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Utilizing Information Systems to Drive Social Change Through Education

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Abstract
This article explores the role of information systems in driving social change through education in Indonesia. Adopting a qualitative approach and a case study design, this research investigates how information systems, including online learning platforms and technology-based academic management systems, contribute to improving the efficiency, quality, and accessibility of education. Data were collected through interviews with key stakeholders, including educators, administrators, and students, along with document analysis from selected schools and institutions. The findings reveal that the integration of these technologies has led to enhanced learning outcomes, greater administrative efficiency, and increased student engagement. However, challenges such as digital inequality, insufficient infrastructure, and resistance to change were also identified. The study concludes that while information systems hold significant potential for educational transformation, addressing these challenges is crucial for maximizing their impact. The implications of this research suggest that policy makers and educational leaders should prioritize investments in infrastructure, training, and inclusive strategies to ensure the equitable and effective use of technology in education. This study contributes to the broader understanding of how technological innovations can drive positive social change within educational contexts in developing countries.

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Introduction

In the era of globalization and the rapid advancement of information technology, the role of information systems in various aspects of life has become increasingly crucial [1]. Information technology has brought significant impacts not only in the economic and industrial sectors, but also in the education sector [2]. Information systems, which consist of key components such as hardware, software, brain ware, and data, can be integrated into the educational process to create a more effective and efficient education system [3]. Furthermore, information systems also have great potential to encourage positive social change [4]. With education supported by information systems, the learning process can become more

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interactive, interesting, and accessible to various levels of society, including those living in remote areas.

The use of information systems in education not only enriches teaching and learning methods, but also opens opportunities for students to access various global learning resources. This is very relevant considering that knowledge and information are developing rapidly and require reliable and easily accessible learning resources for every individual [5]. Information systems can increase collaboration between educational institutions and researchers, accelerate the spread of innovation, and introduce more modern and efficient teaching methodologies. In addition, the integration of information systems in education also has the potential to increase transparency and accountability in education management, which in turn can increase public trust in educational institutions [6].

Education is a fundamental aspect in the social development of a society. Along with the rapid development of information and communication technology (ICT), information systems have become an integral part of the education process in many countries, including Indonesia [7]. Information systems in education help manage student data, provide an online learning platform, and facilitate communication between students, teachers, and parents. Using information systems, education can become more efficient and effective, as well as expand access to education for marginalized communities. Education is not only about the transfer of knowledge, but also about the formation of positive attitudes, values, and behaviors in society. Effective education produces individuals who think critically, act ethically, and contribute to social change. As one of the main pillars in the development of the nation's character and intelligence, education is now faced with new challenges as well as great opportunities in the use of information technology that is increasingly developing [8]. Therefore, the goal of education should not only be to improve the quality of individuals, but also to create broader social change in society.

This article aims to analyze how information systems can be utilized to support social change through education. This research will also explore the impact of the use of information systems on society, as well as identify ways to overcome these challenges to achieve maximum effectiveness in driving social change through education. Thus, this article is expected to provide useful recommendations for stakeholders in designing effective strategies for the integration of information systems in education in Indonesia.

Research Methods

This study uses a qualitative approach with a case study design to explore the use of information systems in driving social change through education in Indonesia. The qualitative approach was chosen because it allows researchers to gain a deep understanding of complex phenomena, especially in the context of information technology-based education, which includes challenges related to infrastructure, access to technology, and human resource readiness.

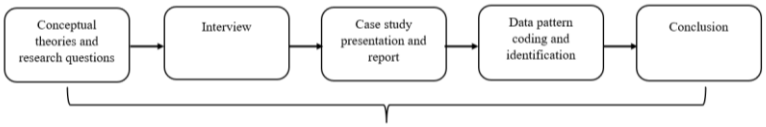

Figure 1. Case Study Analysis Process

A. Location and Subject of Research

This research was conducted in four educational institutions in Indonesia that have applied information system technology in the learning process. The research subjects consisted of 8 people, which included teachers and principals who were directly involved in the application of this technology. The selection of participants was carried out through purposive sampling to ensure their relevance to the topic of this research, namely information systems in education. Although the number of participants was limited, they represented a variety of perspectives needed to understand the dynamics of information systems implementation in the context of education.

B. Data Collection Techniques

The data collection method in this study involves three main techniques, namely semi-structured interviews, participatory observation, and document analysis. Semi-structured interviews are conducted with teachers and principals to gain an in-depth understanding of their experience in integrating information systems into education. Some of the key questions asked include, "How do information systems help you improve efficiency in learning?" and "What are the main challenges you face in implementing this technology?" This technique allows researchers to delve into the subjective views and direct experiences of the participants.

C. Data Analysis

The data collected in this study were analyzed using thematic analysis. Coding is the first stage in the analysis, which aims to identify key themes emerging from the data, such as educational accessibility, administrative efficiency, and the development of learning quality. Once the main themes have been identified, the next step is theme categorization, which is to group them based on their relationship to the role of information systems in education, as well as how each aspect can contribute to social change through education. The final stage is the interpretation of the results, where the findings of the research are compared with the existing literature to highlight the unique contribution of the research to the field of education and information technology. This interpretation process also provides insight into the implications of information systems in education, as well as its potential for development to improve access and quality of education in Indonesia.

Results

This research aims to explore how information systems can be used to drive social change through education in Indonesia. Based on the results of data collection conducted through interviews, observations, and document analysis, several key findings were found that lead to a deeper understanding of the influence of information systems on education and social change.

A. Utilization of Information Systems in Education

In general, the findings show that information systems have a significant impact on improving the quality and accessibility of education. Interviews with teachers and principals revealed that the implementation of information systems, such as online learning platforms and technology-based academic management systems, has helped in improving learning efficiency

and reducing administrative burdens [9]. Teachers report that the use of platforms such as Google Classroom and Moodle allows them to deliver learning materials more interactively and reach students in a more flexible way, which was previously not possible in traditional face-to-face teaching.

B. Challenges of Technology Implementation

This research also finds various challenges in the implementation of information technology in the education sector. The main challenge faced is the limited infrastructure, especially in remote areas, which hinders students' access to the technology they need. Principals in rural areas report that many schools do not have adequate internet facilities, which prevents students from accessing digital learning materials. In addition, the readiness of educators in using technology is also an obstacle. Some teachers revealed that they need more training and support to optimize the use of technology in teaching [10].

C. **The Influence of Information Systems on Collaboration and Innovation**

One of the other important findings is how information systems can strengthen collaboration between educational institutions. Based on the results of interviews and observations, many schools have integrated information systems to share resources and share best practices between different educational institutions. For example, some schools are holding virtual meetings to discuss new teaching methodologies powered by technology. The use of information systems also increases collaboration between teachers, students, and parents, with more platforms allowing for more transparent and efficient communication[11].

D. Increased Transparency and Accountability

Information systems also play a role in increasing transparency and accountability in education management. Some principals report that the use of technology-based academic management systems allows them to track student progress in more detail and transparently [12]. This not only speeds up the reporting process but also provides more accurate data to parents and education policymakers.

E. The Role of Information Systems in Social Change

As a result of this study, it can be concluded that information systems have the potential to encourage social change through education. By improving the accessibility of education, especially for those living in remote areas, information systems open up wider opportunities for equal education [13]. This is in line with the goal of reducing social and economic disparities that have limited access to quality education. For example, projects such as One Laptop per Child (OLPC) that have been implemented in several regions show that technology-based education can accelerate the improvement of digital literacy and cognitive skills among students from underprivileged families.

Discussion

This study reveals the important role of information systems in driving social change through education in Indonesia, although significant challenges related to infrastructure and human resource readiness are still major obstacles. The results of the study show that information technology, through online learning platforms and technology-based academic management systems, has a great impact on improving

learning efficiency and enriching teaching methods. Information systems allow education to be more flexible and accessible to various levels of society, including those living in remote areas [14]. Teachers and principals involved in this study reported that the use of systems such as Google Classroom and Moodle helped create more interactive learning and made it easier for students to access the material independently [15]. This shows that technology not only improves the quality of teaching, but also opens up new opportunities for students to obtain a more equitable education, in accordance with the times.

However, the major challenge identified is the limitations of the technological infrastructure. Although many schools have started implementing technology, some areas, especially those located in rural and remote areas, still face great difficulties in terms of internet connectivity and adequate provision of devices. These findings are consistent with a report by [16] which shows that although internet penetration in Indonesia continues to grow, there are still many areas that are not fully connected to the internet. In addition, another challenge is the readiness of educators in using technology. Although most teachers are aware of the importance of technology in learning, many feel that they are not skilled in operating such technological devices. This underscores the need for more structured and sustainable training programs to ensure that teachers can make optimal use of technology.

On the other hand, information systems have shown their ability to strengthen collaboration between educational institutions [17]. The results of the interviews showed that the use of technology-based systems allowed schools to more easily share resources and knowledge, accelerate the spread of educational innovations, and introduce more efficient teaching methodologies. This collaboration also contributes to increased transparency and accountability in education management. Academic management platforms allow students, teachers, and parents to access information directly regarding academic progress, test scores, and other learning activities [18]. This creates a more transparent relationship between schools and the community, as well as allows stakeholders to more quickly detect problems and find solutions.

Information systems also function as a catalyst for social change by opening wider access to education, especially for those who have been marginalized. By providing more equitable access to quality education, information systems can reduce existing social and economic disparities. For example, programs such as One Laptop per Child (OLPC) [19], [20] applied in several regions in Indonesia shows how technology can be used to improve digital literacy and cognitive skills of students from underprivileged families [21]. This confirms that educational technology can play a key role in accelerating social development, especially by providing fairer opportunities to children from low socioeconomic backgrounds.

Based on these findings, this study recommends several important steps that should be taken by policymakers. First, improving technological infrastructure in remote areas must be a top priority [22]. The government and the private sector need to work together to provide wider internet access and adequate devices for schools that lack facilities [23]. Second, intensive training programs for teachers in using technology must be implemented on an ongoing basis to improve their ability to utilize technology tools in teaching. Third, collaboration between educational

institutions, the government, and the private sector must be encouraged to ensure that technology is used optimally, as well as to accelerate the application of innovation in education [24], [25].

Thus, although challenges related to infrastructure and human resource readiness still exist, the great potential of information systems in education provides a very positive prospect for driving more inclusive and equitable social change in Indonesia. Appropriate policies and support from various sectors can help overcome these barriers and ensure that information technology can be an effective tool in creating social change through education.

Conclusion

This study highlights the transformative potential of information systems in driving social change through education in Indonesia. The findings suggest that online learning platforms and technology-based academic management systems significantly improve the efficiency, quality, and accessibility of education, particularly for underserved communities in remote areas. However, challenges such as inadequate infrastructure and limited readiness of educators hinder the full utilization of these systems. The impact of these findings is profound, as they emphasize the role of technology in bridging educational gaps and creating more equitable learning opportunities across the country. To maximize the potential of information systems, it is essential to address infrastructural limitations, provide ongoing training for educators, and foster collaboration between stakeholders in the education sector. It is recommended that policymakers invest in strengthening digital infrastructure, particularly in rural areas, and prioritize professional development programs for educators to enhance their digital literacy. Additionally, a more inclusive approach to technology adoption that considers the diverse needs of students and teachers is crucial for sustained success. The implications of this study are significant, offering insights for educators, policymakers, and technology developers to design and implement more effective and inclusive educational systems. Ultimately, the integration of information systems in education can contribute to long-term social change and development in Indonesia..

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Author Contributions

Agus Martins: conceptualization; formal analysis; data curation; methodology; writing- review and editing. Agung Prihatmojo: data curation; writing- review and editing. La Basri: formal analysis; data curation; writing- review and editing. Diah Retno Anggraini: writing-original draft; writing- review and editing. Khoirul Anam: formal analysis; data curation; methodology; writing- review and editing.

Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

No additional information from the authors.

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