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Technology and Its Impact on Education

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Abstract

Technology and education are two sectors that are continuously developing side by side. They support the integrated development of other sectors to encourage the progress of human civilization. However, in order to keep up with the new generation's technological advancements, the ways of educating need to be reconsidered. This literature review aims to explain the impact of technology on education. Data obtained from various literature sources, especially journals, were analyzed using qualitative analysis consisting of data reduction, data display, and drawing conclusions. Based on the results, it was found that the sustainability of values transmission occurs through the education process, making the integration of technology with contextual learning very important. Educators, as the closest people responsible for the learning process, need to constantly improve their abilities to provide the best learning environment for students by using various easily accessible learning resources.

Keywords: *competency, education, learning environment, technology*

Introduction

Technology and education are two sectors of life that continue to develop side by side. Both support the development of other sectors in an integrated manner to encourage the progress of human civilization [1], [2]. Technology by definition is all the work of humans that can facilitate human activities to improve the quality of life. The aspect of technology that needs to be realized is that technology is developing at an unimaginable speed. Technology predictions sometimes do not match because technology products occur in various ways.

This acceleration can be seen in the chronology of technological developments. For example, agricultural technology that was hundreds of years old was replaced with industrial technology in the 1900s. However, not until one hundred years old, industrial technology has been replaced by information technology. Information technology has also developed and has significantly changed human life. Nowadays, everyone feels how this information technology has an impact on life. Industrial automation, banking, courier services, business transactions, as well as educational services. This automation also encourages new technological discoveries that further accelerate the development of the technology itself.

As mentioned earlier, technology and education develop hand in hand. But in reality education does not develop significantly. Education as a process of passing on values from one generation to another develops slowly and tends to remain constant. When we enter the technological era that carries the characteristics of Volatility, Uncertainty, Complexity, Ambiguity (VUCA); education faces new challenges [3]. Ways of educating need to be reconsidered to be able to accompany the development of

the new generation. With the current situation, this article explains the impact of technology on education.

The use of technology in educational institutions has been extensively developed, serving as a learning medium, such as the development of android-based learning models [4]–[12], learning videos [13]–[18], and educational games [19]–[23]. Technology is also utilized as an administrative tool for educational institutions [24], [25], open and distance learning management [26], and as an improvement to learning models, such as e-learning [27], [28]. Despite the advantages provided by technology in education, there are also disadvantages that need to be constantly improved to keep up with the demands of modern times.

This study aims to explain the impact of technology on education. The urgency of this study is to examine the importance of technology in education during the rapid growth of the information age and to minimize technology illiteracy among education practitioners. By doing so, it becomes easier for them to adapt to the technological advancements that will ultimately lead to the ultimate goal of education - to liberate humanity from ignorance and technological backwardness.

Methods

This study is a literature review on the impact of technology on education. The research question is to explain the impact of technology on education. Search for literature to collect literature from various sources, especially journals, to obtain data on the impact of technology on education. The data was analyzed using qualitative analysis methods, including data reduction, data display, and conclusion drawing, to analyze the data obtained from the literature review. Collect and map the data based on categorization. Based on the results of the data analysis, draw conclusions about the impact of technology on education. Finally, communicate the findings of the literature review on the impact of technology on education in a clear and concise manner including determine if there are any limitations or areas for future research.

Results and Discussions

A. Current Generation Characteristics

The current generation was born when the internet has developed rapidly in various forms of use. They tend to be digital natives who are very smart in using/operating various digital devices. This capability far surpasses that of previous generations [29]. Differences between people are facilitated according to their respective interests. Everyone has their own circle of friends with a very wide range. This situation makes the current generation a generation that is open to various values. They are very easy to obtain various information according to their individual needs. If in the past the surrounding community was called a source of non-formal learning, now these sources come from all corners of the world and have various types of values. Disclosure of this information has an impact on the ambiguity between right and wrong. They tend to no longer care about basic values. This situation can have an impact on an attitude of life that tends to be secular. Religious values are becoming less and less due to the values of relativism that are developing in the internet world [30]. However, it cannot be denied that the current generation tends to be more capable of interacting with a variety of different characters.

They can also work multi-tasking, acquiring knowledge in a faster way. This explains that in technology, positive and negative impacts will continue to go hand in hand. The role of the educator is to provide assistance, facilitate, become a trainer so that these new characters can still live a good and beneficial life.

The current generation has a uniqueness that is different from previous generations. They were born and grew up in an era of highly advanced technology, so that they have better skills in operating various digital devices and obtaining information from around the world [31], [32]. This openness of information makes them have a wide circle of friends and are open to various values. However, the ease of access to this information also has a negative impact. This generation tends to pay less attention to basic values and has an attitude of life that tends to be secular. The need to distinguish between true and false information becomes very important. Even so, the current generation has extraordinary abilities in interacting with various characters and working in multi-tasking. This shows that this generation has great potential to become future leaders and thinkers. Therefore, the role of educators is very important to help them utilize this potential and form good character and benefit society. Educators can facilitate and provide assistance to ensure that this generation can lead a good life and have a positive impact on society.

A. Technology and Learning

Formal education cannot be separated from the teaching and learning process or the learning process. At this time, the old ways of learning are no longer relevant when used. Technology brings new opportunities in the interaction process between educators, students, and other learning environments. The role of educators in providing assistance so that students gain learning experiences supported by technology is important [33]. Technology can be used in many aspects of learning, such as a learning management system (LMS), a tool for developing digital learning media, a tool for data collection, or for simulating certain phenomena.

An important key in technology is how to use it. Technology as an enabler. An enabling means for better learning performance. For example, with LMS students can start learning from anywhere according to their desire to learn, can learn from various places and times flexibly [34]. All of these activities can still be monitored and guided by students. With technology, phenomena that cannot be represented in real terms such as electricity, genes, atoms can be studied better. Or students can observe areas that are not reached with the help of the internet of things. These are all opportunities that can be used to improve learning.

Formal education is currently experiencing changes in the teaching and learning process. Technology opens up new opportunities for interaction between educators, students, and other learning environments. The role of educators now is to provide assistance and utilize technology as an enabler for better learning. LMS, digital learning media, data analysis, and simulation are some examples of the benefits of technology in learning [35]–[37]. Learning flexibility and broader views can be accepted by students through technology. Technology must be accepted as an opportunity to enhance the learning process.

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B. Technology and Competence

With the development of various sectors of life that are influenced by technology, there is a direct change in competence as a result of learning. The basis of honesty in interacting becomes very important. Digital footprints are very easy to trace to see someone's track record. Collaboration with partners from various parts of the world at different times can be done today. The product design is made in country A, but the production is carried out in country X. That is very possible. Creativity in generating new ideas and products is the key in solving various life problems. Awareness as a global citizen who is responsible for shared survival is also important as a current competency. All of that requires adjustments in the teaching and learning process. Learning that is only oriented towards mastery of the material and is measured by paper and pencil tests will not provide opportunities for students to succeed in a good life. Need new ways of measuring learning outcomes. Learning outcomes need to be measured in the learning process, not only at the end of learning [38], [39].

Current competency changes require adaptation to the technologically influenced environment. Interaction and collaboration skills, creativity, responsibility as a citizen of the world, and adjustments in the teaching and learning process are very important. Social theory emphasizes the role of learning in shaping a person's behavior and attitudes, so a learning approach is needed that focuses on developing these competencies. The learning outcomes assessment system also needs to be updated to measure student performance in the learning process, not just the final results.

C. Technology and Its Ethical Impacts

Technology brings a lot of benefits, but it also has negative impacts on its users. In education, irresponsible technology use can lead to plagiarism, the ease of finding answers on search engines, and the spread of misinformation. Technology has also contributed to the rise of online gaming and K-pop, leading to children and even toddlers focusing on their gadgets instead of interacting with each other. The solution to these issues is for technology use to be accompanied by individuals who have morals, manners, and wisdom. Morals are the foundation of human personality formation, and education aimed at developing ethical individuals should be prioritized. Ethics are also a tool for psychological and social control for individuals and society. Without ethics, humans would be like animals that lack values in their lives [40].

In using technology, especially for Muslim students, they should always uphold manners in socializing, by respecting their fellow creatures created by Allah. They should remember that every action taken in this world will be held accountable in the afterlife. Words typed or spoken should be good and not hurtful. Good manners in technology are implied in the Qur'an, such as conveying information correctly, avoiding suspicion, gossip, slander, and curiosity; investigating new facts before seeking clarification (*tabayun*); avoiding namimah or sowing discord; avoiding insulting or mocking others (*sukhriyah*); and avoiding things that invite many harms in social media. The use of technology should be accompanied by a moral and ethical framework that guides individual behavior [41], [42].

In summary, being wise in using technology means using it appropriately and proportionally while considering the rights of others [41], [43], [44].. Technology in education should be accompanied by the maturity level of students, especially those who are still immature and need adult supervision. Excessive

use of gadgets can negatively affect children's behavior and create a tendency to constantly stare at screens and enjoy the features of gadgets [45]. However, technology can also make communication and data management easier and improve student creativity through the use of metaverse. Therefore, to respond to technological advancements, individuals must have good moral character, manners, and be wise and smart.

Conclusion

The role of technology in modern society is undeniable. Technology has provided immense benefits and has transformed the way we live and work. Education is one of the areas that have been significantly impacted by technology, with the integration of technology becoming increasingly important in the learning process. The continuous transmission of values occurs through the educational process, which is why it is crucial to integrate technology with contextual learning. Educators play a vital role in shaping the future generation. As such, they need to be equipped with the necessary skills and knowledge to provide the best learning environment for their students. To achieve this, educators need to continuously improve themselves by taking advantage of the various learning sources that are easily available through technology. The integration of technology in education has revolutionized the way students learn, making it more interactive, engaging, and accessible. With the use of technology, educators can create a personalized learning experience that caters to the individual needs and interests of each student. Students can access learning materials at their own pace, review concepts they find challenging, and collaborate with their peers in real-time. Overall, the integration of technology with contextual learning in education can provide an environment that promotes critical thinking, creativity, and collaboration among students. Educators must ensure that they are using technology wisely and responsibly to achieve the best learning outcomes for their students.

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