

Digital Technology in Education: Navigating the Challenges and Opportunities for the 21st Century Learner

Zhao Hao

Meihekou Kangmei Vocational and Technical College, Hekou, Jilin, China

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Abstract: In the ever-evolving landscape of digital technology, the analysis in this article depicts its far-reaching impact on various fields, especially education. The integration of digital technologies in educational settings offers many advantages, including enhancing accessibility of learning resources, facilitating distance learning, and facilitating interactive learning experiences through virtual reality and online platforms. However, the proliferation of these technologies also brings significant challenges, such as issues related to performance reliability, privacy, ethics, and technical compatibility. Specifically, this article delves into the application of digital technology in education, covering online learning platforms, virtual laboratories, distance learning, student management systems, digital libraries, learning management applications, data analytics, virtual reality teaching, and student engagement platforms. The article highlights the critical role of digital literacy education in equipping students with the skills needed to navigate the digital world safely and responsibly, and highlights the importance of developing critical thinking and insight to become informed digital citizens. The article's comprehensive exploration of the intersection between digital technologies and education highlights the double-edged nature of these advances, arguing for a balanced approach to harnessing their potential while addressing the challenges that come with it.

1. Introduction

In today's digital age, digital technology has become an integral part of our lives and work. From education to business, from entertainment to social interaction, digital technology has permeated every field and has had a profound impact on People's Daily lives. However, with the popularization and application of digital technology, it also brings a series of challenges and problems. In the process of growing up, students are frequently exposed to various digital technologies, such as smart phones, social media, online games, etc. These technologies not only bring convenience, but also have various security risks and negative effects.

The use of emerging technologies in digital technology may face a number of problems, and whether it can provide stable and reliable performance in practical applications. These issues relate to technology, privacy, ethics, such as performance, reliability, and compatibility.

And many other aspects. Here are some common questions examples:

In the first mineral springs of a new technology, their performance and reliability can be elusive. Virtual reality devices may degrade performance or crash after prolonged use. In the first mineral sources of emerging technology, the hardware is not optimized enough, so its operation may not be correct. For example, virtual reality (VR) headsets may over- or under-perform after prolonged use, which can affect the user experience^[1]. (As shown in Figure 1) Things like the Oculus Rift CV1 heat up after prolonged use. In some early versions of the Oculus Rift CV1 virtual reality headset, due to poor cooling design, prolonged use may cause the device to overheat, which can lead to problems such as performance degradation or blurry image failure and sensor failure.



Figure 1: Equipment performance comparison

For example, virtual reality applications may behave differently on different hardware platforms, or there may be various software vulnerabilities and glitches that can cause the application to crash or degrade performance. The HTC Vive virtual reality system has had software crashes. In some early versions of the HTC Vive virtual reality system, users may experience frequent crashes in the application. This can be due to bugs or instability in the software, which can make the user experience unstable and affect their confidence and satisfaction with the virtual reality technology (As shown in Figure 2).

	HTC Vive	Oculus Rift CV 1
Screen Size	2x3.6-inch OLED screen	2X3.5 inch OLED screen
Resolution	Monocular resolution 1080X1200 (Total resolution 2160X1200, pixel density 447ppi)	Monocular 1080X1200 (Total resolution 2160X1200, pixel density 456ppi)
Abgle of view size	110 degrees	110 degrees
Refresh Rate	90Hz	90Hz
Adaptation platform	SteamVR/Oculus Home support is available through third-party plugins)	Oculus Home & SteamVR (native support)
Location Technology available or not	Yes, tracking range 15 by 15 feet	Yes, tracking range 5 X 11 feet
If you have motion sensing technology	Yes	No, motion-sensing handles and accessories will be available soon
Input	HTC Vive motion-sensing controller, gamepad, keyboard and mouse, front-facing camera	Xbox One gamepad (included), keyboard and mouse
Audio Device	In-car headphones are included	Comes with detachable headphones
Input Jack	USB 3.0X1, HDMI/DPX1, helmet, positioning device require additional power input	USB 3.0X2, HDMIX1, no additional power input
Output Port	USB 3.0 x 1, 3.5mm audio port	No
Oupil distance adjustment is available	Yes	
Whether focal length adjustment is available	Yes	
Price	\$699	\$599

Figure 2: HTC Vive and Oculus Rift CV1 performance comparison

Emerging technologies may have compatibility issues with existing technologies or devices, which can lead to erratic performance or functional failures. Virtual reality devices may need to interoperate with a variety of different types of computers, operating systems, and applications, and compatibility between these systems can pose challenges^[2].

2. Online learning Platform

Online learning platforms can serve as the main platform for teachers to publish course materials. Teachers can upload courseware, video, audio and other forms of teaching resources for students to look up and learn online. Students can view homework tasks, upload homework files, and complete homework online on the platform^[3]. This online operating system not only facilitates the distribution and management of jobs, but also improves the feedback speed and quality of jobs. Online learning platform and also provides a variety of test functions, teachers can create a variety of forms of tests (such as multiple choice, fill in the blank, short answer, etc.). Students can complete the test within the allotted time and see the results and feedback in real time (The teaching situation is shown in Figure 3 and 4).

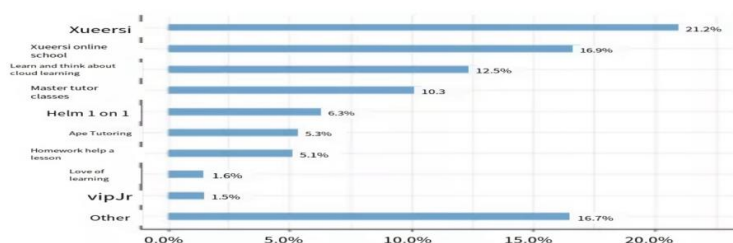


Figure 3: Common tutoring platform for students

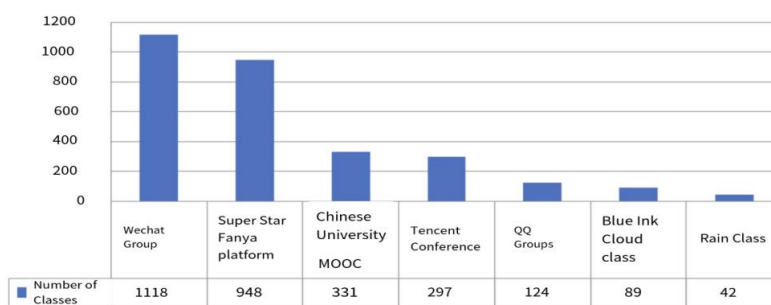


Figure 4: The first week of each school network teaching situation

3. Virtual laboratory

Simulations of chemistry, physics and other subjects are performed with the help of virtual laboratory programs. Using virtual lab software to simulate chemistry, physics and other materials can give students a safe, economical and efficient experience. Students can conduct experiments and observe the results of the experiments using software without using real laboratory equipment. Virtual laboratory software typically simulates all aspects of a real experience, including experiment preorder, operation during experiment, data collection and analysis process^[4].

4. Distance Learning and video conferencing

Distance learning and video conferencing refers to distance learning and conferencing using

tools such as Zoom and Microsoft Teams.

Distance learning technology can help schools break through geographical constraints and attract more students and teachers. Zoom, Microsoft Teams, and others provide a convenient way to communicate and collaborate online. Teachers can conduct face-to-face remote teaching with students through video conferencing. They can share screens, present courseware, and even write and draw in real time to make teaching more lively and interesting. You can write, draw, present ideas and solve problems in real time, enhancing the interactivity and efficiency of the meeting. You can also share your own screen content through screen sharing to display presentations, reports, or other relevant materials for participants to understand and discuss^[3].

5. Student Management System

Student management systems are systems that use student management systems such as PowerSchool and Blackboard to manage student information, grades and attendance. Educators may update student information at any time and ensure that the information is accurate and complete.

Teachers can easily input scores, calculate average scores, generate transcripts, etc. These systems usually support different forms of achievement evaluation, such as percentage system, grading system, rating system, etc., to meet the evaluation needs of different subjects and teaching objectives. Students, parents and teachers can view students' achievements and academic progress in real time through the student management system, learn about students' learning situation in time, and carry out necessary learning support and guidance.

6. Digital library and document retrieval system

Such as EBSCO, JSTOR, etc., allow students to access and search academic literature online. Academic databases such as EBSCO and JSTOR have a large library of academic documents, covering literature resources in multiple disciplines. Students can access and retrieve the academic literature they need online through these platforms, without having to visit the library in person or purchase paper documents. These academic databases contain many types of academic literature, including journal articles, dissertations, books, reports, etc^[1].

7. Learning Management Application

Learning management apps use learning management apps like Anki and Quizlet to help students develop study plans, self-tests, and revision. Apps like Anki and Quizlet offer a wide variety of self-tests that allow students to test themselves on words, concepts, formulas, and more. Apps like Anki and Quizlet also offer review features that students can use to view knowledge scores and reinforce learning. These apps typically use scientific learning techniques, such as spaced repetition and the memory curve, to help students better remember and absorb learning content.

8. Data analysis and prediction systems

Data analysis and prediction system is the use of data analysis and prediction system to help schools understand student performance and trends, early intervention and support students. The school collects students' academic scores, attendance records and classroom interaction data through the student management system and other education platforms, analyzes students' academic performance trends, attendance and class participation, and identifies students' learning problems

and potential risks. These data can be collected and updated in real time in an automated manner, ensuring the timeliness and accuracy of the data.

9. Virtual Reality teaching

The use of virtual reality teaching means that virtual reality technology can be used to carry out field visits and teaching of biology, geography and other subjects. They can interact with objects in the virtual environment and experience learning and practice in real scenarios.

Virtual reality teaching can make up for the limitations and high costs of field trips, and provide students with a safe, convenient and efficient learning environment.

This immersive learning experience can stimulate students' learning interest and imagination, increasing their learning motivation and engagement.

10. Student Participation Platform

Student engagement platforms are the creation of student engagement platforms, such as online forums and social media groups, to facilitate communication and collaboration among students. For students in academic, interest, social activities and other aspects of exchange and discussion. The forum can be set up in different sections, covering various subject areas, campus life topics, etc., so that students can choose topics of interest to participate in the discussion. These social media groups can be wechat groups, QQ groups, Facebook pages, Instagram accounts, etc., and the appropriate platforms are selected according to students' habits and preferences^[5].

11. Digital Literacy Education

Digital literacy courses teach students to use digital technology safely and responsibly. To help students understand the importance of network security and learn how to protect personal privacy and information security. Courses can cover password management, network fraud detection, malware prevention and other content to help students build a healthy awareness of network security^[3].

12. Conclusion

Digital literacy education courses can help students establish correct digital values and cultivate their awareness of network security and information literacy. We need to develop students' critical thinking and judgment skills to become digital citizens with independent thinking and insight.

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