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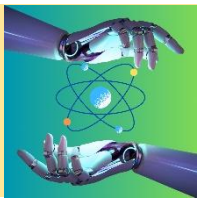

Development of Digital Educational Media on Cybersecurity for Rural Communities in Aceh Besar

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Abstract

The rapid development of information and communication technology has increased the use of digital services in society, including in rural areas. However, this growth has not been fully accompanied by adequate understanding of digital security, leaving communities vulnerable to threats such as online fraud, misuse of personal data, and the spread of misinformation. This community service project aims to develop digital educational media to enhance digital security literacy among residents of Lampeuneurut Gampong Village. A descriptive approach was employed, involving stages of needs identification, reference collection, design, development, and evaluation of the educational media. The outputs include digital posters and infographics that provide information on personal data protection, safe social media practices, and cybercrime awareness. The materials are designed using simple language and engaging visuals to ensure accessibility and ease of understanding across diverse community groups. The media can be accessed flexibly through digital devices, enabling independent learning. The developed educational media is expected to improve public awareness and understanding of safe and responsible technology use, while also supporting the enhancement of digital literacy within the village community.

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1. Introduction

The rapid advancement of information and communication technology (ICT) has significantly transformed various aspects of human life, including in rural communities [1]. Increasing internet accessibility has enabled rural populations to utilise a wide range of digital services, such as social media, online communication, and electronic transactions [2]. This digital transformation has contributed to improved connectivity, access to information, and economic opportunities. However, alongside these benefits, the growing use of digital technology also introduces various risks, particularly related to digital security [3].

Digital security has become a critical issue that requires attention from all levels of society. Limited digital literacy often makes individuals more vulnerable to cyber threats, including online fraud, identity theft, misuse of personal data, and the spread of misinformation or hoaxes [4], [5]. These risks not only

affect individuals but can also have broader social and economic impacts, especially in communities that are still adapting to digital environments [6], [7].

In rural areas such as Lampeuneurut Gampong Village, Aceh Besar, the use of digital technology is increasing, particularly through smartphones and internet-based applications. Nevertheless, public understanding of safe and responsible digital practices remains relatively limited. This gap highlights the importance of educational initiatives that can improve awareness and knowledge of digital security [8], [9].

One effective approach to addressing this issue is the development of digital educational media that is informative, accessible, and easy to understand. Educational media such as digital posters, infographics, and interactive content have been proven effective in conveying information and increasing engagement among diverse audiences [10], [11]. Such media can provide practical guidance on protecting personal data, recognising online scams, and using digital platforms responsibly [12], [13].

Moreover, digital education initiatives play a crucial role in empowering communities by promoting independent learning and fostering digital resilience [14], [15]. By integrating visual communication and simple language, educational content can be more easily understood across different age groups and educational backgrounds [16], [17]. The flexibility of digital media also allows users to access information anytime and anywhere, making it a sustainable solution for continuous learning [18].

Previous studies have highlighted the importance of community-based digital literacy programs in reducing cyber risks and enhancing safe technology adoption [19], [20]. Therefore, this community service activity aims to develop digital educational media on digital security to improve digital literacy among rural communities. It is expected that the developed media will increase awareness, strengthen understanding, and encourage a safer, more responsible use of digital technology in daily life.

2. Methodology

2.1 Type of Activity

This community service activity involved developing digital educational media to improve public understanding of digital security. The media produced consisted of informative, accessible digital content, including posters and infographics, designed to deliver essential knowledge about safe technology use. The materials focused on key aspects of digital literacy, particularly digital security, such as personal data protection, safe social media practices, and awareness of cybercrime.

2.2 Target Participants

The target participants of this activity were the residents of Lampeuneurut Gampong Village, Aceh Besar, Indonesia. The focus was primarily on individuals who actively use digital devices, such as smartphones, and have internet access. This group was selected for their high exposure to digital technology, while still requiring an improved understanding of digital security practices. Additionally, the developed educational media was intended to be inclusive and accessible to a broader audience, regardless of age or educational background.

2.3 Research Approach

This activity employed a descriptive approach, emphasising the systematic design and development of educational media. The approach aimed to identify community needs, develop relevant educational content, and ensure that the resulting media effectively addressed existing gaps in digital security literacy.

2.4 Stages of Implementation

The implementation of this activity was carried out through several structured stages:

a) Needs Identification: This initial stage involved identifying the digital security challenges faced by the community. It was conducted through a literature review and the observation of common issues related to digital technology use, such as online fraud, data misuse, and misinformation.

b) Data and Reference Collection: Relevant data and references were collected from scientific journals, articles, and credible literature on digital literacy and digital security. These sources served as the foundation for developing accurate and reliable educational content.
c) Design of Educational Media" At this stage, the educational content was structured systematically. The language was simplified to ensure clarity and accessibility, while visual elements such as icons, colours, and illustrations were carefully designed to enhance user engagement and understanding.
d) Media Development: The designed materials were converted to digital formats using appropriate software tools. The outputs included digital posters and infographics that were ready for distribution and use by the community.
e) Evaluation and Refinement: The final stage involved reviewing and refining the developed media. This process ensured the clarity, relevance, and effectiveness of the content as an educational tool. Adjustments were made to improve both the visual presentation and informational accuracy.

2.5 Output of the Activity

The final outputs of this activity were digital educational media products, including posters and infographics. These materials were designed to be easily accessed through digital devices, allowing flexible use by the community and supporting independent learning.

3. Result & Discussion

The results of this community service activity demonstrate the successful development of digital educational media to improve digital security literacy among the residents of Lampeuneurut Gampong Village. Through a systematic process involving needs identification, content design, and media development, the resulting outputs, digital posters and infographics, effectively present essential information on personal data protection, safe social media practices, and awareness of cyber threats. These media were designed using simple language and visually engaging elements to ensure accessibility for diverse community members. Furthermore, the implementation of these educational materials indicates their potential to enhance public awareness and understanding of digital security issues. This section discusses the outcomes of the activity and evaluates their impact on the community, focusing on knowledge improvement, behavioural awareness, and the ability to adopt safer digital practices in daily life.

Figure 1 illustrates the initial stage of the community service program, during which the implementation team engaged directly with local officials and community representatives from Lampeuneurut Gampong Village. This interaction reflects the importance of establishing collaboration and mutual understanding before conducting educational interventions. The presence of village officials signifies institutional support, which is crucial to ensuring the program's effectiveness and sustainability. Through this engagement, the team introduced the objectives of developing digital security educational media and identified local challenges related to digital literacy and security awareness. Such participatory approaches are essential in community-based programs, as they allow the intervention to be tailored to the specific needs, characteristics, and technological readiness of the target community.

Furthermore, this activity demonstrates the role of community engagement as a foundation for successful knowledge transfer and empowerment. By involving local stakeholders from the outset, the program fosters trust, encourages active participation, and enhances the acceptance of the educational media developed. This collaborative environment also facilitates the dissemination of digital security knowledge more effectively, as local leaders can act as mediators and advocates within the community. In this study, strong coordination between the service team and village authorities contributes to the successful implementation of digital literacy initiatives, ultimately supporting the improvement of safe, responsible technology use among rural communities.

Figure 1. Community Service Team with Lampeuneurut Gampong Village Officials

Figure 2 depicts the discussion session conducted between the community service team and residents as part of the program implementation. This stage plays a crucial role in facilitating direct communication and knowledge exchange between the team and the community. Through this interactive session, participants were introduced to key concepts of digital security, including personal data protection, safe online behaviour, and awareness of cyber threats. The discussion format allowed residents to actively engage by sharing their experiences, asking questions, and expressing concerns related to their daily use of digital technology. This participatory approach not only enhances understanding but also ensures that the educational content is relevant to the community's real challenges.

Moreover, the discussion session serves as an effective means of identifying gaps in digital literacy and tailoring educational materials accordingly. The active involvement of community members indicates a positive response and a growing awareness of the importance of digital security. Such engagement also strengthens participants' sense of ownership, encouraging them to adopt safer digital practices in their daily lives. In the context of this study, the discussion session contributes significantly to the success of the community service program by bridging the gap between theoretical knowledge and practical application, ultimately supporting the development of a more digitally aware and resilient rural community.

Figure 2. Discussion Session on the Implementation of Community Service Activities with Local Residents

Figure 3 illustrates the implementation of educational activities involving children as part of the community service program. This activity represents an important effort to introduce basic digital literacy and awareness from an early age through engaging and interactive methods. The use of creative

learning approaches, such as drawing and hands-on activities, enables children to participate actively while developing their cognitive and social skills. Although the program's primary focus is digital security, involving children in educational sessions helps build foundational awareness of responsible technology use. This approach also reflects the importance of inclusive education, where all age groups are considered in the process of community empowerment.

Furthermore, this activity demonstrates the effectiveness of combining educational content with creative and participatory learning techniques. By creating a comfortable and enjoyable learning environment, children are more receptive to new knowledge and values. The involvement of facilitators in guiding activities ensures that learning objectives are delivered effectively while maintaining student engagement. In the broader context of the study, this activity contributes to the program's long-term impact by fostering early awareness and shaping positive attitudes toward technology use. It also supports the development of a digitally literate community, which is essential for sustaining safe and responsible digital practices in rural areas.

Figure 3. Educational activity session with children as part of the community service program

Figure 4 illustrates the community interaction session between residents and participants during the implementation of the community service program. This activity highlights the importance of direct engagement in fostering effective communication and strengthening relationships between the service team and the local community. Through informal interactions and group discussions, residents actively participated, shared their perspectives, and engaged with the educational content in a more relaxed, open environment. Such interactions create opportunities for mutual learning, where the facilitators can better understand community needs while residents gain insights into digital security practices and responsible technology use.

Furthermore, this interaction session plays a significant role in enhancing community involvement and program acceptance. The inclusive atmosphere encourages participation from people of all ages, including adults and children, fostering a more comprehensive dissemination of knowledge. This approach not only increases awareness but also promotes collective responsibility in adopting safer digital behaviours. In the context of this study, the strong engagement observed during the interaction session indicates a positive response from the community and reflects the effectiveness of participatory

methods in community service programs. Ultimately, this contributes to building a more digitally aware, connected, and resilient rural society.

Figure 4. Community interaction session between residents and participants during the community service program

Figure 5 presents the outcomes of the educational activities, where children proudly display their artwork created during the community service program. This stage reflects the successful implementation of participatory and creative learning methods that actively involve children in the educational process. The artwork produced demonstrates not only the children's creativity but also their engagement and understanding of the activities delivered. Although the session was designed in a simple, enjoyable format, it plays an important role in fostering early awareness and positive attitudes toward learning, which can later support the development of digital literacy and responsible use of technology.

Figure 5. Children presenting their artwork created during the community service program's educational activities.

Furthermore, the presentation of the children's work serves as an indicator of the program's effectiveness in creating an interactive and motivating learning environment. The sense of achievement

experienced by the participants can enhance their confidence and willingness to participate in future educational activities. This activity also strengthens the relationship between facilitators and the community by fostering a supportive, encouraging atmosphere. In the broader context of this study, such outcomes highlight the importance of integrating creative approaches in community service programs, as they contribute to sustainable knowledge transfer and the long-term development of a more digitally aware and empowered community.

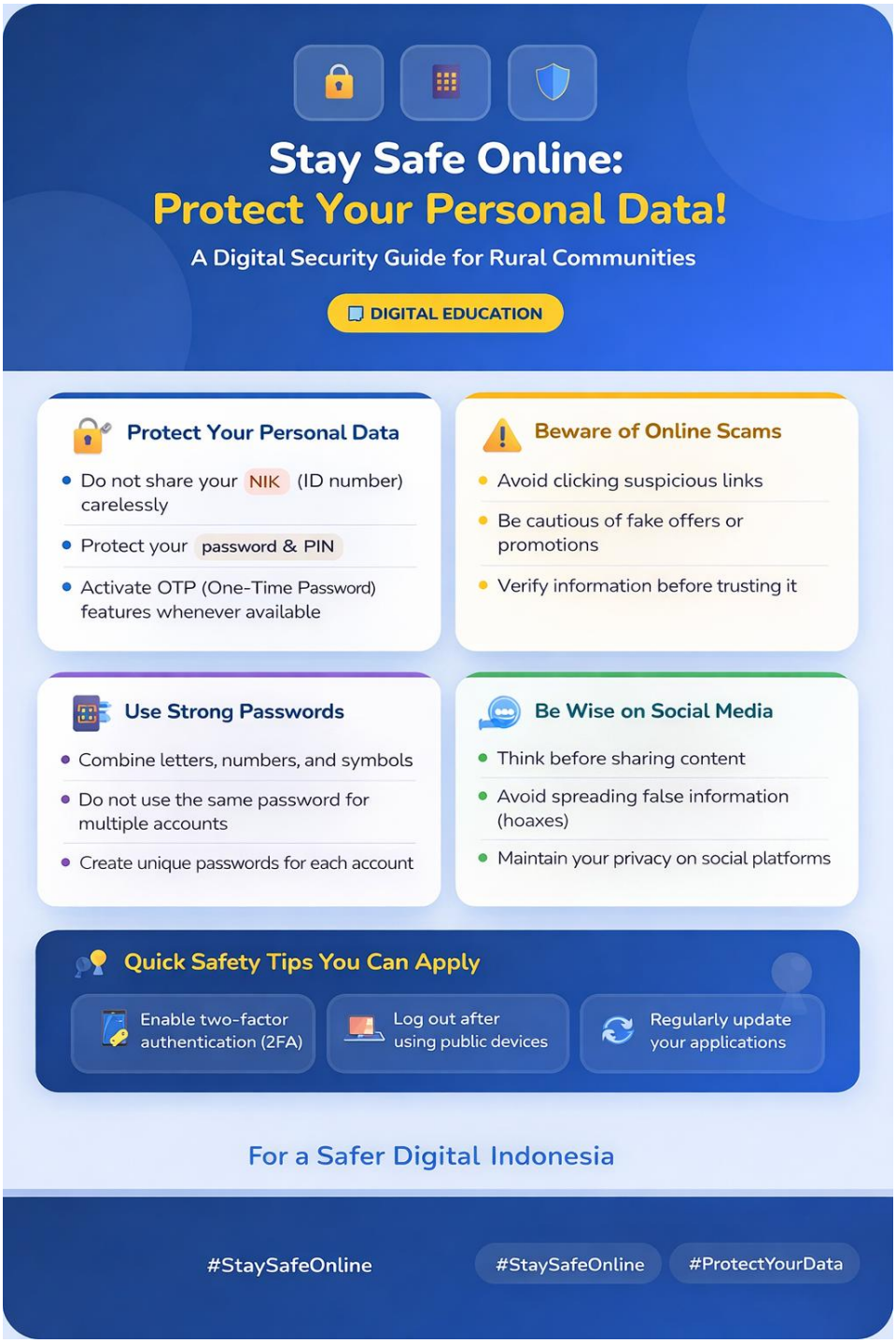

Figure 6. Digital security education infographic on personal data protection and safe online practices for rural communities

Figure 6 presents the digital educational media developed in this community service program, presented as an infographic focused on digital security awareness. The infographic is designed to

provide clear, concise, and practical information regarding safe online practices, particularly for rural communities. Its structure is organised into several key sections: personal data protection, awareness of online scams, password security, and responsible social media use. This structured presentation allows users to easily navigate and understand the content, making it suitable for audiences with varying levels of digital literacy.

The visual design of the infographic plays a significant role in enhancing user engagement and comprehension. By incorporating appealing colour schemes, icons, and simple layouts, the media effectively captures attention and facilitates learning. The use of straightforward language ensures the information is easily understood by a wide range of users, including those with limited educational backgrounds. This aligns with the objective of community-based education, which emphasises accessibility and inclusivity. As a result, the infographic serves not only as an informational tool but also as a practical guide that can be readily applied in daily digital activities.

Furthermore, the infographic's content addresses common digital security challenges faced by rural communities. Topics such as protecting personal identification information, recognising suspicious links, avoiding online fraud, and maintaining privacy on social media are highly relevant to the current digital environment. The inclusion of actionable tips, such as enabling two-factor authentication and regularly updating applications, provides users with concrete steps to improve their digital safety. This practical orientation enhances the effectiveness of the educational media by bridging the gap between knowledge and real-world application.

In the broader context of this study, the development of this infographic demonstrates the potential of digital media as an effective tool for improving digital literacy and security awareness in rural areas. Its flexibility allows access from various digital devices, enabling continuous and independent learning. Additionally, the infographic can be easily distributed and shared within the community, increasing its reach and impact. Overall, the results indicate that well-designed digital educational media can significantly empower communities, foster safer digital behaviour, and support sustainable digital transformation at the local level.

4. Conclusion

This study demonstrates that developing digital educational media is an effective approach to improving digital security literacy in rural communities. Through a systematic, participatory process, the resulting infographic and digital materials effectively deliver essential knowledge on personal data protection, safe online behaviour, and cyber threat awareness in a clear, accessible manner. The integration of simple language and engaging visual design enhances user understanding and encourages practical application in daily digital activities. Furthermore, the implementation of community-based educational interventions, supported by active engagement with local stakeholders, significantly increases awareness, participation, and acceptance among community members. The findings highlight that combining contextualised content with interactive and inclusive approaches can foster sustainable development of digital literacy. Overall, this study confirms the potential of digital educational media as a scalable and impactful solution for promoting safe and responsible technology use, particularly in underserved rural settings.

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