

Optimizing the Anticipation of Problematic Gadget Use in Children by Utilizing Artificial Intelligence Technology at SMPN 23 Bekasi City

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ABSTRACT

The objective of this community service (Pengabdian kepada Masyarakat - PKM) program was to increase awareness of problematic gadget use and optimize the role of teachers in educating students to use gadgets productively. The program was implemented from July to September 2025, targeting 20 students, 10 teachers, and 20 students' parents. To achieve its goals, the PKM team employed several strategies, including engaging 20 students' parents in prevention and management efforts, providing counseling services for students exhibiting problematic gadget use, enhancing the IT skills of teachers and students, and establishing a healthy digital community within the school environment. Healthy gadget use in this context is defined as limited screen time, adherence to rules such as the 20-20-20 rule, and balancing usage with physical activities and direct social interaction. Conversely, negative gadget use refers to excessive usage that causes various problems, whether mental, physical, or academic. Based on an evaluation conducted through pre-test and post-test questionnaires administered before and after the program, the students' level of Problematic Gadget Use (PGU) was significantly reduced. The measurement tool used was a standardized questionnaire previously validated and found reliable (with a Cronbach's Alpha of 0.886) in a similar population, ensuring data accuracy. Before the PKM, the average PGU score for SMP Negeri 23 students was at a moderate level. Before the training, the students' negative gadget use level was 53.86%, and afterward, it dropped to 29.67%, placing it in the low category. Regarding the level of understanding among teachers and students concerning Artificial Intelligence (AI) technology, the average pre-test score was 56.80%, categorized as moderate. This score increased to 86.36% post-PKM, reaching the high category. For the aspect of teachers' understanding regarding the anticipation of problematic gadget use, the average pre-test score was 44.53% (moderate category), which increased significantly to 82.80% (high category) after the program implementation.

ARTICLE INFO

Article History:

Submitted/Received: 23 Sept. 2025

First Revised: 23 October 2025

Accepted: 30 October 2025

First Available online: 31 October 2025

Publication Date: 31 October 2025

Keyword:

Problematic Gadget Use

Technology Utilization

Artificial Intelligence Technology

INTRODUCTION

The rapid development of digital technology has a significant impact on daily life. Consequently, efforts to manage and prevent problematic gadget use (PGU) have become increasingly vital (Ulfah, 2020). Gadget usage is now widespread across nearly all global societies and encompasses many levels, including the school environment (Andini et al., 2023; Utaminingsih, 2006). In the context of this program, healthy gadget use is defined as technology utilization that is limited, goal-oriented, and balanced with physical activity and direct social interaction, including the implementation of screen-time rules like the 20-20-20 principle (Handayani, 2020). Conversely, negative or problematic gadget use refers to patterns of excessive usage that significantly interfere with daily functioning, encompassing mental, physical, and academic aspects (Goenawan, 2025). The literature indicates that excessive gadget use has a significant correlation with an increased risk of sleep disorders, stress, and anxiety symptoms in adolescents (Hasanah, 2017; Karuniawan & Cahyanti, 2014; Iryadi et al., 2024).

Furthermore, uncontrolled gadget use can negatively affect student productivity both at school and at home. Students who frequently engage in unproductive activities, such as browsing social media or playing games, may experience decreased academic performance and concentration (Kristiwati et al., 2019). Gadget dependency also has the potential to erode the quality of face-to-face social interaction as students' focus shifts to their devices, which can affect relationships with family and peers (Nurhayati, 2023). Therefore, anticipating problematic gadget use is crucial for promoting balanced technology utilization and safeguarding students' overall mental and physical health.

Artificial Intelligence (AI) technology offers innovative diagnostic and intervention tools for anticipating Problematic Gadget Use (PGU) in children. The primary role of AI lies in analyzing behavioral patterns and monitoring gadget usage in real-time. Furthermore, AI systems can personalize content recommendations geared toward developing skills and knowledge. AI also has the potential to be used to develop applications that promote physical activity and creativity, serving as a counter-program to excessive usage. With proper utilization, AI can help optimize screen time into a more structured learning experience (Fahmiah and Khasanah, 2018).

In the context of this Community Service (PKM) program, the sustainability strategy involves the establishment of a graphic design enthusiast community organized through a WhatsApp group. The use of WhatsApp aligns with Khasanah's research, which highlights the importance of WhatsApp in the teaching and learning process, as its various features facilitate the collection of assignments. The massive use of WhatsApp in schools, including among teachers and students at SMK Dharma Bhakti Kota Tangerang, necessitates an increase in supporting facilities for using WhatsApp as a learning medium, such as laptops, LCDs, and speakers in classrooms, to ensure optimal functionality (Khasanah, Nasan, Edy, & Jus'aini, 2021).

We have also studied Khasanah's research on the Utilization of Quizizz Media intended to engage students in more productive activities using their gadgets. The study stated that "This study's results have implications for choosing Quizizz media and the relationship between learning media interactions with students' learning independence" (Khasanah & Lestari, 2021). Similarly, in this Community Service activity, we formed a Graphic Design Community with various activities, all coordinated through the WhatsApp group.

Based on educational concepts and the superiority of utilizing Artificial Intelligence in education, particularly for improving learning quality, SMP Negeri 23 can leverage AI in its learning process. At SMP Negeri 23, Bekasi City, problematic gadget use is prevalent. This is evidenced by an interview with

the school principal, Ibu Ruslina, M.Pd., who stated that students at SMP Negeri 23 find it very difficult to put down their gadgets, even during classroom learning activities. If this is not anticipated, it significantly disrupts the learning atmosphere because students struggle to concentrate. Additionally, students find it difficult to interact with their surroundings due to excessive focus on their gadgets. Therefore, it is crucial to address problematic gadget use at SMP Negeri 23, Bekasi City. The issue of problematic gadget use at SMP Negeri 23, Bekasi City, is an escalating concern due to its impact on the quality of learning, mental health, and social interaction among students.

The interview findings above are reinforced by a survey we conducted with 120 students at SMP Negeri 23 Bekasi. The results indicate that SMP Negeri 23 students experience problematic gadget use at moderate to high levels. This is reflected in the average student PGU score of 53.86%. Furthermore, 12.5% of the 120 students across grades 7, 8, and 9 exhibit a high level of PGU, while 87.5% experience a moderate level. More detailed data can be seen in Figure 1.

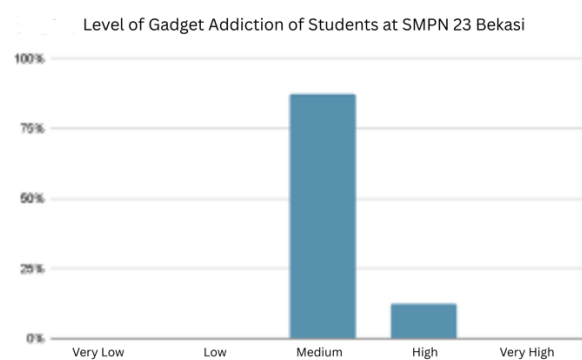


FIGURE 1. Level of Gadget Addiction of Students at SMPN 23 Bekasi

Another major issue identified is the suboptimal utilization of gadgets by teachers in the learning process. Survey results indicate that 52.1% of students reported that their habit of using smartphones caused them to forget scheduled tasks. Additionally, 45.17% of students stated that their smartphone made it difficult for them to concentrate on homework.

Another key problem at the partner location is the absence of an IT community focused on productive activities that could serve as an anticipation strategy against Problematic Gadget Use (PGU). Productive activities are necessary as alternative ways for students to utilize their gadgets and develop specific essential skills. The role of parents in controlling gadget use at home and school is also currently suboptimal. A survey at SMP Negeri 23 revealed that 50% of students were happier with their smartphone than with others, including spending time with their parents at home.

Furthermore, the school's IT Teacher is not optimally utilized to train students and teachers to create digital technology products that foster self-development and creativity. This is crucial given that 61.83% of students reported that the presence of a smartphone made them impatient when learning material was provided by the teacher.

The objectives of this Community Service (PKM) program are: (1) To enhance understanding and build awareness of the risks associated with excessive gadget use at SMP Negeri 23 Kota Bekasi; (2) To optimize the role of teachers in educating students about healthy gadget use and providing beneficial, productive activities. This is implemented through training to enhance teachers' mastery of Artificial Intelligence (AI) technology in learning; (3) To establish an IT Community that will facilitate students and teachers in improving their technology skills. These objectives will be realized through meticulous preparation by the implementing team from Universitas Islam As-Syafi'iyah Jakarta, consisting of 3

lecturers and 2 students.

To achieve the program's goals, several strategies were executed: engaging teachers relevant to the expertise areas at the partner school, involving 20 students' parents in efforts to prevent and manage students' Problematic Gadget Use, providing counseling services for students identified with Problematic Gadget Use, improving the IT skills of both teachers and students, and establishing a healthy digital school community.

The 10 teachers at SMPN 23 Bekasi were initially equipped with knowledge by participating in a Seminar on Education and Training planned by the implementing team, covering 7 activities. Subsequently, selected students identified with Problematic Gadget Use (20 students in total) were involved in extracurricular activities and received more intense classroom interaction.

Parents and teachers participated in an Education Seminar with the theme, "Anticipating Problematic Gadget Use in Children as an Effort to Optimize Child Intelligence." This seminar aimed to broaden their knowledge, increase awareness of student mentoring, and encourage students to participate in various school-provided extracurricular activities and youth development communities.

Counseling services were provided for students with Problematic Gadget Use, featuring experts in the counseling field. Students were also intensively monitored by the school's Guidance and Counseling (BK) Teacher regarding their gadget usage at school. The target for this activity was for 100% of the students to be served and to reduce their over-reliance on gadgets.

To enhance the IT skills of teachers and students, training was conducted for the target groups (10 teachers and 20 students) over 8 sessions, lasting 4 hours per session. The program aimed for 100% of participants to be proficient in utilizing various applications and creating learning products with the assistance of Artificial Intelligence (AI) technology.

METHOD

The location for this community service (Pengabdian kepada Masyarakat - PKM) program was SMP Negeri 23, Bekasi City. The site selection was based on observation, interviews, and questionnaire results, which indicated that students at SMPN 23, Bekasi City, exhibited Problematic Gadget Use (PGU) at moderate to high levels. The PKM was carried out from July 2025 to September 2025, which included preparation, implementation, and evaluation phases. The target participants for this community service were 20 students, 10 teachers, and 20 students' parents. The participating students were specifically selected based on having the highest negative gadget use scores (high category). This targeted approach aimed to optimize the effort to reduce the students' level of problematic gadget use.

Preparation Stage

The service team from the Faculty of Teacher Training and Education (FKIP) at Universitas Islam As-Syafi'iyah Jakarta conducted an initial Situation Analysis and Coordination by communicating and discussing the program with the Principal of SMP Negeri 23, Bekasi City.

Implementation Stage

This stage involved preparing the participants, venue, and materials. Participants were determined by the school, consisting of 20 students and 10 teachers. The activities took place in one of the classrooms.

The program was delivered using a socialization and training method, which included presentations and question-and-answer sessions. The overarching goal was to optimize the learning process at the school. The activities were conducted by a team of three lecturers with diverse academic backgrounds: one specializing in the Master of Educational Technology, one in Guidance and Counseling (FKIP), and one in Educational Management.

Evaluation Stage

In the final stage, the team evaluated to measure the students' comprehension and knowledge improvement after participating in the activities. Evaluation involved direct practical application, where students were asked to practice using the prepared tools. As an appreciation, the team provided door prizes to students who completed the practical tasks correctly and quickly.

The primary indicator of success for this community service program was the reduction in students' problematic gadget use scores from the initial moderate-to-high category to the low category. Furthermore, the program's success was assessed by the increase in understanding scores among teachers and students regarding Artificial Intelligence (AI) technology and the increase in teachers' understanding scores regarding strategies for anticipating problematic gadget use in children.

The evaluation method utilized a Likert scale questionnaire. The measurement tools used were standardized questionnaires that had been tested for validity and reliability, yielding a Cronbach's Alpha value of 0.886 in a similar population, thus ensuring the accuracy of the data collected. Three separate questionnaires were administered: one to measure the students' level of Problematic Gadget Use (PGU), one to measure the teachers' and students' understanding of Artificial Intelligence technology, and one to measure the teachers' understanding of anticipatory strategies for problematic gadget use.

RESULT AND DISCUSSION

The community service program aimed at reducing Problematic Gadget Use (PGU) among students was implemented from July 2025 to September 2025 to achieve its objectives optimally. The activities conducted included Educational Seminar with the theme, "Anticipating Children's Gadget Addiction as an Effort to Optimize the Increase of Children's Intelligence.", Training and practical sessions on creating posters and presentations using Artificial Intelligence (AI) through Canva, Training for school counselors and teachers on methods to reduce student gadget addiction, Provision and practice of counseling services for students with problematic gadget use. Training and practical sessions on creating educational games using AI, Training and practical sessions on utilizing AI-based design through the Teachy application in learning, and Establishment of the Design Graphics Community at SMPN 23, Bekasi City.

Activity 1: Educational Seminar on “Anticipating Problematic Gadget Use to Optimize Children’s Intelligence”

The educational seminar titled “Anticipating Problematic Gadget Use to Optimize Children’s Intelligence” was held in the computer laboratory of SMPN 23 Bekasi on July 28, from 12:30 PM to 5:30 PM Western Indonesian Time (WIB). This activity constituted the first component of the Community Service (PKM) program.

The event was attended by 50 participants, comprising 10 teachers, 20 students, and 20 students'

parents. The seminar aimed to provide understanding and strategies for addressing the issue of problematic gadget use in children to optimize their cognitive potential. The speakers for this event were Sabar Lesmana, S.Pd, M.Si, Kons., a lecturer from the UIA Counseling and Guidance Department, and Dr. Samsudin, M.Pd, a lecturer from the UIA Master of Educational Technology program and a member of the PKM team.

The event commenced with opening remarks delivered by Dr. Khasanah, M.Pd, as the Head of the PKM team; Dra. Ruslina, M.Pd, the Principal of SMPN 23 Bekasi, and a representative from the Bekasi City Education Office. Following the opening session, the seminar proceeded with presentations by the two speakers, who discussed issues related to problematic gadget use, its impact on children's intelligence, and practical solutions that could be implemented by teachers, students, and parents. A question-and-answer session was also conducted to facilitate further interaction between the participants and the speakers.



FIGURE 2. Seminar Opening and Q&A Session

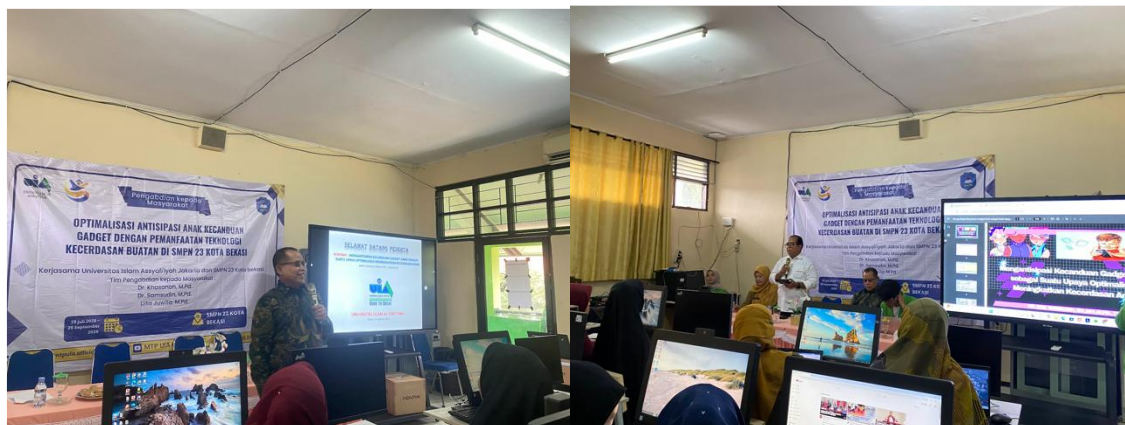


FIGURE 3. Speakers 1 and 2 Explain the Material

Activity 2: Training and Practical Session on Creating Posters and Presentations Using Canva's Artificial Intelligence (AI)

The training and practical session on creating posters and presentations using Canva's Artificial Intelligence (AI) features was conducted in the computer laboratory at SMPN 23 Bekasi over two days: July 29 and 30, 2025. The activity was attended by 10 teachers and 20 students. On the first day, from

12:30 PM to 5:30 PM Western Indonesia Time (WIB), participants focused on training and practicing poster creation using Canva. They were taught how to leverage Canva's AI features to design posters quickly and creatively.

The second day, from 12:30 PM to 5:30 PM WIB, continued with training and practical sessions on presentation creation. Participants were trained to utilize Canva's AI features to generate engaging and professional presentation slides, covering everything from layout design to data visualization. The activity was led by the speaker, Jafar Shodiq, M.Pd., and the community service team. The main objective was to equip both teachers and students with relevant digital skills, particularly in utilizing AI technology for educational and creative needs.



FIGURE 4. AI-Assisted Poster Creation Training and Practice in Canva



FIGURE 5. AI-Assisted Presentation Creation Training and Practice in Canva

Activity 3: Training for School Counselors and Teachers to Reduce Students' Problematic Gadget Use

The training for school counselors and teachers, aimed at reducing Problematic Gadget Use (PGU) among students, was successfully held on July 31, 2025, at the Science Laboratory of SMPN 23 Bekasi. The activity took place from 12:30 PM to 5:30 PM Western Indonesian Time (WIB) and was attended by

10 teachers, including the Guidance and Counseling (BK) teacher from SMPN 23 Bekasi. The primary goal of this training was to equip educators with the knowledge and practical skills necessary to address the prevalent issue of problematic gadget use among students.

The resource person for this event was Ken Heryani Sulis, M.Pd., a lecturer from the Guidance and Counseling study program at Universitas As-Syafi'iyah (UIA). The material covered included the identification of PGU symptoms, its negative impact on student development, and effective intervention and guidance strategies to help students manage their gadget usage. The material was delivered by the speaker using counseling (BK) media that had been prepared in advance.



FIGURE 6. Training School Counselors and Teachers in Mitigating Students' Problematic Gadget Use

Activity 4: Provision and Practice of Counseling Services for Students with Problematic Gadget Use

The counseling service activity for students with problematic gadget use was held twice, on August 1 and 6, 2025. Each session lasted 4.5 hours, from 1:00 PM to 5:30 PM WIB. The goal was to directly help and guide students in overcoming this issue. In the first session, students were guided by Ken Heryani Sulis, M.Pd., a lecturer from the Counseling and Guidance study program at Universitas Islam As-Syafi'iyah (UIA). This session involved group counseling to help students understand the root causes of the gadget dependence they were experiencing.

The second session was continued with guidance from Dita Juwita Zuraida, M.Pd., who is part of the Community Service (PKM) team and also a Counseling and Guidance lecturer at UIA. She was assisted by several UIA Counseling and Guidance students. This session focused on practical counseling services, where students were guided to apply the strategies and techniques taught in the previous meeting to reduce their dependence on gadgets. The second session was conducted in both group and individual formats.



FIGURE 7. Implementation of Counseling Services for Students with Problematic Gadget Use in the First Session



FIGURE 8. Implementation of Group and Individual Counseling Services for Students with Problematic Gadget Use in the Second Session

Activity 5: Training and Practical Session on Creating Educational Games with the Aid of Artificial Intelligence (AI)

On August 4, 2025, a Training and Practical Session on Creating Educational Games with the Aid of Artificial Intelligence (AI) was successfully held in the computer laboratory of SMPN 23 Bekasi. The event, which ran from 1:00 PM to 5:00 PM Western Indonesian Time (WIB), was attended by 10 teachers and 20 students. The main objective of this training was to equip participants with the practical skills necessary to create engaging and interactive learning media.

The training materials were delivered by Jafar Shodiq, M.Pd., who guided the participants in utilizing various AI-based applications, such as WordWall, Canva, Kahoot, and Quizizz. Through hands-on practice, participants learned how to design and produce educational games that are not only entertaining but also effective in boosting students' interest in learning. It is hoped that this initiative will encourage students to use their gadgets for positive purposes, thereby reducing their inclination toward problematic or negative gadget use.



FIGURE 9. Training and Practice on Creating Educational Games using Artificial Intelligence (AI)

Training and Practice on Utilizing Teachy Application-Based Intelligent Design in Learning

The Training and Practice on Utilizing Teachy Application-Based Intelligent Design in Learning was successfully conducted on August 5, 2025, in the computer laboratory at SMPN 23 Bekasi. The activity took place from 1:00 PM to 5:00 PM Western Indonesian Time (WIB) and was attended by 10 teachers and 20 students. The training focused on using the Teachy application as a medium to design interactive and effective learning.

The material was delivered by Dr. Khasanah, M.Pd., and Hadi Ismail, M.Pd. Participants were instructed on how to optimize Teachy's features to design engaging learning content, create quizzes, and manage classes digitally. The main objective was to equip both teachers and students with new skills in utilizing AI technology to enhance the teaching and learning process.



FIGURE 10. Training and Practical Application of AI-Based Design Using the Teachy Application in Learning

Establishment of the Graphic Design Community at SMPN 23, Bekasi City

The official establishment of the Graphic Design Community at SMPN 23, Bekasi City, was held on August 6, 2025, in the school's computer laboratory, from 13:00 to 17:00 WIB. The community was inaugurated by Dra. Ruslina, M.Pd, the Principal of SMPN 23 Bekasi, and Dr. Khasanah, M.Pd, the Head of the Community Service (PKM) Team. The purpose of forming this community is to serve as a platform for both teachers and students to develop their creativity and skills in the field of graphic design.

The activity was attended by 10 teachers and 20 students. Through this community, it is hoped that members can continue to learn and collaborate in creating beneficial visual works, both for the school's interests and for personal development. The ultimate goal of this entire series of activities is to reduce the level of problematic gadget use among students at SMPN 23 Bekasi. The focus of the activities is not solely on limiting usage but also on optimizing the positive utilization of technology and diverting students' interests toward more productive and beneficial activities.



FIGURE 11. Official Launch of the Graphic Design Community at SMPN 23 Bekasi City

Before the implementation of the community service (PkM) program, participants were asked to complete a pre-test questionnaire. Three questionnaires were administered: one to measure the students' level of Problematic Gadget Use (PGU), another to gauge the level of understanding of Artificial Intelligence (AI) technology among teachers and students, and the last one to assess the teachers' understanding of anticipating problematic gadget use in children.

The measurement results for students' PGU showed that before the PkM, the average score for students at SMP Negeri 23 was at a moderate level, with a mean score of 53.86%. Following the PkM, the students' average score decreased significantly to 29.67%, placing it in the low category. This demonstrates that the implemented community service successfully lowered the scores for problematic gadget use among students at SMPN 23 Bekasi.

To measure the effectiveness of the intervention, a statistical test for significant difference (such as a Paired Sample T-Test) was conducted. The test results indicated that the reduction in the average score for problematic gadget use was statistically significant, with a p-value of 0.00000000.

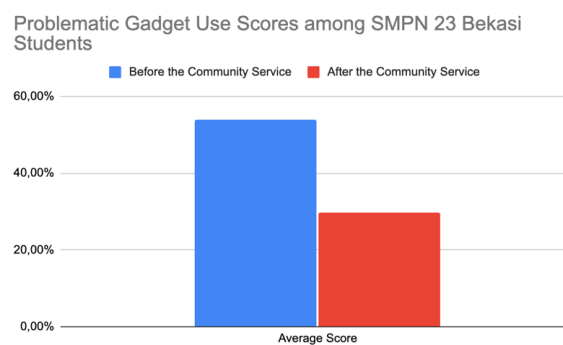


FIGURE 12. Comparison Graph of Problematic Gadget Use Scores among SMPN 23 Bekasi Students

For the aspect of the level of understanding of Artificial Intelligence (AI) technology among teachers and students, a pre-test and post-test questionnaire was also administered before and after the community service program. In this aspect, the average pre-test understanding score was 56.80%, categorized as moderate. Following the implementation of the community service program, the average understanding score for the utilization of AI technology by teachers and students increased to 86.36%, reaching the high category. To measure the effectiveness of the intervention, a Paired Sample T-Test was conducted. The test results indicated that the increase in the average understanding score of teachers and students was statistically significant, with a p-value of 0.000000002651184408.

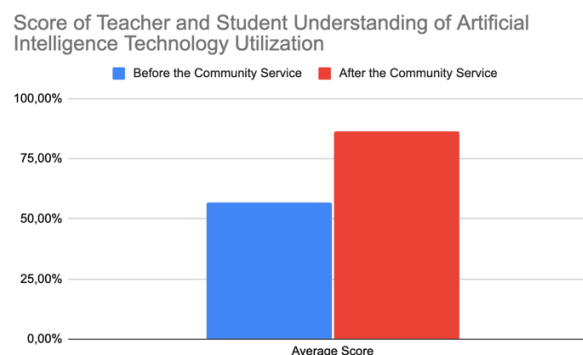


FIGURE 13. Comparison Graph of Teacher and Student Understanding Scores regarding the Utilization of Artificial Intelligence Technology

Regarding the teachers' level of understanding related to anticipating problematic gadget use in students, a measurement was conducted before the community service (PKM) implementation, which yielded an average score of 44.53%, falling into the moderate category. Following the PKM, another measurement was taken, and the average score for the teachers' understanding of anticipating problematic gadget use increased to 82.80%, reaching the high category. To measure the effectiveness of the intervention, a Paired Sample T-Test was performed. The test results indicated that the increase in the average score of the teachers' understanding was statistically significant, with a p-value of 0.000000002635395279.

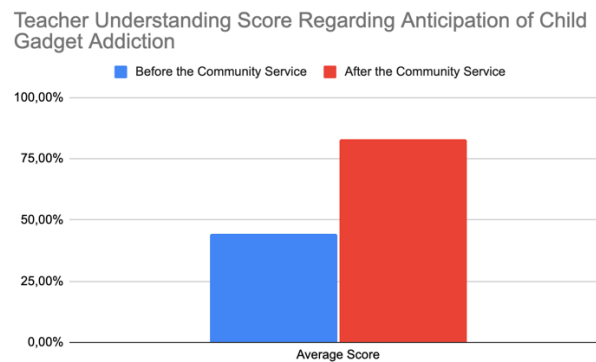


FIGURE 14. Comparison Graph of Teacher Understanding Scores on Anticipating Problematic Gadget Use in Students

Based on the results of pre-test and post-test analysis, which were confirmed to be statistically significant, it can be concluded that the Community Service (Pengabdian kepada Masyarakat - PKM) program implemented at SMPN 23 Bekasi City proved to be effective. The program not only successfully reduced students' scores on Problematic Gadget Use (PGU) but also significantly increased the understanding of both teachers and students regarding artificial intelligence technology and strategies for anticipating healthy gadget use. Nevertheless, these results require follow-up with objective behavioral evaluations to mitigate the potential for response bias.

CONCLUSION

Based on the results of the Community Service (PkM) program implemented at SMPN 23, Bekasi City, the program demonstrated a positive and significant impact across three main aspects. The students' level of Problematic Gadget Use (PGU) successfully decreased significantly, dropping from an average pre-test score of 53.86% to 29.67% in the post-test, placing it in the low category. The knowledge of both teachers and students regarding the utilization of Artificial Intelligence (AI) technology also increased significantly; the average pre-training understanding score rose from 56.80% (moderate category) to 86.36% (high category). Furthermore, the teachers' level of understanding regarding the anticipation of problematic gadget use in children also showed an improvement, increasing from an average pre-program score of 44.53% (moderate category) to 82.80% (high category) after the program's completion.

However, it must be noted that these results reflect data captured immediately post-intervention and may be influenced by Social Desirability Bias, where participants tend to provide socially expected answers. Therefore, the significance of these findings must be interpreted cautiously, as they do not yet fully validate students' long-term behavioral changes. Nevertheless, this PkM program serves as a valuable initial intervention in promoting digital literacy and fostering more directed gadget usage behavior. It is

recommended that this activity be established as a routine and continuous program to broaden its benefits to various schools in Bekasi City and beyond. Ensuring the continuity of this program is essential for sustainable positive impact.

ACKNOWLEDGEMENT

We extend our sincere gratitude to the Diktisaintek Grant Provider (Pemberi Hibah Dana Diktisaintek), Universitas Islam As-Syafiiyah, and SMPN 23 Bekasi City for their invaluable support, which enabled the successful execution of this community service program as planned.

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