Interactive Media Development Training for Primary MGMP Mathematics Teachers to Support the Project for Strengthening Pancasila Student Profiles

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Abstract

The interactive media development training for Mathematics teachers in the MGMP group at SMP Negeri 1 Soromandi aimed to enhance teachers' competencies in utilizing PhET and Word wall technologies in project-based learning, in alignment with the Projek Penguatan Profil Pelajar Pancasila. This study used a questionnaire method to evaluate the training, with 21 participants providing assessments regarding the usefulness of the material, the effectiveness of the trainers, the use of media, and the challenges faced. The results of the analysis showed that the training was highly beneficial, with an average score of 5.00, and the interactive media used was deemed effective, with an average score of 4.90. The trainers were rated highly competent in delivering material systematically (average 4.95) and communicatively (average 4.90). However, the training manual received criticism for being incomplete (average 1.00), and some participants suggested extending the discussion time. This training successfully achieved its goal of improving teacher competencies, although improvements are needed in the training manual and discussion time allocation. Future training program development should focus on these two aspects to increase the effectiveness and sustainability of the training.

Keywords: *Pengembangan Media Interaktif, Guru Pratama MGMP, profile pelajar pancasila.*

INTRODUCTION

The implementation of the Merdeka Curriculum in Indonesia emphasizes the importance of project-based learning to develop students' critical, creative and collaborative thinking skills. One of the important elements in this curriculum is the Pancasila Student Profile Strengthening Project, which aims to shape student character in accordance with Pancasila values, such as independence, mutual cooperation and creativity. (Irawati et al., 2022). However, the implementation of project-based learning in various schools, especially in remote areas, still faces a number of challenges. One of the main challenges is the lack of use of technology that supports interactive and dynamic learning (Nurrita, 2018).

(a) Computer Lab

(b) School environment

Figure 1. Facilities and Environment at SMPN 1 Soromandi

Figure 2. Learning still uses minimal media

At SMP Negeri 1 Soromandi, the results of the situation analysis show that although the school has great potential for natural resources and local culture to be integrated into learning, the use of technology in teaching and learning activities is still not optimal. Teachers still tend

to use conventional methods that are less interactive, so that students' active involvement is limited (Ramdani & Oya, 2024). This shows that there is a gap between the demands of the Independent Curriculum and implementation in the field, where the use of relevant interactive media has not been utilized optimally in the learning process.

Previous research highlights those educational technologies, such as PhET and Word wall, are effective in increasing student participation and strengthening understanding of abstract concepts through interactive learning experiences (Brookhart, 2010). PhET is an interactive simulation platform that allows students to experiment with math and science concepts visually and dynamically, while Word wall supports learning by providing fun and challenging game-based activities, so students can learn with more enthusiasm and engagement. The use of interactive media like this is in line with constructivist learning principles which prioritize direct learning experiences and active student participation.

However, many teachers, especially in remote areas, still face obstacles in integrating technology into learning. This is often caused by a lack of relevant training and appropriate mentoring to increase teacher competence in utilizing interactive media (Damayanti & Nawawi, 2023). Therefore, interactive media development training for teachers is an important step to answer this challenge and support the effective implementation of the Independent Curriculum.

The training held at SMP Negeri 1 Soromandi aims to increase teacher competency in designing and implementing project-based learning that supports strengthening the Pancasila Student Profile through the use of interactive media such as PhET and Word wall. Teachers are trained to utilize these two platforms to create learning that is more interesting and suited to student needs. It is hoped that this training will be able to provide a solution to the problem of low student engagement, as well as support the achievement of a more holistic and integrative curriculum goal.

Thus, it is hoped that this training will not only increase teacher competence, but also

encourage more effective, creative and enjoyable learning. Apart from that, this training can become an implementation model for other schools in order to support the transformation of education in Indonesia through the use of innovative technology and Pancasila values.

METHOD

The implementation of interactive media development training for Mathematics Subject Teacher Conference (MGMP) teachers at SMP Negeri 1 Soromandi was carried out through several systematic stages to ensure effectiveness and sustainable impact. Each stage is structured based on a participatory and problem-based approach, with the aim of increasing teacher competence in utilizing PhET and Word wall technology as interactive learning media.
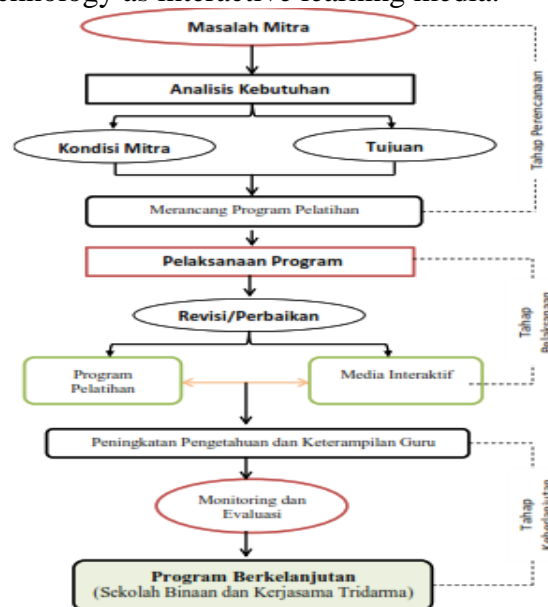

Figure 3. Devotion Flow Chart

Training Design

This training is designed in the form of a workshop consisting of several sessions which include:

- **Introductory Session:** In this session, participants were introduced to the basic concepts of interactive media and the importance of their application in project-based mathematics learning. The speaker explains how the use of technology can support the project of strengthening the profile of Pancasila students**.**

- **Demonstration Session**: Participants are introduced to two main platforms, namely PhET and Word wall. The training team demonstrated the steps for creating interactive learning media using these two platforms. PhET is used for interactive math simulations, while Word wall is used to create games and learning activities that actively engage students.
- **Independent Practice Session**: Teachers are divided into small groups to practice using PhET and Word wall according to their mathematics learning needs. Each group is accompanied by a team of experts who assist them in developing media that is relevant to the topic they are teaching.
- **Discussion and Evaluation Session**: After practice, a group discussion session was held where each group presented the results of their interactive media development. The coaching team provides feedback regarding the effectiveness and potential improvements of the media produced.

Participant

The training participants consisted of 21 MGMP Mathematics teachers from SMP Negeri 1 Soromandi. These teachers were selected based on their active involvement in the MGMP forum and the need for increased competency in project-based teaching. Participants have diverse educational backgrounds, but most do not have significant experience in using interactive technology in learning.

Data Collection Techniques

The data used to evaluate the effectiveness of training is collected through several instruments, namely:

- **Questionnaire**: Before and after the training, participants are asked to fill out a questionnaire to measure their level of understanding and skills regarding the use of interactive media. This questionnaire covers aspects of technical competency, student engagement, and learning motivation.
- **Observation**: The coaching team conducted direct observations during practice sessions to assess how teachers implemented the use of PhET and Word wall in teaching simulations.

- **Interview**: Interviews were conducted with several key participants to gain in-depth insight into the challenges they faced in adopting this new technology.

Data Analysis Techniques

Data obtained from the questionnaire was analyzed using the method **descriptive statistics**, focusing on the change in mean scores before and after training. Apart from that, data from observations and interviews were analyzed **qualitatively** to identify factors that influence the success of training as well as the challenges faced by participants in implementing interactive media in the classroom.

Mentoring Process

After the training, participants are given the opportunity to apply the media they have developed in their daily teaching. The service team provides ongoing assistance for 2 months to monitor progress and provide additional guidance if needed. Assistance is provided through direct visits to schools as well as online meetings to discuss challenges and solutions found by teachers.

RESULTS AND DISCUSSION
Results

Figure 4. Implementation of Training

Interactive media development training for MGMP Mathematics teachers at SMP Negeri 1 Soromandi showed very positive results, based on data obtained from questionnaires filled out by the participants. The results of this questionnaire provide insight into the effectiveness of training in various aspects, such as the benefits of the material, the quality of the presenters, interactivity, and use of media. Apart from that, there are several areas that still need improvement, especially regarding the guidebook.

Benefits and Understanding of Training Materials

Table 1. Teacher Assessment of Training Materials

No	Indicator	Average Score
1	The training material is very useful	5.00
2	Material is easy to understand	4.95
3	Material coverage as needed	5.00
4	Material meets expectations and needs	5.00
5	The material can be understood well	4.90
6	The explanation of the material is very systematic	4.95
7	The presenter is very communicative	4.90
8	The presenter mastered the material very well	5.00
9	The presenter provides time for discussion	4.95
10	Training activities feel boring	1.38
11	The presenters create an interesting training atmosphere	5.00
12	Training provides quite good examples	5.00
13	The training atmosphere is not interactive	1.62
14	The speaker helps when the material is not understood	4.71
15	The guidebook is incomplete and confusing	1.00
16	The guidebook is easy to understand and systematic	5.00
17	The training media is very good	4.90

Table 1 showed that the majority of participants considered this training to be very useful and relevant, all participants considered that the training material was very useful in supporting learning activities in the classroom. The average score for material benefits is 5.00, which reflects that this training meets the participants' needs. Apart from that, the material provided was also considered easy to understand, with an average score of 4.95. This shows that the material presented is able to answer the needs and expectations of participants in designing interactive project-based learning.

Quality of Speakers in Presenting Material

Diagram 2. Distribution of Leading Indicators

Participants gave very good assessments of the presenters, especially in terms of their ability to convey material systematically and communicatively. The average score for delivering material systematically was 4.95,

while the presenter's ability to communicate well received a score of 4.90. The presenters were also considered to have mastered the material very well, with an average score of 5.00.

One participant stated "The presenter was very competent and communicative, making it easier for us to understand and apply interactive media such as PhET and Word wall in learning." These results show that the presenters succeeded in creating an interactive and interesting atmosphere during the training, so that participants could be actively involved in discussions and direct practice.

Use of Interactive Media in Learning

Figure 5. PhET Interactive Media and Word wall

The media used in the training, such as PhET and Word wall, are considered very effective in increasing student engagement and strengthening understanding of concepts. The average score for very good training media was 4.90, indicating that participants felt this media was relevant to their teaching context. Participants also assessed that this interactive media helped them create more dynamic and interesting learning.

One participant said:

"The use of PhET is very helpful in explaining abstract mathematical concepts, while Word wall facilitates more fun and interactive learning."

Criticism and Suggestions for Improvement

Although the training generally went well, there were some aspects that received criticism, particularly regarding the guidebook. Most participants considered that the manual provided during the training was incomplete and confusing, with an average score of only 1.00. However, when assessed in terms of ease of understanding, the guidebook received a score of 5.00, which shows that even though it is incomplete, the guidebook is quite easy to understand. This area needs to be improved in future training, especially to ensure that the manual can provide more comprehensive instructions and support participants in applying the material after training.

Discussion

Interactive media development training for MGMP Mathematics teachers at SMP Negeri 1 Soromandi has shown significant success in increasing teacher competency in using tools such as PhET and Word wall for project-based learning. This training is in line with the focus of the Merdeka Curriculum which prioritizes interactive and contextually relevant learning. Several important aspects analyzed include the benefits of training, the effectiveness of material delivery, the use of interactive media, and the challenges faced during training.

Benefits of Training

Based on the results of the questionnaire, this training was considered very useful by the participants with an average score **5.00**, which reflects that this training effectively meets teachers' needs in designing more interactive and dynamic learning experiences. Gurrea et al. (2023) and Polly et al. (2019) emphasized the importance of designing applicable materials to improve teachers' abilities in facing the challenges of 21st century learning. The use of interactive media such as PhET and Word wall plays an important role in engaging students and helping them understand abstract concepts better. This is in line with the findings of Harianto & Sudatha (2024) and Kaban et al. (2023) who emphasize the importance of technological tools in creating a more participatory and immersive learning environment.

Effectiveness of Material Delivery

The training presenters were considered very competent in delivering material systematically with an average score of 4.95, and communicative with a score of 4.90. This creates

an engaging training atmosphere, as shown in research by Gurrea et al. (2023) and Ulumi et al. (2023) which states that the quality of the presenter plays an important role in the success of a training. Effective communication and a supportive environment are key factors in ensuring participants are ready to apply new skills in the classroom (Kadir et al., 2023).

Use of Interactive Media

The use of interactive media in this training significantly improves the learning atmosphere. With an average score of 4.90, participants felt that media such as PhET and Word wall were able to make learning more dynamic and participatory. Harianto & Sudatha (2024) and Kaban et al. (2023) found that technology tools designed for education can increase student engagement and strengthen their understanding of the material being taught. The use of PhET, in particular, helps teachers visualize complex mathematical concepts, in accordance with the findings of Noviyanti et al. (2024) and Kaban et al. (2023) which highlights the role of educational technology in improving student learning outcomes.

Challenges in Using Guidebooks

One aspect that received criticism from participants was the guidebook used during the training. With a mean score of 1.00, the guidebook was rated as incomplete and confusing, indicating the need for more comprehensive and clear guidance to support post-training implementation (Arafat et al., 2024). As expressed by Kadir et al. (2023), a well-structured guidebook is essential to maintain long-term training impact.

Interactivity and Engagement in Discussions

Although most participants felt this training was interesting and not boring, there were suggestions to extend the discussion time so that participants could explore the material in more depth. The average score for discussion time was 4.95, indicating that although the discussion was rated positively, participants wanted more time to participate. Inderawati et al. (2023) and Nyoman Mantra et al. (2023) emphasized that extending discussion time can increase participants' understanding and facilitate the exchange of ideas about the application of interactive media in learning.

CONCLUSION

Interactive media development training for Mathematics teachers at SMP Negeri 1 Soromandi succeeded in achieving its goal, namely increasing teacher competency in using technology such as PhET and Word wall to support project-based learning. Based on the results of the questionnaire, this training was considered very useful, with an average score of 5.00, which shows that this training meets the needs and expectations of the participants. The interactive media used is also considered very effective in increasing student involvement, helping teachers visualize abstract concepts, and creating a more dynamic learning atmosphere.

One of the main advantages of this training is the ability of the presenters to present the material systematically and communicatively, which received high marks from the participants. An interesting and interactive training atmosphere is also an important factor in the success of this training.

However, there are some areas that need improvement. The guidebook used during the training received criticism from participants, who stated that the guide was incomplete and confusing. In addition, some participants suggested that discussion time be extended to allow for more in-depth exploration of the material being taught.

For further development of the training program, it is recommended to improve the guidebook to make it more comprehensive and clearer, as well as providing longer discussion time to increase participants' active participation. By improving these two aspects, future training will be more effective and have a long-term impact in supporting the implementation of the Independent Curriculum and the use of interactive media in learning.

Soromandi, so as to increase teacher competence in utilizing technology for project-based learning. Thank you also to the school and all participants who have actively participated in this activity.

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