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Understanding Biometric Identification for Indonesian Immigrant Families in Sanggar Belajar Sentul, Kuala Lumpur, Malaysia

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ABSTRACT

The primary objective of this community service activity is to provide Indonesian Immigrant Workers (IIWs) with a fundamental understanding of biometric data. This study is significant due to the growing reliance on biometric systems across sectors and the vulnerability of IIWs, who often lack awareness of data security risks. Limited digital literacy and inadequate access to legal protections heighten their susceptibility to data misuse and breaches. The research employs a Community-Based Participatory Research (CBPR) approach, ensuring the involvement of stakeholders from Sanggar Belajar Sentul to design the activities, making them contextually relevant and addressing the specific needs of the target community. The community service successfully educated 23 Indonesian Immigrant Workers, increasing their awareness of the types of biometric data and the associated risks, particularly data leakage. The findings emphasise the importance of such educational initiatives in empowering vulnerable populations to safeguard their personal information. It is recommended that similar programs be expanded to other immigrant communities, integrating hands-on training and leveraging digital platforms for broader outreach. The contributions of this research include the effectiveness of community-based education in improving biometric data literacy and data protection awareness among immigrant workers, which can serve as a model for future educational interventions aimed at strengthening digital literacy in marginalised communities.

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INTRODUCTION

Biometric data such as fingerprints, facial patterns, retinal scans, and voice recognition are now crucial to identification systems in various services, from immigration and employment to healthcare (Ahmed & Asghar, 2023; Idoko et al., 2024). One positive development is the increasing public awareness of the importance of biometric data (Syarifah et al., 2024; Malik, 2024). The low level of education and digital literacy among Indonesian Immigrant Workers (IIW) is a significant factor increasing their vulnerability to biometric data misuse. A study of prospective IIW digital literacy shows that limited technological knowledge leads to a lack of understanding of personal data rights (Fadillah et al., 2023), including the consequences of providing biometric data to unreliable parties. Malaysia is one of the largest immigrant worker-receiving countries in Southeast Asia, with approximately 2.7 million IIW in Malaysia, the majority through irregular channels. Furthermore, official data from the 2025 KP2MI report shows Malaysia as the third-largest recipient of IIW. KP2MI recorded that from January to March 2025, Malaysia received approximately 4,000 PMI.

Sanggar Belajar Sentul is an informal educational institution in Kg Chubadak Hilir, Kuala Lumpur, Malaysia. This guidance center was established to ensure that the children of immigrant workers continue to have access to education while living in Malaysia. The center's establishment was motivated by a sense of concern for the children of Indonesian immigrant workers who lack adequate educational opportunities. This center serves as a learning and play space for Indonesian imimmigrant children who live and reside temporarily in Malaysia following their parents, who work in the informal sector. Most of these children's parents work as contractors, laundry, domestic, and food stall employees. This community lives in a densely populated environment with limited access to information, particularly regarding digital literacy, technology, and personal data protection. Lack of exposure to modern issues, such as biometric data security, means that people in this environment are unaware of the importance of protecting sensitive identity information. However, the use of biometric data is no longer limited to forensics; it has also penetrated the administrative and social sectors (Kruger et al., 2024; Wienroth & Amelung, 2023; Jacobsen, 2021). Therefore, a lack of understanding of the concepts and functions of biometric data can place immigrant workers at high risk of data breaches and misidentification (Arianto & Rofii, 2024).

The main problem immigrant workers face is their limited knowledge of the basic concepts and types of biometric data, such as fingerprints, facial recognition, retinal recognition, or voice patterns, and their use in individual identification. Limited access to relevant information and educational materials, the lack of contextual counseling, and limited digital literacy exacerbate this situation, leaving imimmigrant communities without adequate learning resources and unaware of the importance of biometric data privacy and security in their daily lives.

In response to this situation, our team conducted a community service activity aimed at educating immigrant workers parents in the Sanggar Belajar Sentul, Kuala Lumpur, Malaysia. The primary objective of this activity was to provide a basic understanding of the types of biometric data, with a primary focus on fingerprints, and how this data is used in identification processes, both in forensic and administrative contexts. Furthermore, this outreach program emphasized the benefits of biometric data for medical and health research and its potential use as part of a broader database system.

Efforts to strengthen digital literacy through community-based education have proven highly effective in broadening the horizons and enhancing the capabilities of immigrant workers in facing technological developments. It is hoped that the public will be aware of the importance of biometric data, its sensitivity, and the need to protect it, while also increasing vigilance in responding to data requests from external parties. The findings of this study are expected to provide valuable insights into the role of community-based education in raising awareness of data protection and digital literacy among marginalised groups. It is recommended that similar educational initiatives be expanded to other regions with large immigrant worker populations, integrating practical knowledge of biometric data and broader digital literacy skills to empower communities to respond to potential data privacy breaches.

METHOD

This community service activity was implemented using a contextually designed Community Based Participatory Research (CBPR) approach, involving local stakeholders—in this case, the coordinator of the Sanggar Belajar Sentul—to participate in designing activities to suit the characteristics and needs of the target group (Corrigan & Oppenheim, 2024), namely the Indonesian immigrant worker community whose children study at the Sanggar Belajar Sentul in Kuala Lumpur, Malaysia. This approach is expected to meet the IIW's need to understand biometric data. Details of the approach taken by the community service team are described in the Table 1.

Table 1. Stages of the Community Service Activity Approach Method

No	Step	Activities	Description
1	Problem identification and planning	Problem identification	The activity began with location identification and social mapping of the community environment.
		Focus Group Discussion (FGD)	The community service team coordinated with the coordinator to obtain permits for the activity and to schedule an appropriate time to avoid disrupting the class's routine activities and the participants' work.
		Preparation of educational materials	The team developed materials based on current literature on biometric data, emphasizing fingerprint identification, the benefits of biometric data in forensics and medicine, and biometric data protection issues in the context of immigrant communities.

2	Implementation	Providing educational materials	The education session was held in person in one of the classrooms at the Sanggar Belajar Sentul in Kuala Lumpur. The material was presented in PowerPoint format, featuring simple, concise, and contextual visuals.
		Providing additional learning media	Printed leaflets were provided to participants to facilitate information transfer and reinforce their retention of the material. The leaflets included key information on the definition of biometric data, the benefits and risks of its use, and basic data protection tips that can be applied in everyday life.
3	Evaluation	Observation	Conduct a question-and-answer session with participants to assess their understanding.
		Discussion	Conduct a discussion session as a follow-up to the question-and-answer session.
		Evaluation	Conduct a joint evaluation with stakeholders regarding future activities and participant needs.
		Sustainability program	Prepare a program sustainability plan.

The analysis of this community service activity reveals significant insights into the effectiveness of educational interventions aimed at enhancing biometric data literacy among immigrant workers. During the implementation phase, the interactive nature of the educational sessions, supplemented with printed materials, proved crucial in engaging participants and reinforcing key concepts (Espinosa & Verney, 2021). The question-and-answer session and subsequent discussion provided valuable feedback, highlighting the participants' increasing understanding of biometric data and its relevance to their daily lives. However, challenges were noted in terms of the varying levels of prior knowledge and digital literacy among participants, indicating a need for further simplification of the material and more tailored learning approaches.

FINDING AND DISCUSSION

The education session was held face-to-face in one of the classrooms at the Sanggar Belajar Sentul in Kuala Lumpur, Malaysia, on Friday, July 25, 2025, at 7:00 PM local time. Twenty-three participants, six men and 16 women, aged between 20 and 48, attended. Participants came from various informal employment backgrounds, including contractors, domestic workers, food stall owners, hardware store employees, and cleaners. Based on the team's observations, the average occupation of the participants aligns with the job descriptions outlined by the Ministry of Immigrant Workers Protection, which focuses on the placement of Indonesian immigrant workers in roles such as housemaids, caregivers, plantation workers, and domestic workers.

The educational material was delivered using an Indonesian verbal lecture. The material covered an introduction to the types of biometric data, the use of biometric data in forensic identification, its application in medical and health

research, and the strategic role of biometric data in the national database system. The presentation lasted 45 minutes, followed by a 20-minute question-and-answer session and discussion.

Figure 1. Education by Expert dr. Mustika Chasanatusy Syarifah

Figure 2. Immigrant Workers with The Coordinator

The participants' enthusiasm was evident during the question-and-answer session and discussion. This demonstrated a growing awareness of the importance of understanding the functions and risks of biometric data use. One question reflecting this concern is the possibility of fingerprints being unreadable due to the type of manual labor they perform daily. Participants expressed concern that their biometric data would be invalidated during immigration processes or when compared to the national database. In response, the expert explained that, in theory, such a situation could occur. A certificate from a forensic pathologist could serve as supporting documentation to explain any obstacles to fingerprint reading.

A further discussion among younger participants concerned the recent viral news story about biometric data misuse in Indonesia. An unauthorized agency had been collecting citizens' biometric data with the promise of hundreds of thousands of rupiah in compensation. Regarding this phenomenon, participants wanted to know how to avoid similar incidents and what would happen if another party recorded the biometric data. In response, the presenter explained that once another party has scanned biometric data, the owner's control over it is partially lost. Therefore, increased vigilance is the only way to ensure biometric data security. Participants in the training were encouraged to

thoroughly verify the consent of the party requesting the biometric data and the purpose for which it was recorded. The expert also emphasized that knowing the purpose of the recording and who is recording the biometric data is the right of the biometric data owner. Biometric data is categorized as specific personal data that may only be processed with the explicit, written consent of the data owner. This consent requires clear information regarding the collector, the purpose of use, and the data owner's rights over their data.

Questions and discussions from the training participants indicated that, as immigrant workers, participants have a strong interest in biometric data protection while reinforcing the need for further educational activities. This is crucial because immigrant workers are vulnerable to the misuse of digital technologies such as biometrics due to limited digital literacy and weak legal protection in destination countries. Biometric data, like passwords, is highly sensitive and immutable, so that any leaks can have long-term and difficult-to-remediate consequences. Therefore, awareness of how and when biometric data is provided is key to self-protection for immigrant communities, who generally have limited access to legal aid and information technology.

Figure 3. Appreciation for Immigrant Worker Participation

Figure 4. Group Photo after The Educational Activities Concluded

Challenges encountered during the activity included some participants having difficulty reading and writing and requiring direct guidance in completing attendance lists and other written communications. Despite this, all participants completed the activity. The participants and the organizing committee deemed the outreach program successful. Participants felt they gained

new insights they had never heard before, particularly regarding the importance of protecting and understanding the use of biometric data in everyday life. This activity is expected to be the beginning of increasing biometric data literacy among the immigrant worker community and opening up opportunities for ongoing education.

Discussion

The results of the community service program reflect a positive impact on the participants' understanding of biometric data and its importance. The interactive nature of the educational session, which included a question-and-answer segment and a discussion, allowed participants to engage actively with the material (Haile, 2021; Rahmayani, 2025; Zahro, 2025). The majority of participants expressed a heightened awareness of biometric data risks, particularly in light of recent issues surrounding its misuse. The inclusion of real-life examples, such as the potential misuse of biometric data by unauthorized entities, further helped the participants connect the topic to their daily experiences. Additionally, the provision of printed materials ensured that participants had something tangible to refer back to, reinforcing the session's learning. However, the fact that some participants struggled with literacy indicates that future sessions should consider more inclusive teaching methods to accommodate varying levels of educational backgrounds.

The outcome of the program highlights a direct correlation between education and increased awareness of biometric data security. The discussions and questions raised during the session reflect the participants' concerns about biometric data misuse, particularly due to their vulnerability in an unfamiliar legal environment. The fears expressed by the participants—such as concerns over fingerprint accuracy due to manual labor—point to the broader issue of digital insecurity faced by immigrant workers (Ibrahim et al., 2023). This vulnerability is compounded by their limited understanding of biometric data's role in immigration and other administrative processes. The immediate impact of the program is evident in the heightened vigilance among participants about who collects their data and for what purposes (Circo & McGarrell, 2021; Manley & Williams, 2022). The awareness created through this session is crucial for preventing data misuse and fostering more informed decision-making.

The program could be further enhanced by addressing the gaps in literacy and incorporating more hands-on, practical demonstrations of biometric technology. While the verbal lecture and printed materials were effective in conveying the core message, the participants' struggles with reading and writing suggest that supplementary techniques—such as visual aids, infographics, or digital platforms—should be integrated into future sessions. Providing a more interactive experience through demonstrations, such as showing how biometric data is used in everyday scenarios or conducting mock consent form signings, could solidify participants' understanding (Bahri, 2022; Mohammed & Ali, 2024).

Additionally, future programs should consider incorporating local language variations and cultural contexts to further ensure that the educational material resonates with immigrant workers. It would also be beneficial to collaborate with local organizations, including legal aid services, to provide continuous support and guidance to participants, especially in cases of data misuse or breach (Grünenberg et al., 2022; Hegarty, 2023). These adjustments would make the program more inclusive and impactful for a broader segment of the community.

The findings from this program suggest that when immigrant workers are provided with accessible, relevant, and culturally sensitive education, they become more aware of their personal data rights and the potential risks associated with biometric data (Pahuja & Goel, 2024; Vandana & Kaur, 2022). The discussions indicated that participants, despite their initial lack of knowledge, demonstrated significant curiosity and concern once they were made aware of how biometric data impacts them. This highlights the importance of community-based educational initiatives in empowering marginalized populations. Moreover, the fact that participants expressed concern over their fingerprint data and its potential misuse shows that the program sparked critical thinking and encouraged proactive behavior (Utama et al., 2024; Palmer & Piper, 2023). The positive reception of the program suggests that future activities should continue to prioritize accessibility and engagement while adapting to the evolving needs of the community.

The implications of this program extend beyond the immediate community, suggesting that such educational initiatives can play a pivotal role in strengthening data protection awareness in vulnerable immigrant populations. The awareness raised through this session can potentially lead to a greater demand for legal protections and policies that safeguard immigrant workers' personal data in destination countries. Moreover, this program serves as a model for similar initiatives aimed at improving digital literacy and data security awareness in marginalized communities. The successful outcome of this activity underscores the need for continued advocacy and educational efforts to ensure that immigrant workers are equipped to protect themselves in an increasingly digital world, thereby reducing their susceptibility to exploitation and data breaches.

CONCLUSION

The community service activity at the Sanggar Belajar Sentul in Kuala Lumpur successfully provided 23 Indonesian immigrant workers with a basic understanding of biometric data protection, types, benefits, and importance. Using the Community Based Participatory Research method through interactive presentations, open discussions, and supporting media in leaflets, this activity raised participants' awareness of the risks of data breaches and the importance of vigilance when providing biometric data. Despite the challenges of varying literacy levels, the program ran smoothly and achieved its objectives. The

program highlighted the vulnerabilities faced by immigrant workers due to limited digital literacy and the lack of awareness about data misuse risks. As a result, participants were better equipped to make informed decisions regarding the sharing of their biometric data. However, challenges related to varying literacy levels suggest that future initiatives should incorporate more inclusive and interactive teaching methods.

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