

Research on the Mechanism of Information Technology Empowering Teaching Innovation in Preschool Education Majors in Colleges and Universities

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ABSTRACT

To address the practical dilemmas such as practical resources, practical teaching, and personalized cultivation in preschool education majors in colleges and universities, and to implement the requirements of the digital education strategy, this article deeply explores the internal mechanism of information technology empowering teaching innovation. Based on the educational value and pedagogical principles of information technology empowerment, it constructs an integrated innovative path on the basis of theory, with the digital reconstruction of course content, the innovative design of teaching models, the intelligent upgrade of evaluation systems, and the improvement of teachers' digital literacy as the main contents. This article further points out that to effectively implement the above paths, it is necessary to rely on the collaborative guarantee of support systems, such as institutions, resources, and quality supervision, to form an internally coherent empowerment system. This research aims to provide a systematic reform framework for the preschool education majors in colleges and universities, ranging from concept to practice, with the expectation of effectively enhancing the quality of training outstanding preschool teachers and empowering the high-quality development of the preschool education through the deep integration and application of information technology.

KEYWORDS

Information technology; Preschool education in colleges and universities; Teaching innovation

1 Introduction

With the continuous advancement of the digital education strategy, the integration of information technology into teaching and education has become a key driving force in promoting the connotative development of higher education. The preschool education majors in colleges and universities shoulder the significant task of cultivating future outstanding preschool teachers, and its cultivation quality affects the healthy operation of China's preschool education. At present, the teaching process of this major is generally faced with problems such as the shortage of high-quality practical resources, the inability to break through the traditional teaching mode, and the lack of support for personalized cultivation. Although the application potential of information technology has been recognized, how to transcend the utilization of information technology as a mere tool, systematically build an internal promotion mechanism for information technology to empower teaching innovation, and effectively transform the knowledge imparting towards the ability cultivation still remains a key topic worthy of in-depth exploration. Against this backdrop, this study starts from the convergence point of solving practical problems and meeting contemporary demands, deeply analyzes the theoretical logic and practical paths of information technology empowering teaching innovation, and provides theoretical reference and practical paths for improving the teaching quality in preschool education majors in colleges and universities.

2 The Internal Logic and Value Adherence of Empowerment: A theoretical Analysis of Information Technology-driven Teaching Innovation

2.1 Internal Motivation: Highlight the Multi-dimensional Teaching Value of Information Technology Empowerment

The significant value of information technology empowering teaching is first reflected in the innovation of teaching models and educational functions. Its foundation lies in transcending the boundaries of time and space, enabling users to achieve ubiquitous learning supported by online platforms and mobile terminals, and making students learn autonomously at their own pace, engage in collaborative exploration, and enhance their initiative and flexibility in learning. Secondly, from a social perspective, the use of information technology can facilitate better allocation of educational resources and promote educational equity^[1]. In addition, with the help of tools such as MOOCs (massive open online courses) and virtual simulation experiment platforms, high-quality courses and related practical training resources can be shared among different regions and schools, thus changing the current educational gap between schools and regions and helping to achieve educational equity. Thirdly, information technology plays a vital role in

deepening context awareness and enhancing practical functions. By using VR, AR, MR and other technologies, it can create highly realistic teaching scenarios, and make students train in a controllable and safe simulated environment, which not only reduces the risks of internships, but also enhances the efficiency and effectiveness of practical training. Finally, information technology can provide strong support for precise teaching and personalized development. By generating learning profiles through learning analytics technology, teachers can adjust teaching strategies and specify learning paths based on the data, thereby implementing individualized teaching ^[2]. New teaching tools such as interactive courseware can enrich classroom interaction forms and create an active atmosphere of multi-directional communication, which is conducive to effectively stimulating students' motivation and prompting them to transform from passive recipients to active participants.

2.2 Value Compliance Framework: The Core Principle for Achieving Effective Empowerment

The empowerment of information technology in education is not merely a simple accumulation of technologies, it should serve the cultivation of high-quality talents in accordance with scientific value principles. Specifically, the following key principles should be followed. The first is the principle of people-centered education. It should take the cultivation of qualified preschool teachers as the fundamental goal, avoid technology for the technology's sake, and ensure that the development and use of digital resources revolve around the all-round development of students and the improvement of educational quality. The second is the principle of collaborative integration. It should rely on the TPACK framework to promote the organic integration of information technology with curriculum design, teaching methods, and evaluation mechanisms, making technology truly the internal support of the teaching system. The third is the principle of strengthening practical operations. It should closely consider the practical operational needs of the preschool education major, and arrange the application approaches of technology around the problems in practical teaching scenarios to effectively enhance the care and education levels for students. The fourth is the student-centered principle. It should promote the teaching structure to shift from teacher-oriented to student-oriented ^[3], and emphasize the stimulation of students' critical thinking and innovative abilities. The fifth is the continuous iteration principle. In accordance with the technological development and the changes in teaching demands, it should build a mechanism for continuous assessment and dynamic optimization, and constantly update the empowerment strategy to ensure that the teaching effect conforms to educational laws and industry standards.

3 The Core Paths of Empowerment: Systematic Reconstruction and Innovation of All Elements of Teaching

3.1 Digital Reconstruction of Course Content

The digital reconstruction of course content is the foundation of teaching innovation. The course content needs to be aligned with digital technology through modular integration, interdisciplinary fusion and dynamic updates. Modular integration breaks the linear structure of traditional courses, and decomposes knowledge attributes and skill requirements into theoretical knowledge points, practical skill points, and case expansion points. It also develops supporting digital resources such as micro-lessons, animations, interactive courseware, and virtual simulation projects, and enables flexible combination and efficient presentation of course content to meet students' needs. Interdisciplinary fusion breaks through the boundaries of disciplines, incorporates educational big data, artificial intelligence and other relevant knowledge, as well as adds modules like "Application of Digital Teaching Tools in Preschool Education" to cultivate students' abilities in applying digital teaching tools, interpreting children's behavioral data, and designing digital resources, thus achieving an effective combination of professional knowledge and digital skills. The construction of a dynamic update mechanism promotes the cooperation between universities and kindergartens. Based on the timely feedback from front-line teachers, they continuously optimize and improve the content corresponding resource libraries of digital courses to ensure that they always closely meet the actual teaching needs of kindergartens and enhance the practicality and relevance of the course content.

3.2 Innovative Design of Teaching Modes

Innovation in teaching models is a key part. It forms a digital-adaptive teaching system through in-depth blended teaching, project implementation and school-enterprise collaborative teaching. The blended teaching shapes a closed-loop form across pre-class, in-class and post-class phases. Before class, teachers distribute micro-videos, e-textbooks and preview homework, and students study basic theories independently. During class, practical training is carried out in virtual simulation laboratories, supplemented by group collaboration and case analysis to deepen application understanding, with teachers providing targeted guidance. After class, online platforms are utilized for Q&A, results presentation and extended learning to achieve the purpose of consolidating and extending knowledge, combining the flexibility of online learning with the interactivity of offline learning. Project-based teaching takes the realistic activity

design of kindergartens as the core point and relies on an online cooperation platform to complete the entire process including scheme design, resource development, simulation practice and evaluation. During this process, students can cooperate with each other across space and time, while teachers can provide timely tracking guidance, and improve students' practical abilities and problem-solving skills in a targeted manner. School-enterprise collaborative teaching can transcend geographical barriers through live streaming and cloud viewing. It can invite front-line teachers from kindergartens to participate in the classroom teaching process, and share their experiences and insights. Universities and kindergartens can jointly plan teaching content and practical training programs, achieving effective connection between school and kindergarten education and ensuring that talent cultivation highly meets job requirements.

3.3 Intelligent Upgrade of the Evaluation System

The optimization of the evaluation system becomes an important guarantee. A scientific and effective intelligent system is constructed through the digitalization of formative evaluation, the diversification of evaluation subjects, and the immediate evaluation feedback. The formative evaluation relies on the learning management system (LMS) to comprehensively record students' online duration, resource interaction frequency, assignment/test completion, virtual training operations performance, and practical work quality. The rich procedural data can objectively reflect attitudes, knowledge acquisition, and ability development trajectories, and make up for the deficiencies of traditional result-based evaluation. The evaluation subject forms a four-dimensional model of teacher evaluation, student mutual evaluation, kindergarten mentor evaluation, and intelligent system data analysis. Teacher evaluation focuses on the overall performance and comprehensive ability of students. Student mutual evaluation pays attention to collaboration engagement and contribution levels. Kindergarten mentor evaluation is based on the level of practical skills and professional ethics during internships. And the intelligent system provides objective conclusions through quantitative analysis. This system ensures comprehensive and objective assessment through multi-dimensional guarantees. The evaluation feedback uses intelligent tools to quickly generate reports on students' ability shortcomings, and push targeted remedial resources. Teachers then adjust their teaching strategies and modify their tutoring plans, ensuring immediate feedback and precise correction.

3.4 Improvement of Digital Literacy among Teachers

Teachers' digital literacy determines the effectiveness of empowerment, and stratified training and practical empowerment can comprehensively enhance teachers' digital teaching capabilities. It should conduct advanced application training for young teachers in virtual simulation teaching, digital resource development, learning analytics technology, to cultivate their digital teaching innovation capabilities. For middle-aged and elderly teachers, it should provide basic practical operation guidance on operating online platforms, creating interactive courseware, and using digital evaluation tools, helping them master fundamental skills. Practical empowerment requires the establishment of digital teaching innovation studios for teachers, and supports the implementation of reform projects centered on the digitalization of courses and the innovation of teaching models. It also can promote teachers' practice through competitions such as teaching improvement competition and case evaluation, and encourage teachers to explore digital teaching methods, share experiences, and enhance their technical application skills, scheme planning capabilities, and teaching update research standards in practical operations, thus building a high-quality professional teaching team with digital literacy^[4].

4 Empowerment Support System: Collaborative Construction of Multi-dimensional Guarantee Mechanisms

4.1 Institutional Support: Driven by Both Strategic Planning and Incentive Policies

Institutional guarantee is the prerequisite for the orderly advancement of digital teaching reform. In terms of policy support, colleges and universities can issue the implementation plan for digital teaching reform of preschool education majors to clearly define the reform goals, core tasks, implementation steps and departmental responsibilities, and set short-term, medium-term and phased goals. They can also formulate implementation requirements and assessment standards around key links such as course digitalization and teaching model innovation. Besides, they should establish a leading group headed by senior management to coordinate the efforts of the academic affairs office, colleges and teacher representatives, and implement it in actual work. In terms of incentives, the achievements of digital teaching innovation should be incorporated into the teachers' professional title evaluation and performance assessment, and a special reward fund should be established to honor outstanding digital teaching cases, reform projects and resource achievements, so as to stimulate teachers' enthusiasm for participation and innovative, and encourage them to be willing, daring and skilled in reform^[5].

4.2 Resource Support: Co-construction and Sharing of Hardware Infrastructure and Digital Resource

Libraries

Resource guarantee is the material foundation for technological empowerment. It is necessary to make significant investments in digital hard objects in hardware, improve the construction of multimedia classrooms, virtual simulation laboratories and cloud-based teaching platforms, and install auxiliary equipment such as multi-functional projectors and interactive blackboards to support interactive teaching. It also needs to equip VRF/AR devices to imitate the situation in kindergartens, and the cloud information platform with functional performances such as resource push, online communication and data collection and statistics. In addition, it should plan a protection and update system to keep the machines running normally. In terms of resource sharing, numerous educational institutions, outstanding kindergartens and technology companies should cooperate to build a digital resource database cluster. Colleges and universities undertake the tasks of theoretical data research and development as well as case analysis and development. Childcare faculties provide operational examples and sources of practical training materials. Relevant high-tech enterprises offer technical support. The essence of all is collected as the core system filling content to eliminate the cost and expenses incurred when setting up separately, and implement the open and shared rule.

4.3 Quality Control: Regular Assessment and Feedback Adjustment Mechanism

Quality control can provide guarantees, and make the effect continuously optimized. The quarterly self-inspection should be combine with the annual evaluation. The teaching team conducts quarterly self-inspections on the usage of digital resources, the effectiveness of the teaching models applied by teachers, and the feedback from students. The academic affairs office, in collaboration with a third-party institution, conducts an annual evaluation to carry out a comprehensive quantitative and qualitative assessment from multiple perspectives such as the improvement level of teaching quality and the enhancement degree of students' abilities, by combining quantitative and qualitative indicators. At the same time, it should open up multiple feedback channels to listen to opinions and suggestions from all sides, analyze the causes of problems, and make corresponding adjustments, thus constantly improving teaching content and methods. It also need to form a cycle system of assessment-feedback-improvement-re-evaluation to continuously promote high-quality innovative teaching.

5 Conclusion

The empowerment of information technology in teaching innovation for preschool education majors in colleges and universities is a requirement for education in the current era and the key to improving the quality of talent cultivation. The article proposes its multi-dimensional value and five major principles, establishes four paths such as digitalization of courses, and builds three supporting systems to form a complete empowerment system. The preschool education majors in colleges and universities should seize the opportunity to integrate technological empowerment into teaching reform, change the traditional teaching problems, and eliminate the superficial application of technology. In the future, it is necessary to intensify practical efforts, study and adapt to new technologies and industry changes, as well as adjust teaching methods, in order to cultivate high-quality preschool teachers and promote the high-quality development of preschool education.

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