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THE PRACTICALITY LEVEL OF STUDENT WORKSHEETS ON PARABOLIC MATERIALS BASED ON GUIDED DISCOVERY

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Abstrak

Adanya wabah covid-19 di seluruh belahan dunia menyebabkan pergeseran bentuk pembelajaran. Pembelajaran yang biasanya dilaksanakan secara tatap muka berubah menjadi pembelajaran daring menggunakan jaringan internet. Salah satu alternatif yang ditawarkan adalah difasilitasinya dengan bahan ajar yang bisa dipelajari kapanpun dan dimanapun. Peneliti mengembangkan sebuah lembar kerja mahasiswa yang akan diuji oleh mahasiswa untuk mengetahui tingkat praktikalitasnya. Penelitian pengembangan ini menggunakan penelitian pengembangan model Mc Kenny. Subjek dari penelitian ini adalah mahasiswa semester III Program Studi Pendidikan Matematika IAIN Bukittinggi. Praktikalitas produk dinilai oleh 2 orang ahli dan mahasiswa setelah mereka menggunakan bahan ajar yang sudah dirancang. Hasil penelitian menunjukan bahwa bahan ajar yang ditawarkan telah memenuhi praktis dengan persentase 79,17 berdasarkan penilaian 2 orang ahli dan 83% berdasarkan angket yang telah disebarkan kepada mahasiswa. Kesimpulan dari penelitian ini adalah bahan ajar yang dikembangkan telah dapat dinyatakan praktis baik oleh para ahli maupun mahasiswa

Kata kunci: Praktikalitas, Lembar Kerja Mahasiswa, Penemuan Terbimbing

Abstract

The global Covid-19 pandemic has resulted in a change in the way people learn. Face-to-face learning is transformed into daring learning with the use of the internet network. One option that is facilitated by learning and that may be learned at any moment is presented. The researcher created a student worksheet that students would evaluate to see how practical it was. The Mc Kenny development research model is used in this study. The participants in this study were third-semester Mathematics Education Study Program students from IAIN Bukittinggi. After using the designed teaching materials, two experts and students evaluated the product's practicality. The results showed that the instructional materials provided met the practical criteria with a %age of 79.17 based on the evaluation of two experts and 83 % based on a student questionnaire. The study's result is that the generated teaching materials have been deemed useful by both experts and students.

Keywords: *Practicality, Student Worksheets, Guided Discovery*

Introduction

Geometry is one of the few subjects that has been taught continuously from elementary school to university, particularly in the Mathematics Education Study Program. Given the importance of geometry, students should be able to master the ideas covered in the course. In truth, most second semester students in the Field and Space Analytical Geometry course had low UTS learning outcomes in the Field and Space Analytical Geometry course, which I taught in the field. When students struggle to solve problems, they have poor learning outcomes. This question is about issues that kids may face in their daily lives. Students must be able to analyze difficulties, build mathematical models, and solve problems according to the instructions in order to solve parabolic problems. These inadequate abilities may result in poor student learning outcomes in the Field and

Space Analytical Geometry course. A good education, according to Buchori, is one that not only prepares students for a job or position, but also helps them overcome challenges in their daily lives (Mariani, 2014).

Using the Student Worksheet for guided discovery-based parabola material in Field and Space Analytical Geometry is one strategy to improve student learning outcomes. This is in line with the opinion of Sahputra in Marlina (Marlina et al., 2015), according to which teaching materials created by instructors as professional educators must take into account the qualities and environment of pupils.

Student Worksheet (LKM) is a printed instructional material in the form of sheets of paper that contains material, summaries, and directions for implementing learning tasks that must be completed by students, both theoretical and/or practical, and which refers to the competencies to be attained. Its utility is contingent on other educational resources (Prastowo, 2014).

According to Martin, guided discovery brings together teachers who use expository methods with students who use free-exploration methods (Eka Saputri & Oktarin, 2019). As a result, lecturer actions to identify subjects and create questions are used to develop guided discovery-based Student Worksheets (LKM) in this study, encouraging students to solve problems individually or in groups. Lecturers ask students to investigate what they don't understand and build their own conclusions after going through various activities by acting as guides, assisting students in using previously learned concepts, ideas, and skills to gain new knowledge, and asking students to investigate what they don't understand and build their own conclusions after going through various activities.

According to the following theories about the Student Worksheet (LKM) and guided discovery, the Student Worksheet (LKM) Based on Guided Discovery consists of:

1. The lecturer formulates issues from the topic to be studied as clearly as possible so that students can satisfy the objectives set out at the start of the meeting.
2. Students compile, process, arrange, and analyze the data offered through activities. In this scenario, the lecturer's assistance is limited to assisting students in completing statements that must be completed by them.
3. Students create conjectures (forecasts) based on the findings of the previous stage's analysis. Students complete assertions that are still missing in this guided discovery-based Student Worksheet (LKM).
4. Students validate their prior replies. This task is completed by summarizing the steps of the previously examined activities. This is necessary to ensure the accuracy of the student predictions.
5. After obtaining certainty of the conjecture's correctness, the following stage is to verbalize the conjecture. A summary of the study materials is provided in this Student Worksheet.
6. Students go through numerous stages of guided discovery; Student Worksheets provide questions to assess students' abilities at each meeting, as well as homework; and a parabolic material evaluation is also included.

Method of Research

The McKenny model was used to create student worksheets for Guided Discovery Based Parabolic Materials in the Field and Space Analytical Geometry Course. The McKenny approach has three stages: preliminary (preliminary analysis), prototyping, and assessment. The needs and context analysis activities, literature survey, and conceptual and theoretical framework building for a research are all part of the introduction stage. The prototype stage is a cyclical and sequential design process that uses formative evaluation to refine and improve research model treatments. The assessment step is a semi-summative evaluation to determine whether the solutions provided are in line with the expected outcomes, as well as to make suggestions or recommendations for constructing an intervention model (Gravemeijer & Cobb, 2013).

The trial subjects in this study were third-semester students at IAIN Bukittinggi who were enrolled in the 2021-2022 Mathematics Education Study Program. The Student Worksheet (LKM) based on guided discovery was tested on the same students in a series of trials. The guided discovery-based Student Worksheet is used on the same student to see how effective it is at the assessment stage.

The following was the instrument used to collect practical test data for this study:

1. Experts' prediction of practicality questionnaire (Expert)
   'Practicality' refers to the extent that users (and other experts) consider the intervention as clear, usable and costeffective in 'normal' conditions (Gravemeijer & Cobb, 2013). The experts' practical prediction questionnaire (Expert) is designed to gather information regarding the feasibility of the Student Worksheet (LKM) based on the experts' predictions and considerations. An expert validated this questionnaire before it was used. There were no major changes made in general. This practicality test instrument's validity test score is 4, with the validity criterion exceeding very valid.
2. A questionnaire for students to complete in response to the Student Worksheet
   The goal of the practicality prediction questionnaire, according to students, is to predict student responses to Student Worksheets (LKM) during learning. An expert validated this questionnaire before it was used. There were no major changes made in general. This practicality test instrument's validity test score is 4, with the validity criterion exceeding very valid.

The data analysis of the Student Worksheets (LKM) practicality test can be observed in the questionnaires that students filled out. A Likert scale is used to organize practicality questionnaires (Pranatawijaya et al., 2019). The Likert scale is set up in the shape of a positive category, therefore positive assertions are weighted based on the following factors:

Weight 4 for statement strongly agree (SS)
Weight 3 for statement agree (S)
Weight 2 for disagree (TS)
Weight 1 for strongly disagree (STS) (Arikunto, 2002)

The Student Worksheet (LKM) practicality questionnaire is explained using the data frequency analysis technique with the following formula:

P = R/SM×100%
P = Practical Value
R = Score
SM = Maximum Score
(Purwanto, 2004)

Discussion/Research Finding

Based on guided results by lecturers and students, the practicality test attempts to establish the extent of the benefits, simplicity of use, and time efficiency of using Student Worksheets (LKM). The following are the findings of the Student Worksheet (LKM) practicality test:

1. Student Responses to the Practicality Questionnaire

   Students are given practicality questionnaires after partaking in guided discovery-based learning utilizing a Student Worksheet (LKM). There were 34 students who participated in completing out the practicality questionnaire by emailing it to the google form that had previously been provided. Based on practicality questionnaires, here are some ideas from students.

Table 1. Students' Suggestions for Improvement

No	Suggestions
1	- Important elements or keywords should be written down to make them easier to remember - It is preferable to do more exercises or tasks in order to improve student comprehension.
2	More material should be added.
3	Some questions on assignments and evaluations do not have an answer key.
4	The cover is just as good, with additional vibrant colors to keep things interesting.
5	The material for drawing parabolas should be revised once again so that students can understand it.
6	It is preferable to increase the number of sample questions in the LKM activity.
7	The sample questions should be made more tough so that students have no trouble completing assignments and evaluations in the LKM.
8	Images in student worksheets should be created in a professional manner.
9	It's preferable if the examples of questions, tasks, and evaluations are based on real-world issues.
10	Before entering the questions, it is preferable to prioritize the grasp of the terminology.
11	The graphics in the Student Worksheets have been enhanced and clarified.
12	It's preferable if the Student Worksheet's content enables students to study independently.
13	There are still pictures/instructions/explanations in the parabolic material area that are difficult to understand.
14	It's preferable to make the most of the blank pages.
15	The material submitted is not very detailed, making it difficult for pupils to learn on their own.

Table 2. shows the findings of the practical analysis of the Student Worksheet (LKM) based on guided discovery as reported by students.

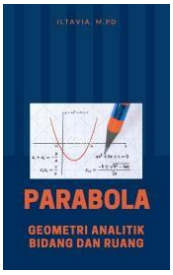
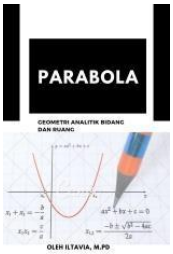
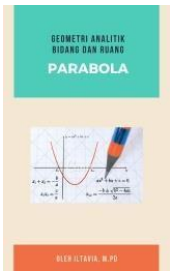
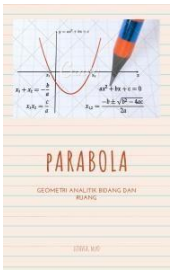
Table 2. Results of the Practicality Test Based on Student Responses

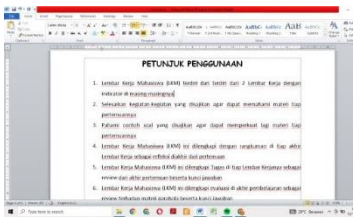
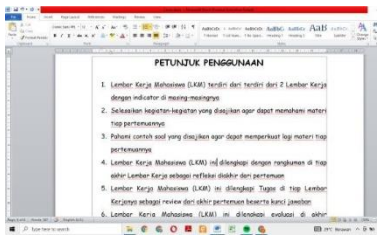
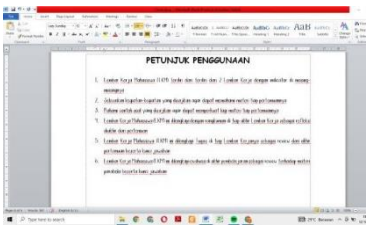
No	Statement	% Practicality	Category
1	This Student Worksheet is small enough to carry about and utilize.	84,03	Very Practical
2	This Student Worksheet is very appealing.	82,64	Practical
3	This Student Worksheet's words and sentences are simple to read and comprehend.	81,94	Practical
4	The Student Worksheet comes with explicit instructions about how to use it.	80,56	Practical
5	The usage of visuals in this Student Worksheet helps me grasp the course better.	88,89	Very Practical
6	Student Worksheets are beneficial to the learning process.	87,5	Very Practical
7	The use of Student Worksheets assists me to solve challenges that arise in my daily life.	78,47	Practical
8	Using this Student Worksheet has inspired me to learn.	83,33	Practical
9	I was able to grasp the concept of the content being studied thanks to the use of Student Worksheets.	81,25	Practical
10	I can study on my own with the help of this Student Worksheet.	79,86	Practical
11	It's easy to do using this Student Worksheet.	82,64	Practical
12	Student worksheets inspire me to think outside the box.	84,03	Practical
13	The amount of time spent on the Student Worksheet is adequate.	84,72	Very Practical
	Average	**83,07**	**Practical**

Table 2 shows that each phrase describing practicality has a practical value ranging from 78.47 % to 88.89%, putting it in the category of practical and highly practical. While the average practicality score earned in the practical area is 83 %. This means that the Student Worksheet (LKM) is based on students' practical guided exploration.

The researcher ran a poll to choose the cover and font usage for the discovery-based Student Worksheet in addition to employing a questionnaire distributed to students (LKM). Coverage is seen in the results. The poll's analysis yielded the following results:

Table 3. Results of Online Polling Analysis

No	Picture	Description	% Age
Book cover			
1		Draw a parabola with a pencil using the colors dark blue, white, and orange.	3,6%
2		Draw a parabola with a pencil using mostly black and white hues.	10,9%
3		Draw a parabola with a pencil using the dominant hues of orange and blue.	25,5%
4		The picture is made up of stationery, and the colors are dominated by blue and yellow.	27,3%
5		Draw a satellite dish using a pencil in an orange-dominated color scheme.	16,4
6		The picture is made up of stationery, and the colors are dominated by blue and orange.	14,5%

Font			
1		Calibri	34,6%
2		Comic Sans MS	45,4%
3		Lazy Sunday	16,3%

Polling was conducted by 55 mahasiswa from semester 3 as part of Lembar Kerja Mahasiswa (LKM). According to polling results, approximately 27,3 % of mahasiswa choose cover pilihan no. 4, which is a biru and kuning warna with a gambar made of alat tulis. Hasil 45,4 % mahasiswa memilih cover pilihan nomor 2 yakni font Comic Sans MS untuk font di Lembar Kerja Mahasiswa (LKM).

2. Results of the Practicality Prediction Questionnaire according to the Expert
   - According to experts, the purpose of the practicality prediction questionnaire is to acquire information regarding the practicality of the Student Worksheet (LKM) through guided discovery based on expert predictions and considerations.
   - Here are the findings of an expert's practical analysis of Student Worksheets (LKM).

Table 4. Experts' Recap of Practical Analysis

Expert Name	Statement					
	1	**2**	**3**	**4**	**5**	**6**
1	2	4	4	4	3	2
2	3	3	3	3	4	3
Average	2.5	3.5	3.5	3.5	3.5	2.5
%age	62.5	87.5	87.5	87.5	87.5	2.5

According to the experts, the results of the practicality questionnaire data analysis are shown in Table 5.

Table 5. Shows The Results Of The Practicality Prediction Analysis.

No	Statement	% Practicality	Category
1	The size of this Student Worksheet is ideal for student.	62,5	Practical
2	This Student Worksheet's words and sentences are simple to read and comprehend.	87,5	Very Practical
3	The usage of pictures/illustrations in this Student Worksheet will help students understand the learning goals more easily.	87,5	Very Practical
4	Students will enjoy learning how to use this Student Worksheet because it is based on real-life situations.	87,5	Very Practical
5	This Student Worksheet allows students to study independently.	87,5	Very Practical
6	The use of a Student Worksheet to present subject content is more practical.	62,5	Practical
	Average	**79,17**	**Praktis**

Table 23 shows that each statement describing practicality has a practical value ranging from 62.5 % to 87.5 %, which falls into the category of practical to very practical. While the average practicality score earned in the practical area is 79.17 %. This indicates that the expert believes the Student Worksheet (LKM) based on guided exploration will be useful in the classroom.

Conclution

The Student Worksheet (LKM) Based on Guided Discovery of Parabolic Material in the Field and Space Analytical Geometry Course produced met the practical criteria in terms of implementation, convenience, and time required, according to the findings of the research. Average practicality score earned in the practical area is 83 % based on student responses. Average practicality score earned in the practical area is 79,17 % based on expert judgments.

References

Eka Saputri, M. E., & Oktarin, I. B. (2019). Pengembangan Modul Pembelajaran Berbasis Penemuan Terbimbing Pada Mata Kuliah Matematika Ekonomi. *Jurnal Teknologi Pendidikan (JTP)*, *12*(2), 155. https://doi.org/10.24114/jtp.v12i2.15230

Gravemeijer, K., & Cobb, P. (2013). Educational Design Research Educational Design Research. *Netherlands Institute for Curriculum Development: SLO*, 1–206. http://www.eric.ed.gov/ERICWebPortal/recordDetail?accno=EJ815766

Mariani, M. (2014). Penerapan Model Penemuan Terbimbing Berbasis LKPD Terhadap Hasil Belajar Fisika Pada Peserta Didik Kelas XII1 Madrasah Aliyah Muhammadiyah Limbung. *Jurnal Pendidikan Fisika Unismuh*, *2*(1), 121604.

Marlina, R., Hardigaluh, B., & Yokhebed, M. (2015). Pengembangan Modul Pengetahuan Lingkungan Berbasis Potensi Lokal Untuk Menumbuhkan Sikap Peduli Lingkungan Mahasiswa Pendidikan Biologi. *Jurnal Pengajaran Matematika Dan Ilmu Pengetahuan Alam*, *20*(1), 94. https://doi.org/10.18269/jpmipa.v20i1.569

Pranatawijaya, V. H., Widiatry, W., Priskila, R., & Putra, P. B. A. A. (2019). Penerapan Skala Likert dan Skala Dikotomi Pada Kuesioner Online. *Jurnal Sains Dan Informatika*, *5*(2), 128–137. https://doi.org/10.34128/jsi.v5i2.185

Prastowo. (2014). *Panduan Kreatif Membuat Bahan Ajar Inovatif*. Diva Press.

Purwanto. (2004). *Prinsip-prinsip dan Teknik Evaluasi Pembelajaran*. Remaja Rosdakarya.