Empowering Digital Citizenship in Indonesia: Navigating Urgent Digital Literacy Challenges for Effective Digital Governance

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Abstract: Currently, the level of digital literacy in Indonesia still needs to be improved. In the ever-growing digital era, digital literacy is a critical skill and knowledge for society. This research aims to explore the literacy policies implemented and the challenges faced by the government in supporting increased literacy in digital governance in Indonesia. This study uses a qualitative approach using Online Research Methods (ORMs) as a data collection method. The analysis tool that is maximized is Nvivo 12 Plus. The findings of this research show that digital literacy plays an essential role in ensuring the active participation of citizens in governance, efficiency of public services, growth of the digital economy, and security in the digital environment. Strong digital literacy is essential for Indonesian society because it allows better access to online services and bridges the public into an era of ever-growing digital democratization. This condition could make Indonesia ready and adaptive to the progress of the digital era. However, the implementation of digital literacy policies is also faced with several inhibiting factors, such as disparities in access and infrastructure, economic and social challenges, lack of education and training, lack of research and data, lack of involvement and coordination between parties, rapid technological changes, including the framework regulations that are not yet fully accommodating. Therefore, Indonesia needs adaptive policies to overcome these obstacles so that digital literacy can increase evenly.

Keywords: *Digital literacy; literacy policy; digital governance, digital society, public services*

INTRODUCTION

The level of digital literacy in Indonesia still needs to be higher. The CNBC Indonesia report states that the digital literacy rate in Indonesia is only 62%. This number is the lowest compared to other ASEAN countries, which, on average, reaches 70% (Anam, 2023). Several general factors cause low levels of digital literacy in Indonesia; although internet access has increased significantly, some areas in Indonesia still have limited internet access (Azhari & Fajri, 2022; Suwana, 2017), making it difficult for some people to connect with technology and access digital information. In addition, there is a digital divide between urban and rural areas and a gap between the older and younger generations (Onitsuka et al., 2018; Puspitasari & Ishii, 2016).

Some community groups, especially in rural areas and among older people, may not have sufficient opportunities and access to learn and develop digital literacy skills. In addition, the education system in Indonesia still needs to integrate digital literacy into the curriculum fully (Eryansyah et al., 2019). The lack of formal training and education related to digital literacy leaves many people without the knowledge and skills needed to operate effectively in a digital environment (Eryansyah et al., 2019).

In the government context, digital literacy enables the public to access government information transparently and understand the decision-making process related to public policy (Jaeger et al., 2012; Robinson, 2020). With digital literacy skills, the public can access data and information through the government's online portal, understand government reports, and make it possible to monitor government performance. Thus, digital literacy can allow the public to actively participate in government decision-making processes (Chohan & Hu 2022; Yuan et al., 2021). Communities can also use social media and other digital platforms to convey aspirations, submit suggestions, and provide input regarding public policies (Baharuddin, Jubba et al., 2022; Baharuddin, Qodir & Loilatu, 2022). With digital literacy, community participation can occur more easily, thus strengthening the relationship between the government and the people (Adnan et al., 2022).

In addition, digital literacy is important in optimizing e-government implementation and improving the quality of public services (Doran et al., 2023; Sharma et al., 2021). Through digital literacy, people can also understand and use online services provided by the government, such as making administrative documents, paying taxes, and submitting project proposals. With good digital literacy, people can utilize technology to obtain more efficient and responsive public services (Chung & Kim, 2019; Spencer et al., 2023). Apart from that, digital community involvement with adequate human resources also indicates that democratization and development are moving in a better direction (Rifaid, Abdurrahman et al., 2023; Rifaid, Rachman et al., 2023; Sulistyaningsih et al.,2023). Overall, digital literacy is crucial in strengthening citizen involvement in government, increasing transparency and accountability, and driving efficiency and better services. Thus, it is important to encourage and improve digital literacy in Indonesia so that people can take maximum advantage of advances in digital technology in the context of the government.

Based on the trend of previous research results, the level of digital literacy in Indonesia still needs to be improved, with the figure only reaching 62%, one of the lowest among ASEAN countries. Common factors that cause low levels of digital literacy include limited internet access in some areas, the digital divide between urban and rural areas, and generational divisions between younger and older. Apart from that, the need for integration of digital literacy into the education curriculum is also a severe problem. However, increasing digital literacy has the potential to empower citizens with more transparent access to government information, enable active participation in decision-making processes, improve the quality of public services, and strengthen the relationship between government and society. Therefore, increasing digital literacy in Indonesia is very important in optimizing the benefits of advances in digital technology in the government context.

There have been many studies analyzing digital literacy, especially in Indonesia. However, there are still very few specific research results that simultaneously analyze the topic of digital literacy policies in the context of supporting good governance and the digitalization of government in Indonesia. However, there is still some previously available literature that can be utilized to support the analysis of this study. First, awareness of the importance of digital literacy still needs to be improved among Indonesian people (Rahmah, 2015). Second, digital literacy is crucial in strengthening community involvement in government (Koltay, 2011; Lev-On et al., 2021; Machmud et al., 2023). Third, a response from the government and many parties is needed to support increased digital literacy (Coiro, 2021; Pal, 2009; Polizzi, 2020). Fourth, digital literacy policies are important in increasing a country's digital literacy level, especially in supporting digital governance (Nawafleh, 2018; Sarrayrih & Sriram, 2015).

This research aims to bridge the void of previous research by analyzing digital literacy policies to support good governance and digital governance. This research question is described as follows. (1) How have digital literacy policies been developed and implemented to support digital governance in Indonesia? (2) What factors hinder the implementation of digital literacy

policies in supporting good governance and digital governance in Indonesia? (3) What adaptive policy recommendations are needed to support optimal digital literacy in Indonesia? It is possible to find out the answers to these three questions about the efforts that have been made, the obstacles in implementation, and the recommendations for adaptive policies needed to support good digital literacy, as well as bridging the optimization of the development of digital governance in Indonesia.

This research is of significant urgency in Indonesia's increasingly digitalized context. While previous studies have explored aspects of digital governance, the development and implementation of policies specifically targeting digital literacy remain a fresh area of inquiry. The novelty of this research lies in its focus on how Indonesia has approached this challenge, identifying both successes and obstacles in policy design and implementation. The implication is that this research can provide better insights for governments, stakeholders, and academics to formulate and implement more effective digital literacy policies. By increasing digital literacy, the public can participate more actively in government, increase transparency, efficiency, and quality of public services, and accelerate digital transformation in Indonesia. Therefore, this research has the potential to positively impact improving better and more effective governance in the digital era.

RESEARCH METHOD

This study uses a qualitative approach using Online Research Methods (ORMs) as a data collection method. Researchers use specific keyword filters to collect data from internet sites. The keyword used in this research is "digital literacy policy." The found data was then examined and re-analyzed to assess its relevance to the research question.
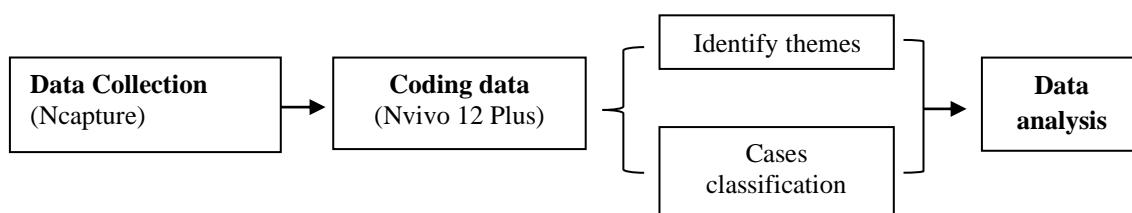

Figure 1. Stages of data analysis
Source: Processed by researchers, 2023

Data considered relevant is then collected using Ncapture and entered into the Nvivo 12 Plus analysis tool. Ncapture is a tool used to collect data from online platforms. Ncapture is integrated with the Google search engine. Nvivo 12 Plus, on the other hand, is data analysis software that facilitates the identification of patterns, themes, and relationships in the data that has been collected. It allows researchers to organize, group, and classify data, helping to generate a deeper understanding and answering research questions more effectively and uniquely. The unit of analysis that is maximized is *identifying themes* and *case classification*. Maximizing this unit of analysis allows researchers to identify and analyze themes that emerge from the data that has been collected. Identification of themes involves the process of grouping data based on similarities in topics or issues that arise. Researchers can identify patterns, trends, or significant findings from the data collected. In addition, the use of Nvivo 12 Plus also allows researchers to classify cases. Case classification involves organizing data based on certain relevant attributes or characteristics. The data collection and analysis method used in this research allows researchers to gain a deeper understanding of digital literacy policies in support of good governance and digital governance. It also allows the researcher to identify relevant findings and provide valuable insights into the research question.

RESULTS AND DISCUSSION
Digital literacy policy in Indonesia

In the rapidly developing digital era, digital literacy policies are essential in supporting the government (Jaeger et al., 2012; Nedungadi et al., 2018; Sharma et al., 2016). Digital government is a concept in which information and communication technology (ICT) is widely used to

accelerate, improve, and simplify governance as well as provide effective and efficient public services to the public (Chen et al., 2019; Gao & Lee, 2017; Manoharan & Carrizales, 2021; Xin et al., 2022). Digital literacy plays a central role in realizing this vision, as it involves the knowledge, understanding, and skills necessary to operate in a complex digital environment. In Indonesia, the government is working to increase digital literacy by formulating a roadmap to support digital literacy policies in Indonesia. This study managed to map out the roadmap as follows:
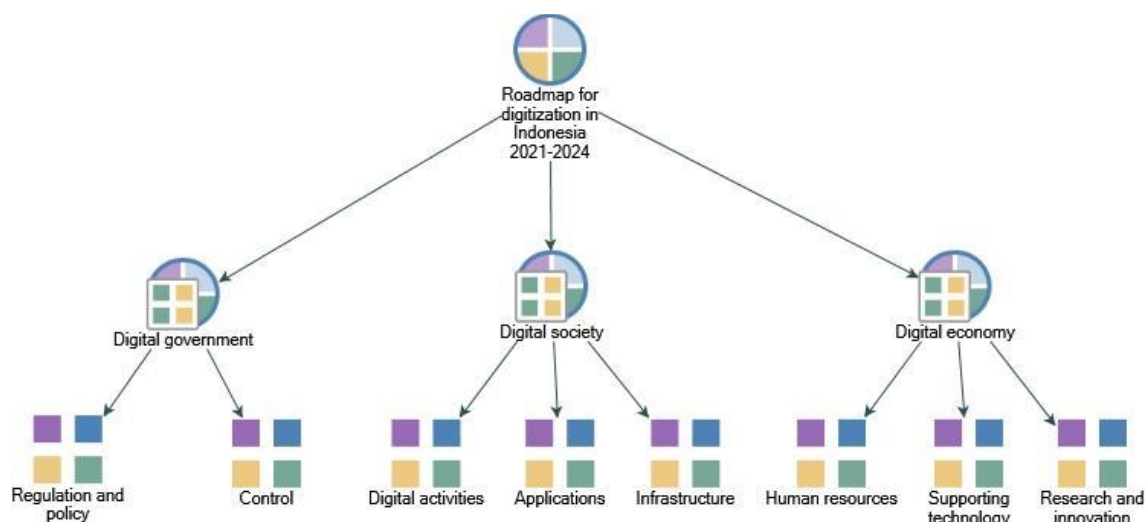

Figure 2. Roadmap to support digital literacy policies in Indonesia
Source: Processed by researchers using Nvivo 12 Plus

The roadmap for supporting digital literacy policies in Indonesia involves three main dimensions: digital government, digital society, and digital economy (Rizkinaswara, 2022). In the digital government dimension, regulations and policies that support the development of digital literacy need to be developed and strengthened, including national policies governing digital literacy and frameworks that guide digital literacy efforts at the local level. In addition, effective control is also important to ensure the success of digital literacy programs through regular monitoring, evaluation, and supervision. The digital society dimension involves digital activities and infrastructure that support digital literacy. Digital activities include increasing public awareness about the importance of digital literacy, training, and education organized to improve digital skills, as well as active participation in digital applications and services. In terms of infrastructure, developing and expanding affordable and reliable internet access throughout Indonesia is necessary to ensure that people can access and make good use of digital technology (Rizkinaswara, 2022).

In the digital economy dimension, it is important to pay attention to skilled human resources in digital literacy (Rizkinaswara, 2022). Digital skills training and development should be provided to individuals in various economic sectors to increase competitiveness and productivity (Carlisle et al., 2023; Stofkova et al., 2022). In addition, technology is needed that supports digital literacy, such as e-learning platforms, educational applications, and adequate technology infrastructure (Olofsson et al., 2020; Zarei & Mohammadi, 2022). Research and innovation are also important in developing new methods and approaches to digital literacy (Rizkinaswara, 2022). By implementing this roadmap, Indonesia can improve digital literacy. Good digital governance, people skilled in digital literacy, and an economy supported by sophisticated human resources and technology will significantly benefit achieving an inclusive and sustainable digital society (Alhassan & Adam, 2021; Chohan & Hu, 2022).

The objective of the Indonesia Digital Roadmap 2021-2024 outline is to explain the direction of policy, implementation, and achievement targets in accelerating the acceleration of digital transformation in Indonesia. The Ministry of Communication and Informatics focuses on budget allocations for completing the 2021-2024 Digital Indonesia Roadmap. In the 2020-2024 National Medium-Term Development Plan (RPJMN), the issue of digital transformation is one of the six mainstreaming national development approaches. In addition, the Ministry of

Communication and Information Technology (Kemkominfo) also stressed the importance of collaboration with various parties, local governments, the private sector, educational institutions, and civil society to realize the goals of this roadmap. In its implementation, the government will focus on developing digital infrastructure, increasing digital literacy, and strengthening the digital ecosystem in Indonesia (Rizkinaswara, 2022).

In the context of how digital literacy policies have been developed and implemented to support digital governance in Indonesia, the roadmap outlined in this research provides a clear picture of the concrete steps that need to be taken, including developing policies and regulations in digital literacy, expanding digital infrastructure to ensure more comprehensive access to technology, and education and training efforts to improve people's digital skills. This roadmap reflects the Indonesian government's commitment to strengthening digital governance by involving various stakeholders, including the private sector, local governments, and educational institutions. Following this roadmap, there will be more effective policy development to increase digital literacy and support better digital governance in Indonesia.

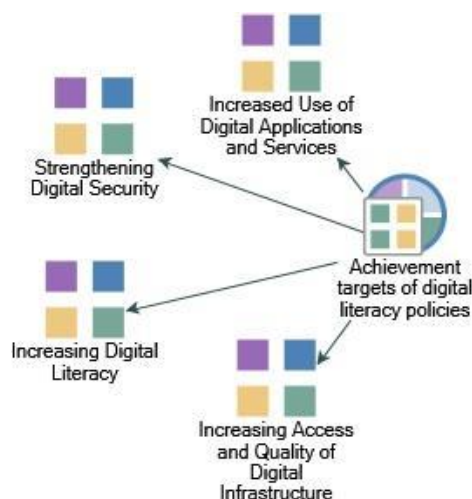The several important targets in implementing digital literacy policies in Indonesia are mapped out as follows:

Figure 3. Achievement targets of digital literacy policies in Indonesia
Source: Processed by researchers using Nvivo 12 Plus

The digital literacy policy in Indonesia through the 2021-2024 road map sets several important achievement targets to accelerate digital transformation in Indonesia. One of the targets is to increase access to and quality of digital infrastructure in all regions of Indonesia, including remote areas. This effort requires increasing internet access and signal coverage to ensure all Indonesian citizens can connect to the digital world (Rachmawati et al., 2021; Setiawan et al., 2021). In addition, improving the quality of the internet network is crucial to ensure the speed and reliability of access required for various digital activities (Allen et al., 2020). Furthermore, the road map also underlines the importance of increasing digital literacy in society (Rizkinaswara, 2022). Through training programs, education, and awareness campaigns, the main objective is to provide the public with sufficient understanding and skills to participate actively in digital technology. With increased digital literacy, it is hoped that people can be more effective and efficient in using digital technology in various aspects of their lives (Colwell et al., 2013; McDougall et al., 2018; Sanjaya & Darma, 2023).

As an empirical example, when these policy recommendations are implemented, society has improved access to and use of digital technology—for example, the positive impact of digital literacy policies in South Korea. The country has implemented various initiatives to increase its people's digital literacy, and there has been a significant increase in access to and use of digital technology. One study examines how South Korea overcomes digital divisions through digital literacy policies. Training and other encouragement have been carried out and contributed positively to digital participation and understanding in South Korea (Park & Jae Kim, 2014). Other

case studies also confirm that Internet access to information and resources is an increasingly important dimension of contemporary life (Van Laar et al,. 2017; Khan et al., 2020). So, optimal Internet use can positively impact access, skills, and motivation. Thus, training, encouragement, and adequate infrastructure, such as the Internet, can influence increasing digital literacy, especially in Indonesia in the future.

Strengthening digital security is also an important focus in this roadmap. Protecting personal data and preventing cyber attacks is crucial in the digital era, which is vulnerable to security threats (Rulandari et al., 2022). Therefore, this roadmap emphasizes strengthening policies, regulations, and international cooperation in cybersecurity challenges (Alharbi et al., 2021; Chung & Kim, 2019). With proactive steps in digital security, people can feel safe and protected when operating in a digital environment. Finally, this roadmap encourages increased use of digital applications and services in various sectors, including electronic transactions, e-government, e-commerce, e-learning, and other digital economy sectors. Encouraging people to be more active in using digital applications and services is also hoped that digital transformation can accelerate in these sectors, bringing significant economic benefits and ease of public services. By implementing this roadmap, Indonesia hopes to achieve significant acceleration in digital transformation. With collaboration and support from various parties, including the government, the private sector, educational institutions, and civil society, Indonesia can optimize the potential of digital technology to increase economic growth, public services, and the quality of life for society.

Factors inhibiting digital literacy policies in supporting digital government in Indonesia

Implementing digital literacy policies that support the digital government in Indonesia is faced with various factors that can hinder this process. These factors include challenges and obstacles that need to be overcome for digital literacy policies to work effectively. Understanding these factors can help the government and related stakeholders identify and overcome obstacles to achieve the desired digital literacy goals. The following are several factors that hinder the implementation of digital literacy policies to support digital governance in Indonesia.
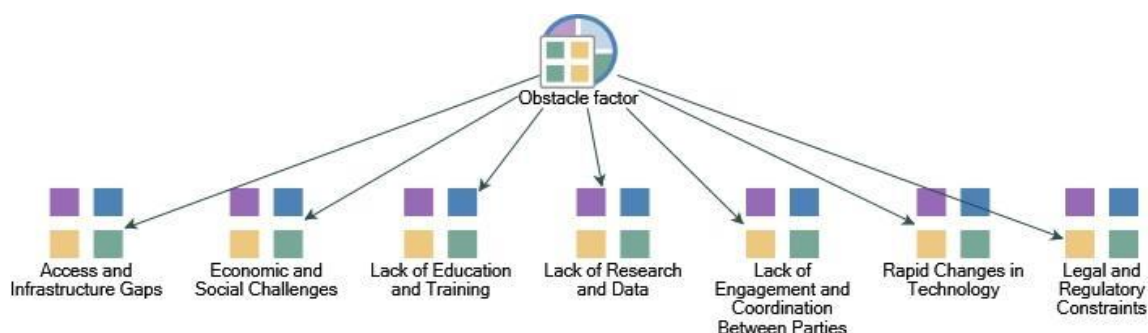

Figure 4. Several factors hinder the implementation of digital literacy policies
Source: Processed by researchers using Nvivo 12 Plus

The gap in access and infrastructure in Indonesia is one of the factors inhibiting the implementation of digital literacy policies. Some remote areas in Indonesia still have limited Internet or even no access (Azhari & Fajri, 2022; Rifaid, Abdurrahman et al., 2023; Suwana, 2017). In addition, the uneven and affordable internet infrastructure also affects the quality of internet access and speed. This condition causes a digital divide between urban and rural areas and between different socio-economic groups (Sujarwoto & Tampubolon, 2016). The solution to overcome this factor is to allocate adequate resources to improve digital infrastructure throughout Indonesia, including developing affordable internet access and expanding reliable internet networks (Furuholt & Wahid, 2008; Kharisma, 2022).

Economic and social challenges are also constraining factors in implementing digital literacy policies. The relatively high cost of internet access, lack of ownership of digital devices, and community economic limitations can be obstacles to gaining access to and utilizing digital technology (Reddick et al., 2020; Toluyemi & Mejabi, 2011). In addition, social factors such as low levels of general literacy, distrust of technology, or anxiety about digital safety can also influence

community adoption and participation. In addressing this challenge, inclusive programs involving the government, the private sector, and civil society are needed to address social and economic disparities related to digital literacy. In addition, efforts to increase awareness and education regarding the benefits and safety of digital technology also need to be carried out to overcome public distrust and anxiety (Mirkovski et al., 2019; Nugroho & Fajar, 2017).

In addition, the lack of education and training related to digital literacy is also an inhibiting factor in policy implementation. An education system that has yet to integrate digital literacy into the curriculum fully can affect the availability of a workforce with adequate digital literacy skills. In addition, the lack of training programs for the general public can also affect the level of digital literacy among non-educators. In addressing this factor, it is important to improve digital literacy education at all levels by developing relevant curricula, improving teacher training, or developing digital literacy training programs for the general public. Collaboration between the government, educational institutions, and the private sector in providing access to and resources for digital literacy education is also very important.

The need for adequate research and data on digital literacy was also identified as an obstacle to developing appropriate policies. Further research is needed to identify trends, gaps, and best practices in digital literacy. Accurate and up-to-date data is also needed to understand the condition of digital literacy in Indonesia. In addressing this factor, there needs to be an investment in more in-depth digital literacy research, both by the government and independent research institutions. Comprehensive data collection and regular monitoring will help in more effective decision-making and policy development.

The lack of involvement and coordination between the government, educational institutions, the private sector, and civil society can limit the implementation of digital literacy policies. Strong engagement and synergy between various parties are essential in overcoming barriers and advancing digital literacy at all levels. Collaboration between the government, educational institutions, the private sector, and civil society in planning, implementing, and evaluating digital literacy programs will increase policy effectiveness and impact. There needs to be a forum or platform that allows stakeholders to interact, share knowledge, and work together to increase digital literacy in Indonesia.

Another obstacle is related to inadequate laws and regulations. Obstacles in terms of laws and regulations related to privacy, data security, and consumer protection can also hinder the implementation of digital literacy policies. A clear and adaptive legal framework is needed to ensure adequate protection for users of digital technology. In addition, policies and regulations that promote cyber security, personal data protection, and the ethical use of digital technology are also important in supporting the implementation of digital literacy policies. In dealing with these inhibiting factors, it is important to strengthen coordination, collaboration, and cooperation between various related parties. The government needs to act as a facilitator and mover in ensuring the creation of an ecosystem conducive to digital literacy. Collaboration between the government, educational institutions, the private sector, and civil society is needed in designing and implementing effective digital literacy programs. In addition, increasing education and training, improving digital infrastructure, increasing public awareness, and responsive regulations are key steps in overcoming inhibiting factors and advancing the implementation of digital literacy policies in Indonesia.

Adaptive policy recommendations needed to support optimal digital literacy in Indonesia

Adaptive policies are needed to achieve optimal digital literacy in Indonesia that can respond to changes in technology and societal needs. Digital literacy is an important skill and knowledge in the digital era, which enables individuals to understand, use, and participate in the digital world effectively and responsibly (Waheduzzaman & Khandaker, 2022). This study provides several adaptive policy recommendations that can support optimal digital literacy in Indonesia. One of the important policy recommendations is the development of a digital literacy curriculum integrated into formal education at all levels. The curriculum should provide a basic understanding of digital technology, ethics, online security, and communication skills (Hsu et al., 2019; Potyrała & Tomczyk, 2021).

In addition, it is also important to provide training and development to teachers so that they can become facilitators in helping students develop digital literacy (Rambousek, & Vaňková,

2016; Sánchez-Cruzado et al.,2021). Close collaboration between government, industry, and educational institutions also needs to be built to develop relevant digital literacy programs and accommodate the needs of the labor market and technological developments (Jaeger et al., 2012). In addition, policies that support increasing equitable and affordable internet access throughout Indonesia are very important so that all citizens can access and use digital technology effectively (Nugroho & Nafi'ah, 2019; Puspitaningrum & Atmini, 2012). Community awareness and education campaigns should also be increased to increase understanding and awareness of the importance of digital literacy (Rahmah, 2015). Implementing these adaptive policies is hoped to achieve optimal digital literacy in Indonesia, providing broad benefits for economic growth, effective public services, and active participation in the digital era.

Adaptive and optimal implementation of digital literacy policies can have significant implications for digital governance in Indonesia. In digital governance, good digital literacy is the key to creating active and participatory public participation in effective governance and public services. With increasing digital literacy among the public, digital government can become more inclusive. Communities can also better utilize digital technology to access government information, participate in decision-making processes, and provide valuable input. It can strengthen transparency, accountability, and participation in governance, resulting in better policies that match people's needs and aspirations.

Good digital literacy also contributes to the efficiency and effectiveness of public services. People who can use digital technology well tend to be able to access government services online, submit applications, pay taxes, or access public information easily. It reduces bureaucratic problems, speeds up processes, and increases public satisfaction with public services provided by the government. In addition, optimal digital literacy can provide significant economic benefits in the context of digital governance. People skilled in digital literacy can better participate in digital economy sectors like e-commerce, startups, or technology-based jobs. It will create new jobs, increase productivity, and promote sustainable economic growth in the digital age.

Regarding data security and protection, good digital literacy will also help protect society from cyber threats. With an adequate understanding of digital security, people can be more aware of online fraud, protect their data, and participate safely in digital transactions. A strong digital government must also have high digital literacy to protect the country's digital infrastructure and face complex security threats. Overall, the implementation of adaptive digital literacy policies can have a positive impact on digital governance in Indonesia. Communities with good digital literacy can become active partners in government processes, improve the efficiency of public services, promote digital economic growth, and increase security in the digital environment. Therefore, the government needs to prioritize and implement policies that support increasing digital literacy at all levels of society to ensure the success of an inclusive, effective, and safe digital government.

Digital literacy policies in Indonesia have a significant role in supporting digital governance. With a high level of digital literacy, people can be more active and involved in digital government, use digital technology to access information, participate in decision-making, and utilize public services efficiently. Digital literacy policies provide the guidance, direction, and resources the public needs to develop digital knowledge and skills relevant to the context of digital governance. In addition, this policy can also encourage collaboration between the government, educational institutions, the private sector, and civil society to work together to increase digital literacy in various segments of society. With strong digital literacy, the government can increase transparency, accountability, and public participation, as well as the overall efficiency and quality of public services. Therefore, a digital literacy policy that supports the digital government is an important step in building a society ready to face challenges and opportunities in the digital era.

CONCLUSION

The importance of digital literacy in supporting digital governance in Indonesia cannot be doubted. Digital literacy plays an important role in ensuring the active participation of citizens in governance, efficiency of public services, growth of the digital economy, and security in the digital environment. However, the implementation of digital literacy policies is faced with several inhibiting factors, such as access and infrastructure disparities, economic and social challenges, lack of education and training, lack of research and data, lack of involvement and coordination

between parties, rapid changes in technology, and legal and regulatory constraints. Therefore, adaptive policies are needed to overcome these obstacles.

To achieve optimal digital literacy, policy recommendations that must be considered include developing a digital literacy curriculum integrated into formal education, teacher training and development, a collaboration between government, industry, and educational institutions, increasing equitable and affordable internet access, and public awareness and education campaigns. With the implementation of adaptive digital literacy policies, Indonesia can fully use digital technology's potential, increase public participation in government, create effective and efficient public services, and build a sustainable digital economy. In facing challenges and ongoing changes in the digital world, adaptive digital literacy policies are a strong foundation for ensuring Indonesia can move forward in an inclusive and competitive digital governance era.

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