



Multidisciplinary student synergy through the KKM program as an effort to improve the quality of health, education, and community environmental awareness

Asep Yudianto^{1,*}, Laila Munawaroh¹

¹ Department of Primary Teacher Education, Faculty of Teacher Training and Education, Universitas Sultan Ageng Tirtayasa, Serang, Banten 42124, Indonesia.

*Correspondence: asepyudianto@untirta.ac.id

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ABSTRACT

Background: Student community service program (*Kuliah Kerja Mahasiswa*, KKM) bridges universities with rural community needs in health, education, environmental management, and social development. Although participatory community service has been shown to improve public knowledge and behavior, evidence on integrated multidisciplinary KKM remains limited. This study analyzed the implementation of a multidisciplinary KKM program in Jayamekar Village from January to February 2026. **Methods:** A community-based participatory approach was implemented through free health screening, anti-bullying education, biopore training, pest and plant disease counseling, and road reflector installation, supported by school teaching, Qur'an teaching, handwashing campaigns, group exercise, educational competitions, and community events. Data were collected through participatory observation and activity documentation and analyzed descriptively. **Findings:** 38 residents participated in free health screening and demonstrated increased awareness of early disease detection and healthy lifestyles. More than 70 children showed improved learning motivation, literacy engagement, and understanding of positive social behavior. Environmental activities strengthened community knowledge of organic waste management, while road reflector installation enhanced perceived road safety. The integrated implementation also promoted active community participation and collaboration between university students and local residents. **Conclusion:** The multidisciplinary KKM program contributed to community empowerment by addressing interconnected health, education, environmental, and social issues through participatory engagement. However, the findings are limited by the descriptive design, single-village setting, and absence of quantitative outcome measures. **Novelty/Originality of this article:** This study provides empirical evidence on an integrated multidisciplinary KKM model that coordinates health, education, environmental, safety, and social empowerment initiatives within a participatory village-based community service program.

KEYWORDS: community service; education; environment; multidisciplinary; public health; student work lectures.

1. Introduction

Higher education institutions play a strategic role in promoting sustainable community development through the implementation of the *Tri Dharma Perguruan Tinggi* (The Three Pillars of Higher Education), particularly community service. Community service is no longer understood merely as an institutional obligation, but rather as a process of social transformation that relies on the use of science, technology, and the arts to address real-world problems in society. In this context, the student work lecture (*Kuliah Kerja*

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Mahasiswa, KKM) is one form of service implementation that integrates the academic world with social reality directly and contextually. KKM is designed as an experiential learning vehicle that encourages students to interact directly with the community, identify problems, and design solutions relevant to local needs. Through KKM, students have the opportunity to develop collaboration, communication, leadership, and problem-solving skills in real-life situations. Various studies have shown that service-based learning not only improves students' academic competence but also fosters social awareness and responsibility as citizens (Lin et al., 2025). Service-based learning is a learning approach based on experience (experiential learning) that integrates the academic learning process with service activities for citizens to address real needs in their surroundings. Through this approach, students not only gain the conceptual understanding from the course materials but also implement the knowledge, skills, and attitude they have in real life contextual through service activities with a continuous reflective process (Aláez et al., 2022). Service-based learning implementation has proven to provide various benefits to students, including conceptual understanding, critical thinking skills, communication skills, collaboration, leadership, and complex problem-solving skills (Culcasi & Venegas, 2023). Additionally, this approach contributes to improving empathy, social responsibility, and students involvement as an active citizen that strengthening the relationship between university and society (Álvarez-Vanegas et al., 2024). Furthermore, service-based learning integration in higher education can support the achievement of the Sustainable Development Goals through collaboration strengthening, citizen empowerment, and improving the graduate competence that is not only excellent academically, but they also have social awareness and high professionalism (Rodríguez-Zurita et al., 2025).

The problems faced by rural communities are generally complex and interconnected. Public health issues often intersect with education levels, environmental conditions, and prevailing social behavior patterns. Similarly, children's education issues cannot be separated from the local social, economic, and cultural context. Therefore, a partial and monodisciplinary approach to community service is considered ineffective in addressing community needs holistically. A multidisciplinary approach is a strategic alternative for providing more comprehensive and sustainable solutions (Martini et al., 2021). A multidisciplinary approach is an approach that integrates two or more disciplines to examine a topic, phenomenon, or problem from various points of view without removing the characteristics of each discipline. Through this approach, every discipline contributes to the concept, method, and perspective appropriately so that students gain a more comprehensive understanding of real problem (İnci & Kaya, 2022). Multidisciplinary approach implementation supports students in connecting various concepts they learned, enhancing critical thinking skills, creativity, communication, and collaboration in solving complex and contextual problems (Matinho et al., 2022). This approach also makes the learning experience more meaningful because students are able to see the connection between disciplines in their daily life and improve their adaptive skills toward the challenges in the 21st century that demand thinking flexibility and solving problems holistically (Hulse, 2022). Therefore, multidisciplinary learning is increasingly regarded as an effective strategy to build students' competence through knowledge integration, skills, and attitude in an authentic learning context. However, previous studies have predominantly examined multidisciplinary learning from the perspective of student learning outcomes or individual service sectors. Limited attention has been given to how an integrated multidisciplinary KKM program addresses multiple community issues simultaneously within a rural setting. This indicates a need for empirical evidence on the implementation and outcomes of integrated multidisciplinary community service.

A multidisciplinary approach to implementing the community service competency standards allows students from various academic backgrounds to work synergistically within an integrated program framework. This interdisciplinary collaboration enriches the process of problem identification, program planning, and implementation of community

service activities. Research shows that multidisciplinary student involvement in community service programs can improve the quality of interventions, particularly in the sectors of public health, basic education, and environmental management (Kanu et al., 2024). This study is grounded in the principles of experiential learning and service-learning, which emphasize learning through direct experience, reflection, and reciprocal collaboration between universities and communities. These perspectives guided the design of the multidisciplinary KKM program and the interpretation of its contribution to community empowerment.

Public health is a fundamental issue that remains a challenge in many rural areas. Low public awareness of the importance of regular health check-ups, adopting clean and healthy lifestyles, and preventing non-communicable diseases has the potential to lead to long-term health problems. The World Health Organization (WHO) emphasizes that community-based health education involving active community participation is an effective strategy for increasing awareness and changing health behaviors (World Health Organization, 2020a). Health education based on the community is an approach that promotes health and involves citizens' active participation in the planning process, implementation, and evaluation to enhance knowledge, attitude, and health behavior appropriately with the needs and community characteristics. This approach places society as a partner and a main subject in enhancing health standards so that the intervention becomes more relevant, sustainable, and can build the belonging sense toward the ongoing program (Clark et al., 2024). Health education-based community implementation utilizes local potential, social networking, public figures, and local organizations to strengthen health information and support behavior change collectively (Singh et al., 2023). Society involvement in every program step also proved in enhancing the beliefs toward health information, strengthening health literacy, and expanding the susceptible community access toward promotive and preventive service (Gray et al., 2024). The implementation of the approach based on the community is effective in creating more sustainable health behavior change because supported by collaboration, community empowerment, and communication that aligns with the community culture and social context (Stover et al., 2024). Furthermore, early childhood and primary education are the main foundations for human resource development. The persistence of gaps in basic literacy skills, low motivation to learn, and the emergence of bullying in schools demonstrate the need for sustainable educational interventions. A study by the Organisation for Economic Co-operation and Development (OECD, 2021) showed that learning assistance and character-building programs involving various stakeholders can have a positive impact on children's academic and social development.

Environmental aspects are also a significant concern in rural communities. Suboptimal waste management practices, the use of chemicals in agricultural activities, and the community's lack of understanding of simple, environmentally friendly technologies have the potential to degrade environmental quality and public health. Hands-on environmental education, such as the use of biopores and the introduction of natural pesticides, has been shown to increase public knowledge and awareness of the importance of environmental conservation (Hsu, 2025). Based on initial observations and mapping of the needs of the Jayamekar Village community, several key issues were identified, encompassing health, education, and the environment. In terms of health, low community participation in routine health checks and the adoption of clean and healthy lifestyles are key concerns. While health services through integrated health posts (*Pos Pelayanan Terpadu*, Posyandu) and community health centers (*Pusat Kesehatan Masyarakat*, Puskesmas) are routinely implemented, community participation in preventive health check-ups remains suboptimal. Some people tend to utilize health services only after experiencing symptoms or complaints of illness, resulting in inadequate promotional and preventive efforts. In terms of education, gaps in basic literacy skills, limited learning support, and bullying in schools remain. Educational conditions indicate that some students still require assistance in improving their reading, writing, and arithmetic skills, particularly through learning activities outside

of school hours. Teachers also identified instances of teasing and verbal bullying among students, albeit at relatively low levels. Environmental observations indicate that most household organic waste is not optimally managed and is still disposed of with other waste, despite having the potential to be composted. Meanwhile, in terms of environmental and safety, the community faces challenges in organic waste management, the use of chemical pesticides in agriculture, and a lack of road safety facilities in several vulnerable areas. Community agricultural practices are still dominated by the use of chemical pesticides, perceived as more effective in controlling pests, while the use of more environmentally friendly alternatives remains limited. Road infrastructure in several locations also demonstrates a lack of warning signs and safety features, particularly on routes frequently used by schoolchildren and other road users. These findings indicate that the problems faced by the community are multidimensional and therefore require integrated handling efforts through collaboration between village governments, educational institutions, health service facilities, universities, and the community.

To address these challenges, KKM Group 24 implemented an integrated community service program based on multidisciplinary collaboration. The program consisted of five core activities, namely free health screening, anti-bullying education, biopore training, pest and plant disease counseling, and road reflector installation, supported by school teaching, Qur'an teaching, handwashing campaigns, group exercise, educational competitions, and community engagement events. Unlike conventional KKM programs that often focus on a single sector, this program integrated health, education, environmental management, road safety, and social empowerment within a unified participatory framework. While previous studies have demonstrated the benefits of service-learning and multidisciplinary community engagement, limited evidence is available regarding how such integrated KKM programs are implemented at the village level and how multiple interventions collectively contribute to community empowerment. Consequently, the effectiveness of this integrated approach remains insufficiently documented.

Based on this gap, this study addresses the following research question: How does the implementation of an integrated multidisciplinary KKM program contribute to improving community health awareness, educational engagement, environmental responsibility, road safety, and social cohesion in Jayamekar Village? Accordingly, this article aims to analyze the implementation of the multidisciplinary KKM program and describe its contribution to community empowerment through participatory community service. By documenting the implementation process and observed outcomes, this study provides empirical evidence on the practical application of an integrated multidisciplinary KKM model and offers a reference for developing future university community service programs in similar rural contexts.

2. Methods

The community service activities through the student work lecture (KKM) Program were implemented using a community-based participatory approach, which positions the community as both an active partner and the primary subject of intervention throughout all stages of the program. This approach integrates community development theory with collaborative practices that emphasize community involvement in the planning, implementation, monitoring, and evaluation of the program. This participatory approach is considered effective because it increases the program's relevance to local needs and strengthens community capacity and independence after the program concludes, as recommended in contemporary community service studies (Afandi et al., 2022).

The KKM activities were conducted in Jayamekar Village as the primary service location from January to February 2026. The location was selected based on initial identification results that indicated community needs in aspects of health education, basic education, environmental awareness, safety, and social empowerment. The activities followed the KKM schedule established by the university and took place through three main stages: preparation, program implementation, and final monitoring and evaluation.

The community members of Jayamekar Village were directly involved as participants and collaborators. Community service partners include village officials, community leaders, local elementary school teachers, and village health workers. The involvement of these various local stakeholders reflects the principles of community development, which emphasize the importance of collaboration between universities and local actors in producing contextual and sustainable community service programs (Qorib, 2024). The students involved come from various majors, enabling the application of a multidisciplinary approach to addressing complex and multidimensional community problems, as recommended in the literature on community service and development (Boston et al., 2024).

Participants were selected using purposive sampling based on their direct involvement in the KKM activities and their relevance to the objectives of each program. Community participants included residents who voluntarily attended the activities, village officials, community leaders, elementary school teachers, village health workers, children participating in educational activities, and farmers involved in environmental counseling. The inclusion criteria were: 1) residing in Jayamekar Village; 2) participating in at least one KKM activity; and 3) providing information or feedback related to program implementation. Local stakeholders were included because of their roles in facilitating and evaluating community participation throughout the program.

The preparation phase begins with an internal KKM team meeting to agree on activity objectives, formulate success indicators, and develop a collective work plan. Next, initial observations and needs assessments are conducted through structured interviews and discussions with village officials and community leaders to map priority issues that need to be addressed. These needs findings form the basis for developing a relevant and contextual program. This stage also includes the development of a timeline and budget plan for activities, the allocation of student tasks based on cross-departmental competencies, the preparation of educational materials and practical tools, and coordination with local partners to ensure synchronized program implementation. This needs-based planning approach has been proven to increase the effectiveness of community empowerment programs by minimizing interventions inappropriate to the community context (Djazuli, 2024).

The implementation phase is the core of the community empowerment program activities, which were carried out during January–February 2026, in accordance with the established work plan. The programs were implemented in two categories: main programs and supporting programs. The main programs focused on priority community issues, including free health checks accompanied by basic health education in collaboration with village health workers, anti-bullying counseling for children and adolescents, biopore counseling and plant pest and disease management as part of environmental education and sustainable agriculture, and the installation of road reflectors at accident-prone areas to improve environmental safety. Supporting programs were designed to strengthen social impact and increase community participation, including teaching in schools and teaching the Quran to strengthen literacy and moral values, promoting handwashing and group exercise to instill a habit of clean and healthy living, and educational competitions and a peak night as a means of strengthening social cohesion and appreciating community participation.

Data were collected using four complementary instruments: 1) structured observation sheets to record participant attendance, engagement, and responses during activities; 2) field notes prepared by KKM students to document implementation processes, challenges, and reflections; 3) documentation in the form of photographs, attendance lists, and activity reports; and 4) informal interviews and feedback discussions with community members and local partners conducted at the end of each activity. The use of multiple data sources enabled triangulation to improve the credibility of the findings.

Activity monitoring was conducted continuously through direct observation, activity documentation, participant feedback, and reflective discussions with local partners. The

collected qualitative data were analyzed using thematic analysis. First, all field notes, observation records, interview summaries, and documentation were compiled and organized. Second, the data were coded according to recurring themes related to health awareness, educational engagement, environmental responsibility, road safety, community participation, and implementation challenges. Third, codes with similar meanings were grouped into broader categories and interpreted by comparing findings across different data sources to ensure consistency through triangulation. Finally, the interpreted findings were synthesized to evaluate program implementation, identify supporting and inhibiting factors, and formulate recommendations for future multidisciplinary community service programs.

3. Results and Discussion

The implementation of the KKM Program in Jayamekar Village demonstrated that a community service approach based on multidisciplinary student synergy can have a tangible impact on various aspects of community life. Throughout the implementation period, community involvement was high, particularly in activities directly related to basic needs, daily activities, and environmental safety. The involvement of village officials, community leaders, and local partners from the initial planning stage through implementation was a crucial factor in supporting the program's smooth implementation and acceptance within the community. Overall, the results of the KKM implementation demonstrated increased knowledge, changes in attitudes, and active community participation in health, education, and environmental awareness.

In terms of health, the free health check program was the most popular and widely participated activity by the community, as it provided direct access to basic health services that had previously been rarely utilized routinely. Based on the implementation of the program, 38 people received free health services, particularly blood pressure and general physical examinations, which also provided an initial means for the community to objectively assess their health status. Observations indicated that most participants rarely underwent health checks prior to the KKM program, making this program a valuable early detection tool. Through this activity, the community not only received test results but also received brief education on the importance of early disease detection, adopting a healthy lifestyle, and preventing non-communicable diseases. Several participants recognized indications of health conditions that could potentially develop into more serious ones if not accompanied by healthier lifestyle changes. Direct interaction between students, health workers, and the community created a dialogic atmosphere that encouraged openness in the community in reporting health complaints and asking about preventative measures they could take independently. Furthermore, participants identified as having certain health problems received medication and vitamins from the community health center (Puskesmas) as a form of early treatment and prevention to prevent their conditions from developing into more serious illnesses. This activity was not only informative but also provided direct health benefits.

Efforts to increase public health awareness were reinforced through handwashing socialization and joint exercise activities implemented as part of the KKM support program. Handwashing socialization was conducted through demonstrations and hands-on practice, particularly for children at the Islamic preschool (*Raudhatul Athfal*, RA) level, so that participants could concretely understand the six steps of proper handwashing as a disease prevention measure. The results of the activity showed that five students were used as role models to demonstrate the six steps of handwashing, which were then followed by 33 children participating in the education, and in general the children were able to model and implement these steps well. This hands-on approach made it easier for children to understand and remember clean living behaviors that can be applied in everyday life. Meanwhile, the group exercise activities that were regularly attended by around 20 participants, with the majority of children as active participants, not only encouraged

increased physical activity but also served as a means of social interaction that strengthened relationships between residents. The exercise activities were then followed by a group reading activity in the reading park, where most children were able to read fluently, while children of Early childhood education programs (*Pendidikan Anak Usia Dini*, PAUD) age or equivalent still needed assistance and were read to by members of the KKM group. This series of activities demonstrated that the combination of health education, physical activity, and literacy assistance in a collective atmosphere can create a fun learning environment while encouraging the habit of healthy and productive living behaviors among children and the community.

From an educational and social perspective, the Anti-bullying counseling program significantly improved children's understanding of bullying behavior. Prior to the activity, some participants still considered teasing, teasing, or exclusion to be normal aspects of everyday interactions at school. Through interactive presentations combined with group discussions and simple simulations, participants began to understand the various forms of bullying that frequently occur, particularly in elementary schools, and recognized their negative impact on the psychological, social, and self-confidence of victims. Based on the results of the activity, fewer than 70 children at Public Elementary School (*Sekolah Dasar Negeri*, SDN) Jayamekar 1 participated in the counseling and demonstrated an increased understanding of bullying. This was evident in the participants' active involvement in the reflection session, where the children wrote down bullying experiences they had experienced or witnessed on numerous sticky notes. This reflective activity encouraged participants to be more open in expressing their social experiences and fostered awareness of the importance of building respectful, empathetic, and safe relationships within the school and community.

The improvement in children's social understanding through the previous counseling was reinforced through ongoing teaching activities at school and teaching the Quran throughout the KKM period. Teaching activities in schools make a real contribution to improving student motivation and learning quality through the application of more varied and interactive learning methods. Findings in several educational units indicate gaps in basic skills such as reading, writing, and arithmetic (*baca tulis hitung*, calistung), low student participation, and several behavioral barriers that affect the learning atmosphere. At SDN Jayamekar 1, for example, students in grade I showed initially differences in reading, writing, and arithmetic abilities and lacked focus in learning. However, after mentoring, students began to focus more, participate actively, and the classroom atmosphere became more conducive. Similar findings were also seen in Islamic Elementary School (*Madrasah Ibtidaiyah*, MI) Mathla'ul Anwar Janaka grade VI, where limited literacy and low student courage in reading gradually improved after mentoring, marked by increased learning focus, reading courage, and student involvement in learning activities. At SDN Jayamekar 2 grade IV, the application of more interactive learning methods was able to increase student attention to the material, encourage active participation in class activities, and create a more conducive learning atmosphere. Meanwhile, teaching the Quran to recite plays a crucial role in strengthening children's moral values and character. Children demonstrate improved Quran reading skills, understanding basic reading principles, and developing religious attitudes and the habit of regularly studying the Quran. This activity has received positive support from parents and community leaders, as it is seen as helping develop character outside of formal education and instilling values of discipline, responsibility, and positive study habits in children.

In terms of environmental and safety aspects, biopore extension and pest and plant disease extension have made a positive contribution in increasing public understanding and awareness of sustainable environmental management. The biopore extension introduced the concept of water absorption and practical organic waste management, with most residents claiming to have gained a deeper understanding of the biopore system through this activity. Based on the implementation of the activity, 23 people participated in the extension, and 9 biopore units were distributed to village representatives for installation

and implementation in their households. The community also understood that biopores can be made not only using pipes, but can also utilize simple materials such as used gallons, making them easier to implement independently. Monitoring results showed that six biopores have been successfully implemented in several residents' homes, including those of Mrs. X, Mrs. Y, and the Village Head, utilizing household organic waste such as onion peels, banana peels, and other kitchen waste. However, several technical obstacles were encountered, particularly with the biopore covers, which were difficult to open and easily damaged, which are important notes for future implementation improvements. This environmental awareness was reinforced through a pest and plant disease outreach session attended by 12 farmer representatives from the farmer association (*Gabungan Kelompok Tani*, Gapoktan). Participants learned about pests, plant diseases, and the risks of excessive chemical pesticide use on the environment and health. Participants expressed interest in more environmentally friendly pest control alternatives, particularly the production of a botanical pesticide based on papaya extract, which is considered easy and simple to implement. This activity fostered initial community awareness and encouraged them to consider safer and more sustainable agricultural practices. Further monitoring is planned to determine the effectiveness of its implementation in the future.

Furthermore, the installation of road reflectors has had a direct impact on improving environmental safety, particularly on poorly lit and potentially accident-prone road sections. Based on the implementation of the activity, road reflectors were installed at five strategic locations: Kebon Kopi Village, the river area near Jayamekar Village, Kadusalak Village, and Kaduhejo Village. Observations showed that the reflectors functioned well at night, especially when exposed to the glare of passing vehicles, thereby improving road visibility and providing a sense of safety for motorists. The community welcomed this activity positively because its benefits can be directly felt in daily activities, especially at night. Community involvement in the reflector installation process fostered a sense of shared responsibility and concern for the safety and maintenance of environmental facilities in their area, which is crucial for the sustainability of community participation-based environmental safety improvement efforts.

To conclude the series of activities, educational competitions and the peak night served as a means of reflection, appreciation, and strengthening social ties between students and the community during the KKM program. Results showed that almost all children in Jayamekar Village, including most mothers, actively participated in the various competitions with high levels of enthusiasm. This broad community involvement demonstrates that the activities were designed to meet the interests and needs of the community, thus creating a positive atmosphere of togetherness. The peak night, attended by the community and village children, provided a moment of togetherness, where residents not only awaited the announcement of competition winners but also watched the performances of the Jayamekar Village KKM groups as a form of appreciation for the entire program. These activities strengthened the community's sense of ownership of the KKM program and fostered closer social ties between students and residents. Overall, the results of the implementation of KKM show that the integration between the main program and supporting programs is able to create mutually reinforcing impacts, not only in the aspects of health, education, and environmental awareness, but also in strengthening the social cohesion of the Jayamekar Village community as a foundation for the sustainability of the community service program in the future.

The implementation of student work lectures in Jayamekar Village demonstrates that an integrated, participatory, and contextual approach to community service can have a multidimensional impact on the village community. The programs implemented not only produce short-term outcomes but also trigger changes in community knowledge, attitudes, and behavior in aspects of health, education, the environment, safety, and social cohesion. These findings emphasize that KKM cannot be understood simply as a temporary activity, but rather as a social learning process involving students and the community in a reciprocal relationship. This aligns with the community-based development paradigm, which positions

the community as the subject of development, not merely the object of intervention (Argarani et al., 2025).

3.1 Strengthening public health awareness and literacy

In terms of health, the free health check program was the most popular program among the public. Thirty-eight residents utilized this service to assess basic health conditions, such as blood pressure and general physical condition. Field findings indicated that most participants rarely underwent routine health checks before the free health check program. This finding aligns with findings from the World Health Organization (2020b), which states that rural communities in developing countries tend to have limited access to preventive health services and often visit health facilities when their condition has worsened.

Through the free health check program, the community not only obtained objective data on their health but also received brief education on the importance of early disease detection, healthy lifestyles, and preventing non-communicable diseases. Direct interaction between students, health workers, and the community created a dialogic atmosphere that encouraged residents to openly express health concerns. This situation reinforces the literature presented by Batubara et al. (2020), which states that health literacy is not only about the ability to read health information but also includes the ability to communicate, ask questions, and make informed decisions regarding personal and family health.

The free health check program also contributed to increasing public awareness of the risks of non-communicable diseases such as hypertension and metabolic disorders. The education that accompanies the check-ups helps the community begin to understand the connection between daily habits and their health conditions. Research by Huang et al. (2025) shows that an educational approach combined with direct experience (experiential learning) is more effective in encouraging changes in health behavior than one-way counseling.



Fig. 1. Students participating in a free health check program

These health awareness-raising efforts are reinforced through supporting programs such as Handwashing Socialization and Group Exercise Activities. Handwashing socialization is carried out through demonstrations and hands-on practice, especially for children at RA, so that participants can concretely understand the six steps of proper handwashing. A total of 33 children participated in these activities and were able to model

the steps taught. This finding supports research by Haryani (2024), which states that hands-on practice-based hygiene education for early childhood plays a crucial role in establishing clean living habits from an early age.

Meanwhile, the group exercise activities, regularly attended by around 20 participants, mostly children, not only encourage physical activity but also provide a space for social interaction that strengthens relationships between residents. Collective physical activity has been shown to increase motivation and consistent community participation, as demonstrated by Westerbeek & Eime (2021) in their study of community-based physical activity promotion. Therefore, the combination of health education and healthy behaviors within the KKM demonstrates that a practical and collective approach is more easily accepted and internalized by the community.

3.2 Education, social literacy, and prevention of negative behavior

From an educational and social perspective, the Anti-Bullying Counseling program significantly increased children and adolescents' understanding of bullying behavior. Prior to the activity, some participants still considered teasing and exclusion to be normal aspects of everyday interactions. After the counseling, fewer than 70 children demonstrated a better understanding of the various forms of bullying and their impact on psychological and social well-being.

The use of interactive methods, open discussions, and reflective media such as sticky notes encouraged participants to share their personal experiences related to bullying. This finding aligns with research by Lin & Shih (2024), which emphasizes that effective bullying prevention programs must provide a safe space for children to express their social experiences. This reflective approach also supports the development of empathy and collective awareness of the importance of mutual respect within the school and community.



Fig. 2. Students provided education to elementary school students about bullying prevention

Furthermore, the results of this activity indicate that the anti-bullying counseling program not only increased knowledge but also triggered changes in children's social attitudes. Participants became more open in discussions and demonstrated awareness of the importance of creating a safe social environment. This reinforces the findings of Nanda et al. (2025) who emphasized that social and emotional literacy is a key component in 21st century education.

3.3 Learning assistance and strengthening of character education

The ongoing teaching and learning activities at schools during the minimum competency standards period have demonstrated a significant contribution to improving the quality of learning and character development in children. Findings from several schools revealed gaps in literacy and numeracy skills, low student participation, and behavioral barriers that impacted the learning process. After mentoring, students appeared more focused, began to participate actively, and the classroom atmosphere became more conducive.

The implementation of more interactive and varied learning methods aligns with the student-centered learning concept proposed by (Kerimbayev et al., 2023). The presence of students as learning facilitators created a new, more enjoyable atmosphere, so students felt more motivated to engage in the learning process. This also demonstrates that collaboration between formal and non-formal education can be a solution to address limited learning resources in schools.



Fig. 3. Students provide learning assistance to elementary school students

The teaching and learning activities also played a role in strengthening children's moral values and character. Children demonstrated improved Quranic reading skills and established a habit of studying the Quran regularly. The support of parents and community leaders for these activities demonstrates a collective awareness of the importance of character education beyond formal education. These findings align with research by Syafri et al. (2025) who stated that religious value-based education contributes to the formation of children's discipline, responsibility, and prosocial behavior.

3.4 Environmental awareness and eco-friendly practices

From an environmental perspective, the biopore extension program had a positive impact on increasing community understanding of organic waste management and water absorption. Twenty-three participants attended the program, and nine biopore units were distributed to village representatives for implementation. Monitoring results indicated that six biopore units were actively used, utilizing household organic waste such as onion peels and banana peels.

This finding aligns with research by Ningrum et al. (2025), which found that hands-on environmental education can increase community participation and ecological awareness. Technical challenges encountered, such as difficult-to-open and easily damaged biopore covers, were important considerations in evaluating the program's sustainability. This demonstrates that the success of environmental programs depends not only on educational

aspects but also on technical designs that are appropriate to community conditions and habits.



Fig. 4. Students demonstrate the use of natural pesticides made from papaya leaf extract as an environmentally friendly alternative for controlling plant pests

Pest and plant disease extension complemented efforts to raise environmental awareness by providing knowledge on more environmentally friendly pest control methods. Twelve farmers representing Gapoktan demonstrated understanding of the production of botanical pesticides based on papaya extract. Farmer interest in this method demonstrates the potential for shifting agricultural practices toward more sustainability. This finding is in line with Han & Niles (2023) who emphasized that the adoption of environmentally friendly agricultural practices requires an educational approach that is simple, applicable, and appropriate to the local context.

3.5 Environmental safety and community participation

The installation of road reflectors has a direct impact on improving environmental safety, particularly in poorly lit areas. The reflectors installed at five strategic locations functioned well at night and improved driver visibility. This finding supports the research of Li et al. (2021), which states that improving road visibility is a crucial factor in reducing the risk of traffic accidents in rural areas.

Community involvement in the installation of reflectors fosters a sense of shared responsibility for the safety and maintenance of environmental facilities. This active participation reflects the principle of community ownership, where the community feels ownership and responsibility for the program being implemented. Wang et al. (2023) emphasize that a sense of ownership is a key factor in the sustainability of community service programs.

3.6 Strengthening social cohesion through collective activities

To conclude the series of activities, educational competitions and a culminating evening served as a means of reflection and appreciation for community participation. The enthusiasm of almost all the children and mothers in participating in these activities demonstrated that an inclusive, community-based approach can strengthen social bonds between students and the community. These activities served not only as entertainment but also as a space for social learning and strengthening community identity.

These findings align with research by Uwase (2025), which states that the success of community service is measured not only by program outcomes but also by the quality of social relationships and trust established between implementers and the community. Therefore, the competitions and culminating evening serve as an integrative medium, uniting various community service programs into one collective experience. The results of KKM implementation in Jayamekar Village demonstrate that the integration of primary and supporting programs creates mutually reinforcing impacts. Health programs increase preventive awareness, educational programs strengthen academic and social literacy, environmental programs foster ecological awareness, and safety programs and collective activities strengthen social cohesion. These findings emphasize that KKM has the potential to become a holistic, adaptive, and sustainable model of community service if designed based on real community needs and implemented with a participatory approach.

4. Conclusions

The implementation of the KKM Program in Jayamekar Village demonstrates that a multidisciplinary and participatory community service approach can facilitate collaboration among universities, local stakeholders, and community members in addressing health, education, environmental, safety, and social issues. The integration of health promotion, educational assistance, environmental education, road safety initiatives, and community-based social activities created complementary interventions that encouraged active community participation and strengthened local collaboration throughout the implementation process. Rather than functioning solely as a short-term service activity, the KKM program served as a platform for knowledge exchange, experiential learning, and community empowerment based on local needs. The findings indicate that participatory implementation enabled community members to engage actively in health screening, educational programs, environmental initiatives, and collective activities. Field observations, participant reflections, and activity documentation suggested positive community responses and perceived benefits across multiple sectors. Although the present study did not employ experimental measurements to evaluate behavioural change, the implementation process illustrates the potential of multidisciplinary KKM to support community engagement and promote locally relevant development initiatives through collaborative partnerships.

This study has several limitations that should be acknowledged. First, the program was conducted in a single village, limiting the transferability of the findings to communities with different social and geographical characteristics. Second, the evaluation relied primarily on participatory observations, activity documentation, and reflective discussions without pre-test/post-test measurements or standardized survey instruments; therefore, the reported outcomes should be interpreted as observed and perceived changes rather than statistically verified impacts. Third, the relatively short implementation period prevented assessment of the long-term sustainability of behavioural or community-level changes after completion of the KKM program. Future community service research should incorporate mixed-method or longitudinal evaluation designs to assess the sustainability of program outcomes and behavioural changes over time. Comparative studies involving multiple villages or different KKM implementation models would also provide stronger evidence regarding the effectiveness of multidisciplinary community service approaches. In addition, future KKM programs should strengthen post-program monitoring and collaboration with village governments, schools, and local health institutions to ensure that successful initiatives, particularly those related to health promotion, environmental management, and educational assistance, can be sustained beyond the implementation period. Overall, this study contributes practical evidence that multidisciplinary KKM can serve as a collaborative framework for community empowerment when designed according to local needs and implemented through active partnerships between universities, communities, and local stakeholders. The study also highlights that sustainable community service requires not

only community participation but also continuous evaluation and institutional collaboration to maintain long-term impacts.

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Author Contribution

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The authors declare that generative artificial intelligence (AI) tools were used in a limited manner to assist in language refinement, sentence restructuring, and clarity improvement of the manuscript. The use of AI was restricted to editorial support and did not influence the research design, data collection, data analysis, interpretation of results, or the scientific conclusions of this article. The authors take full responsibility for the content, originality, accuracy, and integrity of the manuscript.

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Biographies of Authors

Asep Yudianto, is a lecturer at Sultan Ageng Tirtayasa University, Indonesia. He holds a Master's degree in Elementary Education from Universitas Negeri Yogyakarta and a Bachelor's degree in Elementary Madrasah Teacher Education from IAIN Metro. His expertise focuses on Indonesian Language Pedagogy, literacy studies, and research-based learning innovation in elementary education. As a recipient of LPDP and Bidikmisi scholarships and a top graduate, he has published articles in national and international journals (indexed Q2–Sinta 2) and is actively involved in academic development, publications, and educational research collaborations.

- Email: asep.yudianto@untirta.ac.id
- ORCID: 0000-0002-7960-9892
- Web of Science ResearcherID: KBQ-7254-2024
- Scopus Author ID: 60684486800
- Homepage: <https://www.researchgate.net/profile/Asep-Yudianto>

Laila Munawaroh, is a lecturer in Primary Teacher Education Programme at Universitas Sultan Ageng Tirtayasa. She was graduated from Universitas Negeri Jakarta for her master degree in 2019. Her area of expertise is Educational science, especially in elementary education.

- Email: laila.munawaroh@untirta.ac.id
- ORCID: 0009-0002-5626-8754
- Web of Science ResearcherID: PIH-0013-2026
- Scopus Author ID: N/A
- Homepage: N/A