

# The Role of Technology in Modern Education: A Comparative Analysis of Benefits and Challenges

Noura Mohammad Hassan

The Public Authority of Applied Education and Training  
The Higher Institute for Telecommunications and Navigation  
English Department

**Abstract:** *In recent years the learning process witnessed massive changes especially in the methods used in teaching and instruction. Knowledge is no longer limited to traditional tools such as pens and books. Many of today's jobs require talents and skills that are highly related to technology. The rapid evolution and growth of the information technology has transformed learners into digital learners. Therefore, specialists in the educational sector have endorsed the use of technology in teaching. It requires teachers to integrate technology into their educational approaches. So, their technological knowledge and skills play a significant role in this effective integration. From this perspective, this study investigates the role of technology in modern education, comparing it with traditional teaching methods. Through an analysis of secondary sources, the paper examines the benefits, such as enhanced learning opportunities and improved engagement, and challenges, including distractions and accessibility issues. It aims to analyse the impact of technology on educational methods, comparing traditional and modern approaches, and assessing the advantages, challenges, and future implications of technology integration in education. Findings suggest that while technology significantly enhances education, it is essential to balance traditional and modern approaches to optimize learning outcomes. All the data used in this study comes from secondary sources. Information was gathered from several sources, including journal papers, published dissertations, online textbooks. These resources help in defending the topic of the research.*

**Keywords:** Digital technologies, Traditional Education, Multimedia, Pandemic

## 1. Introduction

Technology becomes a milestone in education in this era. It enables learners to cope with the new pedagogies to cater diverse learning styles. The learning process has been transformed by multimedia materials and digital books and platforms, which motivates critical thinking and problem solving. The use of Internet has expanded learning opportunities beyond the walls of classrooms. Also, Sustainable educational advancement requires collaborative learners, heavily reliant on accessible knowledge. Modern technology supports learning by utilizing tools such as smartphones, tablets, laptops, projectors, and iPads. These tools transform the way students learn and improve the way of teaching by making it more accessible and inexpensive. Also it develops the abilities of students' performance and the quality of education. These abilities are important for their future success. Regardless of its negative impacts on concentration, It makes learning easier since students use multiple programs and tools to create presentations and projects instead of pen and paper. This research depends on collecting data about the importance of technology in education. It compares learning and teaching in the past and now. It focuses on its benefits and challenges on students. And investigates the strengths and limitations of technology in classrooms. This study is significant as it sheds light on the need for educational systems to adapt to technological advancements, especially following the COVID-19 pandemic, highlighting the necessity for a balanced approach that incorporates both traditional and digital methods

So, is technology important in education? It's the question that we would like to get its answer in the following lines and pages.

## Objectives of this research

- 1) To compare between traditional education and modern education.
- 2) To identify the advantages and disadvantages of technological devices in teaching .
- 3) To brief the role of technology during the pandemic.

## Traditional Education and New Education

Today's education systems has witnessed a deep shift from traditional to modern pedagogies. Modern knowledge is no longer limited to traditional patterns such as pens and books. Many of today's jobs require talents and skills that are highly related to technology.

As we know, Traditional education focuses on rote learning and discipline especially for science subjects like math, physics and chemistry. These subjects require focus, concentration and deep understanding of calculations and equations. that is, according to Wang "some subjects that focus more on thinking application and deep calculation should be taught in traditional ways" ([1], p. 272) . and "although traditional lecture-style teaching is more boring than high-tech classrooms, it can be more effective at improving test scores" ([1], p. 271); it is also stated that "rote learning is a well-practiced approach at all educational level, where education and assessments emphasize on memorization of content rather than comprehension and application of content in real life events" ([2], p. 114). So, oral repetition, drilling and memorizations were recommended in the traditional way.

On the other hand, modern education depends primarily on critical thinking , problem solving and pupils –cantered class with integration of technology , for example, "the content [of cultural literacy] in the pedagogical culture is seen pertinent to the modern FL teacher" and at the same time, it includes

“professionalism, non-standard way of thinking/thinking out of the box, originality, high level literacy, expressiveness, logic, lexical wealth and communication, creativity, and culture awareness and readiness for diversity in perception” ([3], p. 103).

In the new educational concept, the purpose of education is not to test, but to inspire students' creative thinking. Modern education emphasizes that the process of education and teaching is a highly creative process. The basic goal is to inspire, guide, develop and train students' creativity. In the research conducted by Bc. Viera Boumová, the author indicated that both teaching methods can improve students' knowledge levels, but modern education is more active in promoting communication and learning motivation [2]. However, modern teaching methods and traditional education methods are not absolutely good or bad. Although traditional lecture-style teaching is more boring than high-tech classrooms, it can be more effective at improving test scores. According to the study conducted by Guido Schwerdt and Amelie C. Wuppermann, “Increasing the overall time devoted to lecture style teaching leads to an increase in test scores when explicitly including the two problem-solving categories and the other class activities.” [3]. The two teaching methods each have their own advantages and disadvantages. To compare the effectiveness of traditional and modern teaching methods, they are mainly analyzed from three perspectives: teaching technique (approach); teaching forms, and bias of focus in learning

Nowadays, the main purpose of education is not to test, but to inspire, guide and develop students' thinking. It looks at the learning process as a creative process especially with the use of technology and multimedia. multimedia can transform abstract concepts and words into active and dynamic pictures. Many technological tools help teachers and students in the learning process like whiteboards, cameras, laptops and smart tablets.

Above aforementioned, the integration of the traditional and modern education is the best solution to cultivate the utmost goals of the learning process. Since, some subjects and lessons require memorization to engrave knowledge in students brains. Also, some lessons require using different gadgets and tools of communication to help learners grasp the knowledge well. Teachers are required to verify the teaching methods upon students' needs.

#### **The benefits of technology in teaching:**

##### **1) Enhance teacher's productivity and efficiency:**

A lot of teachers face some challenges in teaching learners appropriately if they are not competent enough with technology. In this regard, teachers must be updated to the latest updates in the field of teaching methods. Once teachers implement useful digital tools and programs they expand the learning opportunities for students and increase their chances of acquiring new materials. Also schools would reduce the costs paid for physical instructional materials. So, Schools must supply teachers with adequate career development courses which help them successfully use technology in their instructional practices in order to achieve new levels of productivity.

##### **2) Promoting collaboration and communication:**

Using technology helps to foster collaboration and communication between students. Students can work together, share ideas and solve problems in collaborative activities. Also, technology helps in one-on-one instruction and interaction with teachers. They can ask questions, seek additional support and upload their homework and assignments. Teachers can check the completion of the assignments using their laptops.

##### **3) Boost students' curiosity**

Technological methods such as AR, videos or podcasts can spark inquisitiveness in children and boost their curiosity. Some programs help students get a better understanding of math, algebra and language concepts. They can be engaged and interact with students from across the globe. Technology options give students a chance to push forward in the learning process.

##### **4) Learning at own pace**

With the use of technology, students can learn at any time and from anywhere in their comfort zone. They are free to use educational applications and programs to play, pause and re-watch complex topics and better understand difficult concepts. They take enough time to get information and feel more relaxed in acquiring any difficult lesson.

##### **5) Save time and effort**

Both teachers and students can spend less money on their educational materials. Many schools buy online study materials that are cheaper and convenient for storage. Many virtual reality apps and programs are free of cost and useful in keeping students engaged in the learning process easily.

##### **6) Easy communication between teachers and parents**

Some new apps in social media and programs give chances for teachers to interact with parents easily and successfully. Some blogs can help parents to watch their kids in the classroom and what are they learning each day. Even teachers can instantly report kids' behaviour to approve for parents in real-time what is happening throughout the day by emails, chat boxes and message

##### **7) Suitable for multiple intelligence**

Technology allows students to embrace their intelligence in multiple ways. Since there are different kinds of intelligences such as: linguistic, spatial, emotional, mathematical and so on. Excellent students can achieve their potential with the use of technology than the traditional classrooms that focus on lecture lessons. They try new things and ways to collect more data.

##### **8) Prepare students for their future world**

If students were not exposed to technology today, they will be in struggle tomorrow since everything nowadays is highly related and attached to technology. So the traditional ways and subjects will not serve their talents for the future jobs. Today, the IT professions replace many traditional and manual jobs. It's important to have students who are professional in coding, typing and critical thinking. To prepare students for the labour market, educators must focus on the most advanced tools and techniques available.

**The disadvantages of technology in education****1) Technology and distraction**

Once students use technology in the classroom like smart tablets, iPad or laptops for a long time and to achieve different tasks, this can lead to technology distraction. Their brains may be attributed to focus on other things rather than the tasks they're supposed to do. They would likely have short attention span. Also, when students have their devices nearby, it's difficult for them to focus their attention on the teacher or the book. Distractions in modern life may be traced back in large part to technological advancements.

**2) An easy way for cheating**

There must be strict measurements and rules during online quizzes and tests to evaluate students' knowledge with the use of technology, since it's easy nowadays to send messages and emails within seconds. Some students find it easy to steal information. Some technological tools like graphical calculators, high-tech gadgets, and small cameras pave the way for dishonest students to gain an edge over their classmates' work.

**3) Not all families can afford the costs of technology resources**

Whether technology is in the classroom or at home, there is an issue of costs to worry about. Some families can't buy computers, laptops or any tablet to all their kids to achieve their school work. So, Technology seems financially exhausting to some families.

**4) Replace the role of the teacher in some classrooms**

Some classrooms that highly depend on technology minimize the role played by the teacher in instruction. Teachers became observers more than instructors. educators must be willing to integrate technology thoughtfully and purposefully to support, rather than replace, skilled instruction.

**5) Lack of privacy**

Since more people have access to technology nowadays, they are vulnerable to experience identity theft in some way. Parents are placing the identity of their children at risk every day. Even with the existence of privacy issues and filters that reduce the identity loss, there is no straight way to guarantee privacy.

**6) Medical problems**

Eye strain, backache and headache, blurred vision and tiredness all are symptoms of continuous usage of screens. Many orthopaedic surgeons receive patients every year who suffer from health problems caused by the excessive use or wrong posture while using technology.

**2. The Role of Online Learning During the Pandemic**

The Covid-19 pandemic has led to a compulsory use of digital technologies due to the social distancing norms and lockdowns. The lockdown has forced many people to use the internet and internet-based services to communicate, interact, and continue with their job responsibilities from home. The uses of internet services have been increased from 40 % to 100 %, compared to pre-lockdown levels. Many platforms like Zoom and Teams have seen a ten times increase in usage. People, teachers and students all over the world have had to adjust to innovative ways of learning.

Traditional schools are forced to transform into full-time virtual schools to cope with ongoing education. Consequently, students must adapt to the transition from face-to-face learning to fully remote online learning, where video conferences, social media, and educational platforms become their primary hubs for knowledge and peer communication. However, this sudden transition is problematic as some students often lack prior online learning experience. Some lose motivation. and some face problematic issues with connection.

"Apart from aforementioned issues, online learning was a good alternative during the pandemic. So, instead of staying and losing the time, students somehow got information and new experience and the learning process moved on at that period. Furthermore, the disruptive phase of COVID-19 brought an opportunity to enhance the effectiveness of teaching-learning practices through ICT integration at the school level. Technology provides innovative and resilient solutions at times of crisis to combat disruption and helps people to communicate and even work virtually without the need of face-to-face interaction. This leads to many system changes in organizations as they adopt new technology for interacting and working " ([4], Mark & Semaan, 2008). So, no one can neglect its essential role during the pandemic

"Teachers are obliged to develop creative initiatives that assist to overcome the limitations of virtual teaching. Teachers should actively collaborate with one another at a local level to improve online teaching methods. There are incomparable opportunities for cooperation, creative solutions and willingness to learn from others and try new tools as educators, parents and students share similar experiences" ([5], Doucet et al., 2020).

**Conclusion**

In conclusion, the integration of technology in education offers numerous benefits, such as fostering personalized learning and supporting diverse learning styles. However, challenges like the digital divide and potential distractions must be addressed to maximize these benefits. A balanced approach, combining traditional and technological methods, is essential to prepare students for the future. Thus, educators should be equipped with resources to effectively integrate technology into their classrooms, ensuring a holistic educational experience

So, It's worth mentioning that technology tools will continue to play an essential role in tailoring the future of teaching and learning. However, the traditional teaching is still appreciated in some situations, since some subjects require drilling, memorization and lecturing in order to gain the full potential of the lesson. So, teachers can integrate technology with traditional education because technology becomes a powerful tool in every teacher's arena.

**References**

- [1] **Wang Y. A comparative study on the effectiveness of traditional and modern teaching methods. In: 2022 5th International Conference on Humanities Education**

- and Social Sciences (ICHESS 2022). Zhengzhou: Atlantis Press; 2022. pp. 270-277
- [2] **Ahmed A, Ahmed N. Comparative analysis of rote learning on high and low achievers in graduate and undergraduate programs. Journal of Education and Educational Development. 2017;4(1):111-129.** Available from: <https://files.eric.ed.gov/fulltext/EJ1161522.pdf>
- [3] **Chaika O. Implementing technology of poly-/multicultural education for future foreign language teachers: Integrated approach. International Journal of Philology. 2022;13(4):101-109.** DOI: 10.31548/philolog13(4\_2).2022.011
- [4] **Mark G., Semaan B. (2008).** Resilience in collaboration: Technology as a resource for new patterns of action. In Begole B., McDonald D. W. (Eds.), Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work (pp. 127–136). Association for Computing Machinery. <https://doi.org/10.1145/1460563.1460585>
- [5] **Doucet A., Netolicky D., Timmers K., Tusciano F. J. (2020).** Thinking about pedagogy in an unfolding pandemic (An Independent Report on Approaches to Distance Learning during COVID-19 School Closure). Work of Education International and UNESCO. [https://issuu.com/educationinternational/docs/2020\\_research\\_covid-19\\_eng](https://issuu.com/educationinternational/docs/2020_research_covid-19_eng)
- [6] **-Schleicher, A. (2018).** *Teaching for the Future: A Sustainable Approach to Teacher Development*. OECD Publishing. This report emphasizes how the professional development of teachers, including training in the use of digital tools, can improve teacher efficiency and productivity.
- [7] **Cox, M., & Graham, C. R. (2009).** *Learning and Teaching with Technology*. This book provides a comprehensive look at how integrating technology can improve teacher productivity and educational outcomes.
- [8] **Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014).** *NMC Horizon Report: 2014 K-12 Edition*. The New Media Consortium. This report discusses the role of technology in enhancing collaboration and communication, both among students and between teachers and students.
- [9] **Puentedura, R. R. (2013).** *SAMR: A Framework for Transforming Education with Technology*. This work presents the SAMR model, which outlines how technology can foster collaboration, improve communication, and enhance educational practices.
- [10] **Agarwal, A., & Agarwal, R. (2020).** *The Impact of COVID-19 on Digital Learning*. Journal of Educational Technology & Society, 23(4), 11-21.

## Author Profile

**Noura Mohamad** received the B.S. Degree in English Education from the College of Basic Education in 2007. During 2007-2015, she worked as a teacher of English at Al-Najah School, Ministry of Education. In 2015 until now, she works as an English instructor at the higher Institute for Telecommunications and Navigation, The Public Authority for Applied Education and Training.