CURRENT ISSUES IN INTRODUCING DIGITAL AND INNOVATIVE TECHNOLOGIES IN THE PRESCHOOL EDUCATION SYSTEM

Lyu Anqi
Al-Farabi Kazakh National University, PhD student
E-mail: 744782235@qq.com
Tel: +77070259010

Abstract. In the wake of the digital revolution, the system of early childhood education is confronted with a unique blend of opportunities and challenges. The integration of digital technologies and innovative pedagogical tools is geared towards refining the curricular content and instructional methodologies, activating the latent potential of young learners, and fostering holistic development. Nonetheless, this transformative journey has unmasked a myriad of issues, such as the uneven distribution of financial resources and technological infrastructure, the difficulty in assessing pedagogical efficacy, the potential risks to children's physical and psychological well-being, as well as concerns over cybersecurity and the sanctity of privacy. This study endeavors to investigate these impediments and proffer pertinent strategies and recommendations for their mitigation.

Keywords: Early Childhood Education; Digital Technology; Innovative Pedagogy; Current Status; Challenges; Strategic Interventions.

Introduction

In the contemporary era, the pervasive adoption of digital and intelligent technologies has precipitated a paradigm shift in the educational landscape. As the cornerstone of lifelong education, early childhood education is instrumental in shaping children's cognitive, affective, and social development. The digital metamorphosis of this sector is an ineluctable trajectory. An increasing number of early childhood education institutions are experimenting with the incorporation of digital technologies into their pedagogical practices in a bid to enhance the quality of instruction and to enrich the educational experience. However, the assimilation of digital and innovative technologies into the early childhood education framework has introduced a host of challenges and concerns.

The Current Status of Introducing Digital and Innovative Technologies in the **Preschool Education System** :

1. Digital technology transcends the limitations of geography and time, facilitating the global sharing of high-quality educational resources. Presently, the integration of digital technology in early childhood education is quite extensive. For instance, online learning platforms, interactive storybooks, and virtual laboratories developed through digital technology provide children with a wealth of engaging and vivid learning materials. Moreover, leveraging big data and artificial intelligence, early childhood education institutions can accurately analyze each child's interests, abilities, and learning pace, offering personalized teaching solutions.
2. The optimization of the education system of the family and the school: Digital platforms have constructed a more convenient and efficient bridge for parent-teacher communication. Through tools such as parent groups and educational apps, parents can promptly gain insights into their children's academic and daily life at kindergarten, participate in their growth journey, and foster a positive home-school co-educational atmosphere. Additionally, innovative teaching methods and tools, such as project-based learning and gamified instruction, have been widely adopted in early childhood education.

Current challenges with the integration of digitalization and innovative technology in early childhood education:

1. Disparity in capital and equipment. The adoption of digital technology necessitates substantial financial and equipment investment. However, due to disparities in geographical and economic conditions among early childhood education institutions, the imbalance in capital and equipment is pronounced. Some economically developed regions or high-quality institutions can

afford to invest heavily in advanced digital infrastructure, while economically disadvantaged or remote areas struggle to bear such costs, exacerbating educational resource inequality.

2. Difficulty in evaluating teaching effectiveness. The application of digital technology in early childhood education, including interactive elements and virtual scenario-based games, complicates the assessment of teaching outcomes. While traditional evaluation methods rely on written tests and observational records, digital instruction relies more on child interaction and feedback. The subjectivity and unpredictability of this evaluation method make it challenging to accurately quantify, assess, and compare the effectiveness of teaching activities.

3. Health risks for young children. The widespread use of digital technology may lead to increased dependency on electronic devices among children, potentially causing health issues like vision impairment and distractibility, as well as impacting their social skills and emotional development. Moreover, standardized wearable devices may pose safety risks due to their failure to accommodate the physical uniqueness of each child. Addressing the health risks associated with digital education is a significant challenge facing current early childhood education.

4. Cybersecurity and privacy concerns

Digital instruction requires extensive use of the Internet and other communication technologies, which may be vulnerable to cybersecurity threats. If children's personal information and privacy are compromised, it could severely impact their physical and mental health and future prospects. Ensuring the cybersecurity and privacy of children is a critical issue that must be addressed in the ongoing digital transformation of early childhood education.

5. Enhancement of teacher professionalism and skills. The widespread application of digital technology and innovative tools in early childhood education has heightened the demand for teachers' professionalism and technical proficiency. Currently, some teachers may lack the necessary IT skills and digital literacy to leverage these tools effectively, limiting the progress and impact of digital transformation in early childhood education.

Policies and recommendations:

1. In the context of economic development within the People's Republic of China, it is imperative for both governmental entities and societal structures to enhance their investment in the informatization of educational facilities, particularly in rural and remote regions. Such endeavors should focus on improving the extensiveness and quality of network infrastructure, thereby bridging the digital divide. Concurrently, the establishment of a digital education resource-sharing platform is advocated to foster the equitable dissemination of premium educational resources.

2. To address the challenges associated with assessing the efficacy of digital teaching methodologies, the implementation of a scientific evaluation system is essential. This system should incorporate a variety of assessment techniques, including observational records, portfolio presentations, and parental feedback, to ensure a holistic and unbiased evaluation of pedagogical outcomes. Moreover, the exploitation of big data analytics and artificial intelligence technologies is recommended to scrutinize and interpret students' learning data, facilitating the tailoring of personalized educational approaches.

3. A paramount concern in the realm of digital instruction is the physical and psychological well-being of children. It is advisable to prudently manage the duration of children's engagement with electronic devices, encourage participation in outdoor activities, and cultivate wholesome lifestyle habits. In addition, the selection of wearable devices that align with the physiological attributes of children, coupled with periodic health examinations, is imperative.

4. The fortification of cybersecurity and the safeguarding of privacy represent critical dimensions of the digital educational ecosystem. Pre-primary educational institutions should instituting a robust data protection framework, including rigorous oversight of educational applications and data platforms, the establishment of a system to protect children's personal information, and the regular backup and encryption of data. Concurrently, it is essential to enhance children's education regarding cybersecurity and privacy protection to elevate their self-protection awareness. Furthermore, the professional development of educators in the realm of data security awareness is crucial to bolster their capabilities in data security protection.

5. To catalyze the professional growth of teachers, it is necessary to strengthen training initiatives and enhance the proficiency of educators in leveraging information technology. Simultaneously, teachers should be encouraged to engage in collaborative exchanges, exploring innovative pedagogical models and methodologies collectively.

Conclusion. The digital metamorphosis of early childhood education is an inexorable trend consonant with the evolution of the contemporary era. However, as we integrate digital and innovative technologies, it is incumbent upon us to confront and resolve extant challenges. By augmenting governmental investments and support, instituting a scientific evaluation system, prioritizing children's physical and mental health, and reinforcing cybersecurity and privacy protection measures, we can engender a more conducive environment and prerequisites for the digital transformation of pre-school education. This will ensure that every child can thrive in the digital age and partake in equitable, high-quality education.

References.

2. Le Jieyu, Luo Chaoyang, Ding Jingshu, & Li Qing. (2020). Research on the privacy protection mechanism and technology of education of big data. Big data, 6 (6), 0.

3. Yang Xianmin, & Yu Shengquan. (2015). Smart education system architecture and key supporting technology. Audio-visual Education in China, 1,77-84.

4. Petranová, D., & Burianova, L. (2014). Potential of digital technologies use in the formal pre-primary education. European Journal of Science and Theology, 10(1), 263-276.

5. Obiweluozo, E. P., Onwurah, C. N., Oraelosi, C. C., Uzodinma, U. E., & Dike, I. C. (2021). Competencies needed by pre-primary school teachers for effective use of digital technology in the classroom. Journal of the Nigerian Council of Educational Psychologists, 14(1).

6. Koronova, I., Kostolanyova, K., Gasparova, E., & Liskova, D. (2019). THE USE OF