

TEACHING MATERIALS DEVELOPMENT BASED USING GUIDED DISCOVERY MODEL ON PYTHAGORAS THEOREM MATERIALS FOR CLASS VIII SMPN 4 WEST BANGKALA, JENEPONTO REGENCY

Mardhiah¹, Irmawati², Baharuddin³, St. Ibrah Mustafa Kamal⁴, Nurlaelah⁵

Fakultas Tarbiyah dan Keguruan, UIN Alauddin Makassar

Email: mardhiah.hasan@uin-alauddin.ac.id, Irmawatimansyurrr@gmail.com, st.ibramk@uin-alauddin.ac.id, nurlaelah@umi.ac.id

DOI: <https://doi.org/10.37758/jat.v4i2.285>

Received: Juny 2021

Accepted: July 2021

Published: Agustus 2021

Abstract :

This article discusses the development of mathematics teaching materials based on guided discovery models based on the material of the Pythagoras Theorem for Class VIII SMPN 4 West Bangkala, Jeneponto Regency. The purpose of this study was to determine the development of teaching materials based on guided discoveries based on the Pythagorean Theorem material for Class VIII SMPN 4 West Bangkala, Jeneponto Regency that were valid, practical and effective. The type of research performed is research and development (research and development). The Research Results Achieved (1) The validation results for teaching materials and all research instruments received an average overall validity of 4.14, which is in the valid category because it is in the interval 3.5 M 4.3. (2) The practical test resulting from the results of the teacher's questionnaire analysis for all aspects is 97%. In addition, the proportion of student answer questionnaires for all aspects is 89.45%. These numbers lie in the interval 85% RS 100% and can be classified as very positive (3) Effective, the results of the evaluation of the student learning outcome test are 80% classically completed and fall into the high category, so it can be concluded that the teaching materials which are based on a guided discovery of the material of the Pythagorean Theorem Class VIII SMPN 4 Bangkala Barat Jeneponto Regency, which meet the criteria of validity, practicability and effectiveness.

Keywords : *Teaching Materials, Guided Invention Model, Pythagorean Theorem.*

Abstrak :

Artikel ini membahas tentang pengembangan bahan ajar matematika berbasis model penemuan terbimbing berdasarkan materi Teorema Pythagoras untuk peserta didik Kelas VIII SMPN 4 Bangkala Barat Kabupaten Jeneponto. Tujuan penelitian ini adalah untuk mengetahui pengembangan bahan ajar berbasis penemuan terbimbing berdasarkan materi Teorema Pythagoras untuk Kelas VIII SMPN 4 Bangkala Barat Kabupaten Jeneponto yang valid, praktis dan efektif. Jenis penelitian yang dilakukan adalah penelitian dan pengembangan (research and development). Hasil Penelitian yang Dicapai (1) Hasil validasi bahan ajar dan semua instrumen penelitian memperoleh rata-rata validitas keseluruhan sebesar 4,14 yang termasuk dalam kategori valid karena berada pada interval 3,5 M 4,3. (2) Tes praktis yang dihasilkan dari hasil analisis angket guru untuk semua aspek adalah 97%. Selain itu, proporsi angket jawaban peserta didik untuk semua aspek adalah 89,45%. Angka tersebut berada pada interval 85% RS 100% dan dapat digolongkan sangat positif (3) Efektif, hasil evaluasi tes hasil belajar peserta didik secara klasikal tuntas 80% dan termasuk dalam kategori tinggi, sehingga dapat menyimpulkan bahwa bahan ajar yang didasarkan pada penemuan terbimbing materi Teorema Pythagoras Kelas VIII SMPN

4 Bangkala Barat Kabupaten Jeneponto, memenuhi kriteria validitas, kepraktisan dan keefektifan.

Kata Kunci: *Bahan Ajar, Model Penemuan Terbimbing, Teorema Pythagoras*

INTRODUCTION

Education is one of the main factors which is becoming the most important thing in social life. In human life, Education is an absolute need that must be met throughout life (Fuad Ihsan, 2018). It makes education very important because people will have difficulty to develop, so it must be designed to produce high-quality people who are able to compete (Ardiansyah, 2018).

The Effort that designed to improve human resources through formal education according to the Education Law no. 20 of 2003 which is concerning the National Education System, is designed to develop the ability to evolve character and civilization of a dignified nation in the context of educating the nation's life which aims to develop the students potential to become people who believe in Almighty God, noble, healthy, knowledgeable broad and capable, creative, independent and become democratic citizens and sensitive to the challenges of time.

Mathematics is one of the subjects that plays an important role in education, it can be seen from the time allocated to is more than any other subject. However, mathematics in reality is often considered as a difficult subject to understand and even tends to be boring. The mathematics that students learn in school is not acquire through mathematical exploration, but informed by the teacher and the materials. Such thing makes learning process occurs in the classroom tends to be passive. Learning Mathematics still tends to use conventional methods that are more teacher-centered. Teachers who act as mediators and facilitators in the learning process in the classroom must have a good learning design. One of the designs is teaching materials (Rahmadani, 2017). The practice of mathematics learning in the classroom requires attractive teaching materials that can make students fascinated during learning process, however, in reality many teachers still use conventional models that make students less interested to the material presented (Isnardiantini, 2019).

Teaching materials that are systematically arranged will easier for students to receive, that supporting to achieve learning objectives. Teaching materials should be arranged systematically, attractively, highly legible, easily to understand, and comply with the writing rules. Teaching materials are very important for both teachers and students in the learning process in the classroom. Without a complete teaching material, Teachers difficult to increase learning effectivity, and students difficult to understand the material being taught. Therefore, developing teaching materials in schools consider to the needs of students in accordance with the curriculum, which demands more participation and activities of students in learning. (Ida Maryamah, 2019).

The preparation of systematic and interesting teaching materials requires a learning model that can train students to be more active in their way of thinking. One of the learning models that can encourage students to use their way of thinking to find meaningful concepts from the material being studied is a guided discovery model.

"Discovery" is an English verb "Discovery" (Said, 2016). Discovery Guided is a learning process that does not present the concept of material in intact form, but instead encourages student to use their own mindset to find the concept from the material being studied. These guided discovery points the active role of students played in the learning process. Teacher mentoring provides opportunity an active learning for students, as well as the teacher who must be able to guide and point students' learning activities (Mulyatiningsih, 2011). Reciprocal with the research of Ahmad Zakiamani, who concluded that the guided discovery model can help students' skills in understanding mathematical concepts, because there is a relationship between relevant and positive variables to assist in developing the ability to comprehend mathematical concepts (Ahmad Zakiamani, 2018).

Based on the obtained information, teaching materials used by Mathematics Teachers in grade VIII in schools are in the form of textbooks provided by the school were published in 2014, but do not contain Pythagorean theorem, so that students only learn the material through teachers' explanation in front of the class. Learning often to be delivered through lectures, where the teacher explains the material in front of the class and the student pays attention to the teacher's explanation. In general, students have difficulty to understand the material because the Pythagorean theorem requires concepts, principles, and applications.

To solve the problem in learning, it is necessary to develop teaching materials which facilitate students in finding concepts from the material being studied. Along with the research conducted by Rosyadi who conclude that connecting mathematical concepts with previous experiences can cause students not to easily forget the mathematical concepts they have learned. Moreover, students will easier to apply these mathematical concepts or principles to solve in life problems (Alfiani, 2016). This can be done by teachers by designing materials that can encourage students to use their mindset, increase curiosity, and train students' skills in solving problems by collecting, processing, and analysing data in their own way (Adhitama, 2018).

Based on the explanations above, this study aims to develop teaching materials as a complement of teaching materials deficiency used. This research is entitled "Teaching Materials Development Based using Guided Discovery Model on Pythagoras Theorem Materials for Class VIII SMPN 4 West Bangkala, Jeneponto Regency "

RESEARCH METHOD

The research is a research and development (R & D) or development research, where aims to create a product in the form of mathematics teaching materials using a guided discovery model that can be used as an aid for students and teachers in the teaching and learning process in the classroom (Hasmiah, 2016). This development research is rare to do to create new products or to improve existing products (Sukmadinata, 2013).

1. ADDIE Model Development Stage

According to Benny (2019) the more general learning design model is the

ADDIE model (Analysis, Design, Development, Implementation, Evaluation).

Analysis

The first step is to define and identify students need based on the problems and characteristics they must possess. Seeking information about students in general based on expert opinion and then conducting interviews to the teachers to obtain specific information about students.

Design

After analyzing identified problems based on the needs and characteristics of students, the next step is the design. This the stage of determine learning objectives, determine learning outcomes evaluation tools and outline materials to be developed based on the learning objectives that have been made in the analysis stage, after that, determine the type of teaching materials and appropriate learning models used in achieving the learning objectives.

Development

Furthermore, in this stage, the concepts created in the previous stage are then systematically developed into real products. During the development process, the product was continuously revised by the writer. Then validated by two education experts.

Implementation

Teaching materials that have been developed and have validated are then implemented or tested in the classroom.

Evaluation

After being tested in class, then evaluating students' feedback after implementing teaching materials. Revisions are made based on the evaluation and suggestions from students or teachers.

2. Techniques of Data Analysis

Validity of data analysis

Data that has been collected from the validation sheet is analyzed cumulatively, then determine the validity of each criterion or the average of aspect according to the category of validity.

Table 1: Validity Criterion (Shoffashoffan, 2012)

Interval	Criteria
$4,3 \leq M \leq 5$	Very Valid
$3,5 \leq M \leq 4,3$	Valid
$2,7 \leq M \leq 3,5$	Valid Enough

$1,9 \leq M \leq 2,7$	Less Valid
$M < 1,9$	Not Valid

Practicality of Data Analysis

The data that has been collected from the teacher questionnaire response and student questionnaires response are then analyzed cumulatively to determines practicality based on practicality criteria.

Table 2: Practicality Criterion

Percentage	Criteria
$RS < 50\%$	Very not positive
$50\% \leq RS \leq 60\%$	Not Positive
$60\% \leq RS \leq 70\%$	Positive Enough
$70\% \leq RS \leq 85\%$	Positive
$85\% \leq RS \leq 100\%$	Very Positive

Effectiveness of Data Analysis

According to Van Den Akker (Dewi, 2017) the effectiveness is based on the extent to which the experience and outcomes of the intervention are consistent with the learning objectives. The standard categories that have been set by the Ministry of National Education for the category of effectiveness are as follows:

Table 3: Effectiveness Category

Percentage	Score	Criteria
91% - 100%	91-100	Very high
75% - 90%	75-90	High
60% - 74%	60-74	Intermediate
40% - 59%	40-59	Low
0% - 39%	0-39	Very Low

FINDINGS AND DISCUSSION

The research result is a product in the form of guided discovery-based mathematics teaching materials for class VIII students of SMPN 4 Bangkala Barat, Jenepono Regency. The process of developing this teaching material

used the ADDIE model, namely, Analysis (Analysis), Design (Design), Development (Development), Implementation (Implementation), Evaluation (Evaluation).

Students as trial subjects for teaching materials with a guided discovery model are students in class VIII of SMPN 4 West Bangkala, Jenepono Regency for academic year 2020/2021 with 10 various levels of academic ability respondents. During learning, students were asked to work on the tasks individually. In addition, this learning was also carried out online through the Zoom application.

The following figure is the description of the data obtained from the test. The validity of data was obtained from the results of the assessment by the validation team, practical data consisting of the teacher's and student's questionnaire response on teaching materials, while the effectiveness of the data was obtained from the results of the learning outcomes test.

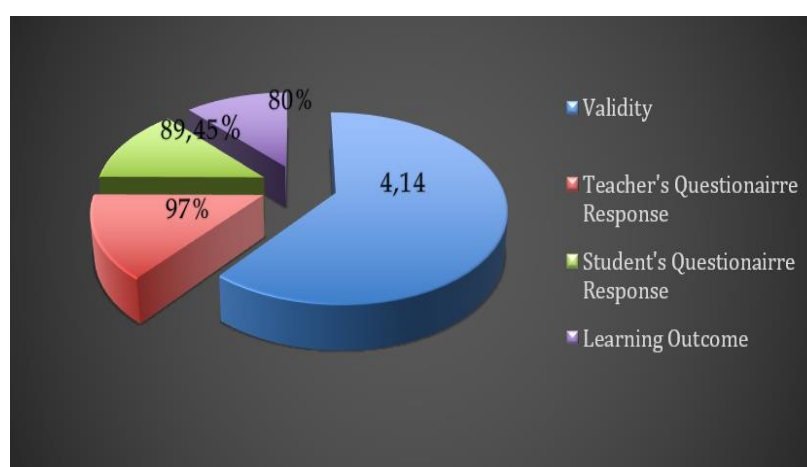


Figure 1: Validity, Practicality, and Effectivity

Validation was conducted by 3 experts as validator, consist of two mathematics education lecturers at UIN Alauddin Makassar and a mathematics teacher at SMPN 4 West Bangkala. The evaluation, comments and suggestions from the validator served as a reference to improve the teaching materials developed so that it appropriate to use in terms of appearance and material. The validation results got from the three experts gave an average of 4.14 and were categorized as valid because the average of each evaluation aspect of set was in the interval of 3.5 m 4.3.

The practicality of teaching materials can be seen from the percentage of the results of teachers' and students' questionnaire response analysis to the teaching materials. Based on the results, it can be seen that the teacher gave a positive response as much as 97% on teaching materials. It is in the interval of 85% Rs 100% and categorized as very positive so that it can be concluded that the practicality criteria for teacher responses have been reached. While the students' response analysis gains a positive response of 89, 45% of the teaching materials. The digit is in the interval of 85% Rs 100% and categorized as very positive.

The effectiveness of teaching materials can be seen in the learning

outcomes analysis. The percentage of learning completeness is 80% and the percentage of learning incompleteness is 20%. It shows that the learning completeness of the eighth grade students of SMPN 4 Bangkala Barat is classically complete, in the interval of 75%-90% as the high category.

CONCLUSION

As a conclusion from data analysis and discussion related to the development of teaching materials based on the guided discovery model on the Pythagorean Theorem material for Class VIII SMP/MTs, it can be concluded:

First, this learning set was developed using the ADDIE model which consists of 5 stages, namely Analysis by conducting student and curriculum analysis; Design to plan research products and instruments; Development, which develop teaching materials that has been designed, validated by the experts, revised like the expert suggestions and analysed the validation; Teaching materials Implementation that have been validated then tested to obtain practicality and effectiveness data; and Revise evaluation is carried out if there are any gaps in improving teaching materials.

Second, teaching materials and research tools validation review is giving overall average validity of 4.14 and categorized as valid. The results of the trial showed that the proportion of teachers' responses to the questionnaire was 97% to the teaching materials received with a very positive category. The proportion of students' questionnaires response was 89.45% for teaching materials and belonged to a very positive category. In addition, the effectiveness test was gained from the results of the learning outcomes analysis of the participants, which were 80% classically complete and has a high category. It can be concluded that the teaching materials based on the Guided Discovery Model for Pythagoras theorem material for class VIII SMPN 4 Bangkala Barat, Jeneponto Regency is valid, practical and effective.

REFERENCES

- Adhitama, dkk. (2018). Discovery ThePythagorean Theorem Using InteractivenMultimedia Learning. *Journal Of Physics: Conference Series* 1008 012066.
- Alfiani Athama Putri Rosyadi. (2016). Pengembangan Modul Pembelajaran Menggunakan Pendekatan Penemuan Terbimbing Pada Mata Kuliah Kalkulus. *Jurnal Pendidikan Matematika*, Vol 2, Nomor 1.
- Ardiansyah Muhammad. (2018). Pengembangan JimathhSebagai Multimedia Pembelajaran Matematika Berbasis Android Untuk Siswa Sekolah Menengah Atas. Mapan: *Jurnal Matematika Dan Pembelajaran*, Vol 6, No. 1, June)
- BennydA. Pribadi, MA. (2019). Desain Dan Pengembangan Program Pelatihan Berbasis Kompetensi Implementasi Model Addie. Jakarta: Kencana
- Depdiknas, Undang-Undang RI N0. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional
- Fuad Ihsan. (2008). Dasar-dasar Kependidikan. cet. V; Jakarta: Asdi Mahasatya
- Isnardiantini, S, et. al. (2019). The Effect Of Discovery Learning-Based Teaching Material By Utilizing Traditional Game On Mathematic Abilities Of The 2nd Graders Of Elementary School. *International Journal Of Educational Research Review*, 4(3), 273
- Mulyatiningsih, E. (2011). Metode Penelitian 9 Terapan Bidang Pendidikan Yogyakarta:Alfabet
- Maryamah Ida, dkk. (2019). pengembangan bahan ajar materi phytagoras yang berorientasi pada kompetensi abad 21 untuk guru SMP . *Supremum Jurnal Of Mathematics Education*, Vol. 3, No. 1, January
- Mustamin Hasmiah. (2016). *Pengembangan Bahan6Ajar Matematika Kelas VII SMP Berdasarkan Model Pembelajaran Kolb-Knisley Berbantuan Geogebra sebagai Upaya Meningkatkan Higher Order Thinking Skill dan Apresiasi Siswa terhadap Matematika*. Laporan yang dipublikasi.
- Rahmadani Yulia dkk. (2018). Modul 6 Matematika berbasis Model 8 Kooperatif Tipe STAD dengan Metode Penemuan 7 Terbimbing pada Pokok Bahasan Teorema Phytagoras. Vol. 21 No. 1 Juni
- Said Alamsyah dan Andi Budimanjaya, (2016). *95 Strategi Mengajar Multiple Intelligence*. Jakarta:Kencana
- Sulistyaningrum Dewi Ayu. (2016). Pengembangan Quantum Teaching Berbasis Video Pembelajaran Camtasia Pada Materi Permukaan Bumi Dan Cuaca. *Jurnal Pendidikan dasar*, vol 4. No 2, Desember
- Sukmadinata Nana Syaodih. (2013). *Metode Penelitian Pendidikan*. Bandung: PT Remaja Rosdakarya

Shoffashoffan ,dkk . (2012). Pengembangan Buku Ajar Operation Research Model Plomp. *Jurnal Yang Dipublikasikan. (Universitas Muhammadiyah Surabaya)*.

Zakiamani Ahmad. (2018). Perangkat Pembelajaran Pada Materi Teorema Phytagoras Dalam Model Penemuan Terbimbing. *Seminar Nasional Pendidikan Matematika FKIP UIR, Agustus*.