

# IMPLEMENTATION OF TECHNOLOGY AND INFORMATION DEVELOPMENTS IN IMPROVING INDONESIAN EDUCATION

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## Abstract

*This research aims to analyze the implementation of technological and information developments in enhancing education in Indonesia. Using a qualitative descriptive method, this study concludes that the current educational landscape actively leverages technological and information advancements to improve the quality of national education. One crucial step in enhancing the quality of national education involves revitalizing the learning processes. The integration of technology, information, and communication plays a significant role in the learning phases. The utilization of technology, information, and communication can stimulate students' creativity during the learning process. Besides serving as a learning tool, technology, information, and communication can also be used to distribute teaching materials and facilitate communication in the learning process. Thus, the comprehensive use of technology, information, and communication contributes significantly to improving the quality of education in Indonesia.*

**Keywords:** *Information technology, education improvement, technological development.*

## 1. INTRODUCTION

The development of technology and information in Indonesia has undergone rapid changes. These changes undoubtedly have significant impacts in various fields, including the economy, health, society, and especially in the field of education. Marimba in Alpian defines education as a guidance process conducted by educators to learners realize personality development both physically and mentally (Alpian, 2019). In facing changes in the external environment, the education sector must consider its impacts as a social institution and how it interacts with these changes. One significant change is the presence of information technology (IT). This is evident from the primary role of IT in various life sectors, such as organizations, education, transportation, health, and research.

Information technology has significantly contributed to fundamental changes in the operational structure and management of organizations and other sectors (Darmawan, 2016).

Education is a structured process aimed at comprehensive improvement of values and dignity, providing opportunities or potential in three dimensions based on the principles of humanism, namely: (i) activity reflected in the quality of faith, piety, noble deeds, and excellent personality, (ii) cognitive processes reflected in thinking abilities and intellectual intelligence to explore, develop, and master science and technology (IPTEK), and (iii) psychomotor skills reflected in technical skill development, expression of opinions, and kinesthetic skills that can optimally develop (Khusnah, Sri, & F, 2020). Therefore, education should be a strategic means in the effort to develop the entire potential of individuals, enabling the comprehensive goal of building the Indonesian human to be achieved.

One sign indicating high-quality learning in education is the presence of opportunities and space for students to develop their potential and talents and fulfill the emotional needs of the learners. Moreover, to create quality learning, it is essential for students to actively engage in the learning process and seek learning materials. However, in practice, learning often relies solely on the teacher as the only source of information, indirectly limiting the active involvement of students in seeking learning materials (Yulando, Sutopo, & T.F, 2019). Students tend to wait for the material provided by the teacher, contradicting the learning process that should be implemented to enhance the quality of education.

Observing the mandate contained in the preamble of the 1945 Constitution and several articles in the body of the 1945 Constitution mentioned above, educational institutions play a crucial role in assisting the government in efforts to create quality and effective education (Aridhayandi, 2018). This aims to produce Indonesian human resources with high quality, productivity, creativity, and competitiveness with other nations. However, in reality, our education system still faces the problem of the low quality of education that has been going on for a long time.

In the field of education, the progress of information technology has had a positive impact. With the development of information technology, the education sector has undergone significant changes compared to previous methods. Currently, distance and time are no longer significant obstacles to acquiring knowledge, as various applications facilitate the learning process. One example of the utilization of technology and information in education can be implemented through various means, such as applying Audio Visual Aid (AVA) learning media, using computer systems in the classroom learning process as well as in the overall education system, and utilizing the internet network to support more effective education and learning.

Furthermore, the development of Information Technology has led to new ways of life, from beginning to end. This lifestyle is known as e-life, meaning life is triggered by electronic needs. Currently, many things are popularly using the prefix e, such as e-commerce, e-government, e-education, e-library, e-journal, e-medicine, e-laboratory, e-biodiversity, and others, all based on electronic technology (Prinstin & Handayati, 2020).

## **2. RESEARCH METHOD**

This research falls under qualitative descriptive research. Qualitative descriptive research aims to analyze research findings without drawing broader conclusions. The primary data in this study were obtained through observations conducted by the researcher on the issues occurring in the field of education. Meanwhile, secondary data were obtained through references from books, journals, and other sources relevant to the subject matter under study.

## **3. RESULTS AND DISCUSSION**

Information technology is a combination of computers and high-speed communication lines. This technology enables the transmission of data, voice, and video. This definition explains that there are two main components in information technology, namely computers and communication. Information itself is processed data that can be well stored in the form of writing, sound, or images.

The relationship between information technology and education occurred during the development of this technology and should be used as a solution to improve the quality

of education in Indonesia, which still lags far behind the progress of education in developed countries. The utilization of technology in education can be used as a means to create equality in providing learning opportunities and improving the quality of education by providing comprehensive information about education.

To harness information technology in the education process, several development steps can be implemented (Miftah, 2018). First, the initial step is designing and developing a database application that can store and process academic data and information. This application includes lecture systems, assessment systems, curriculum information, education management, and learning materials. Next, the second step is designing and developing portal, web, and interactive multimedia-based learning applications. This application consists of interactive tutorials and learning tools. Additionally, the third step is optimizing the use of educational TV as an enrichment source to enhance the quality of education. Finally, the fourth step is implementing the system gradually, starting from a smaller scope and expanding. This aims to facilitate the management of information technology utilization in the education process.

In the field of education, communication technology has undergone four revolutions (Harahap, 2019). The first revolution is the dynamics in the learning environment for society, initially at home using parents as educators. Over time, there was development marked by the emergence of the second revolution, which is the use of written language as a means of the learning process. Then, the third revolution occurred with the invention of printing tools. This marked the beginning of the widespread distribution of textbooks.

From these four revolutions, it is clear that the development of technology and information will continue. This presents an opportunity to improve the quality of education in Indonesia, as demonstrated by other developed countries that have already utilized technology, communication, and information to enhance the quality of education. Therefore, the government and educational institutions, in particular, need to pay special attention to managing the use of technology in education to maximize its benefits. According to Miarso, professional handling in this context is carried out by trained and

educated experts who have specific performance standards and ethics, supported by clear mentoring institutions and professional organizations.

In the educational realm, technology can play a role in several educational processes, including:

a. Information System Management

A Management Information System (SIM) is an information system used to support organizational processes in management. Effective SIM greatly helps save time and resources in organizational transactions and supports operational, management, and decision-making functions. The use of information technology in running information systems allows the flow of information to proceed quickly and accurately. With the online database implemented by the Department of Education and higher education institutions, the exchange of information and data can be carried out quickly, providing efficiency in education in all aspects.

In higher education, SIM (Management Information System) is considered a necessity. This is not only to facilitate communication but also as an indicator of the quality of the educational institution. Currently, there are 11 types of applications used in higher education, including University e-learning Websites, OJS (online journal system), Academic SIM, Inventory SIM, e-library, Financial SIM, and others.

b. Learning Media

The use of information technology as a learning tool can be implemented through the use of the internet in e-learning and the use of computers as interactive media. It is hoped that the use of these media can stimulate the minds, feelings, interests, and attention of learners so that the learning process can proceed effectively. In addition, the use of learning media can also improve the effectiveness of the learning process by overcoming various barriers in communication between teachers and students, such as physiological, psychological, cultural, and environmental barriers.

E-learning is a form of conventional learning presented in digital format using information technology. According to Anwas in Alpian (2019), e-learning needs to be created so that learners can learn as in conventional learning but carried out digitally through the internet. One of the main advantages of e-learning is efficiency in the use of

time and space. As mentioned earlier, IT-based education is not limited by space and time constraints. With e-learning, teaching and learning activities can be carried out across regions and even across countries. Instructors and students do not always need to meet in the classroom at the same time.

c. Life Skill Education

Information technology education has benefits in developing life skills, both specific and general life skills. Skills in using computers and their programs, both applications and programming languages, are life skills related to specific jobs. Meanwhile, the ability to search for information on the internet, process it, and utilize it is a life skill useful in daily life.

#### **4. CONCLUSION**

1. Improving public access to higher-quality education is a task that must be carried out by the Indonesian nation by the goals stated in the Preamble of the 1945 Constitution. The utilization of information technology in the field of education plays a crucial role, especially in efforts to equalize educational opportunities and enhance the quality of education.
2. The growth of technology, information, and communication is currently happening at an incredible speed. The impact of this development extends to various fields, including the economy, health, religion, and, of course, education. In the context of education, the development of technology, information, and communication plays a crucial role in improving the quality of education and the learning process in Indonesia.
3. The development of technology, information, and communication has significantly impacted the world of education. This is evident in the development and utilization of technology, information, and communication to enhance the quality of learning and education in Indonesia. Several methods are implemented, including using technology, information, and communication as a means of delivering learning materials, as a tool for distributing teaching materials through the internet network (websites), and as a support for the development of life skills in education.

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