Introduction of Mathematics Learning Media at the Elementary School in SD Inpres Teamate, Pallantikang Village, Pattallassang District, Gowa Regency

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Abstract
Mathematics is one of the core subjects in elementary school and plays a significant role in the development of students' logical and analytical thinking abilities. Therefore, the need to be given guidance on the introduction of learning media in mathematics education at the elementary school level. This activity aims to introduce and integrate IT-based learning media into mathematics education at Teamate Inpres Elementary School in Pallantikang Village, Pattalassang District, Gowa Regency. The implementation method of the activity includes the development of materials, teacher training, and student mentoring using the Khan Academy and To DO Math platforms. The findings indicate positive involvement, with 90% student participation in the activity. Evaluation of the activity results reveals a significant improvement in the understanding of mathematical concepts, with 80% of students showing increased speed and accuracy in their responses. The benefits obtained include an increase in student interest in learning, improvement of teacher skills in managing IT-based learning, and enhanced collaboration between the school and the community. The conclusion of this activity emphasizes the role of IT-based learning media strategies in improving the quality of elementary-level mathematics education and strengthening community involvement in supporting educational innovation.

A. Introduction
Education is a crucial element in shaping the character and abilities of the younger generation (Suryandaru & Setyaningtyas, 2021). Mathematics, as one of the core subjects in elementary school, plays a significant role in the development of students' logical and analytical thinking abilities. However, challenges are often encountered in the learning process, especially regarding the understanding of concepts and the use of appropriate learning media (Sari et al., 2022; Yayuk et al., 2020). Therefore, providing guidance on the introduction of learning media in mathematics education at the elementary school level is highly relevant to enhance the effectiveness and quality of learning.

Before designing the mentoring program, an in-depth analysis was conducted on the situations faced by teachers and students in elementary schools. Currently, many elementary school teachers still face challenges related to the use of conventional learning media in the teaching of Mathematics (Faizah & Sugandi, 2022; Panggayudi et al., 2017). Blackboards, textbooks, and traditional writing tools remain the primary choices for delivering content. The limitations of these media often make learning monotonous and less engaging for students. An approach that is teacher-centered and lacks interactivity in using
conventional media restricts creativity in content delivery, ultimately affecting students' interest and positive responses to Mathematics learning (Li et al., 2019; Nurhayanti et al., 2021). The impact of using conventional learning media in mathematics education can be seen in the less appealing response from students. Learning that tends to be static and less effective results in low student engagement (Leonardo et al., 2022). The lack of visualization and exploration of mathematical concepts through learning media makes it difficult for students to understand the material more deeply. The lack of appeal in learning can negatively impact students' learning motivation, necessitating guidance to introduce more dynamic and interactive learning media.

Efforts to enhance the quality of mathematics education in elementary schools necessitate mentoring aimed at introducing innovative learning media to teachers (Dewi & Suniasih, 2022). Through this mentoring, it is anticipated that teachers can comprehend and implement more varied and captivating learning media, such as multimedia, educational software, and other interactive tools. This mentoring not only seeks to improve teachers' proficiency in utilizing instructional technology but also aims to stimulate students' interest and engagement in understanding mathematical concepts. Consequently, the mentoring in the introduction of learning media is expected to transform the conventional learning paradigm into a more dynamic process, providing a more enjoyable learning experience for students at the elementary school level.

Based on the results of the situational analysis, a work program has been formulated dedicated to addressing the challenges faced by the target audience and activity partners. This program encompasses strategies and concrete activities to enhance student understanding and assist teachers in the effective use of learning media. For instance, teacher training on the development and utilization of innovative mathematics learning media, as well as the creation of teaching materials tailored to students' needs.

The work program for introducing learning media in mathematics education at elementary schools includes initiatives to integrate information technology (IT)-based learning media that can be tailored to students' needs. In this context, the implementation of the introduction program for learning media in mathematics at SD Inpres Teamate in Pallantikang Village, Pattallassang District, Gowa Regency, is deemed an urgent necessity based on the current learning conditions. Pallantikang Village is a rural area that may face limitations in access to resources and technology. It is likely that mathematics education at SD Inpres Teamate still employs conventional methods and limited learning media. Therefore, the significance of introducing IT-based learning media at this elementary school is crucial to overcome these limitations. Through this introduction, it is expected that teachers and students at SD Inpres Teamate can experience the benefits of using technology to support the mathematics learning process.

The introduction of mathematics learning media at SD Inpres Teamate also aims to enhance the quality of education and align the curriculum with contemporary demands. In facing the digital era, understanding and utilizing information technology in mathematics education are highly necessary. This program will provide opportunities for teachers and students to become familiar with and use IT-based learning media that suit their needs. By embracing technological advancements, it is anticipated that mathematics education can be presented in a more engaging manner, motivating students and improving their understanding of mathematical concepts. Additionally, the introduction of learning media aligns with efforts to integrate technology into the curriculum, preparing students with relevant skills to navigate an increasingly digital world. Thus, this activity provides a foundation for improving the quality of education and the relevance of the curriculum at SD Inpres Teamate in Pallantikang Village, Pattallassang District, Gowa Regency.

Furthermore, the relevance of this work program is highly significant in the development of technology and the current needs of mathematics education. By utilizing IT-based learning media, it is expected to create a more engaging learning environment that aligns with the learning styles of contemporary students (Purnomo & Suparman, 2020). The use of this technology also prepares students to adapt to the evolving technological changes in the future. Additionally, the relevance of this work program lies in the enhancement of the quality of mathematics education through a more contextual and applicative approach. By integrating mathematical concepts with technology, it is hoped that students will not only understand the theory but also be able to apply that knowledge in real-world situations (Saputra et al., 2019). Thus, the work program for introducing IT-based mathematics learning media is a strategic step in improving the relevance and effectiveness of education in elementary schools.

Similar research has been conducted by previous researchers such as (Premana et al., 2022), (Simarmata et al., 2022), (Kurniawan & Rivaldi, 2021), and (Hasiru et al., 2021), indicating that the use of media in mathematics education helps students understand mathematical concepts in a simpler way. This community
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service activity involves learning assistance using the game counting bunny learning media, which also helps students understand mathematical operation concepts, as conducted by (Hidayati et al., 2022).

The importance of mentoring in introducing learning media in mathematics education at elementary schools is reflected in the objectives and benefits of this activity. The objectives can be formulated as an effort to enhance students' understanding of mathematical concepts and teachers' abilities to utilize learning media at SD Inpres Teamate. The benefits include improved student academic achievement, enhanced teaching skills for teachers, and the creation of a more interactive and enjoyable learning environment. With this mentoring, it is expected to contribute positively to the development of the quality of mathematics education in elementary schools, creating a generation capable of critical and creative thinking, with a strong foundation in mathematical knowledge.

Aims and scope of paper: The goal of the effort is to enhance students' understanding of mathematical concepts and teachers' proficiency in utilizing learning media at SD Inpres Teamate. The benefits include improved academic achievement of students, enhanced teaching skills for teachers, and the creation of a more interactive and enjoyable learning environment. With this mentoring, it is expected to make a positive contribution to the development of the quality of mathematics education in elementary schools, fostering a generation capable of critical and creative thinking, and possessing a strong foundation in mathematical knowledge.

B. Method

Population and the methods of sampling:

Mentoring Activity at SD Inpres Teamate, Pallantikang Village, Pattallassang District, Gowa Regency, will take place at 13:30 WIB (Western Indonesian Time) at the school. The chosen location aligns with the continuity of mathematics learning activities within a familiar environment for both students and teachers. Selecting the time at 13:30 WIB is also intended to accommodate the school schedule and ensure full participation from the teachers and students of SD Inpres Teamate.

The target audience for this activity includes students and teachers at SD Inpres Teamate, involving our activity partners, Dr. Agustan and Mrs. Ernawati M. Pd, who will serve as presenters in this event. Additionally, the participating PKM (Community Service Program) students, namely Andi Aswani, Dian Anggreni, and Mei Cahaya, will act as implementing mentors, providing technical assistance and supporting the smooth execution of the activity.

The methodology employed in this community service activity will utilize an approach that introduces and simulates IT-based learning media. The presenters, Dr. Agustan and Mrs. Ernawati M. Pd, will introduce two learning media, namely Khan Academy and To DO Math, to teachers and students. The presenters and organizing committee will actively participate in simulating the use of mathematics learning media, providing practical guidance, and engaging participants in a question-and-answer session. This mentoring aims to enhance teachers' understanding and skills in implementing instructional technology, as well as stimulate students' interest and participation in the mathematics learning process.

The Success Indicators include:

1. Improvement in Understanding Mathematical Concepts: This indicator is measured through the evaluation results of student learning, including the increase in scores on the mathematics concept understanding test after the introduction and simulation of using Khan Academy and To DO Math.

2. Student Participation and Engagement: Success can also be measured through the level of student participation and engagement in learning activities involving IT-based learning media. This includes the level of student activity during learning sessions and their positive responses to the use of technology.

3. Improvement in Teacher Skills: This success indicator involves the improvement of teacher skills in planning and implementing mathematics learning by utilizing Khan Academy and To DO Math. It can be measured through the enhancement of teacher abilities in designing learning materials, presenting content, and managing interactivity with students through these media.
Evaluation Methods:

1. **Post-Test**: Utilizing pre-tests before mentoring and post-tests after the introduction of learning media to measure the improvement in students' understanding of mathematical concepts.
2. **Observation of Student Participation**: Observing student participation during IT-based learning media sessions. This includes the level of student engagement and their interaction with learning materials.

The activity is divided into three main stages: the preparation stage, the implementation stage, and the evaluation stage.

![Figure 1. Stages of activity](image)

**C. Result and Discussion**

The Preparation Stage of the Introduction of IT-Based Learning Media in Mathematics Education at SD Inpres Teamate in Pallantikang Village, Pattallassang District, Gowa Regency, can be outlined as follows:

1. **Identification of School Needs and Readiness**

   The school already possesses internet facilities that can support the use of IT-based learning media. Each teacher is also equipped with a laptop, providing adequate access for technology use in teaching. However, by requesting students to bring mobile devices from home, the school can maximize student participation in IT-based learning activities.

![Figure 2. Installation Process of Banners by Several PKM Students](image)
PKM students are engaged in various preparatory tasks for the event. Some of them are installing banners, responsible for disseminating information and promoting the upcoming activity. Meanwhile, three other students are tasked with checking the readiness of technical equipment, including LCD screens, long cables, and power outlets. They also verify the attendance of event participants, ensuring that all invited individuals are present to optimize participation in the introduction of IT-based mathematics learning media at SD Inpres Teamate. With this division of tasks, PKM students contribute effectively to ensuring the smoothness and success of the activity.

2. **Mapping of Teacher and Student Skills in IT Usage**

The mapping of teacher and student skills at SD Inpres Teamate in Pallantikang Village indicates that approximately 50% of teachers already have experience using instructional media, although they have not yet used Khan Academy and To DO Math. Similarly, students are not yet familiar with these two-learning media. However, the skills in using devices such as laptops and mobile phones (HP) are already quite common among both teachers and students. Therefore, participants are expected to encounter no difficulty in using technological devices during the introduction of IT-based learning media.

3. **Training Plan Development**

The mentoring agenda at SD Inpres Teamate in Pallantikang Village takes place after school hours, with an initial series of activities opened by a welcome speech from the school principal. The event then continues with introductions from presenters, Dr. Agustan and Mrs. Ernawati M. Pd, as well as PKM students such as Andi Aswani, Dian Anggreni, and Mei Cahaya. The main content presented focuses on the introduction of IT-based media for elementary school mathematics education. The training method is conducted offline or face-to-face, using laptops for teachers and mobile phones (HP) for students. This activity is scheduled to take place after school hours at 13:30 WIB, providing a suitable time and ensuring maximum participation from teachers and students.

4. **Selection and Preparation of Learning Media**

Before starting the simulation, PKM students take turns assisting teacher and student participants in opening the links for Khan Academy and To DO Math. The initial content presented is To DO Math, followed by a more in-depth introduction to Khan Academy. With the help of PKM students, participants can access and familiarize themselves with both learning media as an initial step before engaging in simulations of their use in elementary school mathematics learning.
5. Supporting Materials

As supporting materials, a PowerPoint presentation is provided, containing step-by-step instructions for using the Khan Academy and To DO Math applications. This material is presented to teachers and students as a practical guide to understand and use both learning media effectively.

Figure 3. PPT Tutorial for Khan Academy Application

Figure 4. Video Tutorial for To Do Math Application

This presentation provides clear instructions and necessary steps to effectively utilize Khan Academy and To DO Math in the elementary school mathematics learning process.
6. Training for Student Mentors and Lecturers

The mentoring conducted by students and lecturers for teachers and students in using the Khan Academy and To DO Math applications involves technical assistance and practical guidance. PKM students and lecturers provide direct assistance to participants, helping them to open and access application links, explaining the steps of usage, and providing solutions to potential challenges or questions that arise.

Figure 5. PKM Students Presenting a PowerPoint containing Application Tutorials

Figure 6. PKM Students Explaining Application Usage Through Mobile Phones

Figure 7. PKM Students Explaining Application Usage to Participants One by One Through Mobile Phones
7. Testing and Simulation

The mentors provide detailed explanations of the steps for using the applications, offer concrete examples, and respond to questions from participants. The mentors also actively observe and collect feedback from teachers and students, enabling them to make adjustments or provide further clarification as needed.

![Participants' Response During the Trial](image)

**Figure 8.** Participants' Response During the Trial

During the testing and simulation, participants (teachers) showed great enthusiasm in receiving information. Some teachers asked questions related to the exercise system provided by the application. The mentors then responded to each question directly, ensuring that by taking these actions, they strive to ensure that teachers and students feel comfortable and capable of optimizing the use of Khan Academy and To DO Math in elementary school mathematics learning.

8. Evaluation of Results

The evaluation of the trial and simulation of the Khan Academy and To DO Math applications is conducted by considering several aspects. First, through the analysis of test or quiz results given to students after the introduction of learning media. These results reflect students’ understanding of the mathematics material presented through Khan Academy and To DO Math. Furthermore, through the observation of student participation and responses during the learning sessions, including their level of engagement and enthusiasm in using the applications. Additionally, direct feedback from teachers regarding the ease of use and effectiveness of the learning media is also taken into consideration. By analyzing data from various sources, the evaluation of the trial and simulation provides an overall picture of the success of implementing Khan Academy and To DO Math in enhancing mathematics education at SD Inpres Teamate.

The evaluation results from the online simulation with teachers and offline simulation with students are obtained through the percentage of scores achieved by students. These scores are provided by each teacher through their Khan Academy and To DO Math accounts, as presented below:

![Histogram of Khan Academy](image)

**Figure 9.** Results of Student Evaluation Scores Using Khan Academy
The score intervals for students using Khan Academy are as follows:

1. 60-64: In this range, some students may need more attention regarding the understanding of specific mathematical concepts. Additional efforts and guidance can be provided to improve their understanding.
2. 65-69: Students in this interval have demonstrated adequate understanding but still require some improvement. Additional coaching can be done to ensure concepts that may not be fully understood are reinforced.
3. 70-74: Students in this range have shown good ability in understanding the mathematics material on the Khan Academy platform. They can be considered to have mastered most of the taught concepts.
4. 75-80: Students in this range have achieved high scores and demonstrated a good understanding of mathematical concepts. They may be considered as highly achieving students in using Khan Academy.

The score intervals for students using To DO Math are as follows:

1. 60-64: Students in this range may need more attention regarding the understanding of specific mathematical concepts. Additional guidance can be provided to help them overcome these difficulties.
2. 65-69: Students in this interval have demonstrated adequate understanding but still require some improvement. Additional coaching can provide extra support to ensure better concept understanding.
3. 70-74: Students in this range have shown good ability in understanding the mathematics material using To DO Math. They can be considered to have mastered most of the taught concepts.
4. 75-80: Students in this range have achieved high scores and demonstrated a good understanding of mathematical concepts. They may be considered as highly achieving students in using To DO Math.

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Khan Academy Score</th>
<th>To Do Math Score</th>
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<tbody>
<tr>
<td>70</td>
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Figure 10. Results of Student Evaluation Scores Using To DO Math

Table 1. Comparison of Obtained Score Values
The comparison of student scores using Khan Academy and To DO Math provides an interesting overview of the effectiveness of both platforms in supporting mathematics learning at SD Inpres Teamate in Pallantikang Village. Student scores on Khan Academy show variation, with some students achieving high scores, indicating a good understanding of concepts. On the other hand, student scores using To DO Math also exhibit variation, with the majority of students achieving relatively high scores.

In terms of comparison, both Khan Academy and To DO Math contribute positively to improving students' understanding of mathematical material. Despite differences in presentation and approach, both have succeeded in achieving a good level of success in enhancing student scores. These results indicate that both platforms can be valuable resources in supporting the mathematics learning process at the elementary school level.

The findings of IT-based media support, showing an improvement in students' ability to understand geometric concepts, align with the results of previous research (Simarmata et al., 2022). In that study, the use of IT-based learning media was identified as a key factor supporting the improvement of mild intellectually disabled students' abilities to understand geometric concepts. The evaluation of the activity indicated that 80% of mildly intellectually disabled students demonstrated speed and accuracy in their answers, while 20% showed accuracy but at a slower pace.

Moreover, these findings are also consistent with research by Wibowo (2013), which demonstrated that the use of learning media, including in the context of mathematics, made teaching methods at Tamanrejo Public Elementary School more interesting. The availability of learning media provides additional support in the learning process, making mathematical material easier to understand and capturing the students' attention. The correlation between the findings of this support and the research by Simarmata et al. (2022) and Wibowo (2013) indicates that the use of IT-based media can contribute positively to enhancing students' understanding and interest in mathematics learning, especially in the context of geometric concepts.

D. Conclusion

The implementation of the Media Introduction Activities in Mathematics Learning at SD Inpres Teamate in Pallantikang Village, Pattalassang District, Gowa Regency, has brought various innovations and benefits to the local community. This activity provides a profound understanding to teachers and students about the utilization of IT-based learning media, such as Khan Academy and To DO Math. Through the guidance of students and lecturers, teachers and students can access and understand the effectiveness of these two media. Technology in elementary level mathematics learning. Students not only acquire conventional knowledge but are also introduced to more interactive and enjoyable learning methods. This is expected to increase students' interest in learning and broaden their insights into the world of technology. The benefits for the community are evident from the improvement in the quality of mathematics education at SD Inpres Teamate. Teachers become more skilled in integrating technology into their teaching, and students experience the advantages of more engaging and interactive learning. The community supports this progress as it contributes to the formation of a generation more competent in mathematics. In terms of theoretical contribution, this activity complements the literature with field experiences related to the implementation of IT-based learning media at the elementary level. These findings can serve as a basis for further research on the effectiveness of learning media in improving mathematics learning outcomes. Thus, this activity not only provides practical benefits to the local community but also makes a theoretical contribution to the
development of technology-based mathematics education. Recommendations to enhance the impact and sustainability of the initiative: Firstly, there is a need for a more structured approach to involve teachers and students. It is recommended to conduct advanced training that involves teachers more intensively in the use of IT-based learning media. This training should include technical understanding, effective teaching strategies, and classroom management utilizing technology. Furthermore, in efforts to increase student participation, adjustments and development of learning content more suited to their needs and interests are necessary. By integrating more local and relevant material, it will motivate students to actively engage in learning. It is also advisable to involve parents more actively and organize informational activities for them, so they can support and understand the benefits of the new learning approach.

E. Acknowledgments

A heartfelt thank you is extended to the supervising lecturer, Mrs. Ernawati M. Pd, and the tutoring lecturer, Dr. Agustan M. Pd, for their invaluable guidance, support, and inspiration throughout the implementation of this activity. The collaboration and guidance provided by both have been a crucial pillar in the success of introducing learning media at SD Inpres Teamate in Pallantikang Village. Deep gratitude is also directed towards the PKM colleagues who have dedicatedly and enthusiastically executed each stage of the activity together. The teamwork has laid a strong foundation in achieving optimal results and making a tangible contribution to education in the school. Not forgetting, sincere thanks to the teachers at SD Tematea who participated and provided full support as mentoring participants. The collaboration between the PKM team and school teachers is a valuable initial step in realizing positive changes in elementary mathematics education. All parties involved in this activity have demonstrated extraordinary commitment and dedication. Once again, heartfelt thanks for all the valuable contributions made for the progress of education at SD Inpres Teamate in Pallantikang Village.

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