Journal of Saintech Transfer
Journal homepage: https://talenta.usu.ac.id/jst/index

Mathuiz-B Android-Based Application Program to Overcome Dissimilarity in Mathematics Fields of Sabilurrosyad Islamic Junior High School Students

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ARTICLE INFO
Article history:
Received 21th February 2024
Revised 25th April 2024
Accepted 25th May 2024
Available online
https://talenta.usu.ac.id/jst/index

E-ISSN: 2621-4830
P-ISSN: 2621-2560

How to cite:
K. Pusawidjayanti, A.D. Utami, Asmianto, D.E. Cahyani "Mathuiz-B Android-Based Application Program to Overcome Dissimilarity in Mathematics Fields of Sabilurrosyad Islamic Junior High School Students," Journal Saintech Transfer, vol. V7, no. 1. pp. 35-45. 2024.

ABSTRACT
Sabilurrosyad Islamic Middle School is a junior high school in the village of Karangbesuki. The geography school is located on the edge of Malang City and far away from the center of Malang City. Students entering junior high school are big children from local public elementary school graduates. Sabilurrosyad Islamic Middle School is the school that found its students with diverse ability different academics. _ Problems faced _ partner is different competence academic field mathematics in students new Sabilurrosyad Islamic Middle School. Based on the results analysis situation and SWOT analysis, the team devoted the public to the solution by creating and giving application edugames (MATHUIZ-B) that can used by schools. For participants assigned to educate new order capabilities, cognitive students can be uniform with standard junior high school level. The method of this community activity begins with preparation, making the Mathuiz-B application, outreach to teachers and principals of Sabilurrosyad Middle School, and Submission of the application so that service partners can use it. On activities devotion public, team devotion will provide an application manual book and a book regarding successful strategies for learning mathematics for entering junior high school.
Keyword: android application, community service, edugames

ABSTRAK
SMP Islam Sabilurrosyad merupakan SMP di kelurahan karangbesuki, secara geografi sekolah tersebut terletak di tepi kota Malang dan jauh dari pusat kota Malang. Siswa yang masuk di SMP tersebut sebagian besar merupakan anak-anak dari lulusan SD negeri setempat. SMP Islam Sabilurrosyad merupakan sekolah yang mendapati siswa dengan beragam kemampuan akademik yang berbeda-beda. Permasalahan yang dihadapi mitra adalah perbedaan kompetensi akademik bidang matematika pada siswa baru SMP Islam Sabilurrosyad. Berdasarkan hasil analisis situasi dan analisis SWOT maka tim pengabdian masyarakat memberikan solusi dengan membuat dan memberikan aplikasi edugames (MATHUIZ-B) yang dapat dimanfaatkan oleh sekolah untuk diberikan kepada peserta didik baru agar kemampuan kognitif siswa dapat diseragamkan dengan standar jenjang SMP. Metode dari kegiatan masyarakat ini dimulai dengan persiapan, pembuatan aplikasi Mathuiz-B, sosialisasi kepada guru dan kepala sekolah SMP Sabilurrosyad, Penyerahan aplikasi agar bisa dimanfaatkan oleh mitra pengabdian. Pada kegiatan pengabdian masyarakat ini juga, tim pengabdian akan memberikan manual book aplikasi dan memberikan buku terkait strategi sukses pembelajaran matematika untuk masuk SMP.
Keyword: aplikasi android, edugames, pengabdian masyarakat.

http://doi.org/10.32734/jst.v7i1.15737

1. Introduction

The government established a zoning policy when accepting new students and is regulated in Minister of Education and Culture Regulation no. 14 of 2018, which states that schools run by regional governments are required to accept prospective students who live in the nearest zone radius. This results in schools accepting

new students with a variety of academic competencies. This difference in intellectual abilities makes teachers spend more energy and thought when teaching in class so that students' academic competence can be maximized according to the appropriate level of education. According to [1], favorite schools must be able to align with other schools in accepting new students. Students cannot be accommodated because their homes are close to the school, while high-achieving students are not accommodated because the zoning system limits them. Apart from that, the negative impact of this policy is that teachers can experience confusion in teaching because students have different cognitive abilities, so teachers must have appropriate teaching tips and strategies [2]. This gap in cognitive abilities in new students has resulted in new problems for community service partners, namely that the material to be taught must be withdrawn and completed material not completed at the previous level. This results in time being used to discuss previous level material and students who can already continue with the next material being hampered.

According to [3], the COVID-19 pandemic has caused the implementation of distance learning, which causes learning loss, in which students lose skills and knowledge due to certain conditions. This is one factor in the education gap. The Ministry of Education and Culture conducted a survey in 2020 at the research center, and it was found that as many as 24.7% of teachers felt unable to teach optimally when learning from home. From the students' side, it was found that 76.7% of students were unhappy and starting to get tired of carrying out distance learning; this survey was taken from Komisi Perlindungan Anak Indonesia (KPAI) in 2021. This resulted in less than optimal learning, which decreased students' cognitive abilities [4].

According to [5], one of the teacher's roles is as a facilitator whose task is to provide services so that students can easily understand and accept the material that has been given. Apart from that, the teacher's role is to prepare assessment questions adjusted to learning achievement standards. Thus, teachers who are competent in creating assessment questions need to receive assistance so that it is in line with learning outcomes and equal competence.

Humans depend on technology because technology is growing so fast and massive [6]. So, teachers are required to be able to create learning assessment materials or questions using interactive technology. One type of interactive technology used in education is edugames or educational games [7]. Then, [8] stated that not all games can provide good learning results. The games that can improve students' thinking abilities are games that offer education. Creating interactive questions in this activity is one of the edugames that students can utilize.

Sabilurrosyad Islamic Middle School is a middle school in Karang Besuki Village. Geographically, the school is located on the edge of Malang City and far from the center of Malang City. The students who enter junior high school are the children of local state elementary school graduates. The sample partner for this community service activity is Sabilurrosyad Islamic Middle School, which is a school that finds students with a variety of different academic abilities.

Several problems are indicated by various kinds of student data, which provide poor learning outcomes. The problems faced are quite complex. The diversity of students' abilities related to students' academic abilities is quite large, resulting in gaps in academic abilities, especially in mathematics. According to partners, the main factors are implementing the government's zoning system and the Covid-19 pandemic.

By looking at the situation analysis results of service partners, it is clear that partner problems can be classified. First, the diversity of abilities of elementary school graduates who have not yet reached learning standards means that short and complete material enrichment is needed. Second, human resourses (HR) capabilities as facilitators are lacking in developing the latest technology. Third, Lack of innovation in classroom learning. Fourth, students must spend a lot of time deepening elementary school-level material.

These problems can be analyzed using a SWOT analysis can be seen in Figure 1.

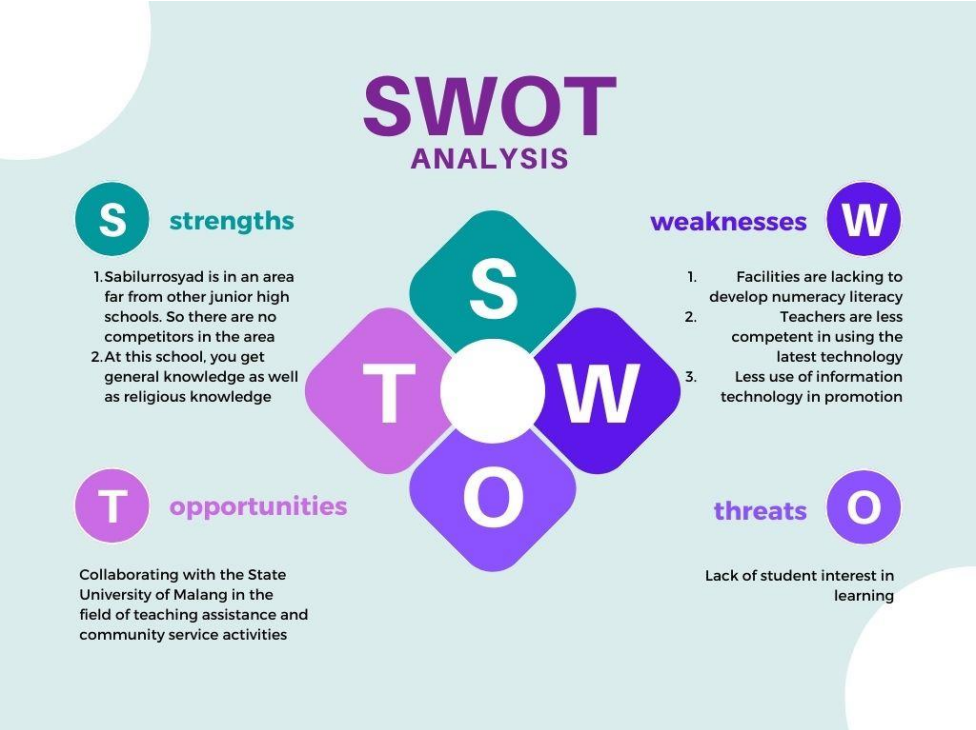

Figure 1 SWOT analysis of Sabilurrosyad Islamic Middle School.

Strength. Sabilurosyad Islamic Middle School is a school that is easily accessible to the local community because, in the Gasek area, Karang Village, Sabilurrosyad Islamic Middle School is the only middle school in the area and is far from other middle schools. So, most likely it will chose by the local community. The next advantage is that this Islamic Middle School is located in an Islamic boarding school environment and is based on Islam, so the school has a double curriculum, namely getting conventional knowledge and religious knowledge simultaneously.

Weakness. One of the weaknesses of Sabilurosyad Islamic Middle School is the Lack of focus on using technology to promote the school. Then, the teacher's role as a facilitator is less competent in using the latest technology. The subsequent weakness is the Lack of facilities for developing numeracy literacy. This can hinder the development of the school.

Opportunities. The big opportunity for this Islamic Middle School is to collaborate with LP3 UM in teaching assistance activities. Then, the school principal will follow up with this community service activity by conveying complaints about problems.

Threats. The threat is that because they are located in areas far from big cities, these service partner schools get students whose academic competencies vary and can even be below standard. Elementary school learning outcomes that should have been exceeded. Students' interests during learning are not fulfilled.

The results of the situation analysis and SWOT analysis of specific service partner problems can be seen as follows:

a. Islamic Middle School is located on the outskirts of Malang City, so prospective new students are children who graduated from state elementary schools in the school area, so their academic abilities vary.
b. Teachers have difficulty providing material with diverse student competencies.
c. The teacher has little time to provide students with enrichment questions. If this is done, it can reduce the learning target because it focuses on competencies that have not been completed.
d. Students are less interested in working on questions because the appearance of the questions seems boring.
e. Students spend more time playing with gadgets than studying.

From the analysis and SWOT analysis results, the service team will provide solutions to this problem. First, the service team will provide training in creating interactive quizzes based on Android games so teachers can develop using advanced and appropriate technology. Second, the service team will develop and provide edugame applications that schools can use to give to new students so that students' cognitive abilities can align with junior high school level standards. Third, in this community service activity, the service team will provide effective tips and steps when dealing with students who are not paying enough attention to understand class material. Fourth, the service team will provide mathematics modules related to elementary school materials that junior high school students must master to increase their literacy repertoire. This activity aims to provide educational applications in the field of mathematics to provide uniformity in students' mathematical abilities at the junior high school level so that students are able to study mathematics material at the junior high school level well.

2. Methods

This community service activity is an activity to solve SMPI Sabilurrosyad problems. The service team will carry out this activity divided into five stages, namely 1) observing partner problems, 2) preparing service activities, 3) creating interactive quiz applications and material modules, 4) implementing activities, and 5) continuing with evaluation and report preparation. The flow of this activity is shown in the flow diagram in Figure 2.

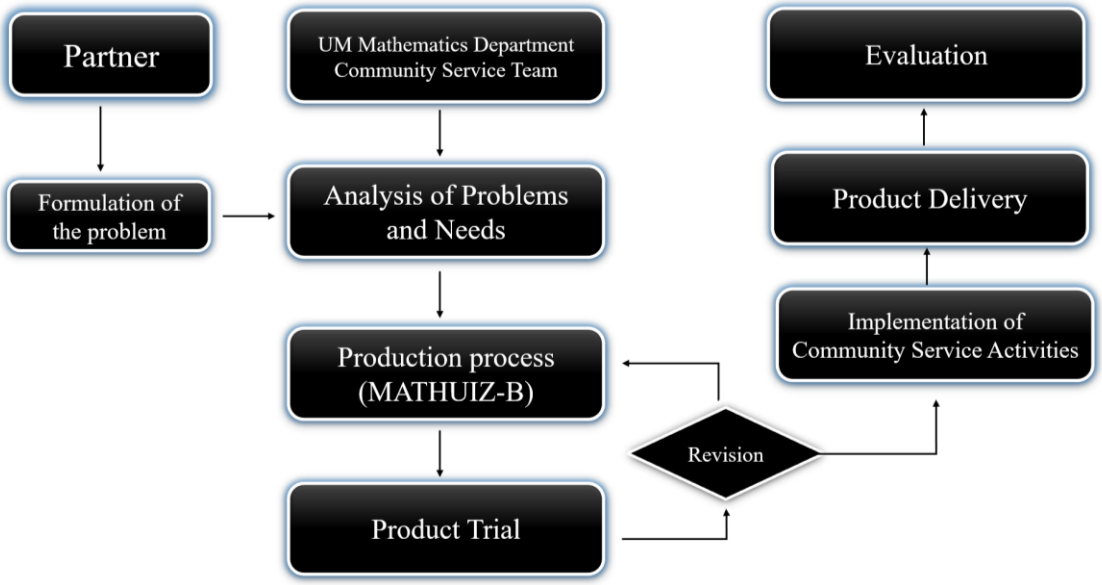

Figure 2 Service team workflow.

The stages of community service activities are divided into six stages, including:

2.1. Partner problem observation (problem and needs analysis)

The service team observed partner problems in November 2022 at Sabilurrosyad Islamic Middle School, Malang. It started with teaching assistant students who complained about differences in ability in mathematics material that should have been completed at the elementary school level. Then, the partner raises the problem so that the service team begins to observe the partner's problem. This observation began with an approach to teaching assistance students, followed by the Principal of Sabilurrosyad Islamic Middle School and then to the students.

2.2. Preparation for community service activities

The second stage was carried out at the home base location of the team proposing the service, namely Building B24, Faculty of Mathematics and Natural Sciences, State University of Malang. The proposing team identified partner problems from the results of observations and the results of situation analysis, then put them into a community service proposal using UM internal funds for the FMIPA community service centralized scheme to fulfill and provide solutions to the partners' problems. All existing important information data will be

recorded and used as consideration in carrying out community activities. At the preparation stage, partners have an important role in providing important information related to product development needs. After coordination, the service proposer can conduct needs analysis and design an Android-based application to solve partner problems.

2.3. Creation of interactive digital quiz applications and material modules (MATHUIZ-B)

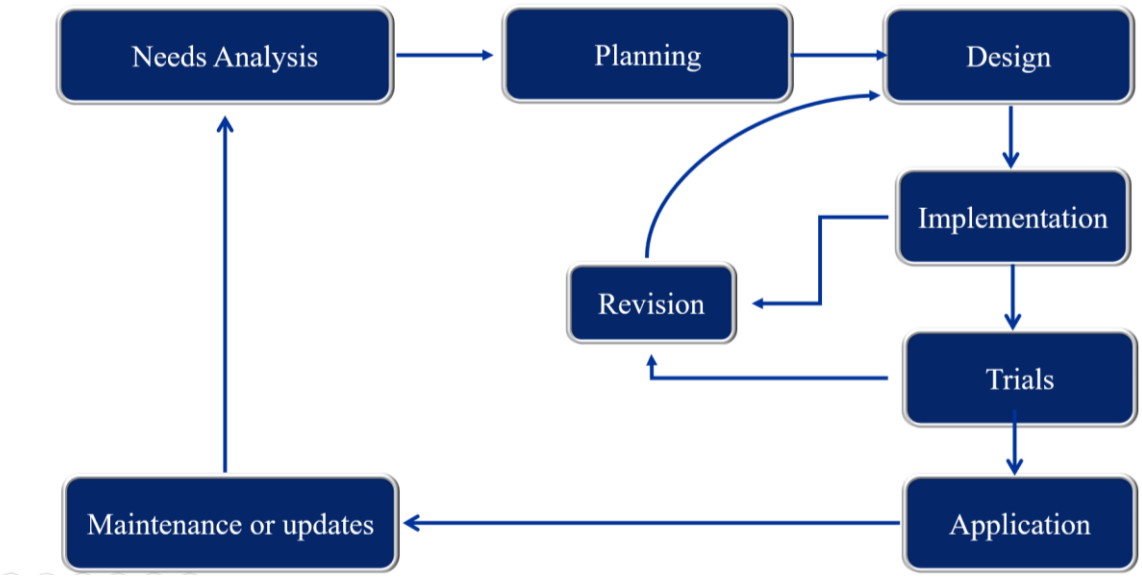

Figure 3 Production flow Mathuiz -B.

The next stage is to create an Android-based interactive quiz application and prepare elementary-level mathematics modules to overcome delays in understanding the material for junior high school students. This is a standard application that anyone can create; you can use Canva or PowerPoint for design. The stages of making this application consist of: 1. Needs analysis, 2. Planning, 3. Design creation, 4. Implementation, 5. Testing, 6. Revision stage, 7. Implementation stage, 8. Maintenance or update stage.

a. Analysis stage is the stage regarding the specification of user needs, what materials are needed, and designing the form of edugames who are interested. This needs analysis can also determine what type of program is suitable for use and can be adjusted to the user's needs.
b. Planning stage: this stage is the stage of preparing questions, which will later be poured into Microsoft PowerPoint to enter the design stage.
c. Design stage: This stage provides an animated description and illustration of the game on each page.
d. Implementation stage: the implementation stage is the first trial stage on each application page to determine the effectiveness of the interactive questions. If there are errors, they can go to the revision stage to be corrected.
e. Testing stage: at this stage, other users can test the application. If there are errors, they can go to the revision stage to be corrected.
f. Revision stage: at this stage, improvements will be made to the application if, at the implementation stage or trial stage, the application experiences errors.
g. Implementation stage: this stage is the stage of implementing the application as a whole. This application can be implemented in service partner schools after it has been handed over.
h. Maintenance stage or update stage: This stage will be carried out if additional adjustments are needed to meet partner needs.

2.4. Implementation of activities and submission of applications

The schedule of events from the activity as Table 1:

Table 1. Rundown of activity implementation.

No.	Activity	Coordinator
1.	Preparation	Service Team
2.	Opening	MC
3.	Greetings from the Principal of Sabilurrosyad Islamic Middle School	Islahuddin
4.	Greetings from the Chief Executive of Community Service	Kridha Pusawidjayanti
5.	Socialization of educational games	Anita Dewi
6.	Effective Learning by Leveraging Technology Latest	Dennis Eka Cahyani
	Training and practice in creating quizzes interactive	Asmianto
7.	Signature of Handover of Assets and Handover of Souvenirs	Service Team
8.	Closing and Group Photo	MC dari Sabilurrosyad

The next stage is training and submitting the MATHUIZ-B application, modules, and LMS to partners. This training is provided for Sabilurrosyad Islamic Middle School teachers so they can provide interactive learning to students. This training took the theme "Training on Creating Interactive Digital Modules and Quizzes to Overcome Academic Dissimilarities for Sabilurrosyad Islamic Middle School Students." This community service activity is carried out by the event rundown that has been prepared. The rundown of this service activity event is shown in Table 1.

2.5. Evaluation and report preparation

The preparation of this activity report is (1) discussion with team members according to their area of expertise, (2) compiling a draft report, (3) evaluating, (4) uploading the approved report, and (5) duplicating the approved report.

3. Results and Discussion

3.1. Pre community service

Preparations made before community service activities are carried out include identifying partner problems through observation, the service team conducting a needs analysis and pouring the results of the analysis into a community service proposal, designing an application Mathuiz -B, and material modules filled from the Mathuiz -B application. This service activity provides an Android-based application, namely Mathuiz -B, and provides training on creating interactive questions. Figure 4 shows that the chairman team devotion currently interviews the head of Sabilurrosyad Islamic Middle School on existing problems. As for some problems shown with various kinds of data, students provide results learned what you haven't yet Good. Problems faced Enough complex. Diversity ability student related to academic students big so that happen gap ability academic especially in mathematics.

Figure 4 Team leader interviewing headmaster.

The resource person who will participate in this community service activity is a lecturer at the Mathematics Department, FMIPA UM. The names of the presenters and the material presented: (1) Dr. Anita Dewi Utami, S.Pd., M.Pd as the speaker for socialization about Mathuiz -B, (2) Denis Eka Cahyani, S.Kom, M.Kom as the speaker about effective learning by utilizing technology latest, (3) Asmianto, S.Si., M.Si. as a presenter for training materials and practice in creating quizzes interactive.

Material about effective learning by using technology was chosen because Sabilurrosyad Islamic Middle School teachers have not used technology much in learning; this material is expected to provide insights related to the latest usage of technology. Material about training and practice in making quizzes Interactive was chosen because it trains teachers to create quizzes easily.

3.2. Implementation of community service

This community service activity was offline on Saturday, September 23, 2023, with 17 participants in the Sabilurrosyad Islamic Middle School library room. The service activities started at 09.00 WIB with an opening by the MC, followed by a welcome from the Head of Sabilurrosyad Islamic Middle School, Mr. Islahuddin, SS. M.Pd.I (see Figure 5a) and, followed by remarks from the head of the service, Mrs. Kridha Pusawidjayanti, S.Si., M.Sc., (see Figure 5b) then the activity continued with the presentation of the first material delivered by Mrs. Dr. Anita Dewi Utami, M.Pd. with the topic of socialization Mathuiz -B. Next, the second material was delivered by Mrs. Denis Eka Cahyani, S. Kom., M. Kom. With the topic of effective learning by utilizing technology latest. Then, we continued with presenting the third material delivered by Mr. Asmianto, S.Sc., M.Sc., with training topics and practice in creating interactive quizzes. After the presentation of all the material was complete, the activity continued with signing the handover of assets and handing over souvenirs. Finally, the MC closed the activity, and a group photo was taken.

(a) (b)

Figure 5 (a) Welcome by the principal, (b) Speech by the head of the service team.

The first material was the socialization of Mathuiz -B delivered by Mrs. Dr. Anita Dewi Utami, M.Pd. (see Figure 6a). This first material discusses the introduction and demo of the interactive digital quiz application the service team created. This application is called "Mathuiz-B." in introducing the application, the speaker conveys several rules and how to use the application, including the Mathuiz-B application, which can be downloaded via smartphone or laptop; there are several levels in the Mathuiz-B application, each level there is a minimum value that is required. Must be completed by 70% if the user If the minimum score cannot be reached, the user cannot continue to the next level. Each quiz question has a different time, and it is located in the top right corner of the question, as well as other rules. After delivering the material, the presenter allowed the participants to try using the Mathuiz-B application directly. In Figure 6b, teachers and principals also practice using the application, from filling in data to getting a grade summary.

(a) (b)

Figure 6 (a) First material presentation, (b) Participants do practice use application.

The second material is about effective learning by utilizing the latest technology delivered by Mrs. Denis Eka Cahyani, S.Kom, M.Kom (see Figure 7). This second material discusses the utilization of technology in learning; he explains the importance of using technology in today's learning; today's students tend to get bored if you still use the conventional learning system; for that reason, he gives suggestions for schools to have an LMS as a media-based learning technology. After delivering the material, the presenter allowed the participants to ask questions, and several participants asked about the features available in the LMS.

Figure 7. Second material presentation.

After completing the presentation of material and discussion, the event continued with the third material. The third material is about training and practice in creating interactive quizzes delivered by Mr. Asmianto, S.Si., M.Si (see Figure 8). This third material discusses how to create quizzes by utilizing existing features on sites on the web, such as Kahoot and Mentimeter, as well as doing direct practice in creating these quizzes. While delivering the material, the presenter allows the participants to ask questions or difficulties while conducting the quiz creation experiment. And this third material is delivering the final material in the training activity.

Figure 8 Delivery of third material.

After all material delivery was completed, the activity continued with the delivery of assets in the form of the Mathuiz -B application for Android and Windows, along with a manual book, from applications, modules, and books about successful strategies for entering junior high school and handing over souvenirs, as shown in figure 9b. Before the assets were handed over to partners, a signing was carried out between the head of the service team and the head of Sabilurrosyad Islamic Middle School. After that, the activity was closed by the MC and continued with a group photo, as shown in figure 9a.

(a) (b)

Figure 9 (a) Signing of asset transfer letter, (b) Handover of assets to partners.

3.3. Post community service

The results of the service participant survey stated that this research was very useful to take part in and could broaden the knowledge of the service participants, as can be seen in Figure 10.

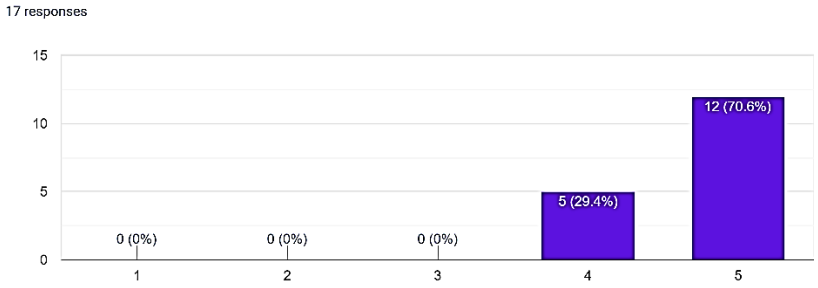

Figure 10 Feedback diagram from participants.

The obstacle experienced during this activity was that there were teachers who could not attend the activity because there were activities at other institutions simultaneously, so there was a reduction in the number of participants who attended the activity.

The output of this activity is as follows: First, publication of online mass media articles on Jatim media

times.com on the page following https://jatimtimes.com/baca/297119/20230924/063200/tim-pengabdian-community-matematika-um-beri-bisnis-guru-smp-islam-sabilurrosyad. Second, there is also news on Jatimtimes.com social media at the following link: https://www.instagram.com/p/Cxneg2mNynj/. Third, the product form application Android-based games, has been handed over to the service partner, namely Sabilurrosyad Islamic Middle School. Fourth, IPR Registration Interactive Quiz at Malang State University IPR Registration https://sentrahki.um.ac.id/. Fifth, e-modules and books with -ISBN with ISBN: 978-623-5934-33-4 e-ISBN: 978-623-5934-34-1 published by Ediide Infographics.

4. Conclusions

This community service activity is training and giving manufacturing-related products quiz interactive and quiz application that has been implemented by the Department of Mathematics, FMIPA, State University of Malang for teachers at Sabilurrosyad Islamic Middle School, sub-district Sukun, Malang City, as an embodiment of the Tridharma of Higher Education to assist teachers in overcoming differences in students' academic fields. Apart from that, this training also encourages the use of digital-based technology in implementing learning.

This community service activity needs to be held again in order to increase teacher references in providing exciting and fun learning media in line with safe developments and hone teachers' skills in providing easily accessible learning materials. In the evaluation column, participants suggested that there should be a follow-up regarding optimizing the use of the Android-based quiz application.

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