

Development of Blog-Based Mathematics Learning Media Using Malay Islamic Context in Junior High School

Syutaridho and Harisman Nizar

Universitas Islam Negeri Raden Fatah Palembang

Correspondence should be addressed to Syutaridho: syutaridho_uin@radenfatah.ac.id

Abstract

The use of technology in learning is a big issue in the world of education. The need to pair technology with learning is a form of response to technological developments. One technology that can be used in learning is blog-based learning media. This research aims to produce blog-based mathematics learning media with a Malay Islamic context in junior high schools that is valid and practical and has a potential effect on mathematical problem solving abilities. This type of research is design research, development study type, which involves students at junior high school level. This research data was obtained from observations, interviews and tests. The conclusion of this research is to produce blog-based mathematics learning media with a Malay Islamic context in junior high schools that is valid and practical. The uniqueness of the blog media developed is that it uses a Malay Islamic context. Then the media developed has a potential effect on students' problem solving abilities with details of 20 students having problem solving abilities in the very high category, 19 students in the high category, 5 students in the moderate category, 4 students in the low category, and 2 students in the low category. Then the average mathematical problem solving was 72.48 in the high category. By knowing the development of this blog learning media, teachers and other researchers can develop blog-based mathematics learning media in other contexts that are close to students.

Keywords: Blog; Malay Islamic; Learning Media.

Information of Article

Subject classification	97C30 Educational material and media and educational technology in mathematics education
Submitted	21 February 2024
Review Start	24 Februari 2024
Round 1 Finish	24 February 2024
Round 2 Finish	18 April 2024
Round 3 Finish	7 May 2024
Accepted	7 May 2024
Scheduled online	10 May 2024
Similarity Check	15%

Abstrak

Penggunaan teknologi dalam pembelajaran menjadi isu besar dalam dunia pendidikan. Keharusan menyandingkan teknologi dengan pembelajaran merupakan bentuk respon terhadap perkembangan teknologi. Salah satu dari teknologi yang dapat digunakan dalam pembelajaran adalah media pembelajaran berbasis blog. Penelitian ini bertujuan menghasilkan media pembelajaran matematika berbasis blog dengan Konteks Islam Melayu di SMP yang valid dan praktis serta memiliki efek potensial terhadap kemampuan pemecahan masalah matematis. Tipe penelitian ini adalah design research tipe development study yang melibatkan siswa pada level SMP. Data penelitian ini didapat dari hasil observasi, Wawancara dan Tes. Kesimpulan dari penelitian ini yaitu menghasilkan media pembelajaran matematika berbasis blog dengan konteks Islam Melayu di SMP yang valid dan praktis. Keunikan dari media blog yang dikembangkan adalah menggunakan konteks Islam Melayu. Kemudian media yang dikembangkan memiliki efek potensial terhadap kemampuan pemecahan masalah peserta didik dengan rincian 20 peserta didik memiliki kemampuan pemecahan masalah dengan kategori sangat tinggi, 19 peserta didik kategori tinggi, 5 peserta didik dengan kategori cukup, 4 peserta didik dengan kategori rendah, dan 2 peserta didik dengan kategori sangat rendah. Kemudian rata-rata pemecahan masalah matematis sebesar 72,48 dengan kategori tinggi. Dengan mengetahui pengembangan media pembelajaran blog ini, guru dan peneliti lain dapat mengembangkan media pembelajaran matematika berbasis blog pada konteks lain yang dekat dengan siswa.

INTRODUCTION

Technological developments are increasingly rapid and require humans to adapt to change. In line with this progress, information media is also developing rapidly. The presence of smartphone with all their fast and sophisticated developments can fulfill the need for accessing any information for humans (Sumartono et al., 2020). Students can learn through various blogs available on the internet on Google applications, browsers, Google Chrome, Microsoft Edge, and other applications. A blog that is categorized as good is a blog that can contain updated information so that it can be accessed by customers anytime and anywhere (Halilurahman et al., 2021). So by developing a blog with the latest information and in accordance with topics that are currently being discussed, it can broaden students' insight. The need for technology was really felt when during the Covid-19 pandemic, students were required to adapt to completely online learning. Not only students, teachers and lecturers are also required to adapt to an all-online system. However, there are quite a few teachers, especially teachers, who do not properly understand the function of the internet, one of which is that it can be a means of accessing learning media (Sulasmianti, 2018). In addition, there

is still a lack of availability of mathematics learning media that can help students understand mathematics. Even after the pandemic, the need for technology is still felt, for example learning with a hybrid system (offline and online). A hybrid system means that teachers can provide learning to students either directly or online using online media such as blogs.

Policies in the world of education, especially independent learning, can make students independent by learning using online information sources, one of which is blog media which can be accessed by students wherever they are. A blog is part of a website or WWW. Blogs can be used by students, teachers and lecturers as a learning resource that can be widely accessed (Sartono, 2016). Blogs have advantages in many ways. Due to its flexible use, it can be accessed via a computer or laptop, as well as from a cellphone connected to the internet without having to install an application. Then the access time for the blog can be accessed 24 hours, making it possible for students to use the blog as a learning medium both during learning and outside learning hours, for example at night. Advanced and continuously updated blog features make the blog better every day. These features make the blog not only contain writing, but can contain learning videos,

quizzes, and so on. This makes it easy for educators to create learning media on blogs. Apart from that, from the results of research shows that learning Mathematics using blog media can make learning easier and can improve the learning outcomes of students in one class who initially had high learning outcomes of less than 50%, after using blog media more than 75% of students had high learning outcomes (Nopitasari et al., 2021; Zulkardi & Putri, 2010).

Previous research related to blog development which developed Blog Media on Trigonometry Material (Nugroho, 2017). The blog results were declared valid by experts and the blogs were interesting. Then research that developed Blog Support to help Mathematics Teachers and Students in Indonesia to study PMRI (Zulkardi & Putri, 2010). Based on the research results, a website was produced with the *p4mri.net* site. And produced as many as seventeen blogs. Then research that developed Blog Support for High School Mathematics Learning (Arifin et al., 2010). Based on the research results, it can be concluded that blogs have potential effects. The potential effect obtained is on the learning process. Then research that developed the Mathematics Blog learning media (Nugroho et al., 2017). From the research, the essence can be drawn, namely that blog media is in the good category and is disseminated and used in learning. Then research that developed web-based interactive media on lines and angles for class VII (Novianti, 2018). Based on the validation results, media validation analysis produces a very valid average score of 3.56, and material validation analysis produces a valid average score of 3.29. The media is considered suitable for testing. The results of the analysis of student responses produced an average score of 87%, which means that the learning media was highly accepted

by students, showing that the percentage of students who achieved the minimum completeness criteria (score 75) was 100%. This shows that web-based learning media is very effective and feasible in the learning process.

Digital learning can support learning in the classroom (Hähkiöniemi et al., 2023). Digital learning can help students notice connections, properties, patterns, or rules in mathematics (Erbas & Yenmez, 2011; Hähkiöniemi et al., 2023; Olsson & Granberg, 2019). The quality of learning in class can be improved by using learning materials (Ariza Muñoz et al., 2023; Malalina et al., 2024; Sujiono et al., 2023). In learning, learning materials have many and important contributions (Dólera-Almáida & Carrillo-Gallego, 2023; Latifah et al., 2023). Learning media can contain learning material that can help students learn. The use of learning media can support learning because it makes learning more interactive (Astalini et al., 2022; Byusa et al., 2022; Muzakkir et al., 2024; Oktaviya & Wahyuni, 2024). Then the use of learning media can improve students' thinking abilities (Abdelrahman & Wang, 2023; Lestari et al., 2019; Pardimin et al., 2019). The ability of students in junior high schools is still low in understanding mathematical concepts so that when solving mathematical problems they have difficulty. So interactive and interesting learning media is needed to help students understand the concepts of mathematical material. Interactive and interesting media is blog-based mathematics learning media which not only contains writing but also contains illustrations related to mathematics material.

The Indonesian archipelago is famous for its Malay culture. Malay Islam is Islam in Malay. Malay Islam is very close to students, especially those who are Muslim and live in Malay areas. Malay Islam can be in the form of Malay Islamic

architecture, Malay Islamic customs, Malay Islamic worship activities. The use of context can make it easier for students to understand mathematics from abstract to real concepts (Nusantara et al., 2021; Putri & Zulkardi, 2020). Then the use of context can stimulate students in learning mathematics (Zulkardi et al., 2020). The Malay Islamic context can be used as a context in Mathematics (Saputrama et al., 2022). From the explanation above, researchers examined the development of blog-based mathematics learning media with a Malay Islamic context in junior high school.

METHOD

The design research type of development study is the one used in this research which consists of a preliminary stage and a formative evaluation stage. Formative Evaluation itself consists of self evaluation, expert reviews, one-to-one, small group, and field tests (Tessmer, 1993; Zulkardi, 2006). The research subjects were junior high school students. At the one-to-one stage, the subjects consisted of 3 students consisting of different abilities. At the small group stage, it consists of 6 students with different abilities. The field test stage consists of 1 class.

The data collection techniques used in this research are walk through, observation, interviews, and tests. Walk through is used at the expert reviews stage. Experts provide comments, input, or suggestions regarding the content, construct, and language of the blog with the Malay Islamic context being developed. The results of the walk through are used during validation with the validator. Observations and interviews were carried out with students when the students worked on the blog at the one-to-one stage, then at the small group stage, and then at the field test stage. This observation was carried out to find out the

students' obstacles in working on blogs at the one-to-one stage and was then used to find out the practicality of blogs at the small group stage. The test is used to determine the potential effect of the blog being developed on students' mathematical problem solving abilities. The test is given at the field test stage after students interact with the blog being developed. The following is the formative evaluation design flow presented in Figure 1.

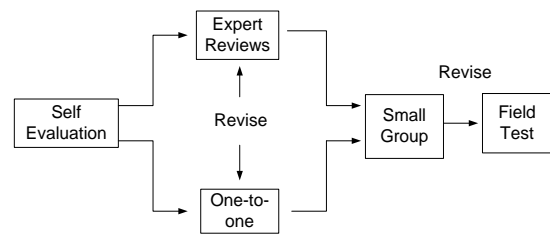
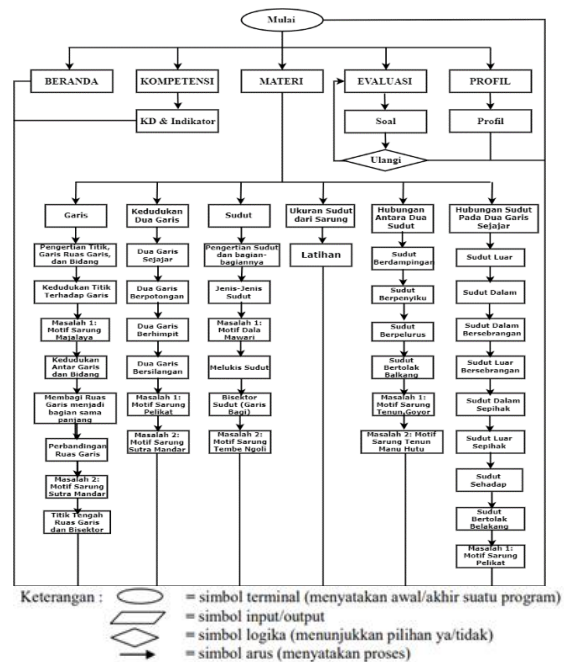


Figure 1. Formative Evaluation Design Flow

Next, the media is developed according to the following flowchart in figure 2.



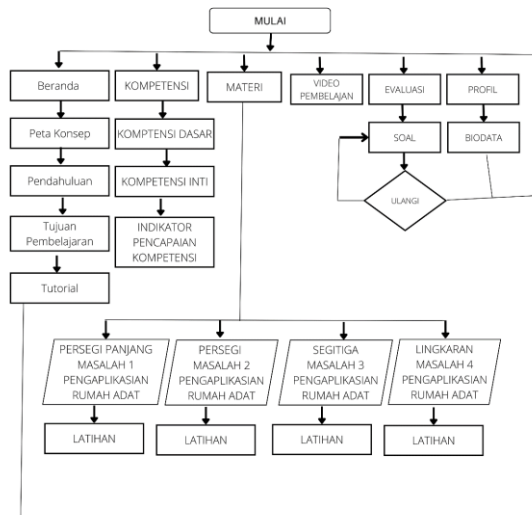


Figure 2. Blog-Based Media Development Flowchart

The validity contained in the blog that will be developed has the characteristics of being valid in terms of content, construct, and language. This was obtained from reviews of several validators at the expert reviews stage. In terms of content, the blog will be adapted to mathematics material in junior high school, the blog will be adapted to junior high school level, the blog will be adapted to basic competencies in the curriculum and mathematics material in junior high school. In terms of blog construction, it will be adapted to the Malay Islamic context, then images, tables, graphs, videos, links on the blog will be presented clearly, legibly and functionally. In terms of language, the blog will be adapted to EYD (Enhanced Spelling) version 6. Posts on the blog do not contain multiple interpretations. The boundaries of questions and answers are clear on the blog.

The practical aspect will be fulfilled if the product is successfully implemented by students with little or no practice (Tessmer, 1993). Practically what will be used is if the blog learning media is easy for students to use. Practicality is obtained at the one-to-one and small group stages.

RESULTS AND DISCUSSION

Results

The mathematics blog resulting from the development of mathematics is a Mathematics Blog with material about lines, angles, prisms, pyramids, and plane figures using the Malay Islamic context consisting of sarong, Malay Islamic mosques, and Malay Islamic traditional houses. There are two stages discussed in this research, namely the preliminary stage and the formative evaluation stage. The formative evaluation stage consists of self evaluation, expert reviews and one-to-one, small group, and field tests.

In the Preliminary stage, student analysis, curriculum analysis and Malay Islamic context analysis are carried out. At this stage the researcher will carry out an analysis of the curriculum implemented in the school, analysis of the materials to be used, and collect information related to students. The information obtained is that the curriculum used is the 2013 Curriculum which has the learning principle that students are required to actively learn independently, be able to construct concepts, be able to solve problems, learn based on various sources of teaching materials, be able to relate between facts, balance between soft skills. and hard skills, learning anywhere, and using technology in learning.

The design stage carried out in this research starts from several stages of creating a flowchart to explain the flow of the media being developed. After that, the researcher made a storyboard by referring to the flowchart that had been made and then collected reference material. Researchers also collect images by taking photos and videos themselves as well as those needed on the internet. Next, the researchers designed material and evaluation questions on the blog which was designed with the most attractive layout

possible through the features found in WordPress with the help of the Canva platform. The design of the material on the blog is sorted according to PMRI characteristics. Then the researchers created a geogebra animation according to the flat-sided building material in which the html link on geogebra was inserted in the blog, so that the blog became interesting and interactive.

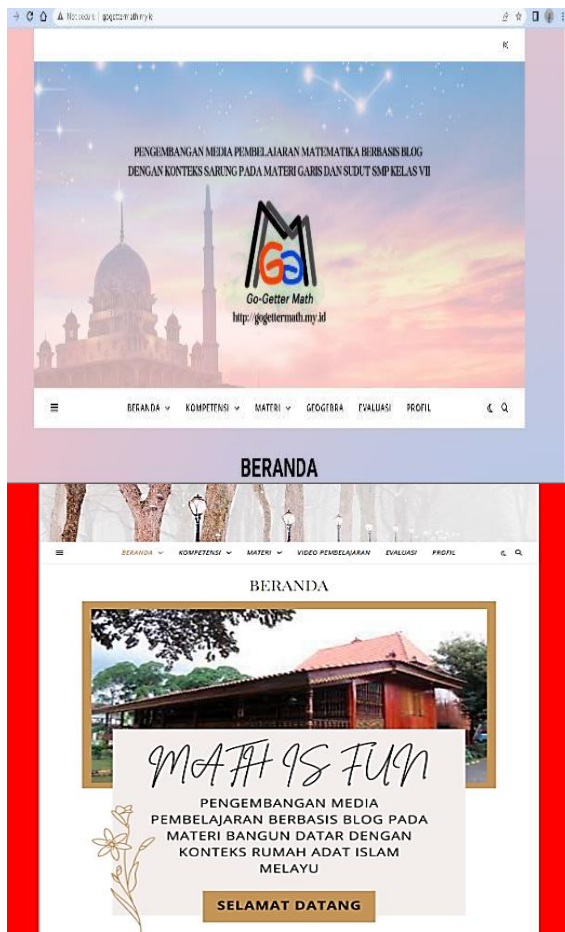


Figure 3. Initial Blog View

The initial display when entering the blog contains the blog names, namely gogetermath, and mathisfun, equipped with accessible illustration images.

The next stage is the expert review and one-to-one stage. The expert review stage involves 8 validators. Validators consist of media validators, content validators, and context validators. The following are validator comments and suggestions in Table 1 (see Appendix).

Simultaneously with expert reviews, product testing was carried out at a one-to-one stage involving 3 students with varying abilities. The following are comments and suggestions from one-to-one stage students in table 2.

Table 2. Comments and Suggestions One-to-One Stage

Students	Comments and Suggestions
High Ability Students	<ol style="list-style-type: none"> 1. The pictures are attractive and easy to understand. 2. The blog is interesting and easy to understand. 3. Images are too small in blog-based learning media materials
Medium Ability Students	<ol style="list-style-type: none"> 1. The explanation text is small. The graphics in the image could possibly be improved. 2. In the animated display media in the video, there are words that are blurry so you can't see them clearly
Low Ability Students	<ol style="list-style-type: none"> 1. The color is not enough (blog color, and the cover is blurry) 2. There is a button that cannot be clicked, sis. 3. Explanation of the circumference of a circle because in flat shapes there are only rectangles, squares, trapezoids and triangles

After the expert review and one-to-one stages, the product was revised based on suggestions and comments from validators and students so that a valid prototype 2 was produced. Prototype 2 was tested on small group stage students. Following are the comments and suggestions of small group stage students in table 3.

Table 3. Comments and Suggestions Small Group Stage

Students	Comments and Suggestions
High Ability	<ol style="list-style-type: none"> 1. It's very exciting, if you can make learning media like this often, because it's better and easier to understand. 2. Very exciting, this blog is complete, there are pictures and animations that allow us to play the animation.
Medium Ability	<ol style="list-style-type: none"> 1. Good very easy to understand.

Students	Comments and Suggestions
	2. I can understand it and the learning is very exciting.
Low Ability	1. Questions that are easy to understand well. Questions can be made even more interesting. The questions are adapted to junior high school students.

After the small group stage, prototype 2 was revised to produce a practical prototype 3. Prototype 3 was tested at the field test stage.

Students are asked to access the link provided using a smartphone or tablet. Next, students interact with blog media. After completing interaction with blog media, students are given evaluation questions to see the potential effect of the blog being developed on students' mathematical problem solving abilities. The results obtained by the developed mathematics blog media have a potential effect on students' problem solving abilities with details of 20 students having problem solving abilities in the very high category, 19 students in the high category, 5 students in the moderate category, 4 students in the low category, and 2 students in the very low category. Then the average mathematical problem solving was 76.08 in the high category.

Discussion

In the learning process that will be carried out, there is a connection between the characteristics and principles of PMRI and learning based on students' mathematical problem solving abilities on the blog media that is being developed. The implementation of PMRI characteristics, PMRI principles and students' problem solving abilities in the blog media developed.

Based on the application of PMRI characteristics and principles, icebergs are obtained for every activity carried out on the blog. The implementation of using a model based on PMRI characteristics

and principles is described in the following iceberg in Figure 4.

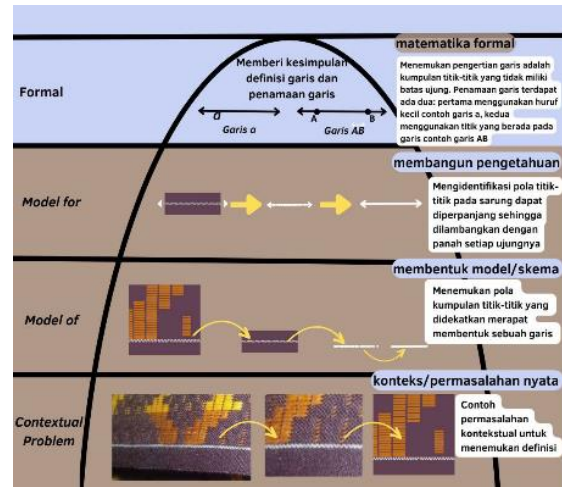


Figure 4. Iceberg Definition and Naming of Lines

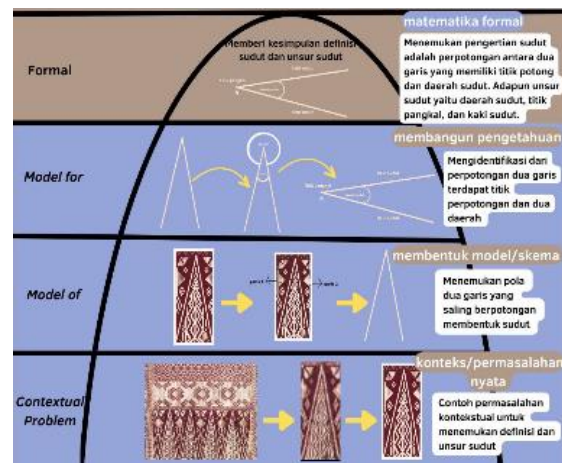


Figure 5. Iceberg Definition and Angle Elements

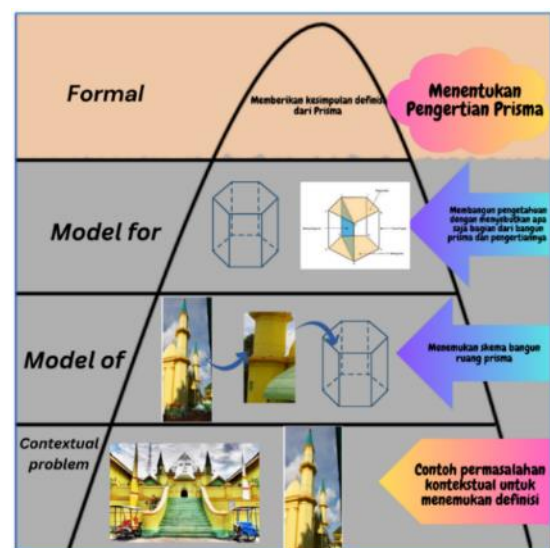


Figure 6. Iceberg Definition of Prism

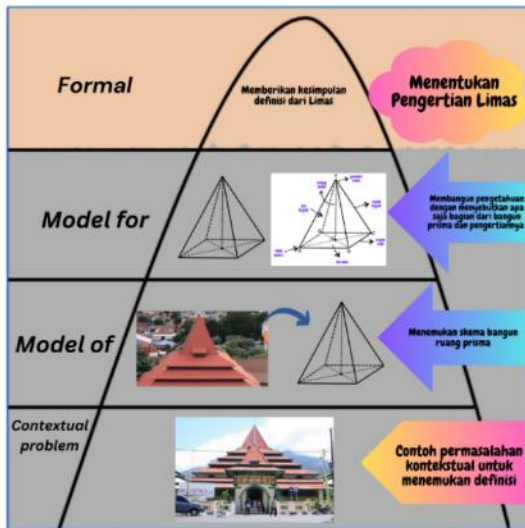


Figure 7. Iceberg Definition of Limas

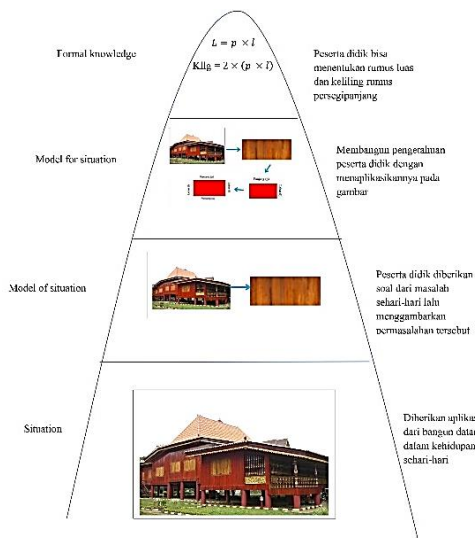


Figure 8. Determining the volume and area of a rectangle

This blog media is equipped with example questions and discussions that have been adapted to the stages of problem solving indicators. Apart from that, this blog is also equipped with evaluation questions to see students' problem-solving abilities. The problem solving scoring guidelines on the evaluation questions provided include aspects of 1) understanding the problem, 2) planning to solve the problem, 3) implementing the plan, 4) interpreting the results obtained.

Furthermore, to assess the potential effect on students' mathematical problem solving on flat-sided spatial figures,

especially prisms and pyramids, an evaluation of questions was carried out on students. In this blog media, there are 5 questions on each blog, so there are a total of 15 questions with problem-solving ability criteria that have been validated by mathematics material experts. There were 50 students who worked on evaluating questions on blog media. The stages and indicators used by researchers were adapted from Polya (Wahyudi & Anugraheni, 2017). These stages are: 1) Indicators for Understanding the Problem, 2) Planning to Solve the Problem, 3) Carrying out the resolution plan, 4) Carrying out checking again.

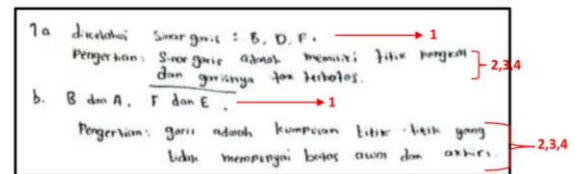


Figure 9. Results of student answers

In Figure 9, students have understood the problem by writing what they know in the problem. Then they have planned to solve the problem, carried out the solution, and checked again, this can be seen from the students' answers who answered that picture 1 has 2 angles, picture 2 has 3 angles, picture 4 has 5 angles, and question b has been answered with 6 angles and 8 angles.

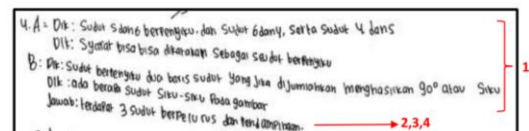


Figure 10. Results of student answers

In Figure 10, students have understood the problem by writing down what they know. Then they have planned the solution, and checked again by answering question 4.a, namely angles 5 and 6 are right angles, angles 6 and 4, and angles 4

and 5, then 4.b the student have answered by explaining the definition of right angles and student have written that there are 3 corners.

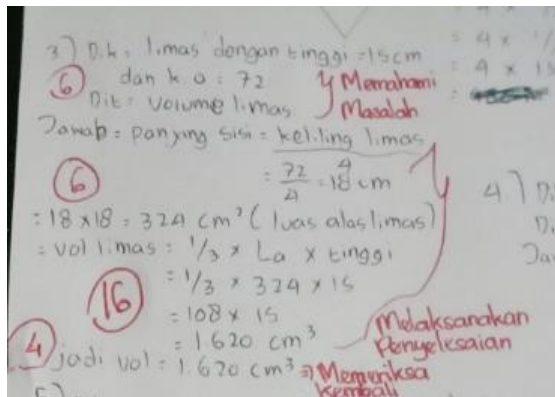


Figure 11. Results of student answers

In figure 11, it was found that the indicator of understanding the problem was that the students were able to state what was known and what was asked correctly. However, on the indicators for planning completion, students do not write them down. This can be caused by several factors. Students are in a hurry to solve problems considering the large number of questions that must be solved simultaneously.

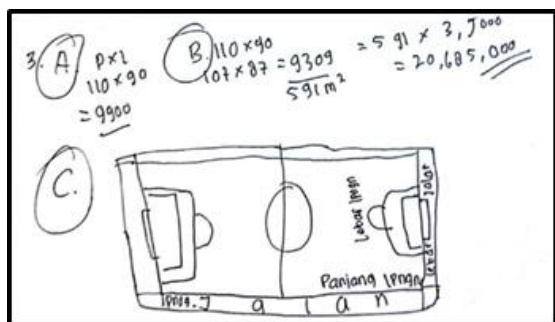


Figure 12. Results of student answers

In Figure 12, students' answers have met the indicators of understanding the problem, planning a solution, implementing the solution, and checking again the answers from the solutions obtained. After all the answers for each student are calculated according to the problem-solving ability scoring guidelines, overall

student data is obtained with the following results in Table 4.

Table 4. Categorization of Mathematical Problem Solving Abilities

No	Category	The number of students
1	Very high	20
2	High	19
3	Enough	5
4	Low	4
5	Very Low	2
Total		50

PMRI (Indonesian Realistic Mathematics Education) is used as an approach to creating blogs. PMRI has 3 principles, namely Guided reinvention and didactical phenomenology, Progressive mathematization of Situations, Self-developed Role models (Zulkardi & Putri, 2010). Then PMRI also has 4 characteristics, namely using contextual problems, using models or bridges with vertical instruments, using student contributions, being interactive in the teaching and learning process or interactivity, being integrated with other learning topics.

In the learning process carried out, there is a connection between PMRI characteristics and students' mathematical problem solving abilities on the blog media that was developed so that it can build students' knowledge. As for the application of PMRI characteristics to students' problem solving abilities in blogs, namely the first section using contextual problems. The context used by researchers in this blog media is the context of sarongs, Malay Islamic heritage mosques and Malay Islamic traditional houses found in Indonesia. The second part is using models, namely in learning using this blog media, students learn through using models that exist in the real world. Then from this model students are guided to determine the scheme and build their knowledge about lines, angles, prisms, pyramids, and flat shapes. The third part uses student

contributions, namely the researcher designs various activities on the blog that can be done individually or in groups. In completing these activities, students are free to use the problem solving strategies presented. Then evaluation questions are provided at the end of the blog lesson that students will work on. The fourth is in the Interactivity section, namely if students encounter difficulties, then the students ask the teacher so that interaction occurs between the teacher and students. The fifth section is integrated with other learning topics, namely after students have studied the topic of lines, then students will then be taught the topic of angles where the two topics are related to each other in the basic concepts of geometry. Because the material is related to each other, students need to know about flat shapes, triangles, quadrilaterals which are the base and cover of prisms and pyramids.

Based on the research process that has been carried out, the researcher produced a blog-based mathematics learning media on lines and angles, flat-sided shapes (prisms and pyramids), and flat shapes with a Malay Islamic context to produce blog-based learning media that is valid, practical and has potential effect on students' problem-solving abilities. This media development was carried out using the PMRI approach. The reason researchers used this material was because of the finding that students still had difficulty understanding things related to this material. Apart from that, students also do not understand the material on indicators for solving problems related to lines, angles, surface area and volume of prisms and pyramids, and flat shapes. Therefore, in developing this media, researchers used the Malay Islamic context, namely sarongs, mosques, and Malay Islamic traditional houses. The motif of the sarong is taken for lines and angles. The mosque is

taken to be one of the objects in cultural acculturation and geometric shapes are found in the design of the mosque, which is intended to make it easier for students to gain related understanding, as well as to build the values of their religious life. Malay Islamic traditional house for flat construction materials. This blog-based learning media is implemented using the PMRI approach in introducing learning to students starting from the use of context to the use of forms of formality.

This development research has two stages, namely the preliminary stage (preparation and design stage) and the prototyping stage which uses the formative evaluation flow by Tessmer (Tessmer, 1993). In the initial stage of creating this learning media, researchers carried out a preliminary stage which was divided into two stages, namely the preparation stage and the design stage. In the preparation stage, researchers carried out analysis in the form of curriculum analysis, material analysis and student analysis which was carried out at LTI Indo Global Mandiri Middle School, Palembang City. Based on the results of this analysis, it was found that new learning media were needed that could overcome students' difficulties in understanding mathematics lessons on lines and angles, flat-sided shapes, especially on prisms and pyramids, and flat shapes. According to (Senjaya et al., 2017) based on the results of observations and interviews, it shows that students who have difficulty learning mathematics focus on lines and angles. The thing that causes students to encounter these difficulties is because there are still many students who do not understand the basic concepts of lines and angles. The flat-sided geometric material is material that tends to be abstract (Saputro & Lumbantoruan, 2020). Students have difficulty understanding the flat geometric material. From interviews of difficulties

experienced by students, one example of the difficulty was incorrectly applying the triangle formula to the questions given (Sabirin, 2014). One of the reasons why students find this material difficult is due to the lack of learning media that can prevent students from feeling bored and increase their enthusiasm for learning. To make it easier for students to understand abstract material, various kinds of real examples are needed in everyday life so that abstract mathematical concepts become more concrete (Kencanawaty & Irawan, 2017). In this case, researchers develop learning media along with the rapid development of digital technology, namely developing media blog-based learning using the wordpress platform. Because the features contained in WordPress are complete and have many advantages, one of which is that it is easy to use and can be used as a learning medium. Teachers can create blogs and fill them with various information related to learning activities (Sartono, 2016). Blogs can be used as a solution to overcome the lack of learning time at school. (Sulasmi, 2018) said that blog learning media can be accessed easily at home, if there is an internet network. In developing this blog-based media, various supporting materials for learning media can be added, such as videos, pictures, geographic animations, the addition of quizzes and can provide several interesting animations. This can attract students' interest and make them more enthusiastic in learning about lines, angles, flat-sided shapes (prisms and pyramids), and flat shapes.

In developing this blog-based learning media, researchers analyzed the curriculum in class VIII of SMP LTI Indo Global Mandiri, namely the 2013 curriculum, where the curriculum requires students to be more active in learning independently, able to construct concepts, able to solve problems, learning based on various types

of learning source of teaching materials, able to link facts, learn anywhere and use technology in learning.

In the design stage, the researcher designed blog-based mathematics learning media using lines, angles, flat-sided shapes (prisms and pyramids), and flat shapes with a Malay Islamic context (sarongs, mosques, and Malay Islamic traditional houses), starting by making a flowchart. to explain the flow of the media being developed. Next, the researcher made a storyboard by referring to the flowchart that had been made and then collected reference material for building flat-sided spaces. Next, the researcher designs in terms of material, and designs in terms of the quality of media techniques such as background, buttons, images, font size, font type, layout, and appropriate animation. At this design stage, researchers produce learning in the form of an initial prototype which will be continued at the self-evaluation stage.

Next, the researcher carried out the prototyping stage using the formative evaluation development flow which consists of the self evaluation stage, expert review and one-to-one, small group, and field test which aims to produce learning media that is valid, practical, and has potential effects. The blog-based learning media that was developed at the preliminary stage was continued to the self-evaluation stage where the blog media that had been developed by the researcher received comments and suggestions from the supervisor. From these comments and suggestions, the researcher carried out revisions and then the result of the blog media revision was obtained prototype I. After obtaining prototype I, it was continued to the expert review and one-to-one stages which were carried out simultaneously. The expert review stage is a validation process carried out by expert experts and there are several main aspects

including content, construct, and language. At this expert review stage, it was found that the blog media product was valid based on the revision of the comments provided by the validator on the validation sheet. So, it can be concluded that blog-based learning media with a Malay Islamic context in junior high school is declared valid.

Then, before revising the blog media based on suggestions and comments, the researcher first tested prototype I at the one-to-one stage consisting of 3 students in junior high school who had high, medium, and low abilities. Furthermore, there are comments and suggestions from validators and students in expert reviews and one-to-one researchers who have revised prototype I to create a valid prototype II. Validity of comments/suggestions from validators at the expert review stage in terms of media, material and context (Jannah et al., 2019; Nizar et al., 2018b, 2022; Yansen et al., 2019; Zulkardi, 2003).

In prototype II, it was tested at the small group stage with 9 class VIII students as subjects. Where there are 3 students in 1 group with each group having high, medium, and low abilities. Based on the revision of comments and suggestions at the small group stage as well as the ease of students in using the developed blog, it was found that the blog-based learning media with the Malay Islamic context that was developed was practical. The results of the revision of the blog learning media at the small group stage are called practical prototype III which will then be tested at the field test stage. Practicality is obtained from revisions based on one-to-one and small group stages as well as the ease of students using blogs at the small group stage (Nizar et al., 2018b, 2018a; Riyanto et al., 2018; Tessmer, 1993). After going through a development process consisting of two stages, namely

preliminary and prototyping, results were obtained regarding the validity and practicality of blog media on flat-sided building material in the context of a mosque. Next, the field test stage is the final stage. At this stage the researcher used subjects totaling 50 students in classes VII and VIII of SMP LTI Indo Global Mandiri Palembang to carry out the learning process using blog-based learning media and provided evaluation questions to see the potential effect on mathematical problem solving abilities. Based on the potential effect on students' mathematical problem solving abilities, the potential effect on students' mathematical problem solving abilities is reviewed based on indicators of achievement of mathematical problem solving abilities (Wafiqoh et al., 2016).

Implication of Research

This research develops blog-based mathematics learning media with a Malay Islamic context in junior high schools. By knowing the development of this blog learning media, teachers and other researchers can develop blog-based mathematics learning media in other contexts that are close to students.

This research contributes to developing more mathematics learning media, especially blogs, that are effective in dealing with students' difficulties in learning mathematics. By understanding the development of blogs, teachers and other researchers can design interactive learning media other than blogs to also help students understand mathematics material. Apart from that, teachers or other researchers can be inspired to use contexts that are close to students or local wisdom as context in developing learning media or context in learning.

Limitation

This research is limited to developing mathematics blog media with a Malay Islamic context in junior high schools. Therefore, the results of this research are limited to developing blog media. Then research only in the context of Malay Islam. Malay Islam in question is limited to the context of Malay Islam and has not yet been included in the specific theory of Malay Islam. Then the mathematics material discussed is limited to only a few materials in junior high school.

With the number of research subjects only in one school, suggestions and input from students are limited. In addition, with research subjects only in one school, the potential effects obtained are limited.

CONCLUSION

The conclusion of this research is to produce blog-based mathematics learning media with a Malay Islamic context in junior high schools that is valid, practical and has a potential effect on mathematical problem solving abilities. Validity is obtained from instruments that have been validated by experts (validators or media experts), material experts and context experts carried out in an expert review process in terms of content, construct, and language. The practicality of blog media can be seen from comments and suggestions as well as the ease of students using blogs at the one-to-one, small group stage. Then the media developed has a potential effect on students' problem solving abilities with details of 20 students having problem solving abilities in the very high category, 19 students in the high category, 5 students in the moderate category, 4 students in the low category, and 2 students in the low category. students in the very low category. Then the average mathematical problem solving was 72.48

in the high category. So, it can be concluded that the blog-based mathematics learning media with a Malay Islamic context in junior high school which was developed has a potential effect on students' mathematical problem solving abilities with the average student score reaching 72.48 in the high category. This means that students can understand the problem, plan a solution, carry out the solution, and carry out re-examination.

REFERENCES

- Abdelrahman, G., & Wang, Q. (2023). Learning Data Teaching Strategies Via Knowledge Tracing. *Knowledge-Based Systems*, 269, 110511. <https://doi.org/10.1016/j.knosys.2023.110511>
- Arifin, S., Zulkardi, Z., & Darmawijoyo, D. (2010). Pengembangan Blog Support Pembelajaran Matematika Sekolah Menengah Atas. *Jurnal Pendidikan Matematika*, 4(2), 70–85. <https://doi.org/10.22342/jpm.4.2.817>
- Ariza Muñoz, E. del C., González-Calero, J. A., de Oro Aguado, C. M., & Cózar-Gutiérrez, R. (2023). Colombian Future Teachers' Beliefs about Mathematics and its Learning. *International Journal of Mathematical Education in Science and Technology*, 54(8), 1–16. <https://doi.org/10.1080/0020739X.2023.2170834>
- Astalini, Darmaji, Kurniawan, D. A., Chen, D., Fitriani, R., Wulandari, M., Maryani, S., Simamora, N. N., & Ramadhanti, A. (2022). A Study for Student Perception of Mathematical Physics E-Module Based on Gender. *Journal of Turkish Science Education*, 19(3), 911–936. <https://doi.org/10.36681/tused.2022.156>
- Byusa, E., Kampire, E., & Mwesigye, A. R. (2022). Game-Based Learning Approach on Students' Motivation and Understanding Of Chemistry Concepts: A Systematic Review Of Literature. *Heliyon*, 8(5), e09541. <https://doi.org/10.1016/j.heliyon.2022.e09541>
- Dólera-Almáida, J., & Carrillo-Gallego, D. (2023). Dynamic and Multipurpose Teaching Models at the First International Exhibition of Mathematics Teaching Material. *Education sciences*, 13(3), 265, 16 pages. <https://doi.org/10.3390/educsci13030265>
- Erbas, A. K., & Yenmez, A. A. (2011). The Effect of Inquiry-Based Explorations in a Dynamic Geometry Environment on Sixth Grade

- Students' Achievements in Polygons. *Computers & Education*, 57(4), 2462–2475.
<https://doi.org/10.1016/j.compedu.2011.07.002>
- Hähkiöniemi, M., Francisco, J., Lehtinen, A., Nieminen, P., & Pehkonen, S. (2023). The Interplay Between the Guidance from the Digital Learning Environment and the Teacher in Supporting Folding Back. *Educational Studies in Mathematics*, 112(3), 461–479.
<https://doi.org/10.1007/s10649-022-10193-x>
- Halilurahman, H., Tandriani, E., & Suniantara, I. K. P. (2021). Pengembangan e-Commerce Tembe Nggoli (sarung) Khas Bima Berbasis Web Responsive di Desa Nata. *JTIM : Jurnal Teknologi Informasi Dan Multimedia*, 3(2), 53–62. <https://doi.org/10.35746/jtim.v3i2.134>
- Jannah, R. D., Putri, R. I. I., & Zulkardi. (2019). Soft Tennis and Volleyball Contexts in Asian Games for Pisa-Like Mathematics Problems. *Journal on Mathematics Education*, 10(1), 157–170.
<https://doi.org/10.22342/jme.10.1.5248.157-170>
- Kencanawaty, G., & Irawan, A. (2017). Penerapan Etnomatematika dalam Pembelajaran Matematika di Sekolah Berbasis Budaya. *EKUIVALEN - Pendidikan Matematika*, 27(2), 169–175.
<https://doi.org/10.37729/ekuivalen.v27i2.3652>
- Latifah, N., MS, Z., Sumantri, M. S., & Setiawan, B. (2023). Elementary School Teachers' Perceptions of Indonesian Elementary School Textbooks: A Case Study. *Journal of Higher Education Theory & Practice*, 23(1), 62–74.
<https://dx.doi.org/10.33423/jhetp.v23i1.5782>
- Lestari, F., Saryantono, B., Syazali, M., Saregar, A., Madiyo, M., Jauhariyah, D., & Rofiqul, U. (2019). Cooperative Learning Application with the Method of "Network Tree Concept Map": Based on Japanese Learning System Approach. *Journal for the Education of Gifted Young Scientists*, 7(1), 15–32.
<https://doi.org/10.17478/jegys.471466>
- Malalina, Putri, R. I. I., Zulkardi, & Hartono, Y. (2024). Developing Mathematics Teaching Materials Using Maritime Context for Higher-Order Thinking in Junior High School. *Journal on Mathematics Education*, 15(1), 173–190.
<http://doi.org/10.22342/jme.v15i1.pp173-190>
- Muzakkir, Zulnaidi, H., & Abd Rauf, R. A. (2024). Mathematics Module Based on STEAM and Quranic Approach: A study for Student's Perception. *Journal on Mathematics Education*, 15(2), 363–384.
<http://doi.org/10.22342/jme.v15i2.pp363-384>
- Nizar, H., Putri, A. D., & Septy, L. (2022). Islamic Context on PISA-Like Mathematics Problem in Junior High School. *Jurnal Didaktik Matematika*, 9(2), 298–313.
<https://doi.org/10.24815/jdm.v9i2.26315>
- Nizar, H., Putri, R. I. I., & Zulkardi. (2018a). Developing PISA-like Mathematics Problem Using the 2018 Asian Games Football and Table Tennis Context. *Journal on Mathematics Education*, 9(2), 183–194.
<https://doi.org/10.22342/jme.9.2.5246.183-194>
- Nizar, H., Putri, R., & Zulkardi. (2018b). PISA-like Mathematics Problem with Karate Context in Asian Games. *Journal of Physics: Conference Series*, 012063. <https://doi.org/10.1088/1742-6596/1088/1/012063>
- Nopitasari, E., Rahmawati, F. P., & Ratnawati, W. (2021). Peningkatan Hasil Belajar Matematika Melalui Model Pembelajaran Blended Learning Berbasis Blog Pada Peserta Didik Di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 3(5), 1935–1941.
<https://doi.org/10.31004/edukatif.v3i5.699>
- Novianti, V. (2018). *Pengembangan Media Pembelajaran Interaktif Berbasis Web Pada Materi Garis dan Sudut Kelas VII SMP*. [Doctoral Dissertation] University of Muhammadiyah Malang.
- Nugroho, A. A. (2017). *Pengembangan Media Pembelajaran Berbantuan Blog Pada Materi Trigonometri*. [Doctoral Dissertation] UIN Raden Intan Lampung.
- Nugroho, A. A., Putra, R. W. Y., Putra, F. G., & Syazali, M. (2017). Pengembangan Blog Sebagai Media Pembelajaran Matematika. *Al-Jabar: Jurnal Pendidikan Matematika*, 8(2), 1–14. <https://doi.org/10.24042/ajpm.v8i2.2028>
- Nusantara, D. S., Zulkardi, & Putri, R. I. I. (2021). Designing PISA-like Mathematics Task Using a Covid-19 Context (Pisacomat). *Journal on Mathematics Education*, 12(2), 349–364.
<https://doi.org/10.22342/JME.12.2.13181.349-364>
- Oktaviya, U., & Wahyuni, I. (2024). Development of Monokram (Islamic integrated mathematics monopoly) Learning Media on Numbers Material. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 15(1), 1–10.
<https://doi.org/10.15294/3hag6286>
- Olsson, J., & Granberg, C. (2019). Dynamic Software, Task solving With or Without Guidelines, and Learning Outcomes. *Technology, Knowledge and Learning: Learning mathematics, science and the arts in the context of digital technologies*, 24 (3), 419–436.
<https://doi.org/10.1007/s10758-018-9352-5>
- Pardimin, Arcana, N., & Supriadi, D. (2019). Developing Media Based on the Information and Communications Technology to Improve the Effectiveness of the Direct Instruction

- Method In Mathematics Learning. *Journal for the Education of Gifted Young Scientists*, 7(4), 1311–1323.
<https://doi.org/10.17478/jegys.562636>
- Putri, R. I. I., & Zulkardi. (2020). Designing PISA-like Mathematics Task Using Asian Games Context. *Journal on Mathematics Education*, 11(1), 135–144.
<http://doi.org/10.22342/jme.11.1.9786.135-144>
- Riyanto, B., Zulkardi, Putri, R. I. I., & Darmawijoyo. (2018). Mathematical Modeling in Realistic Mathematics Education. *Journal of Physics: Conference Series*, 012049.
<https://doi.org/10.1088/1742-6596/943/1/012049>
- Sabirin, M. (2014). Representasi dalam Pembelajaran Matematika. *Jurnal Pendidikan Matematika*, 1(2), 33–44.
<https://doi.org/10.18592/jjpm.v1i2.49>
- Saputrama, R., Fitrianti, Y., & Ramury, F. (2022). Development of Arithmetic Rows and Series Learning Media in Malay Islam Context. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 13(1), 88–99.
<https://doi.org/10.15294/kreano.v13i1.34701>
- Saputro, P. A., & Lumbantoruan, J. H. (2020). Pengembangan Media Pembelajaran Matematika Berbasis Articulate Storyline pada Materi Bangun Ruang Sisi Datar Kelas VIII. *EduMatSains: Jurnal Pendidikan, Matematika Dan Sains*, 1(1), 35–49.
<https://doi.org/10.33541/edumatsains.v1i1.2453>
- Sartono. (2016). Pemanfaatan Blog sebagai Media Pembelajaran Alternatif di Sekolah. *Transformatika*, 12(1), 120–134.
<http://dx.doi.org/10.31002/transformatika.v12i1.205>
- Senjaya, A., Sudirman, & Supriyatno. (2017). Kesulitan-kesulitan Siswa dalam Mempelajari Matematika pada Materi Garis dan Sudut di SMP N 4 Sindang. *MATHLINE: Jurnal Matematika Dan Pendidikan Matematika*, 2(1), 11–28.
<https://doi.org/10.31943/mathline.v2i1.32>
- Sujiono, Andayani, Setiawan, B., & Wardani, N. E. (2023). The Effectiveness of a Textbook Based on Multicultural and Contextual Understanding as a Learning Material for Scientific Writing. *International Journal of Instruction*, 16(2), 347–368.
<https://doi.org/10.29333/iji.2023.16220a>
- Sulasmianti, N. (2018). Pemanfaatan Blog sebagai Media Pembelajaran (the use of blog as learning media). *Jurnal Teknodik*, 22(2), 143–158.
<https://doi.org/10.32550/teknodik.voio.365>
- Sumartono, Huda, N., & Mardiana, N. (2020). Persepsi Guru dan Siswa Terhadap Kualitas, Kepuasan dan Manfaat Web SMA Dharma Wanita 4 Sidoarjo. *Jurnal Andi Djemma Jurnal Pendidikan*, 3(2), 48–57.
<http://dx.doi.org/10.35914/jad.v3i2.451>
- Tessmer, M. (1993). Planning and Conducting Formative Evaluations: Improving the Quality of Education and Training. In *Planning and Conducting Formative Evaluations*. Kogan Page.
- Wafiqoh, R., Darmawijoyo, D., & Hartono, Y. (2016). LKS Berbasis Model Eliciting Activities untuk Mengetahui Kemampuan Pemecahan Masalah Matematika di Kelas VIII. *Jurnal Elementen*, 2(1), 39–55.
<https://doi.org/10.29408/jel.v2i1.176>
- Wahyudi, & Anugraheni, I. (2017). Strategi Pemecahan Masalah Matematika. In *Satya Wacana University Press* (Issue August).
- Yansen, D., Putri, R. I. I., Zulkardi, & Fatimah, S. (2019). Developing PISA-like Mathematics Problems on Uncertainty and Data Using Asian Games Football Context. *Journal on Mathematics Education*, 10(1), 37–46.
<https://doi.org/10.22342/jme.10.1.5249.37-46>
- Zulkardi. (2003). Developing a Learning Environment on Realistic Mathematics Education for Indonesian Student Teachers. *Thesis University of Twente, Enschede. - With Refs. - With Summary in Ducth ISBN 90 365 18 45 8 Subject*.
- Zulkardi. (2006). *Formative Evaluation: What, Why, When, and How*.
<http://www.oocities.org/zulkardi/books.html>.
- Zulkardi, Z., Meryansumayeka, M., Putri, R. I. I., Alwi, Z., Nusantara, D. S., Ambarita, S. M., Maharani, Y., & Puspitasari, L. (2020). How Students Work with PISA-like Mathematical Tasks Using Covid-19 Context. *Journal on Mathematics Education*, 11(3), 405–416.
<http://doi.org/10.22342/jme.11.3.12915.405-416>.
- Zulkardi, Z., & Putri, R. I. I. (2010). Pengembangan Blog Support untuk Membantu Siswa dan Guru Matematika Indonesia Belajar Pendidikan Matematika Realistic Indonesia (PMRI). *Jurnal Inovasi Perekayasa Pendidikan (JIPP)*, 2(1), 1–24.

Appendix of article entitled: Development of Blog-Based Mathematics Learning Media Using Malay Islamic Context in Junior High School

Table 1. Validator Comments and Suggestions

Validator	Comments/Suggestions
Validator 1	<ol style="list-style-type: none"> 1. First login screen directly to the homepage 2. Learning objectives are adjusted to PMRI principles 3. On the home page there are instructions on what to study and make a concept map
Validator 2	<ol style="list-style-type: none"> 1. Improve the appearance by creating a sub menu so that on the home menu there are several sub menus such as introduction, learning objectives, click on the button. If there is an advanced menu, the sub menu is placed on the blog and can be clicked, it's more interesting. 2. Replace the introductory words with brief words about the blog. 3. The homepage is just the initial pamphlet. Add animated movements or any kind of animation for a little beauty.
Validator 3	<ol style="list-style-type: none"> 1. In the menu row, prioritize competence over material. 2. Add a video on how to use the blog. 3. Adjust your learning objectives to the ABCD criteria.
Validator 4	<ol style="list-style-type: none"> 1. Correct typos in the blog 2. The font size should be slightly enlarged to make it clearer and easier to read 3. The flat image used should be similar to the image with the context and approach used
Validator 5	<ol style="list-style-type: none"> 1. When choosing a sarong motif, you should choose a motif that is more clearly related to the material in question 2. There needs to be continued assistance to students 3. The scoring grid and rubric are good. It's just that when it comes to evaluation questions, the time is adjusted to the class schedule here.
Validator 6	<ol style="list-style-type: none"> 1. Added learning videos or 3D images to the understanding material about determining the surface area of flat-sided shapes (prisms and pyramids) so that students better understand what surface area means. 2. In the material on the surface area of the prism using the mosque charity box, the information in the picture is made clearer so that students can easily understand the context of the picture. 3. The evaluation questions are written in accordance with current regulations where students are given questions in the form of AKM (literacy and numeracy) as pictures are added to the questions.
Validator 7	<ol style="list-style-type: none"> 1. So that students understand/work on problems in a coherent manner. Each material on the blog is designed with special settings. For example, students cannot click on the next material if they have not worked on the previous problem. The next material is locked first. 2. In the blog display, list the classes that will study the material 3. The display of the sarong image for each problem is made clearer and enlarged
Validator 8	<ol style="list-style-type: none"> 1. In the introduction there is a picture of each mosque which has typical Malay Islamic characteristics. From the characteristics of each Malay Islamic Mosque, provide a picture or explain which parts show that the mosque is a legacy of Malay Islam. 2. Use clear images. 3. When you enter the blog, no other images will be displayed. Try giving the image a different look to make it interesting.