by the region, empowerment by the government, responsibility of master teachers, and project-based management" in personnel selection, daily management, institutional development, financial support, platform support, and other aspects, as shown in Figure 3.

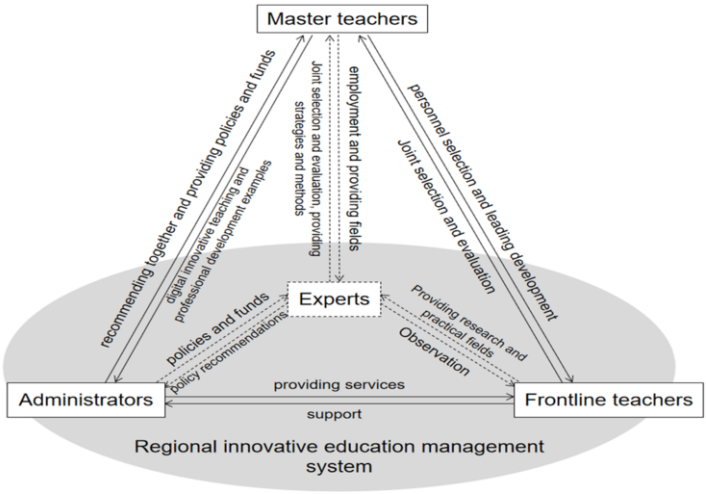

Figure 3. Regional Teacher Studio Digital Transformation Promotion Mechanism of "Triple Recommendation by the Region, Empowerment by the Government, Responsibility of Master Teachers, and Project-based Management"

- Regarding Personnel Selection

To break away from the previous government-led selection approach, the establishment of master teachers is determined through a collaborative recommendation process involving administrators, experts, and frontline teachers. The regional education administrative department grants accreditation to the Teacher Studio. The master teachers are responsible for hiring subject teaching experts to guide the development of the studios and selecting core members from the frontline teachers in urban and rural schools. The core members then select ordinary members from the frontline teachers in urban and rural schools for the studios.

- Regarding Daily Management.

The project system refers to a scientific research management system in which research projects are established based on the principles of fair competition and selecting the best, and research activities are organized, managed, and conducted by project groups as the basic activity units[13]. The project system management method can be used in the region to manage the Teacher Studio following the steps of "project application—project approval—project proposal review—research implementation—phase evaluation—final evaluation—result promotion", with full support from the expert group. The Teacher Studio is a loosely-administrative organization. The project system management can

effectively weaken the administrative interference from the government while fully utilizing the expertise and autonomy of the teachers, providing sufficient space for the independent development of the Teacher Studio. In addition, both the master teachers and core members have certain experiences in project research. Compared to other management methods, the teachers can easily adapt to and master the procedures of the project system management without exerting much more effort. Unlike conventional project research, the topics of the Teacher Studio include integrated research and training on information technology-based teaching innovation, project research, and teaching in rural areas. These activities are all collaboratively completed under the guidance of master teachers, which can effectively expand the coverage of master teacher resources and promote the integrated development of urban and rural teachers.

- Regarding Institutional Development

Institutions play an important guiding role and can provide external motivation for educational practices. The region needs to establish management systems for Teacher Studio, evaluation systems for Teacher Studio, and financial management systems for Teacher Studio. The management system for Teacher Studio elaborately regulates aspects such as personnel selection, daily management, financial support, and platform support to ensure effective empowerment. The evaluation system for Teacher Studio evaluates them based on their characteristics, highlighting the "autonomous development" feature of Teacher Studio. The evaluation is results-oriented and adopts a diversified evaluation mechanism, including teachers' reports, expert reviews, and random revisits to service recipients. The financial management system for Teacher Studio provides detailed constraints on special fund allocation, expenditure scope, budget management, and daily supervision to ensure that the funds comply with national financial management regulations while providing sufficient financial support to Teacher Studio.

- Regarding Financial Support

The region should establish special funds for Teacher studio, clarify the responsible entities and direct responsible persons, and implement budget management for project funds. After the approval of the project proposal for the Teacher Studio, the teachers will complete the budget preparation within a certain period of time, and the regional education administration department will disburse the funds to the units where the teachers are located in stages according to the budget of each Teacher studio. The units where the master teachers are located are responsible for the daily management and supervision of the project funds. As the direct responsible persons for the use of project funds, the teachers bear corresponding responsibilities for the compliance, rationality, authenticity, and relevance of fund utilization. After the project is completed, the teachers will prepare the final accounts, and the units where they are located will report the fund utilization to the regional education administration department.

- Regarding Platform Support

The region should establish an online training platform, project management platform, and outcome promotion platform to support the Teacher Studio in conducting training activities, regional management of Teacher Studio, and promotion of the research results of the Teacher Studio.

4.3 Construct a Symbiotic Training Model of "1+1+X+XN" Supported by a Three-dimensional Integration Space

The trinity integration space formed by the convergence of information space, physical space, and social space integrates services, resources, and data, supporting interaction, sharing, and innovation in education and teaching. It provides the capability support for the transformation of teaching methods and the reengineering of educational processes[14]. The trinity integration space is the digital transformation field of the Teacher studio and is characterized by intelligence, cloud computing, and simplicity. It promotes the integration space level through continuous advancement in the four dimensions of "cloud, network, school, and terminal". As for the composition of members, "1+1+X+XN" refers to 1 master teacher, 1 teaching expert, X core members from urban and rural schools, and "N" ordinary members from urban and rural schools led by each core member. The master teacher, teaching expert, core members, and ordinary members form a mutually beneficial symbiotic relationship, collectively constituting a symbiotic entity. Through research and practice, they promote the continuous growth of each member. In this process, teaching experts introduce innovative theories from fields such as education, ecology, management, and sociology, providing direction and theoretical support for innovative research and teaching practices of the Teacher studio. At the same time, they also promote theoretical innovation in online training through innovative practices. Regarding the training methods, a blended approach of online and offline training can fully utilize the advantages of personalized online learning and cross-regional activities, as well as comprehensive observation and emotional communication in offline learning, to achieve a strong correlation and resonance between offline practice and online learning. During the training process, activities such as theoretical exploration, expert lectures, collective lesson preparation, lesson observation and discussion, case demonstrations, and experience sharing can be carried out online, while teaching practices, collective lesson preparation, lesson observation and discussion, and expert guidance can be conducted offline. As for the training content, the focus is on innovative practices in information technology teaching, aiming to establish an information technology teaching model that can be regularly and extensively applied. The training model should revolve around the normalization and scalable application of the information technology teaching model. In the process of promoting innovation in information technology teaching, the "centrifugal effect" in the learning environment is a bottleneck that restricts the transition and upgrade of information technology teaching from universal application to integrated innovation and should be vigilantly and rationally reflected upon[15].

4.4 Building "2×N" Minimalist Training Courses for Improving Information Technology Capabilities

Minimalist training refers to a training method that has a short duration, minimal content, flexible methods, and realistic scenarios. It aims to effectively improve learning, work, and life efficiency and quality. The goal and evaluation criteria of such training are based on participants' sense of achievement. It emphasizes the practicality, real-life applicability, immediacy, and contextual nature of the training. It is a new teacher training approach that integrates theoretical learning and practical application in the era of mobile internet[16]. "2" refers to two minimalist training courses for improving information technology capabilities. This includes an information technology leadership

enhancement course for master teachers and core members, and an information technology application capability enhancement course for all members. "N" refers to decomposing each course into N micro-skill points and continually iterating and updating them. The "2×N" minimalist training courses for improving information technology capabilities should possess five characteristics: firstly, the learning content should be hierarchical, taking into consideration the individualized needs of master teachers and members, and designing learning content of different difficulties and progressive levels. Secondly, the learning content should be broken down into micro-skill points, and micro-courses should be developed around each micro-skill point. This includes blended online and offline theoretical learning, on-site observations, concentrated discussions, practical applications, and diversified evaluations. Thirdly, the learning content should be practice-oriented, focusing on the sense of achievement for master teachers and members. The integration of theory and practice should be done through minimalist educational technologies, reducing the difficulty of application migration. Fourthly, market-based and fee-based courses should be introduced, enhancing the internal driving force for autonomous selection and rigid demand on the consumer end, and exerting external pressure on the supply end to pursue high-quality training content. This helps address issues related to low quality, slow updates, and delayed service response of free resources. Lastly, various types of cases, especially those from master teachers and members, should be continuously explored. The demonstration, guidance, and driving role of cases in their surroundings should be fully utilized to enhance the internal driving force for master teachers and members to carry out digital transformation.

5. Conclusion

Promoting the digital transformation of education is an essential part of implementing national strategies[17]. and a core approach to achieving the modernization of education with Chinese characteristics. Teachers are the primary educational resource for educational development, and the key to the success of digital transformation in education lies in teachers' professional development. In the process of digital transformation in education, constructing a teacher training model with Chinese characteristics is the core content for realizing the modernization of Chinese education. As a weakly centralized organization with certain autonomy for development, the Teacher studio has become the main path for teachers' professional development. Its digital transformation should confront the contradictions, conflicts, and readjustments of complex elements within the education system. It should comprehensively promote the unfreezing, transformation, and refreezing of goals, mechanisms, models, and the capabilities of master teachers and members, achieving a systematic transformation of the Teacher studio in terms of all elements, processes, and operations. At the same time, we should also recognize that the digital transformation of the Teacher Studio fundamentally belongs to a subset of the digital transformation of the education system. Furthermore, the digital transformation of education is an important component of the overall societal digitization process. The digital transformation of the Teacher Studio will be influenced at a deeper level by the societal digital transformation, making it a complex, long-term, and challenging process. This study only explored the normative state of the digital transformation of Teacher Studio from a theoretical perspective, identified the challenges that currently exist in the transformation process, and proposed

targeted improvement strategies. However, these are still theoretical ideas. In future research, specific trial areas will be selected, and guided by this study, practical verification will be conducted to assess the effectiveness of the proposed strategies.

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