



# Journal of Educational Sciences

Journal homepage: <https://jes.ejournal.unri.ac.id/index.php/JES>



P-ISSN  
2581-1657

E-ISSN  
2581-2203

## Development of Guided Invention Based Learning Tools on Circle Material to Facilitate Mathematical Comprehension Ability of Class VI SD / MI

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### ARTICLE INFO

#### Article history:

Received: 18 Sept 2020

Revised: 28 Nov 2020

Accepted: 03 Jan 2021

Published online: 24 Jan 2021

#### Keywords:

Learning Tools

Mathematical Comprehension Ability

Guided Discovery

### ABSTRACT

This research was motivated by the lack of teachers in developing learning tools causing students' mathematical understanding is still in the low category. The learning devices used in schools have not trained students' mathematical understanding skills. The aim of this study is to produce guided discovery-based mathematics learning tools to facilitate mathematical comprehension skills that meet the validity and practicality requirements. This type of research was a development research using the ADDIE model. The instruments used in this study were the syllabus validation instrument, lesson plans, student worksheet and practicality using student response questionnaires. Based on the results of data analysis, it shows that the guided discovery-based mathematics learning device is a valid category. The results of the validation of the syllabus, RPP and LKPD showed that the category was very valid with the value sequentially obtaining a score of 92.5%; 95%; and 94.87%. The results of the practicality data analysis in small group trials showed a very practical category with a score of 93.64%. It can be concluded that the learning tools developed are feasible and practical to use in the learning process.

## 1. Introduction

Education is the process of forming and developing reasoning power, skills, and life morality against the potential of every human being. An education is said to be of quality if the educational process takes place effectively so that students gain meaningful experiences for themselves, and the products of education are individuals who are superior and beneficial to society and national development. Learning can be considered as an activity that involves three fundamental things that are interrelated: (1) determining what students will learn; (2) carry out the

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Doi: <https://doi.org/10.31258/jes.5.1.p.104-118>

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actual learning; and (3) evaluating learning. This is in line with the opinion of Moon, Mayes & Hutchinson (2002) which states that effective teachers are very systematic in preparing and implementing each learning process. This shows that teaching and learning activities will be effective if the learning tools are well prepared and arranged, such as syllabus, lesson plans and student worksheet.

Trianto (2011) stated that learning devices are devices used in the learning process. The learning device is one of the preparations made by the teacher before carrying out the learning process. The ability of teachers to develop learning tools and then apply them in classroom learning is the goal of these competencies. However, the practice of daily learning in schools still experiences various problems regarding the learning tools used to operate the learning process. The teacher is not only the deliverer of the material but the teacher can be said to be the designer of learning activities. Fitria (2020) states that most teachers have not developed learning tools that are in accordance with the 2013 curriculum and students need. Learning devices that are made are only limited to the administrative requirements provided by the teacher without paying attention to the goals to be achieved (Atika, 2020). This is in line with Kartika (2020) which states that the learning tools used by teachers such as the lesson plans that are compiled do not yet refer to the RPP components stated by Permendikbud No. 22 of 2016, for example the GPA that has not used operational verbs, the details of learning activities are not in accordance with the learning model used, the scientific approach has not been seen and the steps of the learning model used have not been seen in learning activities.

Several other research results regarding the learning devices used have not referred to Permendikbud No. 22/2016 (Yustianingsih, 2017; Ningsih, 2020). Yustianingsih (2017) states that learning tools have not helped construct knowledge so that they have not achieved the expected learning objectives. In line with Ningsih's opinion (2020) states that the worksheets used by students have not been able to facilitate students to build their knowledge.

Rianti (2020) states that many teachers have not been optimal in developing learning devices according to the 2013 curriculum, including LKPD which encourages students to find the concept of the material being studied to develop mathematical abilities. The LKPD used only contains a summary of the material and examples of questions so that it does not facilitate students in developing mathematical understanding skills. The results of preliminary studies conducted by researchers on students on circle material found that students still had difficulty answering the questions given. This can be seen from the number of students who ask the teacher which formula is appropriate. In addition, seen from the completion process carried out, there were only a few students who answered with the correct steps and answers. As for students who answered incorrectly due to several errors in answering questions, including misconceptions, facts, procedures and errors in principle (Hutagalung, 2017).

One of the efforts to improve mathematical comprehension skills is the selection and use of appropriate learning models. Hutagalung (2017) states that the guided

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discovery model is an alternative that is expected to be able to activate students in the process of finding something innovative, and be able to develop creativity so that it is effective in the learning process. With this discovery process, students use the ideas and understanding they have to find something new, so that the understanding of the concepts that students have can increase. Therefore, researchers chose a guided discovery model which is expected to be able to help students find a concept so that it can last a long time in the memory of students.

Isrok'atun (2018) The steps of the guided discovery model are: (1) Formulating a problem, the teacher presents a problem in the form of a demonstration of story questions and problems contained in the LKS to be solved during the learning process; (2) Formulating Hypotheses, the results of students' understanding of the problems presented can help students formulate temporary answers to the problems at hand; (3) Collecting data, in this case, students can collect a lot of data by reading various related information or collecting data that has been presented in the problem and constructing the knowledge they have previously had in obtaining mathematical concepts; (4) Testing Hypotheses, in testing hypotheses, the data that has been obtained is used to test the hypotheses formulated by students in the previous stage; (5) Draw conclusions, this final conclusion, can be in the form of concept discovery by students in accordance with the teacher's design.

The advantages and disadvantages of the guided discovery model according to Markaban (2008) state that the advantages of the guided discovery model are as follows: (1) Students actively participate in the learning process; (2) instilling and cultivating an attitude of seeking-and of finding; (3) Supporting students' problem solving abilities; (4) Provide a process of interaction between students, as well as students and teachers; (5) The material studied can last longer because it involves students in the process of finding it. Meanwhile, the shortcomings of the guided discovery model are as follows: (1) The time is consumed longer on certain materials; (2) Not all students can follow lessons in this way, because some students are still familiar and easy to understand the lecture model; (3) Not all learning materials are suitable for this model.

Based on the problems faced by the teacher, researchers developed a learning tool based on guided discovery on circle material to facilitate valid and practical mathematical understanding abilities of grade VI SD / MI students.

## **2. Methodology**

This research was a development research using the ADDIE model which consists of five stages, namely analysis, design, development, implementation and evaluation. The analysis stage was carried out by the researcher, namely (1) needs analysis, the researcher conducted an analysis of the learning tools used in schools. At this stage the researcher conducted interviews and reviewed documents. This analysis aims to determine the basic problems that occur in learning devices; (2) student analysis, the researcher conducts a study of the

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characteristics of students as users of the developed learning tools. Researchers conducted a preliminary study of mathematical understanding ability tests. This analysis was carried out to determine the characteristics of students, so that it could be used as a design guide for the quality of learning devices; (3) material analysis, the researcher identifies the circle learning material, the researcher determines the material coverage for four meetings and the researcher determines the sequence of the learning material. This analysis is carried out to determine the content and subject matter needed, so that it can help students improve students' mathematical understanding abilities.

At the design stage. Researchers made the initial design of learning tools in the form of syllabus, lesson plans and student worksheet based on guided discovery. The draft of the syllabus and RPP is in accordance with Permendikbud Number 22 of 2016, while the LKPD was designed according to the steps of guided discovery. Furthermore, the development stage, the researcher develops learning tools according to the initial design. The learning tools that have been developed are validated by three validators, namely two mathematics education lecturers and one mathematics teacher at school.

The implementation stage, after the learning device was declared valid, the researcher conducted a small group test on the LKPD that was developed on 8 students with heterogeneous abilities to see the LKPD readability. In the evaluation stage, the researcher revised the learning device according to the validator's suggestions and suggestions from students during the limited trial. The data collection technique used was a questionnaire, to obtain the validity of the researcher providing a validation sheet that must be filled in by the validator and practicality by filling in the student response questionnaire sheet. Validity data using a formula

$$Va_x = \frac{TSe}{TSh} \times 100\%$$

Information:

TSe: Total empirical score;

TSh: Total maximum expected score;

V\_a: Expert validator

To find out the final results of the validation of the syllabus, RPP and LKPD from the experts, it is calculated using the mean formula. To find out the validity criteria can be seen in Table 1.

Table 1. Criteria for the Validity of Learning Devices

Interval	Category
85,01 % - 100,00%	Very valid
70,01 % - 85,00 %	Valid
50,01 % - 70,00%	Less valid
01,00 % - 50,00%	Invalid

Source: Akbar (2013)

Data on the practicality of learning devices were obtained from student response questionnaires. Analysis of the result data from the student response questionnaire using the following formula.

$$R = \frac{\sum P}{\text{the number of students}}$$

Information:

R: The final result of the response of students

$\sum P$ : Total percentage of practicality

The value obtained is then interpreted by the practicality category, as in Table 2.

Table 2. Criteria for Practicality of Learning Devices

Interval	Category
85,01 % - 100,00%	Very Practical
70,01 % - 85,00%	Practical
50,01 % - 70,00%	Less Practical
01,00 % - 50,00%	Impractical

Source: Roliza (2018)

### 3. Results and Discussion

This research produces learning tools based on guided discovery of circle material for class VI SD / MI. The development model used is the ADDIE model. In the analysis stage, the researcher analyzes the learning device. Based on the results of the researcher interviews with seven teachers, the results are shown in Table 3.

Table 3. Interview Results

Interview Aspects	Teacher Response	Follow-up
Teacher involvement in compiling learning tools	<ul style="list-style-type: none"> <li>Two teachers develop learning tools and use them in the learning process</li> <li>Five teachers use learning tools from the MGMP results and the internet</li> </ul> <p>Conclusion: most teachers have not developed learning tools independently</p>	Learning tools will be developed independently for circle material
Learning Resources	The LKPD used comes from the publisher. Conclusion: LKPD purchased from the publisher contains only material summaries and sample questions so that it does not facilitate students in developing mathematical understanding skills.	Researchers will develop LKPD independently

Analysis of students, the researcher conducted a preliminary study of the mathematical comprehension ability test on the circle material. The subjects of this study were MI class VI students aged 10-11 years. According to Piaget's theory, students who are at that age have the ability to think concretely, where

students are able to think logically but only with concrete objects. Researchers obtained data that the understanding ability of students was still relatively low, as seen in Table 4.

Table 4. Results of the Analysis of Students' Mathematical Comprehension Ability

Mathematical Understanding Indicators	Analysis Results
Provide examples and counter examples of the concepts that have been learned	33% of students have not been able to provide examples and not examples of circle elements appropriately
Apply the concept algorithmically	40% of students have not been able to use the concept and formula of the circumference and area of a circle appropriately
Linking various concepts	67% of students have not been able to associate the concept of a circle with other concepts correctly

Material analysis, researchers identify the material to be developed. This study the researchers chose circle material with KD 3.4, KD 4.4, KD 3.5, KD and KD 4.5. The researcher also arranged the learning activity plan into 4 meetings, namely (1) the center point, radius and diameter of the circle; (2) Bow, Bowstring, Tembereng and Circle Circle; (3) circumference of the circle; and (4) Area of the circle.

In the design stage, the researcher prepared the initial format of the learning tools in the form of a syllabus, lesson plans and worksheet. The draft syllabus and RPP are prepared based on Permendikbud Number 22 of 2016 which is based on guided discovery. Meanwhile, the LKPD design is prepared based on guided discovery steps. In the development stage, the researcher develops learning tools according to the initial design. The learning tools that have been developed are then validated by three validators. Following are the results of the syllabus validation. The explanation of the learning device products developed is as follows.

The syllabus is developed according to the initial design and refers to Permendikbud No. 22 of 2016 concerning Process Standards. This Permendikbud is the requirement should be used by the school in the Indonesia. This is the new version of the previous guidance. The syllabus developed only on Circle material using the guided discovery model. The following is the result of developing the syllabus

Kompetensi Dasar	Materi Pembelajaran	Indikator Pencapaian Kompetensi	Kegiatan Pembelajaran	Penilaian	Alokasi Waktu	Sumber belajar
3.4 Menjelaskan titik pusat, jari-jari, diameter, busur, tali busur, tembereng, dan juring 4.4 Mengidentifikasi titik pusat, jari-jari, diameter, busur, tali busur, tembereng, dan juring	Titik pusat, jari-jari dan diameter	3.4.1 Membedakan titik pusat, jari-jari dan diameter lingkaran  4.4.1 Menentukan titik pusat, jari-jari dan diameter lingkaran berdasarkan gambar yang diberikan	Peserta didik melalui diskusi kelompok menggunakan langkah-langkah penemuan terbimbing melakukan aktivitas-aktivitas sebagai berikut: <b>Merumuskan Masalah</b> <ul style="list-style-type: none"> <li>Mengamati permasalahan yang berbentuk soal cerita yang berkaitan dengan titik pusat, jari-jari dan diameter lingkaran pada LKPD-1 (<b>Mengamati</b>)</li> <li>Menentukan apa yang diketahui dan apa yang ditanya dari permasalahan yang terdapat pada LKPD-1 (<b>Menanya</b>)</li> </ul> <b>Merumuskan Hipotesis</b> Membuat dugaan sementara dari permasalahan yang terdapat pada LKPD-1 <b>Mengumpulkan Data (Mengumpulkan Informasi)</b> <ul style="list-style-type: none"> <li>Membuat pemisalan dari apa yang diketahui dan ditanya pada permasalahan yang berbentuk soal cerita yang ada pada LKPD</li> <li>Menemukan titik pusat, jari-jari dan diameter lingkaran untuk menyelesaikan permasalahan yang berbentuk soal cerita yang ada pada LKPD-1.</li> </ul> <b>Menguji Hipotesis</b> Menyelesaikan permasalahan yang berbentuk soal cerita yang berkaitan dengan titik pusat, jari-jari dan diameter yang ada pada LKPD-1 ( <b>Menalar</b> ) <b>Menyusun Kesimpulan</b> <ul style="list-style-type: none"> <li>Menarik kesimpulan terkait materi yang sedang dipelajari</li> <li>Menyajikan secara tertulis atau lisan hasil pembelajaran, apa yang telah dipelajari atau</li> </ul>	<b>Pengetahuan</b> <ul style="list-style-type: none"> <li>Jenis: Tes Teknik: Tes lisan dengan jawaban singkat. Bentuk instrumen: Pertanyaan langsung yang berkaitan dengan titik pusat, jari-jari dan diameter lingkaran</li> <li>Jenis: Tes Teknik: Tes tertulis bentuk instrumen: uraian yang berkaitan dengan titik pusat, jari-jari dan diameter lingkaran</li> </ul> <b>Tugas</b> <ul style="list-style-type: none"> <li>Membaca dan mencermati mengenai titik pusat, jari-jari dan diameter lingkaran</li> <li>Tugas kelompok: mengerjakan LKPD-1 yang diberikan oleh guru.</li> <li>Tugas mandiri: Mengerjakan latihan soal-soal yang berkaitan dengan materi titik pusat, jari-jari dan diameter lingkaran</li> </ul> <b>Keterampilan</b> <ul style="list-style-type: none"> <li>Lembar pengamatan dengan rubrik.</li> </ul>	2x35'	Buku Guru dan Siswa Matematika Kelas VI, PPT dan LKPD-1

Figure 1. Result of Syllabus Development

The results of the validation of the syllabus are shown in Table 5.

Table 5. Results of Syllabus Validation

Assessment Indicators	Average
Complete identity	100%
Completeness of syllabus components	100%
Clarity of the formulation of the GPA	91,67%
Appropriateness of assessment techniques	91,67%
Time allocation accuracy	91,67%
Suitability of learning resources	83,33%
Suitability of learning activities	90%
The suitability of learning with the characteristics of students	91,67%
<b>Total Average</b>	<b>92,5%</b>

On the indicators of completeness of identity and completeness of components, the score was 100% with the very valid category, meaning that the completeness of the identity and the syllabus components were in accordance with Permendikbud No. 22/2016. The syllabus is in line with the opinion of Sani (2014). The assessment technique obtained a score of 91.67% with a very valid category, meaning that the learning outcome assessment technique in the syllabus was in accordance with the 2013 Curriculum.

Determination of time allocation obtained a score of 91.67% with a very valid category, meaning that the time allocation for each meeting was according to the learning material. And the selection of learning sources obtained a score of 83.33% in the valid category, meaning that the selection of learning sources was in accordance with the opinion of Daryanto (2014). Furthermore, the suitability of 90% learning activities with the very valid category, this is because the learning activities at LKPD have been adjusted to the guided discovery steps based on the opinion of Isrok'atun (2018). Finally, the indicator of the suitability of learning

with the characteristics of students obtained a score of 91.67% with a very valid category, meaning that the learning activities designed were in accordance with the characteristics of students. Overall the score of the validation results obtained a score of 92.5% with a very valid category so that the syllabus that the researchers developed was in accordance with Permendikbud No. 22/2016 and was based on guided discovery. The results of the validation of the RPP by the validator can be seen in Table 6.

Table 6. RPP Validation Results

Assessment Indicators	Average
The suitability of the RPP with the syllabus	100%
Complete identity and RPP components	96%
Clarity of the formulation of the GPA	100%
Clarity of learning objectives	91%
Suitability of Learning material	98%
Selection of media, tools, learning resources	95%
Conformity Assessment techniques	97%
Suitability of Learning activities	87%
<b>Total Average</b>	<b>95%</b>

The suitability of the lesson plan with the syllabus gets a score of 100% in the very valid category, meaning that the lesson plans developed are in accordance with the syllabus. The clarity of identity in the RPP obtained a score of 96% with the very valid category, meaning that the completeness of the identity in the RPP was in accordance with the Minister of Education and Culture Regulation Number 22 of 2016. The clarity of the GPA formulation in the RPP obtained a score of 100% with a very valid category, this agrees with Sani (2014) that the GPA described is in accordance with KD and uses a measurable KKO. The clarity of the learning objectives in the lesson plan obtained a score of 91% with a very valid category, meaning that the learning objectives were in accordance with the GPA that had been determined and contained elements A, B, C, D in line with Sani's opinion (2014). The suitability of the learning material obtained a score of 98% with a very valid category, meaning that the learning material contains facts, elements, principles, procedures relevant to the formulation of the GPA (Permendikbud No. 22/2016).

The selection of media, tools, learning resources in the lesson plan obtained a score of 95% with a very valid category, agrees with Daryanto (2014) that the tools, media and learning resources used are good in helping students understand learning material. The clarity of the assessment technique in the lesson plan obtained a score of 97% with a very valid category, meaning that the assessment on the lesson plan had included aspects of knowledge and skills assessment and the formulation of the assessment instrument was adjusted to the GPA to measure the level of competency attainment of students, this agrees with Akbar (2013). The learning activities in the lesson plan reached an average score of 87% in the very valid category, this result was obtained because the learning activities in the lesson plans were in accordance with the process standards in the curriculum and



were in accordance with the guided discovery steps based on the opinion of Isrok'atun (2018).

The development of learning tools in the form of LKPD is made with a guided discovery model which is in the circle material of Class VI SD / MI. Activities in LKPD are made so that they can guide students to find concepts or formulas independently and be able to apply these formulas through problem work. The following is a display of the developed LKPD.

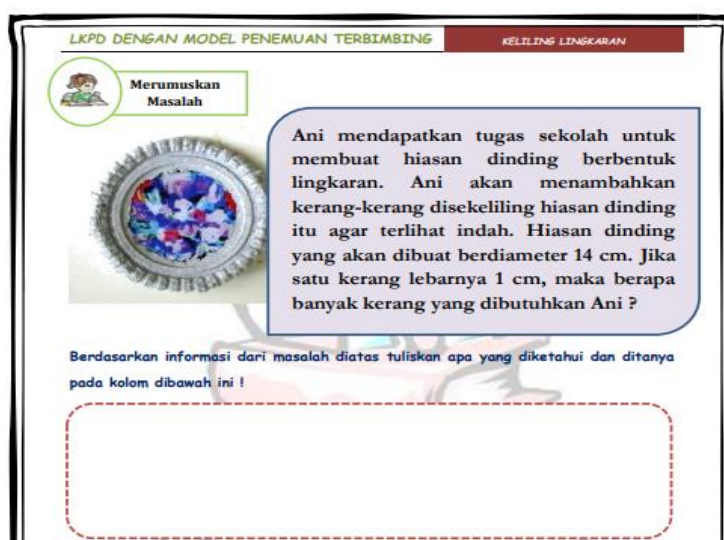


Figure 2. Display of Formulating Problems

At this stage students are asked to formulate problems in the LKPD and students to write down what is known and asked about the problems presented at the LKPD. The following shows the next stage, namely formulating a hypothesis as shown in Figure 3.

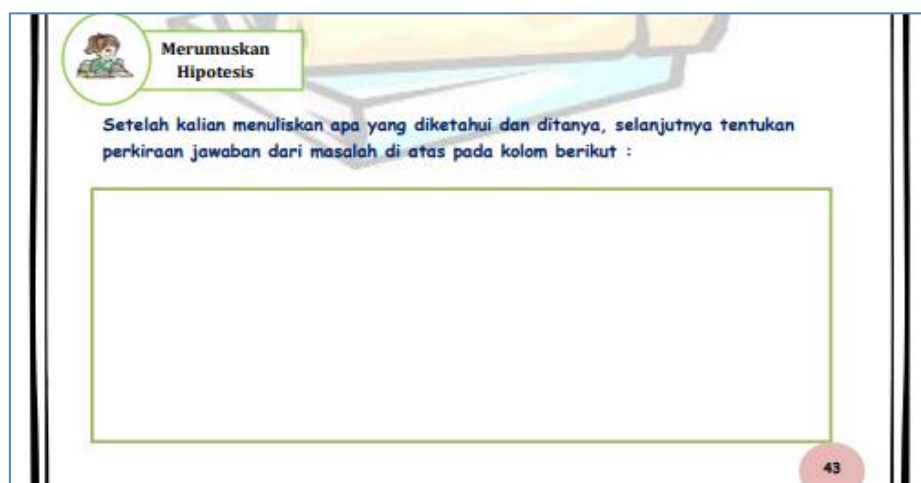


Figure 3. Views Formulating Hypotheses

Students are asked to write down temporary answers to the problems presented in the activity of formulating problems. Furthermore, the display of the stages of collecting data is shown in Figure 4.

**LKPD DENGAN MODEL PENEMUAN TERBIMBING**      **KELILING LINGKARAN**

**Mengumpulkan Data**

- Perhatikan berbagai benda bentuk lingkaran yang terdapat di atas meja masing-masing kelompok.
- Ukur kedua sisi/keliling lingkaran dengan menggunakan meteran yang telah disediakan
- Kemudian ukur diameter kedua benda tersebut.
- Sajikan ukuran keliling dan diameter kedalam tabel di bawah ini!
- Bandingkan ukuran keliling dan diameter yang diperoleh

Benda	Panjang Sisi/Keliling (K)	Diameter (d)	$\frac{K}{d}$

Keliling jika dibagi dengan diameter akan menghasilkan nilai phi ( $\pi$ )

$$\frac{K}{d} = \pi$$

Figure 4. Display Collecting Data

Students are asked to collect data to obtain the concept of the material being studied. Furthermore, the display tests the hypothesis as shown in Figure 5.

**Menguji Hipotesis**

Ayo diskusikan bersama kelompokmu, dengan menggunakan rumus keliling lingkaran yang sudah kamu temukan untuk menyelesaikan masalah di atas. Tuliskan jawaban kalian pada tempat yang telah disediakan

Tuliskan kembali jawaban yang kamu peroleh pada kegiatan menguji hipotesis dan perkiraan jawaban yang ada pada kolom dibawah ini!

Perkiraan Jawaban

Jawaban yang Diperoleh

Figure 5. Display of Testing Hypotheses

Students carry out the stages of testing the hypothesis by solving problems at the LKPD using the concepts obtained in the activity of collecting data and students comparing the results of temporary answers with the results of testing the

hypothesis. Furthermore, the final stage of guided discovery is to draw conclusions as can be seen in Figure 6.

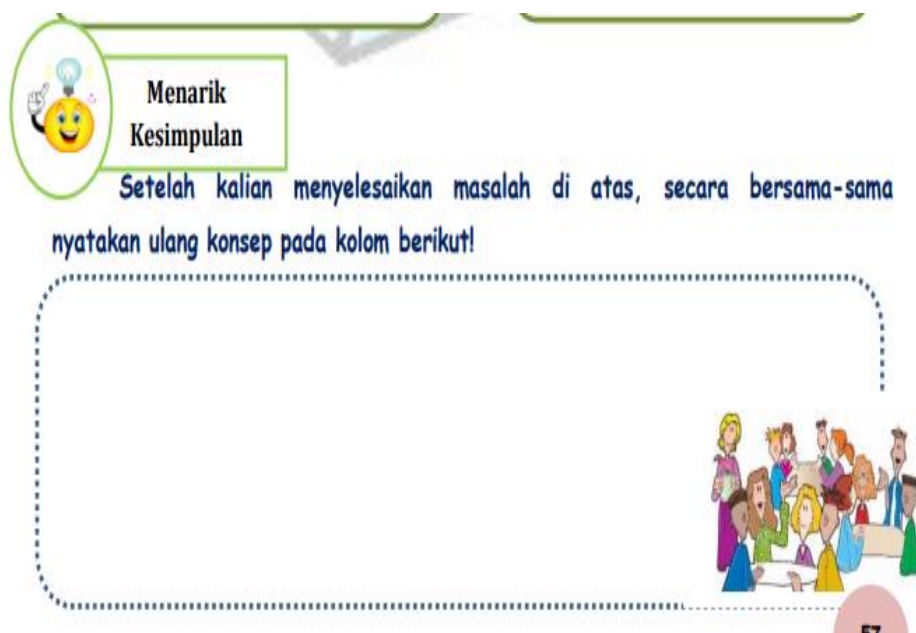


Figure 6. Interesting Conclusion Display

At this stage students write the conclusions from the findings of the concepts obtained. The results of the validation of the student worksheet developed by the researcher are shown in Table 7.

Table 7. LKPD Validation Results

Assessed indicator	Average
Completeness of the components of the LKPD	100%
Suitability of learning material	96,67%
Presentation of learning material	93,4%
Suitability of LKPD with guided discovery steps	96,18%
The suitability of LKPD with mathematical understanding abilities	88,54%
The suitability of LKPD with the level of ability of students	93,05%
The accuracy of choosing the words and language used	88,17%
The letters used in LKPD	100%
Images presented in LKPD	96,87%
LKPD display	95,83%
<b>Total Average</b>	<b>94,87%</b>

The completeness of the LKPD components developed by the researcher obtained a score of 100% in the very valid category. This result is obtained because the components required in the LKPD are in accordance with the Ministry of National Education (2008). The aspect of the suitability of the learning material in the student worksheet developed by the researcher obtained a score of 96.67% with a very valid category. This result was obtained because the learning material was in accordance with the KD that was developed, this agrees with Putri (2020). The suitability of the LKPD with the guided discovery steps obtained a score of

96.18% with a very valid category, meaning that the LKPD developed contained guided discovery steps and the achievement of indicators of success, based on Susanti's (2017) opinion. The conformity aspect of LKPD and KPM obtained a score of 82.29% in the valid category. This result was obtained because the LKPD developed was in accordance with the indicators of mathematical comprehension ability, this is in line with the opinion of Afgani (2011).

The suitability aspect of LKPD with didactic requirements obtained a score of 93.05% in the very valid category. This is because the LKPD conformity is in accordance with didactic requirements (Saputra, 2018). The construction aspect of the LKPD obtained a score of 88.17% with the very valid category, meaning that the language used has been adjusted to Indonesian language rules correctly and simply so that it makes it easy for students to understand it and use clear language, this agrees with Saputra (2018). The suitability of LKPD with technical requirements obtained a score of 97.57% with a very valid category, meaning that the presentation of the LKPD had used the appropriate type and size of letters, LKPD was designed with attractive and different colors for each meeting and the images used could help students understand the problem (Revita, 2017).

Overall, the average result of the LKPD validation that the researcher developed obtained a score of 94.25% with the very valid category, meaning that the LKPD that the researcher developed could be tried out according to the suggestions given by the validator. Furthermore, Putri (2020) in her research stated that the average value of the LKPD validation results with the valid category could be tested at a later stage.

In the implementation phase, the researcher conducted a limited trial on 8 students with heterogeneous abilities to see the legibility and practicality of the developed LKPD. The researcher conducted trials on eight students with heterogeneous abilities. The practicality results from limited trials are shown in Table 8.

Table 8. Results of LKPD Practicality

Assessment Indicators	Average
The material is described in detail	94,53%
Understand the material presented at LKPD	95,32%
The appearance and arrangement of the LKPD is attractive	89,07%
The writing on the LKPD is very clear and easy to read	87,5%
The language used in LKPD is easy to understand	85,16%
Sentences and work orders at LKPD are easy to understand	89,85%
The images shown are in accordance with the material	100%
The pictures provided make better understanding of the subject matter	96,1%
LKPD colors make learning more enthusiastic	93,75%
The space allotted is sufficient to solve the problem	96,88%
The directions given were very clear	90,63%
Knowing the learning objectives written on the LKPD	97,66%
The problems given are in accordance with real life	99,22%
LKPD can guide to solve problems	95,32%
<b>Total Average</b>	<b>93,64%</b>

Overall, the practicality results of the LKPD obtained a score of 93.64% in the very practical category. The next stage the researcher did was the evaluation stage. The evaluation stage, the researcher revised the learning device during the validation process according to the validator's suggestions and the limited trial according to the suggestions of students. As for the revision of the syllabus during validation, one of the validators suggested that writing a scientific approach to learning activities in the syllabus. Furthermore, the revision of the lesson plans during the validation, namely: (1) the validator suggested that improving the sentence learning objectives in RPP-1 to RPP-4; (2) the validator suggests writing down the assessment score on the skills assessment in RPP-1 to RPP-4.

The LKPD revisions suggested by the validator were: (1) the validators suggested fixing the problems in LKPD-3; (2) the validator suggests correcting the command sentences in LKPD-3 and LKPD-4 so that students understand better the activities to be carried out. As for the results of the discussion of researchers and students during the limited trial, students experienced difficulties in interpreting the word "provisional guess" so that the researcher revised the word with "estimated answers" from these students.

#### **4. Conclusion**

This development research resulted in learning tools in the form of syllabus, lesson plans and student worksheets based on guided discovery to improve the mathematical understanding abilities of grade VI SD / MI students. The resulting learning device meets very valid criteria and is very practical. The validity results were obtained based on the assessment provided by the expert validator of the learning tools, while the practicality results were obtained from the results of the student response questionnaire to the developed LKPD.

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How to cite this article:

Lestari, A. D., Kartini., & Zulkarnain. (2021). Development of Guided Invention Based Learning Tools on Circle Material to Facilitate Mathematical Comprehension Ability of Class VI SD / MI. *Journal of Educational Sciences*, 5(1), 104-118.

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