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Web-Based Bullying Case Reporting Information System at Indonesian Schools in Kota Kinabalu, Malaysia

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Abstract

Bullying in migrant school settings presents particular challenges due to limited access to protection services, the sensitivity of reporters' identities, and weak case documentation mechanisms. This situation was observed at the Indonesian School in Kota Kinabalu (SIKK), Malaysia, which serves children of Indonesian Migrant Workers, where a manual reporting system tends to discourage reporters and delay follow-up. This community service activity developed a web-based bullying reporting system using a Rapid Application Development (RAD) approach, including needs assessment, UML modeling, application development, user training, and evaluation using Black Box Testing and a Likert-based questionnaire. Participants included students, educators/mentors, and school coordinators involved in the reporting process. Descriptive-analytical analysis was conducted of system functional data and user perceptions. The implementation resulted in an application that met specifications, with an average feasibility of 87.7% in the very feasibility category, indicating improved documentation regularity and transparency in the case-handling process. This implementation experience provides a conceptual contribution to educational technology-based community service practices by offering an adaptive digital reporting model for Indonesian schools abroad and in cross-border educational contexts, thereby expanding the global discourse on information system integration in student protection.

Keywords: Anti-Bullying Reporting; Participatory Development; Web Applications; Indonesian Overseas School; Child Protection.

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Introduction

The phenomenon of bullying in educational environments continues to be a concern across countries because its implications go beyond individual behavioral aspects and influence the quality of the learning ecosystem as a whole (Coman et al., 2026; Izadi & Hart, 2024). Various international reports show that the experience of being a victim of bullying is associated with increased psychological stress, a reduced sense of safety at school, and decreased academic participation among students (Fossum et al., 2023; Zacharia & Yablon, 2022). In the context of child protection, responsive reporting practices are seen as an important component to ensure that cases do not stop at the informal level, but can be followed up through documented and accountable mechanisms (Frostenson & Johnstone, 2023; Ominyi et al., 2025). Therefore, the approach to handling bullying is no longer sufficient to rely solely on pedagogical interventions; it requires a system that can simultaneously meet the needs of reporters, educators, and policymakers.

Digital transformation in education has opened up space for various technology-based service innovations, including community service practices aimed at improving school governance. Several studies have shown that the use of web-based reporting systems can expand students' access to share their experiences without the social pressures often associated with direct reporting (Amedu et al., 2025; Messman et al., 2024). The integration of anonymity and digital notification features has also reportedly helped speed up the verification process while increasing reporters' trust in educational institutions (Bueno-Pizarro & Lalinde-Pulido, 2025; Ramasamy & Khan, 2024). In addition, the digitalization of guidance and counseling services contributes to more systematic data management and supports the consistency of case documentation over time (Halqim & others, 2024; Meifiana et al., 2025). These findings confirm that technology-based community service is not only related to application development but also serves as a strategy to strengthen educational institutions' capacity to face increasingly complex social dynamics.

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Despite the growing literature on digital reporting systems, most implementations remain focused on formal schools with relatively stable infrastructure. This contrasts with Indonesian community schools overseas serving the children of Indonesian migrant workers, where resource constraints and community social dynamics influence reporting practices. The Indonesian School of Kota Kinabalu (SIKK) in Malaysia offers a unique context that has rarely been explored in previous research. The school's environment within a migrant community demands high sensitivity to reporter confidentiality and requires a system that adapts to users' varying levels of digital literacy. In daily practice, the manual reporting mechanisms still in use often discourage students from sharing their experiences due to concerns about social stigma and a lack of privacy guarantees.

This situation highlights a gap between the development of digital reporting technology and actual needs on the ground, particularly in cross-border community schools. Most prior system development has focused on the technical aspects of applications, while participatory approaches that actively involve users in the design and evaluation process remain limited. Yet, literature on participatory design shows that direct partner involvement from the early stages can increase technology acceptance and strengthen the sustainability of implementation (De Siqueira et al., 2022; Steinke et al., 2022). Without such engagement, digital innovation risks becoming a solution that is not fully integrated into social practices in the school environment.

Starting from this gap, this community service activity developed a web-based bullying reporting system using a Rapid Application Development (RAD) approach that is iterative and user feedback-driven(Anaking et al., 2023; Singgalen et al., 2024). This approach was chosen because it allows the development process to adapt to community needs while also opening dialogue between system developers and users in the field. In the context of community service, integrating RAD methods with participatory design provides an opportunity to build systems that are not only technically functional but also socially relevant.

Theoretically, this activity broadens the discourse on the use of information technology in student protection practices in transnational educational settings, which has received little attention in the literature. Methodologically, applying RAD within a community service framework demonstrates how a cycle of prototyping and user-driven evaluation can improve the system's suitability for the operational needs of community schools. In practice, implementing a digital reporting system at the Indonesian School in Kota Kinabalu provides a concrete example of how technology-based interventions can strengthen the transparency of case-handling processes and encourage a more open, documented reporting culture. Therefore, given the complexity of the context of migrant community schools, this community service activity not only presents an application innovation but also seeks to build collaborative practices among developers, educators, and students, who are the primary users. Through this approach, the developed reporting system is expected to serve as a reference for similar implementations in Indonesian schools abroad with comparable social and infrastructure characteristics.

Method

Community Service Activity Design

This community service activity was developed through a participatory approach that positions partners as active participants in the design and implementation of technological solutions. The system development model is Rapid Application Development (RAD), which allows for iterative adaptation based on user feedback at each stage of development. This approach was chosen to ensure that the resulting solution is not only technically relevant but also aligned with social practices and operational needs within the community school environment (Wiredu et al., 2024; Yulianto Muhammad Arief and Khoirunnnisya, 2026). The activity took place at the Indonesian School in Kota Kinabalu (SIKK), Malaysia, which serves children of Indonesian migrant workers. The intervention focused on strengthening the reporting mechanism for bullying cases by developing a web-based system and increasing users' capacity to manage reports digitally.

Subjects and Participants

Participants included three main groups involved in the case reporting ecosystem: students as potential reporters, educators or mentors responsible for verification, and school coordinators as decision-makers for follow-up actions. Participants were selected purposively based on their role in the school's reporting practices. This multi-role engagement

aims to ensure that the developed system reflects users' actual needs and supports collaborative decision-making (Saputra et al., 2025; Yoliando et al., 2025).

Data Collection Instruments and Techniques

Data were collected through structured observations, semi-structured interviews, and a review of internal school documentation. Observations were used to understand the current manual reporting process and identify barriers faced by students and educators. Interviews focused on exploring the system's functional needs, perceptions of reporting security, and user expectations regarding follow-up mechanisms. Additionally, a Likert-scale questionnaire was used to evaluate user perceptions of usefulness, ease of use, and satisfaction with the developed system. A data triangulation approach was applied to increase the validity of interpretations in educational technology-based community service activities (Budiarti, 2025; Wajnah et al., 2025; Yasin et al., 2025).

Implementation Procedures

The activities were carried out through a series of iterative stages. The initial stage focuses on needs assessment through discussions with partners to map the dynamics of bullying reporting in the school environment. The next stage involved designing a system model using UML modeling as a visualization tool for the application workflow. The implementation was carried out through web-based application development using a prototyping approach, allowing users to provide direct feedback throughout development. Once the system was ready for use, training and mentoring were conducted for students and educators, followed by functional testing using the Black Box Testing method to ensure the system's functions meet user needs (Firdhayanti et al., 2023; Kinasih et al., 2025).

Data Analysis Techniques

Data analysis was conducted descriptively and analytically by integrating qualitative and quantitative findings. Data from observations and interviews were analyzed through reduction, categorization, and interpretation to identify partner responses to the system implementation. Meanwhile, questionnaire data were analyzed using a Likert-scale-based feasibility percentage to illustrate the level of user acceptance of the application. The interpretation of the results refers to educational information system evaluation practices that emphasize the balance between user experience and the effectiveness of system functions (Ngulube & Ncube, 2025; Pyae et al., 2023). The results of the analysis serve as a basis for reflection on the implementation of activities and for system improvements in the next iteration.

Results and Discussion

Program Implementation Results

The implementation of community service activities at the Indonesian School of Kota Kinabalu (SIKK), Malaysia, led to the development of a web-based bullying reporting system to strengthen student protection mechanisms through a digital approach tailored to the context of migrant community schools. The system was not implemented in a one-way manner; it was developed through a collaborative process involving students, educators, and school management from the initial design stage. This participatory approach allows user needs to be directly accommodated in feature design, so that the resulting system is not only technically functional but also aligned with social practices in the school environment (Cumbo & Selwyn, 2022; Sarker, 2025).

Operationally, the system consists of three main modules. The first module is student reporting, which provides anonymity and the ability to upload digital evidence. The second module is verification by educators, which assesses the validity of reports and determines initial follow-up actions. The third module, monitored by the principal, displays a real-time summary of reports to support institutional decision-making. The module structure reflects the integration of user roles within the reporting ecosystem, which aligns with a community-based child protection approach (Ellermeijer et al., 2025). Implementation was carried out through a series of application training sessions, operational support during the initial phase of use, and system functionality testing before widespread rollout. Intensive support was crucial in ensuring that users with varying levels of digital literacy could understand the system's workflow without encountering significant obstacles.

System Functional Test Results

Functional testing is conducted using the Black Box Testing method to ensure that all main features of the system operate as intended within the designed usage scenario (Gunawan & Setyaputri, 2026; Putra et al., 2025). This method

emphasizes the suitability of system output to user needs without evaluating the internal code structure. This approach is relevant to community service because the primary focus of implementation is the system's functionality for end users. Before presenting the test data, it is important to explain that testing was conducted on five core features that represent the entire digital reporting flow in a school environment. A summary of the test results is shown in Table 1.

Table 1. Summary of System Functional Testing Results.

System Features	Expected results	Status
User login	The system validates the account and displays the dashboard.	Succeed
Report creation	Report forms are stored in the database	Succeed
Upload proof	Evidence files can be displayed again	Succeed
Verify report	The report status changes according to user actions	Succeed
Monitoring dashboard	Report data appears in real time	Succeed

The findings in Table 1 indicate that all key features functioned as specified, with no critical errors. Functional stability from the initial implementation stage has important implications for community service activities, as the initial user experience often determines the level of user trust in the technology.g was introduced (Bach et al., 2024; Wanner et al., 2022). A system that fails to function in the initial phase can create user resistance, especially in schools accustomed to manual mechanisms. In addition to technical testing, interface design was examined during implementation. The dashboard navigation structure, which serves as the center of user activity, is shown in Figure 1.

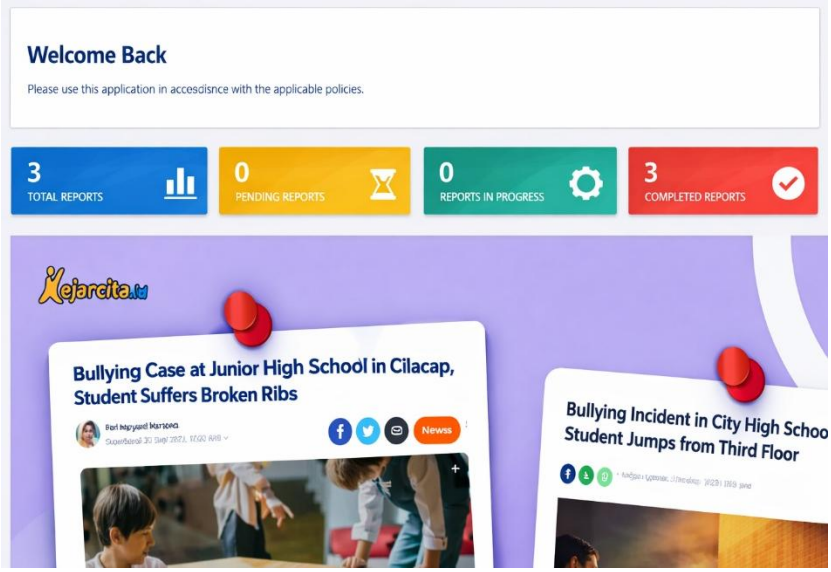

Figure 1. Web-Based Bullying Reporting System Dashboard Display

Figure 1 shows that report information, notifications, and the reporting menu are arranged in a simple navigation structure. A minimalist design approach was chosen to reduce cognitive load and facilitate user adaptation, especially for students who are not yet accustomed to using digital reporting systems. Previous studies have shown that interface simplicity is positively correlated with the level of technology acceptance in educational contexts (Ma et al., 2025; Tao et al., 2022). Thus, the success of the implementation is determined not only by the system's stability but also by the interface design's ability to meet user needs.

Evaluation of User Perception of the System

In addition to technical testing, user perception evaluations were conducted to understand the system's acceptability in everyday practice. This evaluation is crucial because the success of technology interventions in community service activities is measured not only by system performance but also by user experiences while interacting with the technology. Questionnaires were administered to students and educators involved in the mentoring activities.

Assessment indicators included ease of use, feeling safe when reporting, support for student protection, increased anti-bullying awareness, and perceptions of school safety. A summary of the evaluation results is shown in Table 2.

Table 2. Results of User Perception Evaluation of the System

Assessment Indicators	Percentage
Ease of use	91.3%
Sense of security in reporting	85.3%
Support for student protection	86.0%
Raising anti-bullying awareness	87.3%
Safer school environment	88.6%

The average score of 87.7% indicates that the system is highly usable. These results indicate that integrating technology into community service activities can strengthen students' sense of security when submitting reports, especially in community school environments with strong social ties like SIKK. The high level of acceptance also demonstrates that the participatory approach during development contributed to successful implementation.

Integration of Technology and Child Protection Practices

Implementation findings indicate that the web-based reporting system can reduce reporting barriers previously encountered with manual processes. Easy access via digital devices provides a space for students to submit reports without facing direct social pressure. These results align with research. (Henrichsen & Shelton, 2023) which states that digital reporting systems can increase accessibility and reporter confidence in educational settings. From a child protection theory perspective, anonymity and automatic notification features serve as mechanisms to strengthen victims' sense of security. (Bodunde et al., 2025) emphasized that the willingness of reporters to report is greatly influenced by the perceived security of the reporting system. With the option of anonymous reporting, students can control their identity, thereby reducing the risk of social stigma.

However, successful implementation does not solely depend on the technological aspects. A participatory approach during the development process played a significant role in increasing the system's relevance to user needs. Partner involvement as co-designers enabled the system to be designed in accordance with the school's operational practices, rather than simply following the developer's technical framework. This finding strengthens the argument (Lee, 2008; Melles, 2021) that technology-based community service activities will be more effective when users are involved as part of the design process.

Participatory Approach as a Key Factor for Sustainability

Active user participation from the early stages of development creates a sense of ownership of the system, which in turn encourages continued use after the community service program concludes. Furthermore, at SIKK, student and educator involvement in the prototype evaluation process makes users feel that the system is the result of collaboration rather than external intervention. In the context of migrant community education, this sense of ownership is crucial because program sustainability often depends on internal school initiatives. The literature on participatory design suggests that technologies developed in collaboration with communities have a greater chance of long-term adoption than systems introduced top-down (Steinke et al., 2022).

Implications for School Culture and Reporting Climate

The high user-perception scores in Table 2 not only reflect technical success but also indicate an early shift in the school's reporting culture. A transparent and documented system strengthens student trust in the school's efforts to address bullying. (Wessells, 2015) emphasizes that integrating technology into child protection strategies can support a preventive approach by expanding access to reporting and increasing accountability among educational institutions. However, the implementation at SIKK also demonstrates that technology cannot stand alone as a solution. Long-term success remains dependent on school policy support and consistent user support. Without integration with clear child protection policies, digital systems risk becoming mere administrative tools that fail to deliver a significant social impact significant (Andersen, 2024; Tregeagle & Darcy, 2007). Therefore, the development of information systems for community service activities should be understood as part of empowering the educational community as a whole, not solely as a technical innovation.

Conclusions

Community service activities conducted at the Indonesian School of Kota Kinabalu (SIKK) demonstrated that integrating a web-based bullying reporting system strengthened student protection mechanisms by improving access to reporting, enhancing transparency in handling, and improving the structure of case documentation. The system's implementation not only provided a technical solution but also encouraged changes in reporting practices within the school environment to make them more responsive and data-driven. User evaluation results showed high acceptance, indicating that the participatory development approach significantly influenced technology adoption in international community schools. Scientifically, this activity contributes to the development of information technology-based community service practices by positioning users as part of the system design process rather than simply as recipients of interventions. The integration of the Rapid Application Development (RAD) method in the community service context demonstrates that an iterative approach informed by user feedback can improve the system's suitability for field needs. Practically, the developed system has the potential to serve as a model for implementing digital reporting in Indonesian schools abroad with similar social and infrastructure characteristics.

Suggestions

Implementation findings indicate that the web-based reporting system has potential for further development as part of a data-driven student protection strategy. Further development could include integrating analytical features that enable schools to map trends in bullying cases longitudinally, supporting more contextually tailored preventive interventions. Furthermore, the system's continued use requires the support of internal school policies integrated with child protection practices, rather than relying solely on external support during community service activities. From a technological perspective, developing a mobile version of the application and strengthening data security measures could be strategic steps to increase accessibility while maintaining journalists' confidentiality in the context of cross-border community schools. Further studies are needed to evaluate the long-term impact of the system's use on changes in reporting culture and social dynamics within the school environment.

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Contribution

Kadek Ayu Puja Astuti served as the main conceptor of the activity, system designer, methodology compiler, and main author of the manuscript. Mohd. Mandala Putra contributed to coordinating program implementation at the Indonesian School of Kota Kinabalu (SIKK), validating user needs, and evaluating the implementation of community service activities. Murni played a role in facilitating implementation in the school environment, mentoring participants, collecting field data, and providing feedback on system use. Bhavya Joshi contributed to strengthening the conceptual framework by reviewing international literature, refining the academic substance, and editing the manuscript.

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