

## **Need analysis of solid geometry material learning media with character strengthening for 5th grade elementary school**

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**Abstract:** In addition to existing textbooks, student learning activities can be helped by the development of learning media that are expected to help overcome students learning difficulties, especially in math learning. This research aims to analyze the need for media that can be used in the process of learning mathematics to facilitate the understanding of materials by students. The subjects in this study were a teacher and all grade 5th students of SDN 2 Mojorembun, 16 students. Interview and questionnaire techniques are used to obtain and collect data about the learning media needs. The study results obtained an average percentage of 82.1%, which showed a need for continuous development of the need for more practical, engaging, complete learning media for solid figure material with character strengthening. So, it can be concluded that students need to develop learning media about solid figure material with character strengthening.

**Keywords:** Need Analysis, Learning Media, Solid Figure, Character Strengthening.

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## INTRODUCTION

Delivering material and important messages in the learning process can be transferred through learning media. According to Mashuri (2019) learning media is one good way to interact and communicate effectively. It is also can be used to transfer messages or information so that it can stimulate students' thoughts, words, feelings, interests, and attention. Falahudin (2014) also argues that the use of learning media will be able to stimulate interest, new desires, and motivation so that learning activities can be improved. Pakpahan, et al (2020) also mentioned that the effectiveness of teaching and learning activities would be improved with learning media. Therefore, teacher skills are needed to create creative, initiative, and interactive learning using learning media. Based on these opinions, it shows that learning media influences the learning process. Teachers must be creative in creating exciting and innovative learning media to encourage student motivation in learning to maximize learning objectives and implementation.

In teaching mathematics, it is common for teachers to use learning media as it is known that learning Mathematics is difficult for students to understand. One of the difficulties experienced by students is due to the many calculations that cause students to become bored and find it difficult to concentrate. According to Sulistyaningsih & Rakhmawati (2017) the assumption that mathematics is a complex subject to understand will make students afraid to learn it and cause them to be passive in the process of teaching and learning activities. It also happened in research from Kurniastuti (2009) which shows that students who have difficulty learning mathematics can be influenced by their lack of attention when teaching and learning activities. Thus, overcoming students' difficulties in learning can be done by using mathematics learning media. The importance of media in mathematics is expected to overcome students' learning difficulties. With learning media, it is expected that students' knowledge and understanding can develop and foster interest and provide motivation for students in their learning activities.

The quality of learning media can realize success in teaching and learning activities, so selecting learning media criteria is needed to determine suitable and appropriate media in their use. According to Riyana (2012), there are six criteria in selecting media: the suitability of the objectives, materials, student characteristics, theories, learning styles, environmental conditions, support facilities, and availability of time. With the selection and adjustment of these criteria, it will be easier for teachers to develop learning media to be effective and provide efficiency during the implementation of teaching and learning.

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The development of learning media must also be given character strengthening in order to bring out and instill character in students. It is in line with Agusti, et al (2018) that through well-designed and original learning media, it can be used as an opportunity to instill character values into students so that it can become permanent behavior in everyday life. So in selecting learning media, the teacher must pay attention to the suitable and adjust it to the students' needs.

Needs analysis is needed to find out the needs of students in the learning process (Hendriyani, Delianti, & Mursyida, 2018). In line with this opinion, Rosilia & Yuniawatika (2020) also argues that a crucial step that can be taken to develop teaching materials or learning media can be done by conducting a needs analysis. It can help the learning process to be able to run optimally and maximally if the teacher knows what needs are needed by

students in teaching and learning activities, especially in learning media. A previous study conducted by (Rufii & Rochmawati (2019) with the use of learning media that meet the needs of students will be able to increase student motivation. This study aimed to analyze the learning media needs of teachers and fifth-grade students at SDN 2 Mojorembun, Nganjuk Regency as expected, which can be different learning media that is practical, engaging, and strengthens students' character.

## METHOD

### Research subject

The research subject is the main element in implementing the research process, used as a research variable. The central part of a research variable is the research subject (Rosilia & Yuniawatika, 2020). This analysis takes the research subject: a fifth-grade teacher at SDN 2 Mojorembun, Nganjuk Regency, and 16 fifth-grade students at SDN 2 Mojorembun Nganjuk Regency, which are presented in Table 1 below.

**TABLE 1.** *Research subject*

No.	Indicator	Description
1.	Class/Grade	Grade 5 Elementary School
2.	Students	16 students
3.	Average Age	10 – 11 years
4.	Student Characteristics	Students have varied characteristics, each student has different abilities, in receiving material in learning there are three levels, namely high, medium, and slow.

**TABLE 2.** *Interview grid with homeroom V*

No.	Analysis Indicator	Question Indicator
1	Learning Media Analysis	Availability of learning media Problems regarding learning media Intensity of using learning media Expectations of learning media development
2	Curriculum Analysis	Applied curriculum Learning methods Problems in learning mathematics
3	Students' Characteristics Analysis	The total of students Students' characteristics Strengthening the character of students in learning

Modified from (Wati, 2020)

**TABLE 3.** *Student needs analysis questionnaire*

No.	Indicator
1	Difficulty in learning Mathematics
2	Availability of Mathematics learning media
3	Mathematics learning media needs
4	Desire for mathematics learning media
5	Character strengthening integrated in Mathematics learning media

Modified from (Wati, 2020)

## Research Data Collection Instruments

In this study, the data collection instrument in the form of interview guidelines covered three topics, namely learning media, curriculum, and student characteristics addressed to the homeroom teacher of class V SDN 2 Mojorembun, Nganjuk Regency, and a needs analysis questionnaire with eleven questions for 16 fifth grade students at SDN 2 Mojorembun Regency. Nudge. The research data collection instrument is presented using the grid in Table 2 and 3.

## Research Procedure

The research procedure is a stage to collect data obtained through different conclusions (Rosilia, Yuniawatika, & Murdiah, 2020). The data was obtained from interviews with the teacher of class V under interview guidelines and students' needs analysis questionnaires. Interview activities were carried out for a day on January 11, 2021. After interviews with the fifth-grade teacher, activities were carried out to fill out a fifth-grade student's questionnaire online using google forms on February 7, 2021. The results of interviews with classroom teachers and students' need analysis questionnaires as a source of learning media needed.

## Data Analysis

Data were analyzed descriptive quantitative. The students' needs analysis questionnaire used the Guttman scale. Students must answer eleven opinion questions, a score of "1" for the answer "yes" and a score of 0 for the answer "no." Furthermore, the score obtained from data collection was analyzed quantitatively in the form of a percentage using the formula for the frequency of the answers divided by the total number of answers multiplied by 100% (Mungan, 2012). The percentage results from the needs analysis are categorized by modifying from Munggaran (2012). The following describes the categorization in Table 4 below.

**TABLE 4.** *Categorization of percentage results of filling out student needs analysis questionnaires*

Percentage	Category
0 – 1.9%	No need
2% - 25, 9%	Few need
26% - 49.9%	Less than half need
50%	Half need
50.1% - 75.9%	More than half need
76% - 99.9%	Most need
100%	All need

Source: Munggaran (2012)

Furthermore, quantitative data from needs analysis questionnaires will be translated based on Table 3. If the percentage results are more than 50%, half of the students need learning media. If less than 50%, then the learning media does not require learning media. The results in a descriptive form were obtained from interviews with the teacher.

## RESULTS

Interview activities with the homeroom teacher of class V, namely Mrs. Daryani, S.Pd. Related to the needs of learning media consists of three topics, namely about learning media, the curriculum used, and the characteristics of students. The results of interviews with homeroom teachers about learning media are presented in Table 5.

**TABLE 5.** *Interview results about learning media*

No.	Indicator	Answer
1	Availability of learning media	Learning media available in schools include blackboards, LCDs, projectors. And for learning mathematics itself, it is using several spatial frameworks that are no longer suitable for use. Most importantly, students only use textbooks and worksheets to study.
2	Problem	Learning media are still very limited and no longer feasible to use. Students only rely on textbooks in learning activities, and in the textbook, the material reviewed is also very limited and there are differences in the concept of presenting the sub-subject material.
3	Intensity of use	The use of media has not been maximized during teaching-learning process. Students only use textbooks.
4	Hope	It is practical, attractive, and encourages students to experience learning fun.

The conclusion is based on the results of interviews regarding learning media, namely the supply of learning media for students is still very limited, and there are no learning media with adequate and good quality. Textbooks are still dominantly used in the student learning process, and even then, there are still differences in the presentation of the sub-subject material. The teacher hopes that there will be the development of practical, enjoyable, and complete learning media to encourage students to have motivation and interest during the learning process. In addition to conducting interviews about learning media, interviews were conducted about the curriculum in class V SDN 2 Mojorembun, Nganjuk Regency. The results of interviews about the curriculum are presented in Table 6.

**TABLE 6.** *Interview results about curriculum*

No.	Indicator	Answer
1	Curriculum used	The curriculum used is the 2013 curriculum. Students use integrated thematic learning.
2	Method used	Lectures, assignments, and questions and answers are methods that are usually used in the learning process. Because now carrying out online learning, assignments and questions and answers are carried out through the WhatsApp group.
3	Problems in the learning process	Students get a lot of obstacles when learning mathematics, especially the material for building spaces. On average, they have difficulty working on the questions because the textbooks have limited presentation of the material. And students tend to memorize formulas without understanding the concept.

Based on the interviews, class V SDN 2, Mojorembun implemented integrated thematic learning with the 2013 curriculum. The methods used include lectures, assignments, and questions and answers. Students still experience problems regarding learning media in the learning process using the 2013 curriculum because they only rely on textbooks in learning, so that they experience difficulties and students' lack of interest in learning. It can also be considered in developing media according to the needs and characteristics of students. For this reason, an interview with the teacher was conducted to reveal the characteristics of the fifth-grade students.

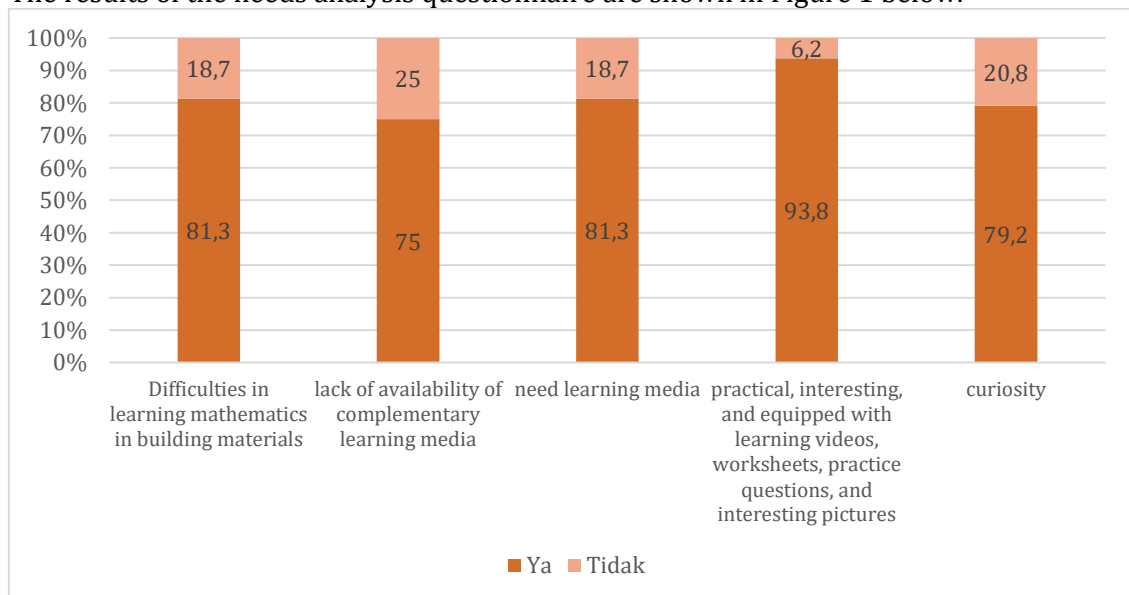
**TABLE 7.** *Interview results about student characteristics*

No.	Indicator	Answer
1	The total of students	There are 16 students, with 7 boys and 9 girls.
2	Student characteristics	The various characteristic of students. Their learning outcomes are quite good, but there are two children who are slow to accept learning but the others are normal.
3	Strengthening the character of students in learning	Some students are quite independent in learning. However, their curiosity about learning activities has not yet appeared enough. Therefore we need activities that encourage their curiosity during teaching and learning activities.

The characteristics of the fifth-grade students of SDN 2 Mojorembun are very diverse. They have different interests and motivations in the learning process. However, two students are slow in accepting learning. Instilling character in students is also lacking in the value of the character of curiosity.

From the results of interviews covering the three topics, it is known that the available learning media is very limited in the context of the material and its presentation. Even for the learning media that is used to help students learn, it is not adequate, while students have learning difficulties, especially in learning mathematics in building materials. Through research, it is hoped that there will be the development of practical, complete, and more exciting media to assist in the learning process. The suitability between the needs and characteristics of students and the applicable curriculum in media development aims to achieve learning objectives and maximize student learning outcomes (Ekayani, 2017).

In addition to the interview technique, the researcher also used a needs analysis questionnaire technique distributed to 16 fifth-grade students of SD N 2 Mojorembun. The questionnaire consists of 5 indicators with ten questions that must be filled in by students with a choice of answers "yes" and "no," the answers are adjusted to each student's opinion. The results of the needs analysis questionnaire are shown in Figure 1 below.

**FIGURE 1.** *Percentage results of needs analysis questionnaire*

The data in the diagram above shows that most students answered "yes" from the five indicators given. The percentage of the data obtained from the answers from students. The data are also presented in Table 8.

**TABLE 8.** *Results of the needs analysis questionnaire*

No.	Indicator	Question Number-	Total score for the answer "yes"	Percentage (%)	Average Percentage	Categories of Needs Analysis Results
1.	The difficulty of students in learning mathematics in building materials.	1.2	26	81.3%		
2.	The lack of availability of companion learning media.	3,4,5	36	75%		
3.	Requires learning media in learning mathematics in spatial building materials.	6	13	81.3%		
	The desired learning media is practical, interesting, and equipped with learning videos, worksheets, practice questions and interesting pictures.				82.1%	Most need
4.	Strengthening the character of curiosity that is integrated into learning media.	7.8	30	93.8%		
5.		9,10,11	38	79.2%		

In the needs analysis questionnaire, there are five indicators. The needs analysis questionnaire obtained the results indicated by the average percentage value of 82.1%. When interpreted in table 1, according to Munggaran (2012) with a range of 76% -99.99% and categorized that is most of the students need. These results are also adjusted with interviews with the teacher of class V SDN 2 Mojorembun, Nganjuk Regency.

## DISCUSSION

Using learning media is needed in the teaching-learning process. According to Musfiquon (2012) teaching media is used to transfer material to be understood, and learning activities run optimally. Meanwhile, according to Nurdin & Andiantoni (2016) valuable things for transferring messages, achieve the learning outcome, thoughts, and feelings so that communication occurs in the learning process is the meaning of learning media. The use of

learning media will help facilitate the delivery of material by the teacher, which is packaged attractively and practically so that students can also participate in activities enthusiastically. Effectiveness, efficiency, and attractiveness in teaching and learning can be supported by learning media (Miftah, 2013).

There are various types of development and learning media in the learning process. According to Nurseto (2011) there are five significant media classification groups: silent visual media, motion visuals, audio, silent audiovisuals, and motion audiovisuals. At the same time, the classification of learning media by Satrianawati (2018) media is visual, audio, audiovisual, and multimedia. Several types of learning media can be considered for adjustment to students' characteristics and learning styles. The selection of learning media is essential by the teacher so that the media is suitable for use by students so that learning can be carried out efficiently (Wahyuni, 2018).

Through teacher interviews and questionnaires filled out by students, data was obtained that the availability of learning media in schools was limited. Under the results of interviews about learning media show that there is a problem with learning media that is not yet available to the maximum. Students rely on textbooks in the form of textbooks and worksheets to study. The limited availability of learning media provided will impact the understanding of the material studied by students. Apart from the interviews, the data was strengthened by three questions related to the needs analysis questionnaire of learning media availability. The result is that there are 36 "yes" answers for the lack of availability of companion learning media and 12 for "no" answers. These results indicate that 75% of students agree that the available learning media are not optimal and still rely on textbooks. It needs to be considered by the teacher in the learning process. Categorization results referenced from Munggaran (2012) concluded that most of the learning media for students is still limited and minimal. However, one of the questions showed that all students in class V in their learning activities use smartphones.

The existence of smartphones in student learning activities will affect their study time. The use of smartphones should be used as a solution to increase students' interest in learning instead of wasting their time in learning activities. Because according to research conducted by Konstantin (2012) Learning media using smartphones, students will be given in-depth learning opportunities because they can build their competencies dynamically. Teachers in choosing learning media can be adapted to technological developments, improving the quality of learning (Huda, 2020). Research results by Wahyuni (2018) show that the teacher's mistakes in choosing learning media will be fatal, so that students experience confusion about the material being studied. Therefore, learning media is very useful to assist in understanding from students and the delivery of material by the teacher.

Meanwhile, the data from interviews on curriculum topics indicate that the 2013 curriculum has been used to implement learning, requiring students to participate in learning activities actively. Curriculum 2013 learning requires students to be active and can investigate, and the teacher as a facilitator must also package learning so that contextual and real problems can be solved by students (Sinambela, 2017). Based on interviews with teachers, it was also obtained that data regarding learning resources owned by students were very limited, namely only in textbooks which resulted in learning mathematics, especially the material for building spaces was difficult to understand and understand by students. Difficulties in building materials were also researched by Sumadiasa (2014) that applying concepts that are not yet appropriate in the material of building space is the cause of students experiencing difficulties. In the questionnaire, there are two questions about learning difficulties. The result is that there are 26 "yes" answers and 6 "no" answers. The percentage result is 81.3%. Based on the categorization of Munggaran (2012) these results are included in the categorization that most students experience difficulty building space material in mathematics learning. It happens cause of due to the influence of two factors, namely internal and external. Interest and motivation in learning mathematics are internal factors in students' difficulties (Asriyanti & Purwati, 2020). Meanwhile, according to



Cahyono (2019) the cause of difficulties in learning mathematics experienced by students is due to external factors, namely the lack of supporting reading books.

In geometry material, the difficulties experienced by students are because they only rely on textbooks in learning activities. Similar to the research conducted by Sari & Putra (2018) namely the availability of books from the government that teachers use during the teaching and learning process and the absence of exciting media, which causes low learning outcomes. Students need media to learn and understand geometry. In the needs analysis questionnaire, there is 1 question, the result of which there are 13 "yes" answers which agree that learning media is needed for learning mathematics in geometrical material. Agree with research by Suana (2019) that students need learning media so that they are more involved in the learning process. The percentage results show that 81.3% need learning media. The categorization from Munggaran (2012) that learning media for building materials is needed by most students. Students can also deepen their understanding of the material by media in learning.

Based on the teacher's perspective, information was also found that there is a need for more practical and complete learning media. It is also supported by the results of the needs analysis questionnaire. There are two questions about the elements needed and development in learning media. The result is that there are 30 "yes" answers and 2 "no" answers that agree on the development of learning media that are practical, interesting, and equipped with elements of learning videos, worksheets, practice questions, and exciting pictures. The percentage of student answers who agree on the complementary elements of learning media development is 93.8%. According to Munggaran (2012), this categorization is included in most students' needs. Then it can be concluded that students need to learn practical, complete, and interesting media. According to Abdul Karim, Dini Savitri, & Hasbullah (2020) good learning media must be equipped with supporting elements such as practice questions, worksheets, and audio in the learning process.

One of the 2013 curriculum implementations emphasizes strengthening character education in the learning process. Teaching and learning activities in all subjects must implement character education (Yuniawatika, Akbar, & Nuraini, 2017). Strengthening character education is rightly done by integrating it into learning media. The existence of 3 questions regarding the integration of character in learning media obtained results, namely, there were 38 "yes" answers and 10 "no" answers. For 79, 2% of students agree on the integration of the character of curiosity in learning media. Munggaran (2012) states including on the categorization of most require. Therefore, it can be concluded that it is necessary to develop learning media that is integrated with the character of curiosity because most students need it. By strengthening the character of curiosity, it will improve the quality of students who have character (Khamalah, 2017).

## CONCLUSION

The interview results showed that the fifth-grade teacher needed learning media on geometry that were complete, more practical, and able to help overcome students' problems regarding learning difficulties in building materials and integrated with strengthening the character of curiosity. The results of filling out analytical questionnaires by students also show that 1) when learning mathematics, especially difficulties in building spatial materials, students experience, 2) learning media available in schools are still limited, 3) learning media are needed that help students to support the learning process 4) students already use mobile phones in their learning activities, 5) the required learning media is equipped with exciting pictures, learning videos, worksheets, and practice questions,

Therefore, the development of media in learning is carried out in a *pop-up book* based on code-building material, strengthening the character of curiosity used in the learning process to help students. In addition, practical use and equipped with exciting pictures, learning videos, worksheets, and practice questions, and integrated with strengthening the character of curiosity. Learning media development must have a more

comprehensive, complete, engaging, and creative scope of material. Needs analysis must be given by taking into account several things, such as the situation and condition of the research subject. It is expected that teachers can take advantage of all existing learning media and the development of subsequent media as well as possible so that students' interest and motivation to learn can be appropriately grown and maximally, of course, adjusted to the needs and characteristics of students.

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