Research on the Integration and Innovation Development of Digital Empowered Lifelong Education under the Background of Informatization

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Abstract: Under the impetus of the wave of informatization, lifelong education has ushered in unprecedented development opportunities. Firstly, digital technology has broken educational resources' temporal and spatial limitations, achieved global resource sharing and provided learners with a broader learning space. Secondly, personalized learning models have emerged with the support of information technology, meeting the diverse learning needs of learners and improving learning outcomes. Finally, cross-border integration and innovative development have become important trends in lifelong education, promoting innovation and development of education models through integration with different industries and the application of emerging technologies. This study analyzes the current development status, challenges and future trends of lifelong education under the background of informatization and proposes corresponding strategies and suggestions to promote the sustainable development and innovation of lifelong education.

Keywords: Lifelong education; Promotion of information technology; Digital empowerment; Integrated innovation

1. Introduction

With the rapid development of information technology, the world is undergoing an unprecedented transformation. Information technology has become a powerful driving force for social development, not only changing people's lifestyles but also having a profound impact on the field of education [1]. As an important concept in the development of modern society's education, lifelong education aims to provide individuals with opportunities for continuous learning and self-improvement to adapt to the constantly changing social needs. In the context of informatization, digital empowerment of lifelong education has become an important force in promoting its integrated and innovative development.

2. Development background and conceptual definition

2.1. Development background

The Chinese government attaches great importance to the digital transformation of lifelong education. It has introduced a series of relevant policies to promote the development of education informatization, digitization, and intelligence. The government has proposed the policy of formulating and implementing the plan for building an education strong country, among which vigorously developing digital education is one of the important contents. This policy emphasizes the priority of education development, accelerating the modernization of education, cultivating the foundation of people's happiness and consolidating the foundation of national prosperity. During the 14th Five Year Plan period, informatization entered a new stage of accelerating digital development and building a digital China [2]. In the "14th Five Year Plan for National Informatization" issued by the Central Cybersecurity and Information Technology Commission, the task of "carrying out lifelong digital education" is proposed, which points out the direction for the development of educational informatization in the "14th Five Year Plan". In addition, the Chinese government attaches great importance to exchanges and cooperation with countries worldwide and promotes the digital development of global education [3].

Under policy promotion, China's digital transformation of lifelong education has achieved significant results [4]. In the future, China will continue to deepen research on digital transformation policies for lifelong education, explore more effective policy measures and further promote the development of education informatization, digitization and intelligence [5].

2.2. Definition of the concept of lifelong education

Lifelong education is a broad concept that mainly refers to the total amount of education people receive at various stages of their lives. It is a unified synthesis of different types of education received by people. This concept covers various stages and methods of the education system. Lifelong education emphasizes the continuity and lifelong nature of education, advocating for providing necessary knowledge and skills in the best possible way when everyone needs them. This educational philosophy breaks the time constraints of traditional education, extends education throughout a person's life and seeks the comprehensive unity of various forms of education [6]. The concept of lifelong education reflects people's deep understanding of the essence and goals of education and also reflects the inevitable trend of educational development.

3. Opportunities for digital transformation and development of lifelong education

The opportunities for the digital transformation and development of lifelong education are becoming increasingly significant in the current context of the information society. This transformation has not only brought profound changes to the education field, but also unprecedented opportunities for personal learning and social progress.

3.1. Unlimited expansion and sharing of educational resources

Under the promotion of digital transformation, there has been a fundamental change in how educational resources are obtained and shared [7]. The development of the Internet and mobile technology has broken the restrictions of time and space, enabling learners to access and obtain various educational resources anytime and anywhere. Digital technology makes the presentation of educational resources more diverse.

3.2. The rise of personalized learning models

Another important opportunity for digital transformation is the rise of personalized learning models. In traditional education models, educational content and methods are often led and arranged uniformly by

teachers, making it difficult to meet the personalized needs of learners [8]. Digital technology can analyze and mine learners' learning behavior, interests and preferences through big data and artificial intelligence, providing learners with more accurate and personalized learning plans.

3.3. The promotion of innovative teaching models

Digital transformation has also driven innovation and transformation in teaching models [9]. In traditional education models, teaching methods often rely mainly on lectures and listening, lacking interactivity and participation. Digital technology can achieve innovation and transformation in teaching modes through online and offline, virtual classrooms, and other means.

4. The challenge of digital empowerment for the integration and innovation development of lifelong education

With the rapid development of information technology, digitization has become an important driving force for promoting the integration and innovative development of lifelong education. However, the process of digital empowerment of lifelong education also faces many challenges, which involve multiple aspects such as technology, the education system and social cognition.

4.1. Technical challenges
4.1.1. The speed of technological updates and replacements

In the digital age, the speed of technological updates is very fast, which poses great challenges to the digitalization process of lifelong education. Educators and learners must spend much time and effort adapting to new technological environments and familiarizing themselves with new learning tools and methods. The updating and upgrading of technology also require the continuous updating and upgrading of educational resources and platforms, which is a huge challenge for the construction and management of educational resources [10].

4.1.2. The popularization and uneven application of digital technology

Although digital technology has been widely applied, there are still significant differences in its popularization and application in different regions, schools and disciplines [11]. In some remote or economically underdeveloped areas, the application of digital technology is still at a relatively low level, which leads to some learners not being able to enjoy the convenience and advantages of digital education [12].

4.2. Challenges at the level of the education system
4.2.1. The integration of education system and digital education

There are significant differences between traditional and digital education systems, and organically integrating the two is an important challenge [13]. Traditional education focuses on imparting and assessing knowledge, while digital education places greater emphasis on cultivating learners' self-directed learning and innovative abilities. Ways to balance the relationship between these two and better integrate digital education into the traditional education system need to be solved.

4.2.2. The integration and sharing of educational resources

Digital education requires a large amount of high-quality educational resources as support, but the integration and sharing of these resources face great difficulties. On the one hand, due to the diverse sources and forms of resources, how to manage and integrate these resources uniformly is a problem. On the other hand, due to copyright and interest

issues of resources, ways to achieve resource sharing is also a problem that needs to be solved.

4.3. Social cognitive challenges
4.3.1. The constraints of traditional educational concepts
In the digital age, traditional educational concepts, to some extent, constrain the integration and innovative development of lifelong education. Some people believe that digital education is only a supplement and auxiliary means to traditional education and cannot replace traditional education. This concept limits the application and development of digital education in education [14].

4.3.2. Differences in understanding and acceptance of digital education
Due to the varying levels of popularity and application of digital education, there are also differences in people's understanding and acceptance of digital education. Some people hold a positive attitude towards digital education, believing that it can provide better learning experiences and educational outcomes. However, some people hold a skeptical attitude towards digital education, believing that it cannot guarantee the quality and effectiveness of education. This difference will affect the promotion and application of digital education.

5. Digitally empowered lifelong education integration innovation development strategy

Addressing the challenges faced in digital empowerment for the integration and innovation of lifelong education requires multifaceted efforts and cooperation. Only with the joint efforts of the government, educational institutions, enterprises and all sectors of society can we promote the in-depth application and development of digital education in lifelong education [15].

5.1. Technical level: Technology empowers integrated innovation and development
5.1.1. Technological innovation and application
Technological innovation should be focused on and applied at the technical level, providing strong technological support for lifelong education. By introducing advanced technologies such as artificial intelligence, big data, and cloud computing, deep analysis of learner learning behavior can be achieved, providing personalized learning recommendations and resource matching for learners. Meanwhile, immersive technologies such as virtual reality (VR) can make learning more vivid and interesting.

5.1.2. Optimizing digital education platforms
Optimizing digital education platforms is the key to promoting lifelong education integration and innovative development. A powerful and user-friendly online learning platform needs to be built to meet the diverse needs of learners. The platform should have functions such as course management, learning progress tracking, homework submission and grading, online interactive discussions, etc., providing learners with a one-stop learning experience. At the same time, the platform should also support multiple forms of learning.

5.1.3. Strengthen data security and privacy protection
Data security and privacy protection are crucial in digital education. Advanced encryption technology and security measures need to be adopted to ensure that learners' personal information and learning data are not leaked or abused. At the same time, a strict data management system and monitoring mechanism must be established to supervise and audit the entire process of data collection, storage, transmission and use.

5.2. Education system level: Institutional reform and resource sharing

5.2.1. Policy guidance and institutional reform

At the level of the education system, the government needs to introduce relevant policies to clarify the strategic position of digital education in the lifelong education system and provide corresponding policy support and financial guarantees. In addition, it is necessary to reform the traditional education system, break the inherent educational framework and encourage schools and educational institutions to explore new digital education models and methods.

5.2.2. Integration and sharing of educational resources

In order to achieve a balanced distribution of high-quality educational resources, the education system should establish a national and even global mechanism for sharing educational resources. More people can enjoy high-quality educational resources by building online education platforms and open courses. At the same time, it is necessary to strengthen inter-school cooperation, promote the circulation and sharing of educational resources within the region, and improve resource utilization efficiency.

5.2.3. Education certification and incentive mechanisms

The education system should establish a suitable learning achievement certification mechanism for digital learning to stimulate learners' enthusiasm for participating in it. By providing learners with diverse learning certifications and rewards, the study aims to enhance the attractiveness and impact of digital learning.

5.3. Social cognitive level: Improving awareness and strengthening overall planning

5.3.1. The importance of popularizing digital education

To enhance society's awareness of digital education, it is necessary to promote the importance and advantages of digital education through extensive publicity and educational activities. This includes utilizing various channels such as media, online platforms and community activities to convey the key role of digital education in the lifelong education system to the public and how it provides flexible, convenient and efficient learning opportunities for individuals.

5.3.2. Cultivate a cultural atmosphere for digital learning

In order to promote the in-depth development of digital education in society, it is necessary to create a cultural atmosphere of digital learning actively. This includes encouraging individuals and groups to develop habits of digital learning and promoting the popularization of a lifelong learning culture. By organizing online learning activities, establishing digital learning communities, and organizing digital learning competitions, the university aims to stimulate learners' learning interests and motivation, allowing them to experience joy and a sense of achievement while participating in digital learning.

5.3.3. Enhancing the social impact of digital education

In order to enhance the influence of digital education in society, a series of measures are needed to demonstrate its positive effects and achievements. This includes strengthening the promotion of digital education cases, inviting experts, scholars and successful learners to share and interpret experiences, and showcasing the contributions of digital education in talent cultivation, social progress, and other aspects. At the same time, the university also needs to strengthen cooperation and communication with other industries and promote the application and development of digital education in various fields.

Disclosure statement

The authors declare no conflict of interest.

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