

Utilization of Information Technology in High School Education in Aceh Barat

Mirna Ria Andini ^{a,1*}, Murhaban ^{a,2}, Sanusi ^{a,3}, Muhammad Ardiansyah ^{a,4}

^a Universitas Teuku Umar

¹mirna@utu.ac.id* ; ²murhaban@utu.ac.id; ³sanusi@utu.ac.id; ⁴m.ardiansyah@utu.ac.id

* corresponding author

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ABSTRACT

As the digital era progresses, the use of information technology (IT) in education is becoming increasingly important. The purpose of this study is to see how the application of IT can improve the quality of learning at SMK Negeri 2 Meulaboh, West Aceh. The qualitative method was chosen because it allows researchers to comprehensively explore the experiences, views and perceptions of research subjects. The results show that SMK Negeri 2 Meulaboh has used technology significantly, especially in supporting technology-based learning by providing facilities such as computer labs, network devices, and IT-based examinations. However, there are some problems that affect the optimization of technology use, such as students do not have good digital literacy and they do not have enough internet access. Teachers also face difficulties to incorporate technology in learning, especially for those who are not familiar with it. However, technology makes students feel comfortable and interested in learning. According to this study, both teachers and students should be more digitally literate and more adequate infrastructure is needed to maximize the use of IT in learning. Thus, IT can improve education and support a better learning process in vocational high schools.

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I. Introduction

In the digital era, the utilization of Information Technology (IT) in education is becoming increasingly important. The rapid development of information technology has provided opportunities for educational institutions, including senior high schools, to improve the quality of learning and education management. Information technology can be used to expand access to educational resources, improve the efficiency of school administration and enhance the learning process.

Studies show that the adoption of information technology in secondary schools around the world has increased in the last five years. Learning management systems (LMS) such as Google Classroom, Moodle, and Microsoft Teams have become popular options to support distance learning and blended learning in secondary schools, using of LMS can increase student engagement in learning and facilitate interaction between teachers and student [1].

Educational apps and mobile devices are essential to the learning process, as the use of smartphones and tablets to access study materials, practice questions, and collaborate on projects has increased student engagement and encouragement. The use of this technology also encourages students to acquire digital skills, which are essential in the era of globalization [2]. In contrast, the use of information technology in education faces several obstacles, especially related to the digital literacy of teachers and students. Low digital literacy can hinder the use of technology in schools. High school teachers' digital literacy needs to be improved, according to [3], so that they can make the best use of technology in the learning process. The study emphasized that teachers need training and professional development to improve their digital skills.



According to [4], IT utilization in high schools also depends on adequate technology infrastructure, which is also supported by government policies and school management. Adequate infrastructure includes stable internet access, adequate hardware, and policies that support the utilization of technology in the school curriculum. While technology adoption in secondary schools has increased, there are still differences between urban and rural schools in Indonesia. Schools in urban areas tend to have better access to technology compared to schools in rural areas, which can have an impact on the quality of education and equitable access to technology.

II. Literature Review

A. *Information Technology*

A collection of systems and tools called information technology is used by organizations to process, store, and disseminate data into relevant information to aid decision making and improve operational efficiency. With a focus on processing data into information that helps make business decisions, information technology is considered a tool that can improve organizational efficiency [5]. Information technology is a strategic tool that enables SMEs to manage their business data, improve efficiency, and gain access to a wider market. Considered a critical component in supporting the digital transformation of SMEs and expanding market access, information technology is considered to be very important [6]. In education, information technology includes the use of software and hardware integrated with communication networks to support the rapid and efficient dissemination of information. The role of information technology in supporting technology-based learning and accelerating the process of delivering information [7].

Information technology is used to collect, process, and analyze agricultural data to improve the efficiency and production of agricultural systems. Information technology as an essential tool that supports information management in various fields, such as business, education, public services, and agriculture, this definition emphasizes the role of IT in decision-making, operational efficiency, and digital innovation.

B. *Quality of Education*

Education is a systematic process of instilling good norms, values and habits through social interaction. The purpose of education is to produce people with strong character and adequate intellectual abilities. Character education is seen by this study as an important component that should be incorporated into academic learning in schools [8]. The right to education is the right of everyone to an equal education and upbringing, regardless of their physical, mental, or social condition, through inclusive educational methods. This definition emphasizes the importance of equitable education, especially inclusive education, which allows everyone to get an education, including students with special needs [9].

The level of success of an educational institution in achieving its learning objectives is called the quality of education. This level of success can be measured by looking at student abilities, curriculum relevance, and the availability of supporting resources. The appropriateness of the national curriculum, the achievement of academic competencies, and the quality of educational facilities are all closely related to the quality of education, according to this study [10]. The ability of the education system to produce graduates who have academic abilities, social skills, and character values in accordance with national education standards and labor market needs is known as the quality of education. the quality of education related to academic achievement and social skills and character in accordance with society and the needs of the world of work [11].

The quality of education is the level of learning success that can be measured through improved student learning outcomes, the use of information technology, and the quality of teacher-student interaction. The use of information technology as one of the important factors in improving the quality of learning and student learning outcomes [12].

C. Education Applications

Educational apps are software intended to assist the learning process. It has features for managing assignments, teacher-student interaction, material delivery, and learning evaluation. The use of online learning applications such as Edmodo and Google Classroom, which facilitate distance learning with features that support collaboration and communication [13]. Educational apps are digital platforms that enable access to learning materials, allow students to interact and cooperate with teachers, and enable structured evaluation. Innovative educational apps that help teachers make lessons more interactive, such as gamification apps like Kahoot and Quizizz [8]. Students' learning outcomes are influenced by the use of educational apps such as Ruangguru and Zenius, especially in independent learning outside the classroom.

So, it can be concluded that educational apps are digital software that supports the learning process through task management, interaction, material delivery, and evaluation, with the aim of improving student learning outcomes through flexible access and interactive features such as collaboration, gamification, and self-paced learning.

D. Utilization of information technology in education

According to the research results, the utilization of information technology in Indonesia has focused on various fields, such as education, government, business, and agriculture. Information technology is the process of combining various hardware and software into a communication network to improve the efficiency, performance, and quality of services provided by the company [14]. In education, information technology includes the use of computers, the internet, and learning software to accelerate, simplify, and enrich the learning process. The importance of information technology in the learning system, especially in terms of improving access to information, accelerating communication between teachers and students, and supporting distance learning [15].

The use of information technology in education includes the use of computers, the internet, and web-based applications to support the learning process, improve access to resources, and facilitate communication between teachers and students. The function of information technology in accelerating and expanding access to education as well as the integration of technology in classroom and distance learning [15]. In digital learning, information technology includes the use of e-learning applications, online platforms, and social media to support the interaction between teachers and students and improve the quality of subject matter. Among the digital technologies used in distance and online learning are e-learning applications such as Google Classroom and Learning Management System (LMS) platforms [16].

In education, the utilization of information technology includes the use of software and hardware to manage the classroom, facilitate learning, and increase student accessibility. Improving the quality of education through technology, especially through the use of video conferencing, interactive learning modules, and classroom management applications. In inclusive education, information technology includes the use of digital aids, such as specialized learning software for students with special needs, to ensure that all students have equal access to learning materials. Information Technology assists inclusive education by providing specialized devices and applications that enable students with disabilities to have the same access to education as other students.

III. Objectives

This research aims to analyze the use of information technology in education to improve the quality of learning. This research will investigate how the incorporation of information technology, such as digital collaboration, adaptive learning systems and e-learning, can make learning more effective, responsive and inclusive and improve student engagement and learning outcomes in various educational contexts.

IV. Method

This research uses a qualitative approach that aims to understand the phenomenon in depth based on the researcher's perspective. The qualitative method was chosen because it allows researchers to

comprehensively explore the experiences, views and perceptions of research subjects. Through in-depth interviews and document analysis, this research is expected to reveal hidden meanings and provide a holistic picture of the use of information technology in education.

The data collected in this study are the results of interviews with principals, teachers and students from SMK Negeri 2 Meulaboh and the total respondents used in this study were four respondents.

V. Results and Discussion

The senior high school that served as the research site is located in the heart of Meulaboh city, Aceh Barat district. SMK Negeri 2 Meulaboh is a vocational high school located in Meulaboh. The school prioritizes vocational education to equip students with the technical and practical skills needed in the world of work. SMK Negeri 2 Meulaboh provides various expertise programs that meet the needs of local and national industries, such as engineering, business, and Information Technology.

According to the results of an interview with the principal, Mr. Tarmidzi, SST, stated that SMKN 2 Aceh Barat started the Merdeka Belajar Curriculum in 2020. However, after some changes and adjustments, this curriculum was only officially used in 2022. The school provides facilities and infrastructure such as books and practical tools that are tailored to the school's main focus on technology. The school also provides information technology facilities to help students learn. Students are supervised by teachers when using school facilities. This assistance is done to ensure that the facilities are used properly and are not damaged due to poor use by students. Teachers also play an active role in helping students use technology as a learning tool. However, there are many challenges that students face. Most students do not know how to utilize the information technology facilities provided by the school. This is a challenge for schools to improve students' technological literacy.

Furthermore, related to the utilization of information technology in learning at SMKN 2 Aceh Barat, the learning process by utilizing information technology at school is carried out by teachers who are experts in the field of Information and Communication Technology (ICT) or digital simulation, especially for materials relevant to technology. The use of technology in learning is tailored to the needs of the material being taught, so it is not always used every time. Information technology provides many benefits, such as making it easier for teachers and students to access learning resources without having to rely on printed books. However, there are several obstacles faced by teachers, such as the lack of skills in using technology-based learning media and the low enthusiasm of some teachers, especially those of advanced age, to learn information technology. This is a challenge in optimizing the use of technology in the learning process.

Tarmidzi added that the utilization of information technology by students is very important in this modern era so that they do not miss information. However, this really depends on the willingness of the students themselves to utilize it. As a learning resource, information technology makes it easy for students to access various learning media, whether in the form of text, audio or video, helping them to understand the material more easily. The benefits are enormous, as almost all knowledge can now be found through information technology. However, the obstacles faced by students are quite significant, such as limited supporting tools such as cellphones, the absence of adequate internet networks, or limited data quotas, making it difficult for them to access information relevant to education.

According to Andi Syahputra, who is one of the teachers at SMKN 2 Aceh Barat, information technology is a technology related to computer devices as the main medium to support the management and delivery of information. At SMK Negeri 2 Meulaboh, information technology plays an important role, especially in supporting student learning and competency testing. The school has four computer laboratories equipped with computer and network devices. The computers are interconnected through a network designed to support various technology-based learning activities. The purpose of this connectivity is to ensure the efficiency and effectiveness of the student teaching-learning process. In addition, SMK Negeri 2 Meulaboh also serves as one of the Competency Test Sites (TUK) in West Aceh District. This TUK is used for various examination activities, both for students and teachers, including the implementation of PPG exams which are conducted online or semi-online. Thus, information technology at SMK Negeri 2 Meulaboh not only supports student

learning, but also acts as a center for conducting competency tests for parties outside the school environment.

Andi Syahputra also said that the utilization of information technology facilities at SMK Negeri 2 Meulaboh involves various devices, such as computers, network devices (routers, cables, and other hardware), and cameras. These facilities are utilized to support various needs, especially in student learning and competency test implementation. The use of these facilities is carried out according to needs, for example in student learning, the internet is used as a learning medium that allows students to access materials online. In addition, as a Competency Test Site (TUK), information technology facilities are also utilized to support the implementation of online and semi-online-based exams, both for students and other parties, such as teachers taking the PPG exam. This shows the important role of information technology in supporting academic and non-academic activities at SMK Negeri 2 Meulaboh.

Then he also added that the availability of information technology facilities at SMK Negeri 2 Meulaboh is designed to support student learning needs. The school provides four computer laboratory rooms, each equipped with 25 units of client computers, one server computer, and integrated network devices. Each laboratory also has a computer suite and internet resources that support optimal access to information. In learning, information technology is a top priority because it is inseparable from the needs of students, both in accessing social media and other learning resources. The facilities provided by the school are considered adequate to support the learning process at the vocational high school level. However, when compared to universities or higher educational institutions, facilities in schools still need improvement in order to meet more complex educational needs. This shows that SMK Negeri 2 Meulaboh has made efforts to provide relevant information technology facilities to support technology-based education.

The results of interviews with SMKN 2 Meulaboh students, namely Muhammad dzuhijjah and M. khalis who are class XI students, stated that students' understanding of information technology covers various aspects, especially those that have been studied at school, such as the introduction of computers and the basics of electronics. In their daily activities, students utilize information technology facilities provided by the school, such as computer laboratories and other supporting devices. Students use these facilities well to support learning activities, ensuring information technology can be optimally utilized in their learning process. This shows that students not only understand information technology in theory, but are also able to practice it through the use of facilities available at school.

According to them, the school provides information technology facilities, one of which is a computer device, designed to support students' learning needs. The facilities provided are considered adequate and suitable for use by students in teaching and learning activities. With these good facilities, students find it helpful in understanding information technology-based learning materials. This reflects the school's commitment to providing relevant facilities to improve the quality of education.

Students mentioned that they often use information technology as a learning resource, especially in learning about computers and cable components. They feel comfortable and prefer to learn using information technology because the learning method is more in line with the techniques taught. Compared to learning from books, students prefer information technology because it is more fun and practical. Information technology is utilized regularly, with students accessing it at least twice a week to explore learning materials. One of the main benefits that students gain is the ability to become familiar with different components of computers and other technologies, which enriches their understanding of the field studied.

Finally, they added that they had used information technology for learning in class, and that preparation for using such technology had started since junior high school. In the classroom, teachers also routinely use information technology in the learning process. This use of technology is done almost every time a lesson takes place, showing that information technology has become an important part of teaching methods in schools. The utilization of technology in learning makes it easy for students to access materials more interactively and effectively.

VI. Conclusion

The utilization of information technology at SMK Negeri 2 Meulaboh has contributed significantly to improving the quality of learning. Facilities such as computer laboratories and internet-based applications make it easier for students to access materials interactively and enrich their understanding. However, challenges related to digital literacy and limited infrastructure, such as internet access and data quotas, still hinder the optimal utilization of technology. The role of teachers in facilitating the use of technology is very important, as are the supportive infrastructure and policies. Overall, despite good efforts, improvements are still needed in facilities and digital literacy to maximize the potential of technology in education.

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