



Cybergogy-Based Training for Enhancing Digital Literacy to Support Indonesia's Golden Generation 2045 at The Aisiyah Community, Bangkalan Regency

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Abstract: This community service program aims to enhance digital literacy among members of the Aisiyah Community in Burneh Subdistrict and to support the realization of Indonesia's Golden Generation 2045. The program was designed to equip participants with knowledge and skills in utilizing digital technology through a cybergogy-based learning approach. The implementation methods included planning, introduction, digital literacy training, collaborative practice, evaluation, and sustainable follow-up. A total of 37 community members participated, representing diverse backgrounds such as homemakers, entrepreneurs, and teachers. Evaluation instruments consisted of a pretest, a posttest, and a questionnaire administered via Google Forms. Statistical analysis revealed a significant difference between pretest and posttest scores (Asymp. Sig. < 0.05). The average N-Gain score of 0.62 (moderate category) indicated an improvement in participants' understanding. Participant responses were also positive, with an average Likert scale score of 3.25, reflecting tangible benefits from the training. A key success factor was the use of Smart TV media, which enabled facilitators to deliver content more interactively and engagingly. Additionally, the provision of rewards helped boost participant motivation. A follow-up impact of the program was the establishment of a smart classroom at TK ABA 4, serving as a sustainable outcome of the training. Overall, this community service activity effectively enhanced digital skills, learning motivation, and community engagement, while serving as a strategic model for integrating technology into community-based education in the digital era.

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Introduction

The rapid advancement of technology has impacted all sectors, penetrating various aspects of life such as communication, economy, education, and more (Christman et al., 2024). One of the positive effects of this development is the acceleration of civilization and the increasing ease of life, particularly in accessing and retrieving the information we need. However, alongside these benefits, there are also negative consequences. For instance, technological progress has intensified competition and reduced job opportunities, as certain roles have been replaced by automation (ÖRS et al., 2020).

In the field of education, technological advancement brings both positive and negative impacts. On the positive side, it has expanded learning resources for both teachers and students. They can now access a wide range of knowledge anytime and anywhere, in various



formats such as text (e.g., PDF books), images, simulations, videos, and more (Valverde-Berrocso et al., 2022). On the other hand, technology also poses challenges, such as declining student interest in learning. This is partly because technology is often used for entertainment rather than educational purposes for example, students spending more time on social media or gaming.

To ensure that the benefits of technological progress outweigh its drawbacks, it is essential to provide education and training for all technology users (Timotheou et al., 2023). Technology is now utilized across all levels of education, from early childhood (kindergarten), elementary school, junior high school, senior high school, undergraduate (S1), to postgraduate studies (S2 & S3) (Naveed et al., 2023). Schools serve as structured and continuous environments for instilling positive habits, beginning with early childhood education. High-quality kindergarten education lays the foundation for subsequent educational stages (von Suchodoletz et al., 2023).

Kindergarten education cannot be separated from parental influence, which is reflected in their active role in accompanying children at home. Given the importance of parental involvement, parents must be able to adapt to current technological developments (Horm et al., 2022).

Burneh Subdistrict, located near the Suramadu access point, is one of the development centers in Bangkalan Regency. Therefore, the quality of education must be prioritized, starting from early childhood education. One institution focused on improving educational quality is the Aisyiyah community. The Aisyiyah community is a collaboration between the parents of TK ABA 4 students and the teaching staff, aimed at supporting holistic community-based education. Its core activities include religious study sessions, skill training, group exercise, and family development through the Bina Keluarga Remaja (BKR) program. The BKR program provides insights into effective parenting and helps parents understand their children's emotional needs. However, several challenges persist, including uneven parental involvement, limited resources, complex time management, the relevance of skill programs, alignment with children's educational needs, and limited facilitator knowledge.

To address these issues, the PKM team will offer educational outreach using a cybergogy approach. This method leverages digital technology and the internet to create interactive and adaptive learning experiences (Nurlaela et al., 2025). The cybergogy approach is particularly suitable as it directly addresses the community's need for practical digital skills. Its methodology ensures that participants learn by actively engaging with and utilising digital technology as the primary mode of learning, rather than just passively receiving information (Asad & Malik, 2023). In addition to training, the team will provide a Smart TV to support the establishment of a smart classroom. The primary objective of this program is not only to enhance the immediate efficiency and effectiveness of community activities but also to establish a sustainable foundation for ongoing learning and innovation (Izadpanah, 2024). By enhancing digital literacy, this program directly supports the national ambition to cultivate the adaptable and tech-savvy human capital required for Indonesia's Golden Generation 2045.

Method

The stages used in the cybergogy training that we will implement to address the challenges faced by our partners have been discussed with the PKM team and are divided into the following phases:

A. Planning



- Identifying participants' needs related to digital technology
- Developing cybergogy-based materials and curriculum (Ajiban, 2024)

B. Introduction

- Introducing the concept of cybergogy and the importance of digital technology in education and community development

C. Digital Literacy Training

- Providing technology literacy training, including:
- Introduction to digital platforms such as collaboration apps and social media
- Teaching basic virtual communication skills

D. Collaborative Practice

- Simulating the use of digital platforms for online discussions and collaborative projects
- Practicing information and knowledge sharing through digital media
- Contextual simulation activities, such as guiding participants to fill out questionnaires and complete assignments using Google Forms

E. Evaluation and Reflection

- Assessing participants' understanding and skills through observation and feedback (Hidayatullah et al., 2024)
- Conducting reflective discussions on the benefits and challenges of technology implementation
- Before the digital literacy training, participants are given a pretest; after the training, a posttest is administered
- Additionally, participants complete a questionnaire all three evaluation instruments are delivered via Google Forms
- Pretest and posttest data are analysed using a Wilcoxon signed-rank test to determine the significance of the learning improvement. In contrast, questionnaire results are analysed using a Likert scale to measure participants' perceptions and satisfaction levels regarding the training

F. Sustainable Implementation

- Encouraging the application of acquired skills in the community's routine activities
- Developing a technology-based work plan for sustainable community development
- As part of this stage, the PKM team provides a Smart TV to support the creation of a smart classroom within the community.

The training targeted 37 members of the Aisyiyah community and was conducted offline on July 20, 2025. The program was delivered by facilitators from the PKM team using a direct interaction method supported by PowerPoint media. The single session lasted approximately 170 minutes, structured as follows: a 15-minute pretest, a 120-minute presentation of core material, a 20-minute question-and-answer session, and a 15-minute posttest. The core topics covered are practical digital literacy skills, including an introduction to collaboration apps, the use of social media for community development, and practising data collection using Google Forms.

Results and Discussion

The activities within the Aisyiyah community began with cybergogy training for its members. The training commenced with a pretest consisting of 20 multiple-choice questions, each with four answer options. Participants were given 15 minutes to complete the test. This



was followed by the core session, which included a 120-minute presentation of the training material and a 20-minute Q&A session.



Figure 1. Cyber Gogic Training

After the Q&A, participants were given a posttest containing the same questions as the pretest. However, in the posttest, participants received feedback on the correct answers and their final scores. The duration for completing the posttest was also 15 minutes. Upon completion, participants were asked to fill out a questionnaire prepared by the PKM team. During the training, the facilitator used a direct interaction method supported by PowerPoint media. This approach was chosen to ensure the material could be delivered clearly and directly. The decision was based on data gathered during the planning and introduction stages, which showed that the participants aged between 35 and 50 years came from various professions, including housewives, entrepreneurs, and teachers. To enhance motivation during the training and while completing the pretest and posttest, the PKM team implemented a reward system. Participants who achieved the highest posttest scores received a reward. Since most participants were women, the reward was given in the form of ShopeePay vouchers.

Table 1. Test Statistic

	Score_pretest_posttest
Mann-Whitney U	89,000
Wilcoxon W	792,000
Z	-6,464
Asymp. Sig. (2-tailed)	0,000

Table 1 indicates that the Asymp. Sig. (2-tailed) The score is 0.000, which is below the threshold of 0.05 (<0.05), suggesting a significant difference between the pretest and posttest scores of the training participants (Ben Ouahi et al., 2021).

Table 2. Descriptive N Gain Score

	N	Mean	Std. Deviation
ngain	37	0,6203	0,21951
ngain100	37	62,0286	21,95095
Valid N (listwise)	37		

Table 2 shows that the mean N-Gain score is 0.6203, which falls into the moderate category. Similarly, the 100% N-Gain score is 62.0286, also classified as moderate. This indicates that the media used in the training has a moderate effectiveness in enhancing participants' understanding (Coletta & Steinert, 2020).

Table 3. Training Participant Response Results

Questions	Total
The training material was easy to understand.	3,24
The training broadened my knowledge of digital learning.	3,22
The instructor delivered the material clearly and engagingly.	3,14
I understand the cyberlogic method after attending the training.	3,08



Questions	Total
This training is useful for implementing in my child's learning at home.	3,11
I feel motivated to play a more active role in my child's learning.	3,11
The training time was appropriate and sufficient.	3,30
I feel this training improved my understanding of the role of parents.	3,14
This training provides practical solutions for assisting children in learning.	3,24
I would like to participate in further training on a similar topic.	3,86

Likert scale for training participant responses:

1 = Disagree, 2 = Somewhat Disagree, 3 = Agree, 4 = Strongly Agree

Based on the data presented in Table 3, the average score for Question 1 is 3.24, indicating that respondents generally agreed that the training material was easy to understand. Question 2 received an average score of 3.22, suggesting that participants agreed the training broadened their understanding of digital learning. Question 3 scored an average of 3.14, showing agreement that the facilitator delivered the material clearly and engagingly. Question 4 had an average score of 3.08, indicating that participants agreed they understood the cybergogy method after the training.

Question 5 received an average score of 3.11, reflecting agreement that the training was beneficial for supporting children's learning at home. Question 6 also scored 3.11, showing that participants felt motivated to take a more active role in their children's education. Question 7 had the highest average score of 3.30, indicating strong agreement that the training duration was appropriate. Question 8 scored 3.14, reinforcing that the training time was considered sufficient. Question 9 received an average score of 3.24, suggesting that participants agreed the training provided practical solutions for assisting children in learning. Lastly, Question 10 also scored 3.24, indicating that participants were interested in attending future training sessions on similar topics.

These results demonstrate that the training had a positive impact on participants' knowledge and understanding. This is supported by the statistical findings in Table 1, which confirmed a statistically significant improvement between the pretest and posttest scores (Wilcoxon test, $p < .001$). Furthermore, both the N-Gain and 100% N-Gain scores fall within the moderate category, and the average participant response score of 3.25 indicates a generally positive experience.

One contributing factor to this positive impact was the use of a Smart TV during the training, which helped participants better understand the material (da Silva Klehm et al., 2022). The PowerPoint presentation prepared by the PKM team featured high-quality visuals and attractive color schemes, which made the content more engaging. This visual appeal helped create a pleasant learning atmosphere, motivating participants to stay engaged throughout the session. Moreover, when learners feel emotionally positive, knowledge tends to be absorbed more effectively (Yin et al., 2024).



Figure 2. Smart TV Handover



At the end of the training session, a Smart TV was officially handed over to the leadership of the Aisyiyah community. The handover was conducted by the head of the PKM team and received by the chairperson of the Aisyiyah community in Burneh Subdistrict. This gesture was met with a positive response from the community. As expressed by the chairperson, the Smart TV media is expected to enhance the efficiency and effectiveness of community activities and motivate members to continue learning and innovating in the digital era.



Figure 3. Smart Class Room

One of the indicators of increased effectiveness and innovation is the establishment of a smart classroom by the Aisyiyah community at TK ABA 4. The objectives of creating this smart classroom include fostering and instilling digital literacy from an early age, as well as enhancing the efficiency and effectiveness of all activities conducted through the smart classroom.

The establishment of the smart classroom by the Aisyiyah community serves as the primary reflective implication of this program. This finding implies that the cybergogy-based training successfully evolved beyond a one-time knowledge transfer event into a sustainable, community-owned initiative. This transition from mere participation to active empowerment is critical; it demonstrates that the community not only acquired digital skills (as shown by the N-Gain score) but also internalised the motivation to innovate independently. This outcome aligns with studies on community development, which argue that the accurate measure of success is not the initial training but the community's capacity to sustain and build upon the intervention autonomously (Dushkova & Ivlieva, 2024). Therefore, this smart classroom acts as a tangible model for how targeted digital literacy interventions can be a catalyst for creating permanent educational infrastructures, directly supporting the long-term vision of developing self-sufficient, tech-savvy human capital for Indonesia's Golden Generation 2045 (Samala et al., 2024).

Conclusion

Based on the results and discussion, it can be concluded that the cybergogy training for the Aisyiyah community was successfully implemented as planned. The program led to increased efficiency and effectiveness in community activities, and motivated members to continue learning and innovating in the digital era. This impact is reflected in the improvement of participants' posttest scores compared to their pretest scores, as well as in the questionnaire responses, which showed agreement across key indicators. Furthermore, the establishment of a smart classroom by the Aisyiyah community at TK ABA 4 serves as tangible evidence of the training's positive outcomes.



Recommendation

Based on the results and discussion, it is recommended that digital literacy programs within the Aisiyiah community be continued in a structured and sustainable manner. The use of interactive media such as Smart TVs has proven effective in enhancing participants' understanding and should therefore be consistently integrated into community learning activities. Furthermore, the smart classroom model established at TK ABA 4 can serve as a replicable example for other educational institutions to promote early digital literacy. To support the sustainability of the program, it is essential to improve the capacity of facilitators so they can deliver cybergogy-based materials in a contextual and participant-centered manner. Regular monitoring and evaluation are also advised to assess the long-term impact of the training, both in terms of knowledge improvement and the practical application of technology in daily community activities.

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