

## **Promoting Responsible Educational Technology Use to Support Student Achievement: A Community Outreach Program in West Aceh, Indonesia**

**Rahma Hidayati<sup>1\*</sup>, Khori Suci Maifianti<sup>2</sup>, Nellis Mardhiah<sup>3</sup>**

<sup>1</sup>Department of Communication Science, Faculty of Social and Political Sciences, Universitas Teuku Umar, Meulaboh, West Aceh, Indonesia

<sup>2</sup>Department of Agribusiness, Faculty of Agriculture, Universitas Teuku Umar, Meulaboh, West Aceh, Indonesia

<sup>3</sup>Department of State Administration Science, Faculty of Social and Political Sciences, Universitas Teuku Umar, Meulaboh, West Aceh, Indonesia

\*Corresponding Author: [rahmahidayati@utu.ac.id](mailto:rahmahidayati@utu.ac.id)

### **Abstract**

Rapid advances in information and communication technology (ICT) expand learning opportunities but may also reduce students' focus when used without guidance. This community outreach program aimed to strengthen students' and teachers' understanding of current educational technology trends and promote responsible use aligned with learning goals (with student achievement treated as a medium-term expected outcome). The program offers a low-cost, school-based model for improving digital literacy and supporting digital self-regulation through interactive dialogue and co-generated strategies for managing distraction. An incidental, one-day outreach activity was conducted at SMA Negeri 3 Meulaboh (West Aceh, Indonesia) on 24 November 2025. Delivery used three sessions (presentation, interactive discussion, and question-answer). Process evaluation applied implementation fidelity and structured reflection based on the official activity report. The activity was implemented as planned and was well received. A thematic synthesis of documented discussion/Q&A outputs identified four salient areas: technology as a learning resource, smartphone distraction, the need for guidance in tool selection, and practical self-control strategies (e.g., time management, reducing multitasking, and credibility checks). Dialogue-based micro-interventions on educational technology and digital self-regulation are feasible in school settings and can generate actionable strategies for students and teachers. Future iterations should add simple pre-post measures and follow-up monitoring to better link immediate learning-readiness outcomes to academic achievement.

**Keyword:** community engagement; digital literacy; educational technology; ICT in education; student achievement; secondary school

## **INTRODUCTION**

The integration of information and communication technology (ICT) into secondary education is accelerating worldwide, reshaping how teachers design instruction and how students access learning resources. International frameworks emphasize that technology use should be accompanied by teacher competence, pedagogy, and ethics so that ICT becomes a lever for learning rather than a distraction (UNESCO, 2018; OECD, 2015).

Evidence syntheses suggest that educational technology can improve learning outcomes when it is integrated with clear instructional design, feedback, and active learning. Meta-analyses report positive average effects of technology-supported learning and blended approaches, but also highlight large variation across contexts, designs, and implementation quality. (Means et al., 2010; Tamim et al., 2011; Cheung & Slavin, 2013). At the same time, large-scale assessments caution that simply increasing screen time or device availability does not guarantee achievement gains, particularly when students use devices for non-academic purposes (OECD, 2015).

Ubiquitous smartphone access introduces a specific challenge for schools: persistent multitasking and attention fragmentation during studying and classroom learning. Research links intensive phone and social media use with lower academic performance and increased task switching, while experimental studies show that multitasking on laptops can reduce comprehension for both the user and nearby peers. (Junco, 2012; Lepp et al., 2015; Rosen et al., 2013; Kuznekoff & Titsworth, 2013; Sana et al., 2013).

From a community engagement perspective, strengthening digital literacy is a capacity-building process: it equips learners with skills to access, evaluate, and use digital information responsibly while supporting personal agency and self-regulation. Digital literacy frameworks stress competencies beyond basic operation, including critical evaluation of information and safe participation in digital environments. (UNESCO Institute for Statistics, 2018; Ng, 2012; Ribble, 2015). Self-regulated learning theory further implies that students need strategies for goal setting, monitoring, and controlling attention to translate technology access into achievement. (Zimmerman, 2002). Such capacity building aligns with participatory approaches that move stakeholders from passive recipients toward more active roles in shaping learning practices. (Arnstein, 1969; Freire, 1970).

In the Indonesian school context, technology is increasingly present in teaching and learning, yet schools may still face uneven readiness and guidance for responsible use. Local studies report both opportunities and concerns related to technology adoption in education, including effects on learning outcomes and student behavior. (Jamun, 2018; Taopan et al., 2019; Kasingku et al., 2024). However, published evidence on short, school-based community outreach interventions—especially in rural and post-disaster regions such as West Aceh—remains limited. Therefore, this paper reports an incidental community outreach program conducted at SMA Negeri 3 Meulaboh and discusses practical lessons for promoting responsible educational technology use to support student achievement. (Hidayati, 2025). In this manuscript, “student achievement” is treated as a medium-term outcome; immediate outputs reported are awareness, digital literacy reflection, and self-regulation intentions.

In Indonesia, empirical and practice-oriented studies report both opportunities and risks of educational technology in schools, including positive associations with learning motivation and achievement as well as the potential for misuse and distraction (Ananda, 2017; Yasmin, 2024; Kristiawan, 2014). Recent school-level innovations also include the use of design tools for learning media (Prayetno et al., 2022) and early exposure to artificial intelligence applications (Hanila & Alghaffaru, 2023). In the partner school, teachers expressed concern that students' achievement had become harder to control amid intensified everyday technology use, motivating a short, dialogue-based outreach intervention (Hidayati, 2025).

## **METHOD**

This paper uses a community service reporting approach to describe an incidental outreach activity implemented by a university lecturer in collaboration with a partner school. The activity took place at SMA Negeri 3 Meulaboh, West Aceh, Indonesia, on 24 November 2025.

The target beneficiaries were senior high school students and accompanying teachers. The activity was coordinated by the school, which assigned available students and teacher companions to attend (a convenience group aligned with the scheduled session). An attendance list was not included in the official report; however, photo documentation in the report suggests approximately 50–60 students and 2–3 teachers were present in the classroom session (Hidayati, 2025).

The outreach followed a three-session protocol (presentation, interactive discussion, and Q&A) delivered within a single school day. Materials consisted of short slide content, facilitator prompts, and a brief wrap-up that translated discussion outputs into actionable strategies. Each session was delivered consecutively; in typical school settings, the sequence can be implemented in approximately 2–3 hours depending on class scheduling.

Because the activity was designed as outreach (not as a research study), evaluation focused on process indicators. For this manuscript, the documented reflections in the official activity report were organized into thematic categories aligned with digital literacy and self-regulated learning concepts to transparently report immediate outputs (implementation fidelity, engagement, and stated strategies) and avoid over-claiming academic performance effects (Hidayati, 2025).

The activity was conducted with the partner school's approval as an educational session. No personal-identifiable data were collected, and reporting is limited to aggregated observations from the official report. Photo documentation in the report was used for institutional accountability and is not analyzed at the individual level (Hidayati, 2025).

## **RESULTS AND DISCUSSION**

As shown in Table 1, the outreach activity followed the planned sequence of presentation, discussion, and Q&A. The outreach activity was delivered according to the planned sequence of presentation, discussion, and Q&A. Coordination with the partner school enabled the activity to be conducted within a single school day, and the school

provided facilities and access to students. During implementation, participants showed high enthusiasm, actively responded to prompts, and asked questions related to everyday technology practices in learning and outside the classroom. (Hidayati, 2025).

**Table 1. Program structure and observed outputs**

<b>Phase</b>	<b>Main activities</b>	<b>Output/indicator (process evaluation)</b>
Coordination & preparation	Confirm partner school needs, schedule, and venue; prepare short slides and discussion prompts; arrange simple learning materials.	Activity readiness; agreed schedule; materials available.
Session 1: Awareness raising	Presentation on educational technology trends, opportunities for learning, and risks of uncontrolled use; examples of learning-oriented practices.	Participants identify differences between learning use and non-learning use; initial reflections shared.
Session 2: Interactive discussion	Facilitated dialogue on students' daily technology habits; mapping perceived benefits and challenges.	Themes emerge (technology as necessity; difficulty to avoid; distraction risk).
Session 3: Q&A and commitments	Open Q&A; clarification of key concepts; co-creation of self-control strategies (time management, reducing multitasking, credibility checks).	Participants propose practical strategies and commitments; evidence of understanding through answers.
Follow-up recommendations	Summarize key points and propose school-level follow-up (periodic training; blended pedagogy; parent–teacher coordination).	Draft action ideas for future programs and school policy discussion.

Source: Hidayati (2025)

Key discussion and Q&A outputs were synthesized into four thematic areas (Table 2). The themes reflect immediate learning-readiness outcomes (awareness and self-regulation intentions) rather than measured academic achievement.

**Table 2. Thematic synthesis of discussion/Q&A outputs and implications**

Theme	Indicative evidence (documented)	Immediate output	Practical implication
Technology as a learning resource	Students emphasized faster access to information, examples, and multimedia resources that support understanding.	Awareness of learning-oriented ICT use.	Embed ICT use in structured tasks and feedback (blended learning).
Smartphone distraction and multitasking	Students described smartphones/social media as difficult to avoid and influencing daily routines.	Recognition of distraction patterns and risks.	Promote attention-management routines (single-tasking; notification control).
Guidance in tool selection and boundaries	Discussion highlighted the need for teacher guidance in selecting tools and setting classroom boundaries.	Shared norms for responsible use.	Align tool choice with pedagogy and agreed rules (e.g., focus mode/phone parking).
Self-control strategies and commitments	Participants proposed time management, reducing multitasking, and credibility checks for online information.	Co-generated strategy list.	Translate strategies into school routines and home-school coordination.

Source: Hidayati (2025), thematic synthesis by authors.

Co-generated self-control strategies (illustrative):

- Set a clear learning goal before opening a device/app.
- Use time-boxing (e.g., 25–30 minute focus blocks) and schedule short breaks.
- Reduce multitasking: study with one app/tab at a time.
- Disable non-essential notifications during study and class.
- Verify online information using credible sources and cross-checking.
- Prefer learning-oriented platforms (e.g., LMS, e-books, educational videos) over social media during study time.
- Agree on simple classroom norms (phone parking/focus mode) and align expectations with parents.

A dominant theme from discussion was that students view technology as a daily necessity but perceive it as difficult to avoid, particularly smartphones and social media. This perception is consistent with the broader literature on media multitasking and academic distraction, where students often struggle to control attention in the presence of digital notifications and concurrent tasks. (Rosen et al., 2013; Kuznekoff & Titsworth, 2013; Sana et al., 2013).

Participants also recognized the benefits of technology for learning, especially faster access to information, examples, and multimedia resources that can support understanding. This aligns with evidence from meta-analyses showing that technology-supported learning tends to produce better outcomes when it is intentionally connected to pedagogy and active learning processes. (Tamim et al., 2011; Means et al., 2010; Garrison & Kanuka, 2004; Graham, 2006).

At the level of teacher practice, the discussion highlighted the need for guidance in selecting tools, designing learning activities, and setting boundaries for technology use during lessons. This points to the relevance of teacher competency frameworks and integrative knowledge models such as TPACK, which emphasize the intersection of technology, pedagogy, and content knowledge. (UNESCO, 2018; Mishra & Koehler, 2006). In addition, students' willingness to adopt recommended strategies can be understood through technology acceptance constructs (perceived usefulness and perceived ease of use), suggesting that school policies should be practical and co-designed with learners. (Davis, 1989; Venkatesh et al., 2003). Teacher professional development is also critical for sustained classroom integration (Tondeur et al., 2012).

From a community empowerment perspective, the outreach used dialogue rather than one-way lecturing to encourage participants to reflect on their own practices and co-generate solutions. Such dialogic approaches support agency, which is essential for self-regulated technology behaviors related to attention control and time management. (Freire, 1970; Zimmerman, 2002). However, structural issues such as unequal access, differences in home supervision, and varying digital skills can still shape how technology affects learning, highlighting the importance of considering the digital divide in follow-up programming. (van Dijk, 2006).

Compared with typical one-way "socialization" sessions, this engagement was designed as a dialogue-based micro-intervention that (i) explicitly frames technology use through digital self-regulation, (ii) elicits students' lived experiences of distraction, and (iii) co-generates practical strategies that can be institutionalized by the school through teacher guidance and parent coordination (Freire, 1970; Zimmerman, 2002).

While the outreach achieved strong engagement, the evaluation was limited to process indicators and immediate responses during the session. Future community service programs could incorporate simple pre–post measures of digital literacy or self-regulation, follow-up monitoring of classroom practices, and stronger involvement of parents to support consistent norms for responsible technology use. (UNESCO Institute for Statistics, 2018; Ribble, 2015).

### **Limitations**

This manuscript reports a one-day outreach program and relies on process indicators documented in the official activity report. No validated pre–post instruments or follow-up academic indicators (e.g., grades, attendance, homework completion) were collected; therefore, effects on student achievement cannot be empirically established within this report. Future programs should incorporate brief questionnaires and teacher-reported follow-up indicators to strengthen outcome claims.

### **CONCLUSION**

This community outreach program demonstrated that a short, dialogue-based intervention can raise awareness of both the opportunities and risks of educational technology among secondary school stakeholders. Participants were able to articulate learning-oriented benefits of ICT and identify common distraction patterns, indicating that structured conversation can foster reflective and self-regulated use. (Hidayati, 2025; Zimmerman, 2002). The novelty lies in using a dialogue-based micro-intervention to co-

produce self-control strategies with students, linking digital literacy to self-regulated learning.

To sustain impact, schools are encouraged to institutionalize periodic digital literacy sessions, strengthen teacher capacity for blended pedagogy, and coordinate expectations between teachers and parents regarding smartphone use for learning. (UNESCO, 2018; Ribble, 2015). The program's practical benefit is a set of implementable norms and strategies for the partner school; theoretically, it supports the view that agency-building and self-regulation are key mechanisms that connect ICT access to learning outcomes. A follow-up cycle (teacher training, parent briefing, and simple monitoring) is recommended to institutionalize the approach.

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