**Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat**
**LPPM-Universitas Muhammadiyah Tasikmalaya**
Volume: 9, Issue: 2, April, 2026; pp: 718-726
E-ISSN: 2614 - 8544

# Empowering Educators through Artificial Intelligence Training for Cyberbullying Prevention: A Community-Based Digital Literacy Initiative

*Putri Taqwa Prasetyaningrum[1, a)], Eka Aryani[1], Ozzi Suria[1], Salleh Amat[2]*

[1]Universitas Mercu Buana Yogyakarta, Yogyakarta, Indonesia
[2]University Kebangsaan Malaysia, Bangi, Malaysia

[a)]Corresponding author: putri@mercubuana-yogya.ac.id

## ABSTRACT

This community engagement initiative aimed to enhance educators' capacity to prevent cyberbullying through Artificial Intelligence (AI)-based training. A participatory action research approach was implemented involving 30 secondary school educators. The program consisted of a needs assessment, hybrid workshops, AI tool simulations, and mentoring support. Pre- and post-training assessments showed an increase in average scores from 54.3% to 85.7%, indicating substantial improvement in participants' conceptual understanding and readiness to implement AI-assisted preventive strategies. Qualitative feedback further revealed heightened awareness of digital ethics, student protection, and responsible AI use in school contexts. While the outcomes are promising, future work employing inferential testing and follow-up measurements is recommended to strengthen claims regarding effectiveness and sustainability.

## ARTICLE INFO

***Article History***:
*Submitted/Received: 06 February 2026*
*First Revised: 20 February 2026*
*Accepted: 20 April 2026*
*First Available online: 30 April 2026*
*Publication Date: 30 April 2026*

***Keyword*** :
Artificial Intelligence in Education
Cyberbullying Prevention
Digital Literacy Training
Teacher Professional Development
Community Engagement


https://doi.org/10.35568/abdimas.v9i2.7734

## INTRODUCTION

The integration of digital technology into educational settings has transformed the way students learn, communicate, and interact(Prasetyaningrum, Ibrahim, Suria, et al., 2025). While this transformation brings innovation and access to global knowledge, it also presents serious challenges—one of the most concerning being cyberbullying(Kim, 2024; Olweus, 2012). Unlike traditional bullying, cyberbullying transcends physical boundaries, occurring in virtual spaces where anonymity and constant connectivity increase the psychological impact on victims(Ghosh et al., 2025; Imam & Naz, 2024). According to recent global studies, nearly one in three students has experienced some form of cyberbullying, making it a critical issue that schools must urgently address (Lennox et al., 2021).

In the Indonesian context, the rapid expansion of students' online interactions has been accompanied by increased exposure to online risks, including harmful peer communication and digital harassment. Studies on Indonesian youth highlight that online opportunities often come together with online risks, underscoring the urgency of strengthening digital literacy and safeguarding capacity in schools. This condition underscores the need for educator-centered capacity-building so that teachers can respond early, apply preventive classroom strategies, and promote responsible digital citizenship in daily learning environments (Luthfia et al., 2021; Prasetyaningrum, Ibrahim, & Suria, 2025; Suria et al., 2025).

Cyberbullying can lead to severe emotional distress, decreased academic performance, school avoidance, and, in some cases, long-term mental health problems (Livingstone & Stoilova, 2021; Luthfia et al., 2021). Despite the prevalence of this issue, many educators remain ill-equipped to recognize, manage, or prevent digital harassment in their classrooms (Jamal, 2023; Lampou, 2023). This gap is largely due to the lack of targeted professional development in digital literacy, online safety, and the ethical use of technology in education (Varsik, 2022). Teachers are often the first line of defense against bullying, yet they are frequently left without the tools or knowledge to intervene effectively in online contexts (Milosevic, Collier, et al., 2023; Palermiti et al., 2022).

In response to this problem, emerging technologies—especially Artificial Intelligence (AI)—have begun to play a role in proactively identifying and preventing cyberbullying. AI can detect patterns in language, monitor digital platforms, and flag potentially harmful content in real-time. However, the effective use of such tools depends on educators' ability to understand, manage, and integrate them into their pedagogical practices (Sharma & Chatterjee, 2023; Tesfagergish & Damaševičius, 2024). AI is not a replacement for human judgment, but rather a powerful augmentation when used ethically and responsibly in education (Milosevic, Verma, et al., 2023).

Given this context, capacity-building programs for educators are essential. Community engagement through structured training can equip teachers with both technical and ethical competencies needed to prevent cyberbullying using AI applications. Such programs not only foster digital literacy but also encourage critical thinking, digital empathy, and awareness of children's rights in online spaces (Aryani et al., n.d.).

Although prior studies have widely examined AI for cyberbullying detection and monitoring, far fewer examine how educators are trained to interpret, ethically adopt, and operationalize AI-assisted prevention strategies in real school ecosystems. This gap is critical because teachers are often the first responders to bullying-related incidents, yet they may lack AI literacy and practical guidance for responsible implementation. Therefore, this article contributes by reporting the design and outcomes of a community-based, participatory AI training initiative for educators, emphasizing not only tool use but also digital ethics, child protection, and readiness for school-level adoption aligned with SDG 4.


https://doi.org/10.35568/abdimas.v9i2.7734

This program is informed by an integrated conceptual framework combining digital resilience, TPACK, and AI literacy. Digital resilience emphasizes educators' capacity to anticipate, respond to, and recover from online risks through informed and ethical practices. TPACK supports aligning technology use (AI tools), pedagogical strategies (preventive classroom management and counseling referral pathways), and content knowledge (cyberbullying forms, impacts, and legal/ethical considerations). AI literacy complements these by enabling educators to understand how AI systems flag content, recognize limitations (false positives/negatives), and apply human judgment to avoid over-reliance and potential surveillance harms. Together, these frameworks position AI as a supportive tool within a teacher-led safeguarding ecosystem rather than a substitute for professional judgment.

This community service initiative aims to bridge the gap between emerging technology and practical application in schools by providing training on AI-based tools for cyberbullying prevention. The program is designed to empower teachers with hands-on skills while simultaneously promoting ethical digital citizenship among educational stakeholders. This aligns directly with Sustainable Development Goal (SDG) 4, which promotes inclusive, equitable, and quality education and supports lifelong learning opportunities, especially in the era of digital transformation (UNESCO, 2023).

The present article describes the design, implementation, and outcomes of this training program, highlighting its impact on educators' awareness, digital skills, and readiness to combat cyberbullying through the informed and responsible use of AI technologies in school environments.

## METHOD

This community service activity employed a participatory action approach, focusing on empowering educators through structured training and direct engagement. The method was designed to ensure the active involvement of the target community (school teachers and educational personnel) in identifying problems, exploring technological solutions, and building digital competencies for cyberbullying prevention.

### Participants

The participants were 30 educators from both public and private schools at the junior and senior high school levels. Selection was coordinated with the local education office, with preference given to schools that had reported prior cases of online harassment or expressed interest in enhancing digital safety practices.

### Stages of Implementation

The activity was conducted in three stages over a period of one month:

- Stage 1: Needs Assessment and Coordination

A preliminary survey and interviews were conducted to assess teachers' understanding of cyberbullying and digital literacy. This also included mapping the schools' technological readiness.

- Stage 2: Training Program on AI Tools and Digital Literacy A hybrid (online and offline) training session was delivered using presentations, tutorials, live demonstrations, and simulations. The content included:
  - ✓ Introduction to cyberbullying: forms, impact, and signs


https://doi.org/10.35568/abdimas.v9i2.7734

- ✓ Digital ethics and child protection principles
- ✓ Introduction to AI tools for detecting harmful content (e.g., AI-powered content filters, monitoring bots)
- ✓ Hands-on use of AI simulations in classroom scenarios
- ✓ Discussion on limitations and ethical implications of AI in education

- Stage 3: Mentoring and Evaluation Post-training mentoring was conducted through WhatsApp groups and online consultation. An evaluation used pre- and post-tests to assess knowledge gain, and qualitative feedback was collected to identify areas for future improvement.

## Instrument and Scoring

A knowledge assessment was administered before and after the training. The instrument comprised 15 multiple-choice items covering (1) forms and impacts of cyberbullying, (2) legal and ethical aspects of digital interaction, and (3) functions and limitations of AI-based detection tools. Each correct response received 1 point, and incorrect responses received 0, resulting in a total score range of 0–15. Scores were converted into percentages for reporting (score/15 × 100), enabling comparison across pre- and post-tests.

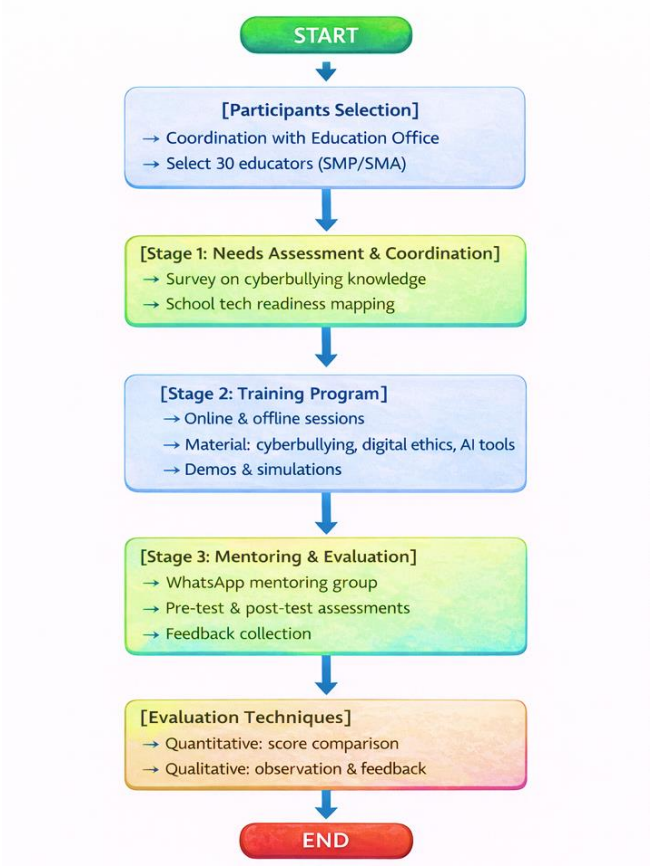


**FIGURE 1**. Community Service Activities

Figure 1. Community service activities conducted through AI-based training workshops, involving interactive sessions, group simulations, and mentoring support for educators in cyberbullying prevention.


https://doi.org/10.35568/abdimas.v9i2.7734

## Validity and Reliability

Content validity was established through expert review to ensure alignment with training objectives and school safeguarding contexts. The draft items were evaluated for clarity, relevance, and representativeness of constructs (cyberbullying knowledge, AI tool understanding, and digital ethics). Reliability analysis was planned using internal consistency estimation (Cronbach's alpha) on the pre-test dataset. (Insert alpha value once computed.)

## Data Analysis

Quantitative data were analyzed using descriptive statistics (means and percentage gains). To examine whether the observed pre–post improvement was statistically supported, a paired-samples t-test is recommended, alongside effect size estimation (e.g., Cohen's d) to assess practical magnitude. (Insert t, df, p-value, and d once computed from raw scores.) Qualitative feedback from observation notes and open-ended responses was summarized thematically to capture participants' perceived benefits, ethical concerns, and implementation barriers.

## Ethical Considerations

Permission to conduct the community engagement activity was obtained from the partner school. Participation was voluntary, and all educators provided informed consent prior to data collection. Participants were informed that they could withdraw at any time without any consequences. No personally identifying information was collected or disclosed; all results are reported in aggregate form to maintain confidentiality. All data were stored securely and accessed only by the research team for evaluation and reporting purposes. Formal ethical committee approval was not required for this minimal-risk training activity under the host institution's procedures; nevertheless, ethical principles of respect, confidentiality, and responsible data handling were applied throughout the program.

# RESULTS AND DISCUSSION

The implementation of this community service activity resulted in notable improvements in educators' understanding of cyberbullying, digital literacy, and the application of Artificial Intelligence (AI) tools in an educational setting. The results are presented in two categories: quantitative findings from pre- and post-tests, and qualitative insights from participant feedback and observation.

During the second stage, participants engaged in direct training sessions that included interactive demonstrations and group simulations. Teachers were encouraged to explore AI tools and discuss scenarios of cyberbullying cases based on their school experiences. Figure 2 shows a snapshot of the classroom-based implementation during the digital literacy and cyberbullying prevention training.


https://doi.org/10.35568/abdimas.v9i2.7734

**FIGURE 2**. Classroom implementation of AI-based digital literacy training with active student and teacher participation.

**FIGURE 3**. Community service team and students during the "Bully Buster" AI-based cyberbullying prevention program at SMPN 2 Godean.

Figure 3: The culmination of the community service activity, which involved distributing educational modules and tools for cyberbullying detection. The program, titled "Bully Buster", was implemented through training and simulation sessions with students and educators, promoting awareness, digital literacy, and the use of artificial intelligence in safe online behavior practices.

## Quantitative Results

A pre-test and post-test were administered to measure participants' knowledge and competencies regarding cyberbullying and AI applications. The test consisted of 15 multiple-choice questions focusing on:

- Types and impacts of cyberbullying
- Legal and ethical aspects of digital interaction
- Functions and limitations of AI-based detection tools. Table 1 below shows the comparison of average pre-test and post-test scores:

**TABLE 1**. Comparison of Pre-Test and Post-Test Average Scores of Participants

| Assessment Type | Average Score (%) |
|---|---|
| Pre-test | 54.3 |
| Post-test | 85.7 |


https://doi.org/10.35568/abdimas.v9i2.7734

There was a 31.4 percentage-point increase in average scores (from 54.3% to 85.7%), indicating a substantial improvement in participants' understanding and readiness to apply AI-assisted preventive approaches in school settings. This is consistent with previous findings where structured digital literacy programs increased teacher confidence in using educational technologies (OECD, 2022).

## Qualitative Insights

From observation during the training sessions and mentoring activities, several themes emerged:

- Increased Engagement: Teachers actively participated in group simulations and discussions. Many were curious about how AI could monitor language patterns or flag potentially harmful messages.
- Awareness of Ethical Use: Participants raised important questions about data privacy, surveillance, and the ethical limitations of using AI in classrooms. This shows a critical level of engagement and awareness, aligning with digital ethics principles (Alimisis & Batzogiannis, 2022).
- Adoption Potential: Some schools expressed interest in adopting AI tools, especially for internal use in student behavioral monitoring and digital counseling initiatives.
- Barriers Identified: Limited internet connectivity and lack of in-school IT support were reported as constraints, particularly in rural school contexts.

## Discussion

The results suggest that AI-based training for cyberbullying prevention has strong potential effectiveness, particularly when delivered through participatory, practice-oriented workshops and mentoring.

This aligns with the framework of digital resilience, which emphasizes the role of education in preparing teachers and students to navigate online risks responsibly (Bello-Bravo et al., 2023; Livingstone et al., 2019). Furthermore, the successful implementation of this program supports the notion that community service initiatives in higher education can contribute to SDG 4—ensuring inclusive and equitable quality education—by integrating technology, ethics, and community empowerment.

These findings also reinforce the value of continuous professional development (CPD) for teachers, particularly in emerging fields like AI and digital safety. With tailored training, mentoring support, and practical tools, educators are better prepared to create safer digital environments and respond proactively to cyber threats in school communities.

Regarding sustainability, implementation may depend on continued mentoring, school leadership support, and the availability of basic digital infrastructure. A practical pathway is to institutionalize the training outputs into school policies, counseling referral mechanisms, and periodic refreshers within teacher professional development cycles. Scalability may face challenges such as uneven internet connectivity, limited IT support, and varying levels of digital readiness across schools. Future initiatives could adopt a train-the-trainer model, enabling selected participants to mentor peers and reduce dependency on external facilitators. In terms of long-term outcomes, follow-up measurements (e.g., after 3–6 months) are needed to assess whether knowledge gains translate into consistent preventive practices, improved reporting pathways, and measurable reductions in cyberbullying incidents.


https://doi.org/10.35568/abdimas.v9i2.7734

## CONCLUSION

This community engagement initiative strengthened educators' capacity to address cyberbullying by integrating AI literacy, digital ethics, and practical simulations within a participatory training model. Participants' post-training scores increased substantially, and qualitative feedback indicated heightened awareness of responsible AI use, privacy considerations, and the importance of safeguarding-oriented digital citizenship in schools. Theoretically, this program supports the development of educator AI literacy and reinforces the role of pedagogically grounded technology integration (e.g., TPACK) in school safety interventions. From a policy perspective, the findings suggest that AI and digital safety content can be meaningfully embedded into continuous professional development (CPD) programs aligned with SDG 4. However, this work was limited by a relatively small sample size and the absence of long-term follow-up, which restricts generalizability and sustainability assessment. Future programs should expand participant coverage, incorporate inferential analysis of learning gains, and evaluate longer-term behavioral and institutional outcomes.

## ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to Universitas Mercu Buana Yogyakarta for institutional support and funding throughout the planning and implementation of this community engagement program. We also extend our heartfelt appreciation to Universiti Kebangsaan Malaysia (UKM) for valuable international collaboration and academic contributions to the development of the training modules. Special thanks are due to the local education office and partner schools for facilitation, as well as to participating teachers and education personnel for their enthusiastic engagement across all program stages.

## REFERENCES

Aryani, E., Amat, S., Prasetyaningrum, P. T., Hadi, A., & Nurbaiti, A. T. (n.d.). *Virtual Reality Therapy (VRT) Intervention In Guidance And Counseling Services To Create Violence-Free Schools*. Retrieved https://ijcsnet.id

Bello-Bravo, J., Medendorp, J. W., Lutomia, A. N., & Pittendrigh, B. R. (2023). *Gender, Digitization, and Resilience in International Development: Failing Forward*. Routledge.

Ghosh, R., Malhotra, M., & Kumar, N. (2025). Cyber Bullying in the Digital Age: Challenges, Impact, and Strategies for Prevention. In *Combating Cyberbullying With Generative AI* (pp. 151–180). IGI Global Scientific Publishing.

Imam, S. K., & Naz, T. (2024). Cyberbullying: Legal Challenges and Societal Impacts in the Digital Age. *Pakistan Social Sciences Review*, *8*(4), 392–407.

Jamal, A. (2023). The role of artificial intelligence (AI) in teacher education: Opportunities & challenges. *International Journal of Research and Analytical Reviews*, *10*(1), 139–146.

Kim, S. (2024). A conceptual framework for mobile-based cyberbullying-related youth suicide risk screening and intervention. *Journal of Human Behavior in the Social Environment*, 1–23.

Lampou, R. (2023). The integration of artificial intelligence in education: Opportunities and challenges. *Review of Artificial Intelligence in Education*, *4*, e15–e15.


https://doi.org/10.35568/abdimas.v9i2.7734

Lennox, J., Reuge, N., & Benavides, F. (2021). UNICEF's lessons learned from the education response to the COVID-19 crisis and reflections on the implications for education policy. *International Journal of Educational Development*, *85*, 102429.

Livingstone, S., & Stoilova, M. (2021). Using global evidence to benefit children's online opportunities and minimise risks. *Contemporary Social Science*.

Livingstone, S., Stoilova, M., & Nandagiri, R. (2019). *Children's data and privacy online: growing up in a digital age: an evidence review*.

Luthfia, A., Wibowo, D., Widyakusumastuti, M. A., & Angeline, M. (2021). The role of digital literacy on online opportunity and online risk in Indonesian youth. *Asian Journal for Public Opinion Research*, *9*(2), 142–160.

Milosevic, T., Collier, A., & Norman, J. O. (2023). Leveraging dignity theory to understand bullying, cyberbullying, and children's rights. *International Journal of Bullying Prevention*, *5*(2), 108–120.

Milosevic, T., Verma, K., Carter, M., Vigil, S., Laffan, D., Davis, B., & O'Higgins Norman, J. (2023). Effectiveness of artificial intelligence–based cyberbullying interventions from youth perspective. *Social Media+ Society*, *9*(1), 20563051221147324.

Olweus, D. (2012). Cyberbullying: An overrated phenomenon? *European Journal of Developmental Psychology*, *9*(5), 520–538.

Palermiti, A. L., Bartolo, M. G., Musso, P., Servidio, R., & Costabile, A. (2022). Self-esteem and adolescent bullying/cyberbullying and victimization/cybervictimization behaviours: A person-oriented approach. *Europe's Journal of Psychology*, *18*(3), 249.

Prasetyaningrum, P. T., Ibrahim, N., & Suria, O. (2025). PELATIHAN DESAIN GRAFIS DAN GAMIFIKASI UNTUK PENGEMBANGAN MEDIA PEMBELAJARAN INTERAKTIF. *JMM (Jurnal Masyarakat Mandiri)*, *9*(3), 2855–2864.

Prasetyaningrum, P. T., Ibrahim, N., Suria, O., Aryani, E., Surga, M. S. P., & Siregar, R. M. (2025). Innovation in Interactive Learning Media Based on Visual Design and Gamification to Enhance Student Engagement. *ABDIMAS: Jurnal Pengabdian Masyarakat*, *8*(3), 1319–1333.

Sharma, S., & Chatterjee, R. (2023). Combating Cyberbullying in Social Networks: An Artificial Intelligence Approach. In *Combatting Cyberbullying in Digital Media with Artificial Intelligence* (pp. 35–53). Chapman and Hall/CRC.

Suria, O., Prasetyaningrum, P. T., & Pratama, I. (2025). Digital transformation of population administration: Enhancing data accessibility in local communities. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, *10*(1).

Tesfagergish, S. G., & Damaševičius, R. (2024). Explainable Artificial Intelligence for Combating Cyberbullying. In K. K. Patel, K. C. Santosh, A. Patel, & A. Ghosh (Eds.), *Soft Computing and Its Engineering Applications* (pp. 54–67). Springer Nature Switzerland.

Varsik, S. (2022). *A snapshot of equity and inclusion in OECD education systems: Findings from the Strength through Diversity Policy Survey*.


https://doi.org/10.35568/abdimas.v9i2.7734