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Impact of Technological Advances on Educational Development: Reflections on Online Learning Models

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Abstract: Technological advances have led to many educational innovations that have had an impact on science, technology, engineering, and mathematics. In the face of a natural disaster such as C-19, it is clear that countries and governments can learn something from the response, as the combination of technology and education has enabled the world to weather difficult times. This paper will discuss the basic questions of technology and education. Including the impact of technology on education, methods for achieving the effective integration of education, and technology and methods for scientific and technological progress. Based on this, this paper presents future challenges reflected in online learning during the pandemic. For example, the conditions of electronic devices and networks required for online learning are not fully met by the versions of devices that all families can have, the reduction of teacher-student interaction, and student health issues. In addition, this paper will make appropriate solutions to this, corresponding to the previous problems, respectively: creating online and offline knowledge interoperability, utilizing web-based applications to strengthen the teacher-student connection, encouraging students to exercise at home with programs, and proposing reasonable solutions.

Keywords: Education, technology development, online learning

1. Introduction

Technological advances have brought about many educational innovations that have had an impact on science, technology, engineering, and math [1]. Under the realistic background of the impact of this natural disaster, the significance and importance of science and technology are more obvious. For example, the development of online learning guarantees students' right to education and the overall development of education. Countries and governments have something to learn from the response, as the integration of technology and education has brought the world through a difficult time. But there is also much to reflect on. This is an issue worth exploring, based on the UN's Sustainable Development Goal, to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all [2]. Judging from the performance of science and technology for education in the context of the C-19 epidemic, more improvements are needed to achieve this UN goal. Therefore, it is necessary to analyze the positive aspects of the technology method in education and address the negative aspects to achieve the UN's Sustainable Development Goals and the long-term benefits of science and technology for humanity.

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2. The Impact of Scientific and Technological Progress on the Development of Education

2.1. Changing the Education Paradigm

The continuous development of technology can make a difference in life, and the same is true for educational models and methods. Li in a study conducted in 2021, it was stated that technological developments can lead to increased access to information in education [3]. With the advent of the Internet and other digital technologies, students can now access a vast amount of information on any topic with just a click of the mouse. This makes it easier for students to do research and learn about content that may not be covered in textbooks. This can't help but be described as a new model of learning - it has greatly reduced the financial cost of learning, and schools and libraries are no longer the absolute gateway to knowledge, which gives learners a great deal of convenience. Furthermore, advances in technology have also contributed to the equalization of educational models and ideas. Thus, scientific and technological progress and development can contribute to equal education as well as ideological improvement.

2.2. Enrich Education and Learning Models

In addition, learning tools are constantly being updated and out, such as online courses, multimedia educational applications interactive simulations, and even VR [4]. These tools make the acquisition of knowledge not only confined to the aspect of reading books, but more diversified learning modes can make students of different ages and backgrounds more engaged in learning. It is worth mentioning the changes brought about by e-learning as well as online classes. This method allows students to hear courses from all over the world, greatly reducing the inevitable time and financial costs of previous learning. Especially during the COVID-19 pandemic. Schools reached online classes through software such as Zoom, Voov Meeting, and other software to keep up with the learning that was otherwise due. It provides learners with control over content material, learning sequence, mastery pace, time, and daily media, allowing them to adjust feedback to achieve their personal mastery goals. Additionally, technology has made it easier for teachers and students to communicate with each other through email, online forums, or videoconferencing. This helps facilitate learning and collaboration, even when students are not in the classroom [3].

In general, the development of science and technology as an integral part of the contemporary social process has brought certain changes in education. Models, ideologies, ideas, and tools of education change according to the times.

3. Problems of Online Learning

However, the impact of technology on education has had some drawbacks, especially during the Covid-19 epidemic. The following section details the difficulties encountered with the technology used during and after the Epidemic. This article takes online learning as an example to analyze the problems existing in the use of science and technology development in education.

3.1. Economic Disparities Lead to Inequality in Education

Many Chinese families are currently lagging behind home electronic products because not every family can afford the high cost of network renewal and equipment renewal [5]. This causes many students to have no reliable Internet connection or necessary equipment, such as laptops or tablets, to attend online courses. In addition, in some cities, due to geographical and economic factors, the Internet connection is not very fast, and poor network connection will lead to the interruption of online classes, thus preventing students from listening to a complete class and slowing down the

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learning process [6]. This creates a major fairness problem, because it brings economic challenges to some students' families, and families with better economies will not encounter this dilemma, which also becomes more complicated when resources (including manpower and electricity) are relatively scarce and tight. This may make students from disadvantaged backgrounds more likely to be affected.

3.2. Online Learning Hinders Communication between Teachers and Students

Teacher-student collaboration is also a challenge in an online learning environment. Teachers also do not have experience teaching courses online, which has led to some older teachers not being able to teach classes because they do not know how to use modern electronic devices, and not being able to respond quickly to surprises in online courses such as network problems [7]. It may therefore be more challenging for teachers to provide feedback to students. Teachers may have difficulty assessing student progress and providing personalized feedback, which is critical to student success [5]. And as a student, it can be difficult to monitor a student's class status with just a webcam. Online learning is challenging for students because it requires a high degree of self-discipline and motivation. Without the structure and social interaction of a traditional classroom, it may be difficult for students to stay engaged and focused [5]. Additionally, students may feel less motivated to learn in an online environment as they may miss the social interaction and support of a traditional classroom [8].

3.3. Internet Dependence Affects Students' Health

Online learning also did not protect students' health during the popularity of the epidemic. Online classes require students to spend more time facing screens, and excessive screen time is associated with problems such as eyestrain, headaches, and sleep disorders. There are many obstacles to the proper conduct of physical education and health classes: for example, the footprint of students' homes is not large enough to support their daily exercise program or the amount of exercise they do, and these types of classes are likely to result in unwanted accidents without the guidance of a professional instructor. This could hurt their health and well-being [9].

Overall, there are many unavoidable drawbacks to online learning as a result of the C-19 epidemic: the lack of equipment to keep up due to financial reasons, and many controversies in terms of teacher-student collaboration as well as student health and well-being.

4. Solutions

Of course, on top of these difficulties, there some several ways and policies can put some of the problems right.

4.1. Combination of Online and Offline

The problem of a lack of online learning opportunities for students almost fundamentally negates the possibility of a fully online education [9]. But in the context of the general C-19 environment at the time, it was almost a desperate one. According to Hafeez et al, it was argued that providing an alternative method of learning could not be avoided as an option to be taken into account. For students who could not study on the Internet, we could offer alternative methods of study, such as printing the lecture notes for self-study or listening to the teacher's lectures in the form of radio broadcasts. However, this is only a delaying tactic and does not guarantee the efficiency of students' listening and learning. As mentioned above, cameras do not guarantee that students are in the same state as they are in the classroom. Teachers cannot focus on whether students are concentrating in the classroom, and in an unsupervised environment, it is unknown whether students can learn effectively. The government can also provide support to the disadvantaged areas to solve these problems, provided

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that there is enough budget to do so [10]. Therefore, it is vital to pay attention to the allocation of hardware resources and combine online and offline teaching methods.

4.2. Increase Teacher-Student Communication

The lack of interaction and participation in e-learning can be addressed through "localization". Teachers can use online interactive games, such as "quizzes" and "online problem solving" to give students competition of conscience, quizzes to motivate educated people to learn, and group discussions to connect students as a bridge of communication. These are undoubtedly a way to connect teachers and students in the online classroom. In addition, keeping interaction and concern with students on social platforms after class, and synchronizing students' current learning status with parents through SMS can also achieve this effect [11].

4.3. Pay Attention to Students' Health

Indoors is also a place where exercise space can be created, although distance sports such as long-distance running cannot be supported. Students can be encouraged to exercise such as jumping rope in order to avoid disturbing their neighbors. Schools should ensure basic exercise standards for students through online classes that allow students and teachers to exercise together in programs such as push-ups and yoga. Additionally, schools can work with parents to monitor their children's exercise and health issues [12].

5. Conclusions

In conclusion, this paper reflects on the popularity of e-technology, the interactivity of online courses, and the health of students, as well as suggestions for connecting online and offline, utilizing the Internet to strengthen teacher-student communication, and urging students to exercise physically, etc. The educational measures of the C-19 outbreak bring a certain amount of certainty to today's educational development and also provide a lot of food for thought for the future direction of education and technological research. Place. In today's society, education, and scientific and technological development have long been inseparable. How to strike a balance between the two and make full use of the existing resources is of paramount importance.

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