PENGEMBANGAN PERANGKAT PEMBELAJARAN TRIGONOMETRI DENGAN PENDEKATAN PENEMUAN TERBIMBING UNTUK SISWA SMA KELAS X SEMESTER II

DEVELOPMENT OF TEACHING LEARNING MATERIAL TRIGONOMETRY APPROACH GUIDED DISCOVERY FOR SENIOR HIGH SCHOOL GRADE X SEMESTER II

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Abstrak

Penelitian ini bertujuan untuk menghasilkan perangkat pembelajaran berupa RPP dan LKS trigonometri dengan pendekatan penemuan terbimbing untuk siswa SMA kelas X semester II. Kualitas perangkat pembelajaran yang dikembangkan ditinjau dari tiga aspek kualitas yaitu kevalidan, kepraktisan, dan keefektifan. Metode yang digunakan adalah Research and Development (R&D) dengan model pengembangan ADDIE yang meliputi *analysis, design, development, implementation,* dan *evaluation*. Penelitian ini menghasilkan perangkat pembelajaran berupa RPP, dan LKS. Penilaian kevalidan RPP mendapat skor rata-rata 160,5 dengan kualifikasi valid. Penilaian kevalidan LKS mendapat skor rata-rata 229 dengan kualifikasi valid. Hasil analisis data angket penilaian kepraktisan menunjukkan bahwa perangkat pembelajaran praktis dengan rata-rata 78,23. Hasil observasi keterlaksanaan pembelajaran menunjukkan klasifikasi sangat baik dengan persentase rata-rata mencapai 86,4%. Hasil penilaian tes hasil belajar siswa didapat persentase ketuntasan belajar klasikal sebesar 90% dengan kriteria sangat baik sehingga perangkat pembelajaran dapat dikatakan efektif.

Kata kunci : perangkat pembelajaran, penemuan terbimbing, trigonometri

Abstract

The aims of this research was to produce teaching learning materials such as lesson plan and students worksheet trigonometry approach with guided discovery for senior high school students grade X semester II. The quality of teaching learning materials that was developed observed in terms of three aspect of quality these were validity, practicality, and effectiveness. The method used was the Research and Development (R&D) with ADDIE model that includes analysis, design, development, implementation, and evaluation. This research was produced teaching learning materials such as lesson plan and worksheet. The validity score of the lesson plan was 160,5 with valid classification. The validity score of worksheet was 229 with valid classification. The result of the questionnaire from student showed that the teaching learning materials was practical with total score 78,23. The result of observervation during the learning process showed very good classification with percentage up to 86,4%. The result exam of student showed that teaching learning materials was very effective with percentage 90%.

Keywords: *teaching learning materials, guided discovery, trigonometry*

PREFACE

In education, teachers are expected to develop learning plan thoroughly and systematically. This is supported by Permendiknas No.41 Tahun 2007 on process standard, which include with sets learning process plan which require teachers on educational unit to develop lesson plan. Every teacher at educational unit must set up teaching learning materials thoroughly and systematically for learning process to work in interactive way. One thing to improve student's participation in learning process is by using teaching learning materials through guided discovery approach. Guided discovery approach is a method to help students to achieve knowledge and skills with their own findings, with teachers as the facilitator to help the in the process. According to Effendi (2012: 8) the use of guided discovery in

problem solving allows students to learn better over the use of conventional method.

Markaban suggested that steps of guided discovery learning are as follows:

a. To formulate problems
b. To set up, process, organize and analyze data.
c. To make hypothesis from the data analysis
d. To check student's hypothesis perfomed by teachers.
e. To draw conclusion from the results
f. To finish exercises

Mathematics plays an important role in supporting education. It can be seen that mathematic is a compulsory subject at any level of education. However, it is considered a difficult subject for students because they deal with mathematical formula. This leads to the low enthusiasm of students. Therefore, the right learning strategy is necessary to improve the quality of mathematics learning. Teachers should find the proper way to motivate students.

One learning method to solve the problem is using guided discovery. Bruner in Ratna Wilis D (2011:103) stated that, learning with guided discovery will make the knowledge last longer and easier to remember if compared to other method. Teachers have students to find the concepts of problems by collecting, organizing, and analyzing data followed by drawing conclusion to make a meaningful learning. According to heruman (2008: 5) meaningful learning is to learn to understand what students have learned and relate it to other situation to know more about it.

Learning materials and teaching methods are very important factors for teacher to make students active, creative and motivate students to enjoy the subject. Learning process is designed in such a way to support learning experience which involves mental and physical process through interaction with students. However, in practice teaching learning materials rarely develop is not facilitate in finding process. In universe only use teaching learning materials is more textual, where is only explain the existing materials in text books while students only listen and take note.

Therefore, innovative learning materials are required to facilitate learning process to be more meaningful. Which one use guided discovery approach with this approach the class activity is dominated by students. From the memorizing activity to thinking activity. From accepting to finding.

Peraturan Pemerintah no.19 tahun 2005 dan Permendiknas No.41 tahun 2007 on process standard requires that teachers should develop learning materials in the form of lesson plan and learning media which refers to contents standard. Lesson plan is a procedure and organizing learning to get a basic competence which contents standard (Supinah, 2008: 26) after make lesson plan teachers also develop worksheet students. In azhar Arsyad (2011: 78), worksheet students are inside intrakurikuler and kokulikuer activity to make students understand about specific materials. Advantage the worksheet students are facilitate teachers to manage learning process, help students to find concept, and develop skill process (Hendro Darmodjo dan Jenny R.E Kaligis, 1992: 40)

One learning material in mathematic subject class X is trigonometry which indikator ratio, function, equation, and identity trigonometry.

Teachers just given the formula trigonometry without the guided discovery method learning. Therefore required learning teaching materials the form worksheet students which facilitate students to learning trigonometry form memorizing activity to thinking activity.

From above description seen that teaching learning materials are important to facilitate students to contsruct their knowledge in mathematics subject be a meaningful learning. That can be meaningful learning if develop teaching learning material with guided discovery approach.

There is a few research which relevan with development teaching learning materials and guided discovery approach. Research from Mira Rahmawati (2013) with development teaching learning materials in angle and line material with guided discovery approach for students in junior high schools class VII which valid, practice product in worksheet students. In students questionnaire the worksheet students are interest and helpfull students to understand concept. And then research from Rani Puspitasari (2012) development lesson plan and worksheet students with guided discovery methods in factorization algebra for class VIII in junior high school 2 pleret which valid, practice, and effective product. Pursuant to Nieveen (1999: 126) a materials product development must complete criteria in valid, practice, and effective so can be used by students.

After that researcher will do research in development teaching learning materials with guided discovery approach in trigonometry for students in senior high schools class X semester II which have valid, practice, and effective complete.

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RESEARCH OF METHOD

Method of this research is "Research and Development (R&D) with ADDIE models Analysis, Design, Development, Implementation, and Evaluation by Dick and Carry (1996)

Location of Reseacrh

This research taken from 30 March 2016 until 4 May 2016 in Senior High School 1 Ngemplak address Jangkang-Manisrenggo Km.2 Bimomartani, Ngemplak, Sleman, Yogyakarta,55584.

Subject of Research

The subject in this research is students class X B in Senior High School 1 Ngemplak with 31 students.

Procedure

The models in this research is ADDIE

1. Analysis

   The main activity is analyzing the models or method learning development and anlyzing the quality of models or method on new learning. There are contain anlyzing require, analyzing curriculum, analyzing students characteristic.

2. Design

   The process in this activity is start from set of learning purpose, design scenario or learning activity, teaching learning activity, material learning, and result of learning process. Researcher design the intrument which used to evaluate

teaching learning materials with valid, practice, and effective quality.

3. Development

   The contains of development is realize product design. Develop of lesson plan and student worksheet suitable with design models. And then the instrument will be validation by teacher, material lecturer, and media lecturer. Their will give score and comment for the instrument.

4. Implementation

   The teaching learning material in this steps implemented in class. And implemented at school which choose as a place of research.

5. Evaluation

   In this step, researcher have revision product based on comment form material, media lecturer and mathematic teacher.

Type of Data and Colleting Data

Datas in the research are qualitative and quantitative data. Qualitative data consist by comment and feedback in lesson plan and worksheet students as validator and questionnaire students. While the quantitative data consist score form validity questionnare, and practical result of students. Collecting data in this research use observation, questionare, documentation, and evaluation exam.

Instrument of Research

Instrument of research teaching learning material containts are set of value materials learning, practical of students questionnare, set of obervation in class, and evaluation exam to get product in valid, practice, and effective quality.

Analyzing Data

A. Qualitative data

The containts in qualitative data are comment and feedback in lesson plan, and worksheet students from validator, questionnaire students to get aspect of practice, and set of observation to describe qualitative.

B. Quantitative data

1. Analyzing Validity of Quality

Analyzing quality of instrument use questionnaire research development (Lesson Plan and Worksheet Students) for material, media validator and mathematics teacher. Anlyzing data use analyzing descriptive with procedure

a. Calculate the mean of score with formula

$$\bar{x} = \frac{\sum x}{n},$$

With

$\bar{x}$ = mean of score

n = member of validator

$\sum x$= score total

b. Convert the mean of score to qualitative data

2. Analyzing Practicality of Quality

The instrument which use to evaluate is students questionnaire responses and observation sheet. Steps of analyzing practice aspect are:

a. Changes qualitative data to quantitave data for positive question, Very agree (SS) = 5, Agree (S) = 4, doubt (R) = 3, Disagree (TS) = 2, very disagree (STS) = 1. And the contrast score for negative question.

b. The next step is same like step count the quality of validity.

To analyzing practice aspect use sheet of observation learning with use the member of observer who choose "Yes". And then count the score with formula:

$$p = \frac{y}{n} \times 100\%$$

Information:

p = percentage of observer
y = total score yes
n = total of statement

3. Analyzing Effective of Quality

To analyzing the effective aspect from the students score of exam. With the maximum score is 100 and the minimum score is 70 for Senior High School in Ngemplak 1 class X.

Analyzing effective use steps:

a. Tabulate data for evaluation

b. Counting of percentage score get by 70

PRODUCT OF RESEARCH

A. Validity Aspect

1. Validity of Lesson Plan

The validity of lesson plan which have validity by teacher and material lecture have score 160,5 with criteria valid. Table 1 is score of validity lesson plan.

Table 1. Analyzing Data Lesson Plan

Score Analyzing Data Lesson Plan	
Total score	**160,5**
Criteria Validity Lesson Plan	**Valid**

2. Validity of Worksheet Student

The validity of worksheet students which have validity by mathematic teacher, media lecturer, and material lecturer have score 229 with criteria valid. Table 2 show the score of worksheet students

Tabel 2. Score of worksheet students

Score of worksheet students	
Total score	**229**
Criteria validity worksheet students	**Valid**

B. Practicality Aspect

The practicality of teaching learning material be measured use students questionnaire and from sheet of observation. The result from students questionnaire get score 78,23 and for the sheets of observation is 86,4%. Table 3 is the result from students questionnaire and table 4 is the percentage of sheet of observation.

Table 3. Analyzing Data of Students questionnaire

Rata-rata Aspek Penilaian	Skor Angket Respon Siswa	Rata-rata Total
Kebermanfaatan	2425	78,23

Rata-rata Aspek Penilaian	Skor Angket Respon Siswa	Rata-rata Total
Kriteria Kepraktisan	Praktis	Praktis

Table 4 Analyzing Data Observation

No	Pertemuan	Persen.	Krit.
1	Pertemuan ke-1	87,5%	Sangat Baik
2	Pertemuan ke-2	91,6%	Sangat Baik
3	Pertemuan ke-3	91,6%	Sangat Baik
4	Pertemuan ke-4	87,5%	Sangat Baik
5	Pertemuan ke-5	95,8%	Sangat Baik
6	Pertemuan ke-6	70,8%	Baik
7	Pertemuan ke-7	79,1%	Baik
8	Pertemuan ke-8	87,5%	Sangat Baik
Mean score		86,4%	Sangat Baik

SIMPULAN DAN SARAN

Simpulan

Based on the result of research and the discussion, withdrawn conclusion the research is develop produce the lesson plan and worksheet students in guided discovery approach material trigonometry. This research use ADDIE models which analysis, design, development, implementation, and evaluation.

The score product of this research from material, media lecturer and mathematics teacher indicate that product is valid for lesson plan get score 160,5 and worksheet students get score 229.

Product for practicality where students questionnaire get score 78,23 and the score of sheet observation learning activity get 86,4% with quality practicality.

The result of the student's exam show that teaching learning mathematic is effective, with classical percentage is 90% .

Suggestion

There is the suggestions that can be explained based from the research

1. Teaching learning material which as lesson plan and worksheet students use guided discovery approach material trigonometry for students in senior high school class X B has aspect valid, practicality, and effective so can be use for students and teacher to support teaching learning activity trigonometry in class.
2. Teaching learning material in mathematics subject which develop in this research limited in one main material trigonometry, therefore other researcher can develop teaching learning material use other material but still using same procedure with this procedure in this research.

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