Region - Educational Research and Reviews, 2024, Volume6, Issue5
DOI: 10.32629/rerr.v6i5.2169
ISSN Online: 2661-4634
ISSN Print: 2661-4626

Analysis of the current status and improvement paths of digital teaching capabilities among early childhood education teachers in Chinese higher vocational colleges

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Abstract: This study investigates the current status and influencing factors of digital teaching capabilities among early childhood education teachers in higher vocational colleges in China. A survey of 50 teachers from five colleges reveals that teachers' digital teaching capabilities are at an initial stage, with shortcomings in resource development, technology application, online teaching, and collaboration. The influencing factors include personal factors like digital teaching philosophy and external factors such as policy support and training. Also, the study proposes strategies to enhance capabilities, including optimizing top-level design, improving training, building platforms, and perfecting evaluation. The findings provide insights for enhancing digital transformation and improving talent cultivation in early childhood education.

Key words: early childhood education; vocational education; digital teaching; professional development

1 Introduction

In the context of digital transformation in vocational education, cultivating high-quality technical and skilled talents has become a consensus [1]. As an essential component, the early childhood education major is actively exploring the path of digital transformation, with teachers playing a crucial role. Analyzing the connotation of digital teaching capabilities, diagnosing the current state, and proposing targeted improvement paths are of great practical significance for promoting the development of these capabilities and improving talent cultivation quality.

This study aims to define the connotation and constituent elements of digital teaching capabilities based on literature review, design questionnaires and interview outlines, and conduct surveys and interviews with early childhood education teachers in selected higher vocational colleges. The objective is to present the current state of teachers' digital teaching capabilities and analyze key influencing factors. The study will propose practical improvement strategies from aspects such as optimizing top-level design, perfecting training systems, building innovation platforms, and establishing evaluation mechanisms, providing theoretical references and practical guidance for capability development.

2 Connotation and composition of teachers' digital teaching capabilities

Digital teaching capabilities encompass three main aspects: developing and applying digital teaching resources, implementing digital teaching processes, and acquiring and innovatively applying cutting-edge technologies [2][3].

Developing and applying digital teaching resources involves skillfully selecting, creating, and processing various resources, such as videos, slideshows, and digital textbooks, and effectively integrating them into teaching. Implementing digital teaching processes refers to utilizing digital tools to conduct teaching activities, including using online platforms and live-streaming courses. Acquiring and innovatively applying cutting-edge technologies requires actively learning emerging theories like AI, big data, and VR, and exploring their integration and application in education to drive digital transformation with innovative teaching models and methods [4].

It is evident that digital teaching capabilities are a comprehensive set of abilities that combines educational teaching skills with information technology literacy. This places higher demands on teachers' knowledge reserves, skill levels, and innovative consciousness. Teachers must establish a digital teaching philosophy, strengthen independent learning, and continuously refine their instructional design, optimize teaching strategies, and innovate teaching models through practice [5][6].

3 Current status of digital teaching capabilities among early childhood education teachers in Chinese higher vocational colleges

To thoroughly assess the digital teaching capabilities of early childhood education teachers in higher vocational colleges, this study surveyed 50 teachers from five colleges in Zhejiang, Shandong, and Guangdong provinces, covering a range of teaching experience. Among the participants, 36% had 0-5 years of experience, 28% had 6-10 years, 24% had 11-20 years, and 12% had over 20 years of experience, ensuring a diverse representation of teaching backgrounds.

In terms of teaching resource construction and application, findings reveal that while most teachers effectively source and select digital teaching materials, their ability to independently develop such resources remains limited. Only 30% of teachers frequently create their own teaching materials using multimedia software, with 56% primarily relying on existing online resources. Despite encouragement from schools to develop digital resources, many teachers express a lack of necessary training and technical support, hampering their independent exploration. While most teachers proficiently employ tools like PPT and videos in their teaching, only 42% demonstrate adeptness in leveraging diverse digital platforms for blended online and offline instruction. However, when it comes to deeply integrating information technology with teaching, such as using virtual reality (VR) technology to create immersive teaching scenarios or conducting teaching analysis and decision optimization based on big data technology, almost no teachers are capable of doing so. 18% of teachers reported that their information-based teaching abilities were relatively weak, making it difficult for them to adapt to the requirements of digital teaching. Some senior teachers confessed that they were "outdated" and that they continued to teach in the traditional mode against the backdrop of the rapid iteration of new technologies.

Correspondingly, in terms of acquiring cutting-edge knowledge and innovative applications, teachers pay insufficient attention to the frontier developments in educational technology. Only 28% of teachers indicated that they frequently stay informed about the application progress of new technologies such as artificial intelligence in education and teaching. 56% of teachers occasionally pay attention, while 16% of teachers directly stated that they have no awareness of paying attention.

Furthermore, in terms of production-education integration and school-enterprise cooperation, the ability to use digital means to serve kindergarten teaching needs to be improved. Although some early childhood education majors in higher vocational colleges have adopted uniform requirements and relied on certain internet platforms to manage and evaluate students' internships in kindergartens, overall, other digital means have not been fully utilized when collaborating with kindergartens. Only 22% of teachers cooperate with kindergartens to develop digital teaching resources, and only 12% use information-based methods to guide the professional development of kindergarten teachers. Schools and teachers who can

use technologies such as virtual simulation to provide students with immersive and interactive practical experiences are even fewer.

In summary, although teachers' digital teaching capabilities are generally improving, they are not yet fully adapted to the requirements of cultivating applied talents in early childhood education. And factors influencing the development of their digital teaching capabilities include both internal factors and external conditions.

Regarding personal factors, digital teaching philosophy and awareness are crucial. As teacher Wang stated, "I have always been consciously paying attention to the development trends of education informatization, wanting to explore ways to deeply integrate information technology with early childhood education and teaching." Some teachers actively participate in competitions and learn from excellent educators, while others lack a deep understanding of technology integration and are content with basic applications. One teacher expressed, "What we learned in school was all traditional (teaching methods). We still lack systematic understanding and planning of how to use new technology to optimize teaching and stimulate children's interests."

External factors, such as school-level policy guidance, funding, and training support, are also key drivers. Teacher Zhang mentioned, "Our school introduced policies to support informationalized teaching, making it an important indicator for teacher evaluation and professional title assessment, while there are also special funds to support the construction of digital resources." Teacher Zhao added, "The school arranged informationalized teaching capability mentors and regularly conducts skills training." However, some teachers pointed out, "In the teaching management process, the quality monitoring of informationalized teaching is not yet in place, and there is a lack of targeted diagnostic guidance, which to a certain extent affects the continuous improvement of teachers' capabilities."

4 Strategies for enhancing digital teaching capabilities of early childhood education teachers in higher vocational colleges

To address the issues identified in the current status survey, the following strategies are proposed:

1. Incorporate the improvement of teachers' digital teaching capabilities into school development and teacher professional development plans, clarify goals, paths, and evaluation standards, formulate targeted policies, and increase funding for digital teaching infrastructure, resources, and innovation.

2. Establish an integrated "research and training" mechanism, develop hierarchical, classified, and blended training courses, leverage teaching and research teams to share experiences and train skills, and encourage participation in high-level training programs.

3. Use big data and AI to construct smart teaching management platforms for data-driven diagnosis and improvement, organize competitions and exhibitions to promote exchange, and create cross-school collaboration communities to integrate and share resources.

4. Incorporate digital teaching capabilities into performance appraisal and professional title evaluation, formulate scientific indicators and methods, recognize and reward outstanding teachers, and provide policy support for training and further education to stimulate enthusiasm and creativity in digital teaching.

5 Conclusion

This study highlights that the digital teaching capabilities of early childhood education teachers in Chinese higher vocational colleges are still developing. While teachers recognize the importance of digital teaching, they face challenges. By addressing influencing factors such as school policy support and professional development opportunities, higher vocational colleges can foster an environment conducive to the growth of teachers' digital teaching capabilities. And it is

crucial for cultivating high-quality, adaptive professionals who can effectively navigate the digital landscape of early childhood education in China.

Acknowledgments

Special thanks to all the teachers who participated in the research. Their valuable insights and experiences have played a crucial role in the successful completion of this study.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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