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New Technologies such as 5G and Artificial Intelligence are Driving Educational Transformation

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Abstract

5g presents a new dimension for education, which is immersive, borderless, and seamless. the integration of artificial intelligence and education has made the interaction between many elements in education, such as teachers, learners, and the environment, more diverse. the integration of 5g networks, artificial intelligence, vr/ar and other technologies can provide more comprehensive technical support services for the use of digital education resources, promoting the organic integration of digital education resources and educational teaching. the deep integration of 5g, artificial intelligence, and education will further transform traditional education, accelerate education transformation, promote the development of digital education, practice the dual empowerment proposition of technology and education, and bring new opportunities for future education development.

Keywords: 5G, Artificial Intelligence Technology, Digital Education, Educational Transformation

Introduction

china's education informatization construction has made significant achievements in updating educational concepts, transforming models, and restructuring systems. especially during the covid-19 epidemic, the path, experience and cases of education informatization development with chinese characteristics have won universal recognition from all countries in the world. at present, china is in a critical window period of information driven education system reform. digital transformation is a key feature of education system reform and an important way for technological innovation to empower comprehensive education reform and support the construction of a high-quality education system.

5g Provides New Dimensions for Education

with the maturity and popularization of 5g technology, 5g presents a new dimension for education, which is immersive, borderless, and seamless. using 5g, teachers and students can communicate and learn anytime, anywhere. 5g networks have the characteristics of security, speed, and stability. 5g utilizes 4g's defense technology and adds features such as stronger data encryption to ensure network security. the fast and stable 5g network ensures that teachers and students can enjoy uninterrupted and continuous connectivity anytime and anywhere, allowing them to focus on learning without having to deal with interruptions caused by unstable connections. reliable connectivity allows teachers and students to learn flexibly from anywhere - for example, they can listen to live lectures on their way to school or attend online courses in cafes. the newly developed augmented reality (ar) and virtual reality (vr) resources for education will completely change the way education is conducted, making it more interactive, stimulating, and practical. therefore, a fast, stable and secure 5g internet connection is essential for digital education. when the internet connection is interrupted, leading to the interruption of on-site classroom discussion, or the interruption of video calls between teachers and students, education and teaching work will be seriously affected. with the current pandemic of covid-19, interactive technology and other video applications make teaching more convenient and safe. but to get the best teaching experience, a stable and fast internet connection is essential. with a powerful 5g network, unprecedented progress can be made in ar and vr. a common problem with vr is nausea caused by delayed exercise. the low latency of 5g networks can greatly reduce the mismatch between actions and responses, as well as the resulting discomfort, allowing students to fully benefit from vr learning. with vr, textbooks can become more vivid, taking students to the center of volcanoes or allowing them to interact with historical figures. 5g allows for the transfer of the burden of processing and rendering visual effects from vr headphones to the cloud. this reduces costs, makes it possible to develop smaller and lighter headphones, and enables educational content developers to be more creative without being constrained by hardware limitations [1].

Through 5g connection, activities such as remote editing of school videos or participating in online team competitions can also be carried out in teaching. the consistency and low latency of 5g networks ensure a smooth and seamless collaborative experience for teachers and students. whether they are conducting group scientific presentations or working as a team to create digital murals, they can work closely as in a real-life classroom. tan qinliang, deputy director of the science and technology department of the ministry of education, expressed the hope to seize the development opportunities brought by 5g technology, promote the integration and innovative development of education informatization in china, and support the updating of education concepts, model changes, and system reconstruction. technology leads the future, innovation illuminates education. 5g will bring changes to the entire process of education [2].

Artificial Intelligence Makes Education More Diverse

The integration of artificial intelligence and education has made the interaction between many elements in education, such as teachers, learners, and the environment, more diverse. for example, in addition to the traditional interaction between teachers and students, students, and humans in the network environment, the interaction between the environment and resources is also carried out in an intelligent way [3]. It continuously iterates and optimizes in intelligent systems, and even surpasses certain human functions in intelligent learning contexts, a smart education ecosystem that includes multiple intelligent topic interactions and learning is forming in the 5g technology scene. integrating blockchain, big data, cloud computing, vr, ar and other technologies in 5g technology scenarios enables seamless connection of knowledge between the real world and the virtual world, and deep integration of education and modern educational technology [4]. Scholars such as guo shaoqing pointed out that artificial intelligence will cause structural restructuring of human life, production, thinking, and learning methods [5].

Throughout history, artificial intelligence technology has been actively applied in the commercial and military fields, but its promotion and use in the education sector have been somewhat insufficient. "why has computers changed almost all fields, but their impact on school education is surprisingly small?" steve jobs asked not about the speed of technological innovation, but about the transformation of the education ecosystem driven by technological factors [6].

The Development and Innovation of Digital Education

Digital education was once regarded as an additional resource. now, with the covid-19 pandemic, digital education is considered to be one of the very necessary educational means. in the digital society, digital information and communication technology has opened a new era of information transmission between people, fundamentally changing the way people connect with the outside world and bringing revolutionary changes to society. "there is no doubt that digital technology has penetrated into every corner of daily life, and we have already entered the digital era of the internet [7]."

5g And Artificial Intelligence Provide Comprehensive Technical Support for Digital Education

the construction of digital education resources in china has been carried out for many years, achieving certain results but also facing certain problems. the integration of 5g networks, artificial intelligence, vr/ar and other technologies can provide more comprehensive technical support services for the use of digital education resources, promoting the organic integration of digital education resources and educational teaching. the latest research report by lewis on how 5g will shape innovation and security suggests that 5g technology provides people with a more three-dimensional digital environment (lewis james, 2018) [8]. the fusion of data and learning technologies has made education based on 5g technology more "people-oriented".

By utilizing technologies such as "5g+vr/ar", "5g+holographic projection", and "5g+4k/8k remote live streaming (fast and slow)", immersive smart classrooms, interactive online teaching, and virtual simulation experimental teaching can be created. by relying on technologies such as 5g+ai, vr, and image processing, intelligent online exams, intelligent patrol and invigilation, remote collection of facial data, sensorless intelligent entry recognition, and intelligent assisted grading can be achieved. with the help of new generation information technologies such as 5g, it is helpful to build an intelligent teaching environment with "internet of things", establish centralized and intelligent support services for teacher training, educational governance, educational supervision, student life, consultation and learning, and home school collaboration, effectively serving the education and teaching process. by utilizing 5g+ai collaboration to upgrade the regional education brain and management platform, timely transmission of operational status data of schools within the region can be achieved, and dynamic monitoring and analysis of degree resources, learning situation data, emergency events, and other information of each school can be carried out to support educational authorities in making management decisions and responding. in summary, new technologies such as 5g and artificial intelligence have broad application prospects in the field of education, which can optimize the learning environment, innovate the forms of learning and teaching, improve learning experience and teaching effectiveness, enhance the level of educational services and modernization of educational governance, promote high-quality and balanced development of regional, urban-rural, and inter school education, and provide strong guarantees for the realization of digital education [9].

Conclusion

In summary, new technologies such as 5g and artificial intelligence have broad application prospects in the field of education, which can optimize the learning environment, innovate the forms of learning and teaching, improve learning experience and teaching effectiveness, enhance the level of educational services and modernization of educational governance, promote high-quality and balanced development of regional, urban-rural, and inter school education, and provide strong guarantees for the realization of digital education.

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