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TRANSFORMATION OF LEARNING INNOVATION INTEGRATED WITH ISLAMIC VALUES AND INFORMATION TECHNOLOGY-BASED IN MADRASAH IN EAST JAVA

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Abstrak: Tantangan terkait integrasi nilai Islam dan pemanfaatan teknologi informasi pada pendidikan madrasah menjadi isu penting untuk dapat meningkatkan mutu pendidikan dan mempersiapkan siswa menghadapi era digital. Tujuan dari program ini adalah untuk melakukan analisis mendalam mengenai situasi pengembangan soal evaluasi yang terintegrasi dengan nilai-nilai Islam dan memanfaatkan teknologi informasi pada madrasah di wilayah Gresik, Jawa Timur. Metode Participatory Action Research (PAR) digunakan dalam pengabdian ini dengan melibatkan semua pihak secara aktif dalam mengkaji tindakan. Partisipasi aktif para guru madrasah sangat penting, dan riset awal melalui survey membantu menentukan jenis pendampingan yang diperlukan terkait integrasi nilai Islam dan penggunaan teknologi dalam pembelajaran. Evaluasi kegiatan dilakukan melalui kuisioner yang dibagikan kepada 44 perwakilan guru yang menunjukkan bahwa kepuasan guru di atas 82% pada setiap indikator, di mana kesesuaian kegiatan dengan tema mendapat skor tertinggi di atas 4,7. Terlihat dampak berupa peningkatan kapasitas guru dalam merancang pembelajaran yang lebih relevan dan menarik. Pedoman penggunaan AI, pembentukan komunitas belajar, serta penyusunan modul pelatihan terstandardisasi perlu didorong untuk keberlanjutan dan penyebarluasan dampak program ke madrasah lain.

Kata Kunci: integrasi Islam, teknologi informasi, kompetisi sains madrasah, pembelajaran madrasah

Abstract: The challenges related to the integration of Islamic values and the utilization of information technology in *madrasah* education are very important to improve the quality of education and prepare students to face the digital era. The objective of this program is to conduct an in-depth analysis of the situation regarding the development of evaluation questions that are integrated with Islamic values and utilize information technology in *madrasahs* in the Gresik region, East Java. The Participatory Action Research (PAR) method is used in this service by actively involving all parties in reviewing. The active participation of *madrasah* teachers is critical, and initial research through surveys helps determine the type of support needed regarding the integration of Islamic values and the use of technology in learning. The activities were evaluated through a questionnaire distributed to 44 teacher representatives, showing that teacher satisfaction exceeded 82% on every indicator, with the "suitability of the activity with the theme" receiving the highest score above 4.7. The visible impact is increased teachers' capacity to design more relevant and engaging learning. Given the increasing ubiquity of AI, guidelines for AI usage in education from elementary to advanced levels, the establishment of learning communities, and the development of standardised training modules need to be promoted for the program's sustainability and broader dissemination to other *madrasahs*.

Keywords: Islamic integration, information technology, *madrasah* science competition, learning in *madrasah*

Introduction

Improving the quality of *madrasah* education faces several challenges that need to be addressed, one of which relates to the integration of Islamic values and the use of information and communication technology (ICT). First, there is the lack of a standard and comprehensive curriculum for integrating Islamic values into learning (Muttaqin, 2018), particularly in

madrasahs under the management of Islamic boarding schools. The limited use of ICT in learning activities is a major obstacle to improving the quality of *madrasahs*. Furthermore, many teachers are not yet skilled in using ICT effectively in the learning process (Farida et al., 2021). For example, some *madrasahs* still use traditional teaching methods, making students less accustomed to modern technology. Furthermore, access to adequate devices and internet access remains problematic in many areas. By addressing these challenges, *madrasah* education can be more relevant and better prepare students for the digital age.

Several studies have explored integrating Islamic values and information technology in *madrasah* education. Research shows that combining Islamic values and technology in mathematics education at *Madrasah Tsanawiyah* (MTs) can enhance character development and technological skills (Safitri et al., 2020). Similarly, integrating Islamic values with ICT in primary schools has been proposed to reduce technology's potential negative impacts on students (Utami & Muqowim, 2020). In addition, although initially challenging, integrating Islamic values into mathematics education in *Madrasah Ibtidaiyah* (MI) can be implemented effectively through a strategic approach by educators to enhance the learning experience (Nurjanah, 2022). Several studies consistently highlight the importance and potential benefits of integrating Islamic values with technology in *madrasah* education. However, these previous studies have not specifically addressed the development of evaluation questions that comprehensively integrate Islamic values and ICT, particularly in *madrasah* management. There are no standard guidelines or methods to facilitate the development of evaluation instruments that effectively combine both components. This gap hinders efforts to improve the quality of learning in alignment with Islamic goals and the demands of the digital era.

Therefore, this community service program comes with novelty in designing methods for preparing evaluation questions that not only integrate Islamic values, but also optimally utilise ICT. The main objective of this activity is to conduct an in-depth analysis of the situation of developing evaluation questions that are integrated with Islamic values and utilize ICT in *madrasahs*, especially in the East Java region. This step is expected to have a broader impact on aligning education with Islamic values and improving the quality of learning (Chanifudin & Nuriyati, 2020). The first specific objective is to develop a method for constructing evaluation questions that integrates Islamic values. This development can help promote ethical, moral, and spiritual values in learning (Minarno, 2017; Zain & Vebrianto, 2017). Second, this program also aims to equip teachers with knowledge and skills related to the appropriate ways of utilising ICT in compiling, managing, and distributing evaluation questions (Nuryana, 2019), so that they can optimise efficiency in compiling questions and providing feedback effectively (Abtokhi et al., 2024). These two goals can encourage innovation in learning related to the integration of science, technology, and Islamic values that create an environment that stimulates creativity and critical thinking.

This program's contribution is expected to encourage learning innovation by integrating science, technology, and Islamic values, creating an environment that stimulates creativity and critical thinking. By involving collaboration between Islamic boarding school administrators, *madrasah* administrators, educators, and the local education community, this initiative seeks to

provide concrete solutions to address current educational challenges and significantly improve the quality of *madrasah* education, focusing on Islamic character development and the wise use of technology.

Methods

This program is aimed at *madrasah* teachers in East Java, at the MI, MTs, and *Madrasah Aliyah* (MA) levels. This study sampled participants from the Gresik region, specifically *madrasahs* under the management of Islamic boarding schools (*pesantren*), specifically teachers who are mentors of the *Madrasah* Science Competition (KSM). This program is not limited to only science teachers, but also includes teachers who teach Islamic Religious Education. This community service utilises the Participatory Action Research (PAR) method, which essentially involves all relevant parties actively reviewing actions to make changes for the better. PAR consists of participation, research, and action, meaning the results of participatory research are then implemented into action. Actions based on participatory research will be targeted (Afandi, 2019).

The active participation of *madrasah* teachers is key to the success of this program, as teachers are the primary actors in learning activities. Initial research into teachers' understanding of the integration of Islamic values in evaluation and the use of technology in learning was conducted through a poll. The results of this poll can then be used to determine what support can be provided. The action research process is illustrated by Stephen Kemmis' cyclical model, with each cycle consisting of four stages: planning, observation, action, and reflection, as shown in Figure 1 (Kemmis et al., 2014).

- Planning Stage: The initial stage involved preliminary research to understand teachers' initial understanding of the integration of Islamic values into evaluation and the use of technology in learning. This initial data was collected through an online poll distributed to 44 target *madrasah* teachers. The results of this poll were used to identify specific mentoring needs.
- Action Stage: Based on the planning results, the service team implemented a series of actions through workshops and mentoring. These actions focused on developing evaluation question-writing methods that integrate Islamic values and the use of ICT.
- Observation Stage: During the action phase, the team observes teacher participation, understanding, and challenges. These observations are conducted through field notes and direct interaction.
- Reflection Stage: Following the actions and observations, a reflection session is held with participating teachers. This reflection evaluates the effectiveness of the actions taken, identifying successes, challenges, and areas for improvement. The reflection results from one cycle are explicitly used to formulate plans and actions for the next cycle, ensuring that the program continues to evolve and become more relevant to teachers' needs.

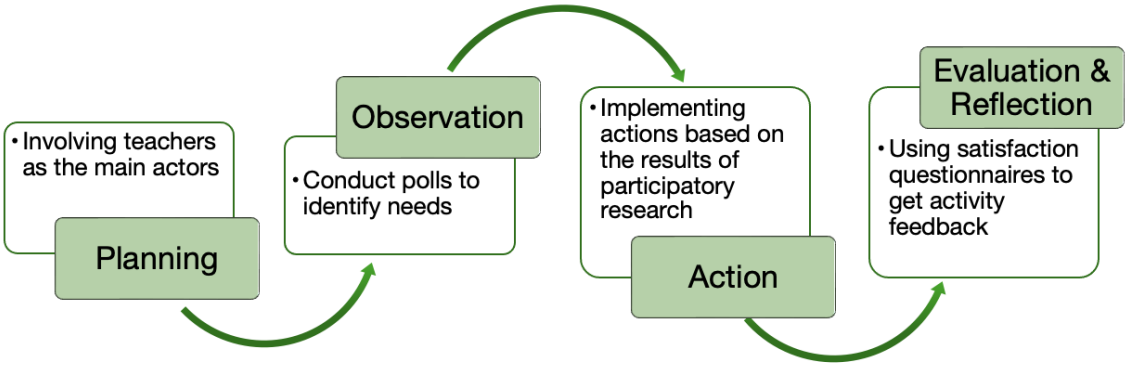

Figure 1. Problem-Solving Framework

The final evaluation of the program was conducted using a satisfaction questionnaire. After completing the mentoring activities, this questionnaire was distributed online to all 44 teacher participants. The questionnaire covered several satisfaction indicators as presented in Table 1, using a Likert scale of 1-5, where one indicates "very dissatisfied" and five indicates "very satisfied." The questionnaire data were analysed descriptively to obtain the mean satisfaction score and percentage of satisfaction levels for each indicator, providing a quantitative overview of the program's success.

Table 1. Community Service Activity Evaluation Questionnaire

Code	Community Service Activity Satisfaction Indicators
Q1	The material is aligned with the community service theme
Q2	The timing of the community service material is aligned
Q3	The speaker's mastery of the material and issues
Q4	The subject's participation in the community service activity
Q5	The relevance and competence of the community service program implementation team
Q6	The community service program can improve the quality, quantity, and added value of human resources
Q7	The community service program can increase the level of independence
Q8	The community service activity is aligned with community expectations

Results and Discussions

Community Service Activities and Results

Prior to the activity, an initial survey was conducted to gather information regarding the application of ICT and Artificial Intelligence (AI) in learning at the assisted *madrasah*. This information was obtained through a poll of training participants. The poll results regarding the application of ICT in learning are shown in Figure 2, where the majority of respondents to the first question, "Have you ever used ICT in learning activities?", answered that they had never integrated ICT in learning. However, in the second question regarding the ICT-based learning media they had used ("What media/tools do you use?"), only a few answered that they had never used ICT media. This response is because the participants were unaware that using media such as slides, videos, and social media is an example of using ICT in learning.

In the second poll regarding understanding of AI, as shown in Figure 3, all participants were familiar with AI, and more than half had used it. When responding to the potential of AI in education, the majority stated that AI could have a positive impact, although some expressed a contrary opinion. The explanations illustrated AI's ability to improve efficiency, accuracy, and personalise learning according to student needs. The belief that AI can create engaging and effective learning experiences opens new opportunities for technology-enabled teaching techniques. The presentation also included simple practical examples of using AI in learning activities.

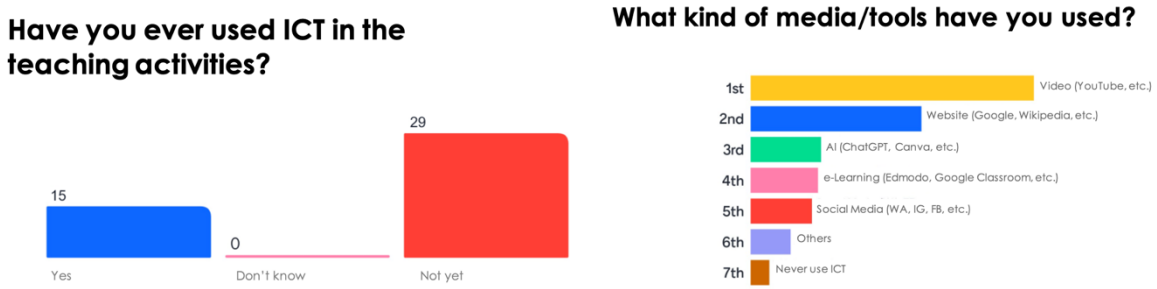

Figure 2. Initial Poll Results Regarding the Use of ICT for Learning

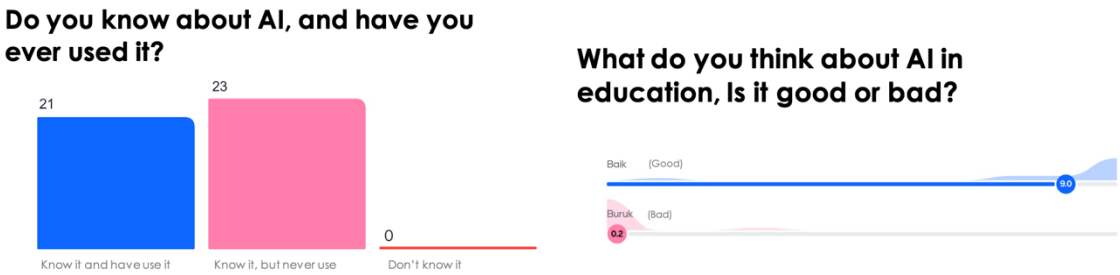

Figure 3. Initial Poll Results Regarding Understanding of AI

Based on the polling results, the main activities were then implemented, including mentoring in developing questions integrated with Islamic values and mentoring in using ICT as a learning medium. The first activity was training that reviewed the importance of integrating science and Islamic values. The direct implications of implementing this integration can be seen in the participation of *madrasah* students in the KSM (Competency-Based Learning) program. This program explained the process of developing KSM questions, which were carefully guided by considering aspects of Islamic values. It emphasised how these questions serve as a window into exploring the concepts and applications of Islamic values such as zakat, falak, and other relevant issues. The training also had a strong goal of assisting participants in conducting a holistic analysis of Islamic concepts and scientific fields. In addition to questions related purely to science, *madrasah* students were encouraged to compete on equal footing with science olympiad participants outside the *madrasah*. Another important point was the inclusiveness of the questions, which were written in three languages: Indonesian, Arabic, and English.

The second activity focused on understanding and practising the use of ICT and AI as effective learning media in *madrasahs*. Participants were explained the role of ICT in advancing education and were allowed to try out AI to support the learning process directly. A concrete

example of AI-based learning media that was introduced and demonstrated its creation was a simple chatbot for creating a Lesson Plan (RPP) using the Gemini platform with input prompts as shown in Figure 4. The importance of using AI responsibly, thoroughly, and carefully was also emphasised. The entire series of activities was documented as shown in Figure 5.

Figure 4. Example of Prompting Using Gemini to Compile Lesson Plans (RPP)

Next, the activity evaluation was conducted through a pre-developed questionnaire. The questionnaire was distributed to participants after the activity was completed. A total of 44 teacher representatives who participated provided their responses. After the activity, evaluation and follow-up plans were also conducted through discussions with the relevant *madrasah* administrators. The average assessment results for each indicator are shown in Figure 6. The assessment results indicate that the first indicator (the activity's suitability to the theme) was the most relevant with the highest average score according to participants. Meanwhile, the fourth indicator (participant participation level) was the lowest because it was felt that the number of participants attending the activity was small and that more could have been involved. This limitation was due to the implementation time during the Eid al-Adha holiday. More detailed results of the assessment percentage for each indicator are shown in Figure 7, where each indicator showed participant satisfaction above 82%.

Figure 5. Mentoring Activities Documentation

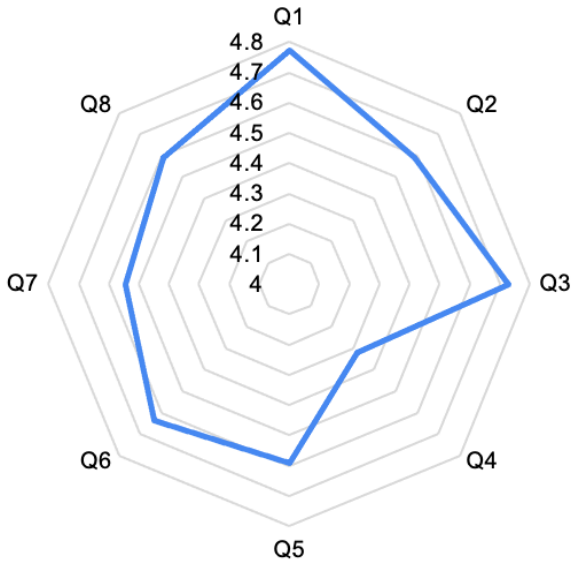

Figure 6. Average Evaluation Rating for Each Indicator

Several qualitative responses from participants from this activity are presented in Table 2, which synthetically demonstrate an increase in participants' understanding of the integration of Islamic values and science and increased confidence in utilising ICT and AI for creating questions and learning media. Teachers participating in the training demonstrated a substantial increase in understanding of the importance of integrating science with Islamic values in learning, and gained new knowledge about the use of ICT and AI in education (Respondents A and C). Teachers felt they had acquired a foundation of skills ready for application (Respondent E). The main challenges identified were time, participant participation, and infrastructure, which need to be addressed to optimise the long-term impact and sustainability of the program (Respondents B and D).

Discussions

The primary outcome of this community service program significantly impacted the quality of *madrasah* education, particularly in East Java. This finding aligns with research demonstrating the importance of teacher competence and technology integration in improving educational quality. Research by Hadijah and Shalawati (2017) emphasised that teachers' ability to utilise information and communication technology is positively correlated with improved educational outcomes. This underlying theory emphasises the importance of pedagogical competence and technology integration in the context of *madrasah* education.

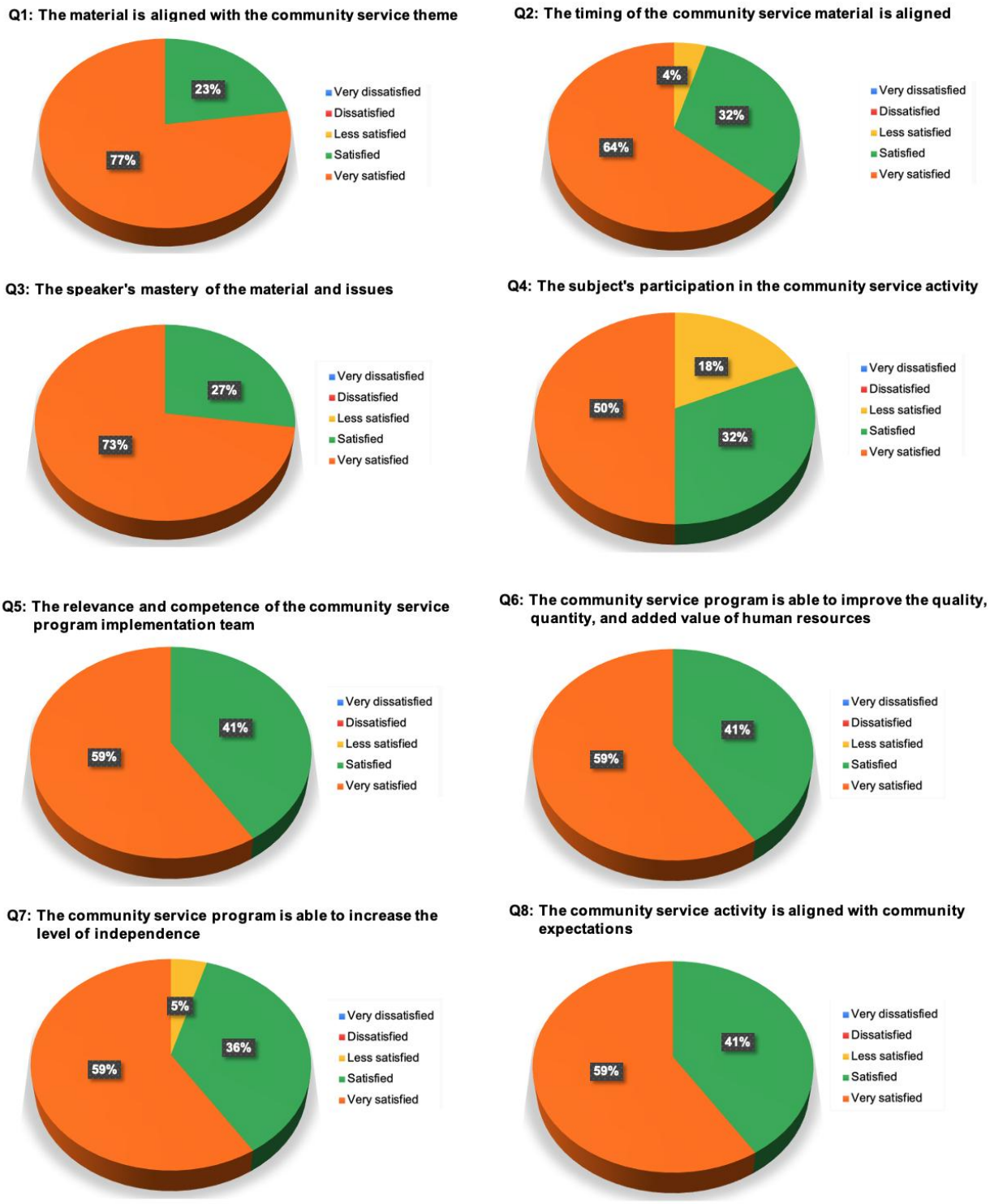

Figure 7. Percentage Distribution of Values for Each Indicator

Table 2. Examples of Responses from Participants Who Attended the Training

Name	Response	Response Conclusion
Respondent A	The material was truly super relevant and perfectly suited to our teaching needs! From start to finish, everything presented was truly eye-opening! It felt like discovering a new treasure trove in the world of education. Every point discussed resonated with us and made us even more enthusiastic about teaching. This program was not just training, but an inspiring experience!	Training adds value to teaching
Respondent B	The event coincided with the Eid al-Adha holiday, so there were fewer participants. Perhaps if it could be rescheduled for a more convenient time, more people would be able to participate and experience the fun of this training!	Participant participation needs to be increased in the future
Respondent C	"The integration of science and Islamic studies in this training is very beneficial and provides a new perspective on teaching. However, we face obstacles due to the lack of IT facilities at the *madrasah*. This lack of facilities challenges us in effectively applying the concepts we have learned."	Availability of IT facilities must be considered for effectiveness
Respondent D	"This training was truly inspiring and provided many new insights. However, I wish there had been more interaction between participants. Discussions and sharing experiences could have made the training even more lively and beneficial."	Interaction between participants needs to be increased for more effective learning
Respondent E	"I found this training very practical and applicable, and it was indeed beneficial for all of us. However, my busy schedule made it difficult for me to attend. Perhaps in the future, we can find a more flexible time so more people can participate and we can share our experiences more freely!"	The schedule needs to be adjusted to accommodate more participants

This program focuses on improving teacher skills, particularly in designing and understanding questions on integrating Islam and science, which is expected to improve student insight and achievement. This focus aligns with the theoretical framework proposed by Gersten et al. (1986), highlighting the importance of teacher expertise in curriculum development. Furthermore, research by Fauth et al. (2019) shows that teachers' in-depth understanding of subject matter contributes positively to student learning outcomes.

Evaluation of various aspects of the program, including analysis of KSM questions and ICT utilisation, is a crucial element. This evaluation process is based on the theoretical framework for program assessment and improvement, as discussed by Milstein and Wetterhall (2000) which aligns with the results obtained by Abtokhi and Fahmi (2023). These notions demonstrate the importance of evaluation in community development for future improvement and ensuring sustainable positive impacts.

Overall, this community service program not only improves teacher competency and educational quality, but also emphasises the importance of continuous teacher development

and technology integration in *madrasahs*. The visible impact is an increase in teachers' capacity to design more relevant and engaging learning, which is expected to improve educational quality and student learning outcomes. Some future steps to ensure a sustainable and broader impact include encouraging the formation of learning communities among teachers who have participated in the training to share experiences, and developing standardised training modules for replication and dissemination to other *madrasahs* outside the Gresik area. At the stakeholder level, guidelines for using AI in elementary and higher education are also needed to address the onslaught of AI in the current era.

Conclusion

An effective strategy for developing science integration questions has significant potential to improve the quality of *madrasahs* in East Java, particularly in Gresik Regency, the target of the community service program. The use of ICT in the learning process has also had a significant positive impact on improving the quality of education in *madrasahs*. This training has had a positive impact, reflected in the quantitative response of participants, exceeding 82% for each indicator, as well as the implementation of follow-up actions based on qualitative responses that have led to improvements and developments in *madrasah* education. Therefore, a sound science integration strategy, effective use of ICT, and appropriate outreach can significantly improve the quality of education in *madrasahs*.

Madrasah teacher competency improvement programs need to be strengthened by focusing on the curriculum, particularly the Independent Curriculum, which is tailored to the teaching needs of each region. This program includes training in developing HOTS (high-order thinking skills) questions, developing teaching modules, and other resources. To ensure that the program's effectiveness can be measured in detail and comprehensively in the future, an intensive ICT training model should be developed that focuses on creating interactive modules, learning videos, and digital learning resources.

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