



## THE DEVELOPMENT OF LEARNING MODULE TRIGONOMETRY EQUATION MATERIAL INTEGRATED ISLAMIC VALUES TO IMPROVE STUDENTS LEARNING OUTCOMES

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### Abstrak

Penelitian ini bertujuan untuk menghasilkan modul matematika yang terintegrasi dengan nilai-nilai Islam dengan penilaian otentik untuk siswa kelas sebelas MA Hasyim Asy'ari Bangsri, Sukodono, Sidoarjo, yang layak dan unggul untuk meningkatkan prestasi siswa dalam matematika. Penelitian ini menerapkan Model pengembangan Plomp. Metode pengumpulan data dalam penelitian ini adalah dengan menggunakan kuesioner dan tes. Data dianalisis secara kuantitatif dan divalidasi. Hasil penelitian ini adalah: 1) Modul Matematika Nilai Islam dilampirkan dengan penilaian otentik dalam proses belajar mengajar. 2) Hasil penilaian ahli terhadap bahan ajar menunjukkan bahwa pengembangan modul matematika nilai-nilai islami dengan penilaian otentik memenuhi syarat baik. 3) Validator media memberikan respons yang baik. 4) Persentase keseluruhan tanggapan siswa pada tes kelompok kecil adalah 88% yang dapat dianggap memiliki kualifikasi yang baik. 5) Tanggapan guru pada tes lapangan menunjukkan bahwa guru merespons dengan baik. 6) Pengembangan modul matematika realistik ini efektif untuk meningkatkan hasil belajar siswa kelas sebelas di MA Hasyim Asy'ari Bangsri, Sukodono, Sidoarjo.

**Kata kunci:** pengembangan, model Plomp, modul matematika, penilaian otentik, prestasi belajar matematika

### Abstract

*This research is aimed at producing an Islamic values mathematical module with authentic assessment for the eleventh-grade students of MA Hasyim Asy'ari Bangsri, Sukodono, Sidoarjo, which is feasible and superior to improve students' achievement in mathematics. This research implemented Plomp's Model of development. Collecting data methods in this research is by using questionnaires and tests. The data analyzed quantitative and validation. The results of this research are: 1) Islamic Values Mathematics Module attached with authentic assessment in the teaching and learning process. 2) The result of the expert judgment on teaching material shows that the development of Islamic values mathematical module with authentic assessment*

*is qualified as good. 3) The expert on media gives good respond. 4) The overall percentage of the students' response to a small group test is 88% that can be considered as having good qualifications. 5) The teacher's response to the field test shows that teachers responded well. 6) The development of this realistic mathematics module is effective to improve the learning result of the eleventh-grade students in MA Hasyim Asy'ari Bangsri, Sukodono, Sidoarjo.*

**Keywords:** *development, Plomp model, mathematics module, authentic assessment, mathematics learning achievement*

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## INTRODUCTION

Education is important for the establishment of a country. The civilization of a country is said to be advanced one of the factors seen is the education system implemented in the country. Education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of intellectual life of the nation aims to develop the potential of students to become human beings who believe and fear God Almighty, noble, healthy, knowledgeable, capable, independent creative, and become democratic and responsible citizens (Depdiknas, 2001).

In Indonesia, education has experienced various dynamics of change almost every year to make Indonesian education better. The curriculum change is no exception. At present, Indonesia is implementing a 2013 curriculum, replacing the previous curriculum that is Education Unit Level Curriculum/KTSP 2006. In this new curriculum, students are required to more actively look for information, while the teacher plays a more facilitating role in learning.

This change in the learning system is not all schools can implement it smoothly. Students are very heterogeneous in their characteristics. So, for active students who easily follow the learning, it is different from passive students. Therefore, with the change in the active student learning system, teachers are required to have many innovations in the learning process, especially in mathematics. Mathematics is one of the difficult subjects for most students, students

tend not to like this lesson. This makes learning in the classroom unpleasant and boring. Besides, modules or reference sources that are used not infrequently actually increase the boredom of students (Lailiyah and Hariyanti, 2017).

Various efforts were developed to improve the quality of learning. One way that can be done is to develop learning media in the form of teaching materials. According to Suryosubroto (2009) said that the provision of a variety of teaching media will be very useful for children to learn according to different ways of learning. Learning materials have a very important role in learning activities. According to Sungkono et al (2003), learning material is a set of material that contains learning material or content that is designed to achieve learning objectives. Teaching material is systematic meaning it is arranged in order so that it makes it easier for students to learn.

According to Majid (2009), teaching materials are all forms of materials used to help the teacher/instructor in carrying out teaching and learning activities. The material in question can be either written or unwritten material. Teaching material includes, among others: Instructions for learning (student/teacher's instructions), competencies to be achieved supporting information, exercises, work instructions, can be in the form of Worksheets, evaluations. According to Finch & Crunkilton in Lasmiyata (2014) suggested that teaching materials are resources that can help teachers in bringing about desired behavioral changes in individual students. There are several types of teaching materials as curriculum material, that are printed teaching materials, audio-visual material, and manipulative assistive devices. Teaching material is systematic, meaning that it is arranged to facilitate students learning. One source of teaching material that can be used is the module. According to Nasution (2008), modules can be formulated as a complete and stand-alone unit and consist of a series of learning activities arranged to help students achieve several goals that are specific and formulated. The understanding of the module according to Suryosubroto (2009) is a kind of unit of learning activities that are planned and designed to help students complete certain goals. While according to the Department of National Education defines that the module as a unit of learning material presented in the form of self-instruction. Based on the

understanding of the module above, it can be concluded that the module is programmed learning materials that are arranged in an integrated, systematic, and detailed manner. By studying the contents of the module, students are directed to the search for a goal through certain learning methods. Therefore, the module is referred to as a package program for learning purposes.

The results of interviews with the head of curriculum affairs Mrs. Sri Asnanik that learning devices in schools have textbooks and worksheets. Due to the lack of textbooks for the 2013 curriculum in school, not all students can borrow textbooks. Meanwhile, for the understanding of material in class XI Odd Semester namely trigonometric equations, the facts in the field many students do not understand the basics of trigonometry because they get trigonometry basic material only in class X. While in the old curriculum the basic trigonometry has been obtained in class IX.

Other research that is relevant to this research is from Wayan, Nyoman, and Made (2018) said that the development of realistic mathematics modules with authentic assessment can improve students' learning outcomes. The difference between this research and our research is that our research uses an integrated module of Islam, there is information about Islamic figures in the field of mathematics and some exercises about integrated Islam.

## **METHOD**

This type of research is Classroom Action Research. This research was conducted on September 20th, 2019 in class XI-IPA 1 MA Hasyim Asy'ari Bangsri Sukodono Sidoarjo. According to Arikunto, the research consisted of 4 stages, namely: 1) The research planning stage, 2) Activity phase, 3) Observation stage and 4) Reflection stage.

The quality of implementation is obtained from the observations of learning analyzed with the following criteria:

**Table 1. Description of Likert Scale Scores**

Score	Description
1	Very less
2	Less
3	Good
4	Very good

Furthermore, the analysis of the learning outcomes test shows the value of students who have used the trigonometry equation learning module integrated Islamic values. Based on the policy at MA Hasyim Asy'ari Bangsri Sukodono Sidoarjo, for a minimum completeness criteria (KKM) of 80 with a classical 80%. The data is analyzed by:

$$Score = \frac{B}{N} \times 100$$

Description:

B = The number of items answered correctly

N = The number of items.

The mastery of classroom learning is obtained using the formula:

$$\text{The mastery of classroom learning} = \frac{\sum \text{Students complete}}{\sum \text{Students}} \times 100\%$$

Meanwhile, to analyze student responses, we use the results of a questionnaire with a percentage of the number of students who have chosen each choice, using the following formula:

$$\text{Index formula \%} = \frac{\text{total score}}{\text{Highest Likert score} \times \text{number of respondents}} \times 100\%$$

Values are presented as a percentage, then converted to the following criteria:

**Table 2. Interpretation of Percentage of Student Responses**

Percentage	Description
0% – 24,99%	Very less
25% – 49,99%	Less
50% - 74,99%	Good
75% - 100%	Very good

Based on these criteria, student responses are said to be positive if the percentage  $\geq$  50%.

## **RESULT AND DISCUSSION**

This development research uses the Plomp model which includes several stages, including (1) Preliminary research, including preliminary observations, observations, reference searches, and opinion polls on modules that are being used in schools according to some Mathematics teachers, students concerned, and the researchers themselves observations; (2) Prototyping stage, including the design and manufacture of modules, the revision stage to the experts and preparation to the student testing phase; and (3) Assessment phase, including module trials to students.

In the preliminary research stage, researchers obtain some points that are less appropriate with the modules used in school, including no basic material or basic formulas that can be used to be able to learn the trigonometric equation material, so students find it difficult to learn and solve trigonometric equation problems. Besides, students are less interested in the appearance and content of books. This resulted in the modules being used did not give the impression that students were less enthusiastic in learning. One of the mathematics teachers we interviewed agreed with the results of the researchers' initial observations and student interviews.

Furthermore, in the design phase of prototype learning modules, researchers try to integrate Islamic material with geometry material. Besides, there are additional basic trigonometry materials at the beginning to help students learn trigonometric equation material.

Then the researcher validated one of the lecturers at UIN Sunan Ampel Surabaya and one of the mathematics teachers at MA Hasyim Asy'ari Bangsri Sukodono Sidoarjo. The validation data that the researchers obtained were qualitative in the form of input suggestions and criticisms regarding the appearance and contents of the module. The data is used for the revision stage. After the

researcher made a revision and was judged good, the researcher tested the product to Class XI IPA 2 MA Hasyim Asy'ari Bangsri Sukodono Sidoarjo.

In the trial phase of this product, researchers conduct a pre-test first. Students are asked to work on as many as three items for 30 minutes and are allowed to open module books that they get from school. After that, researchers distributed learning modules to be studied first for 15 minutes. Next, the researcher asked students to work on the 3-point post-test questions for 30 minutes by being allowed to open books that had been distributed. At the end of the activity, the remaining 15 minutes was used to fill in the questionnaire regarding the module by students.

**Table 3. The Result of Learning Test**

Number	Initial Name	Pre-test Score	Post-test Score
1.	ACW.	40	50
2.	AHF	80	100
3.	DS	40	81
4.	FA	82	100
5.	IS	80	82
6.	MRA	35	80
7.	MFA	35	83
8.	MDAN	35	100
9.	MMAI	35	80
10.	MNH	80	100
11.	NNA	45	100
12.	NA	82	100
13.	NWY	80	83
14.	RKS	35	50
15.	SNA	81	100
16.	TRG	45	84
17.	TNR	82	100
18.	YA	45	80

$$\begin{aligned}
 \text{The mastery of classroom learning in pre test} &= \frac{\sum \text{Students complete}}{\sum \text{Students}} \times 100\% \\
 &= \frac{8}{18} \times 100\% \\
 &= 44,44\%
 \end{aligned}$$

$$\text{The mastery of classroom learning in post test} = \frac{\sum \text{Students complete}}{\sum \text{Students}} \times 100\%$$

$$\begin{aligned} &= \frac{16}{18} \times 100\% \\ &= 88,88\% \end{aligned}$$

In addition to the above data, researchers also added data on the mastery of learning obtained by researchers through pre-test and post-test, an increase in exhaustiveness learning in class XI IPA 2. The average value obtained by students after the pre-test was 36.05. This differs greatly from the average post-test results after using the learning module that is 80.67. There was an average difference between pre-test and post-test of 44.62 points.

From the data obtained there is a difference between learning outcomes before and after the provision of this teaching material. Improved learning outcomes like this make researchers confident of concluding that using the mathematics module of trigonometric equation XI material can improve student learning outcomes.

**Tabel 4. The Results of Student Response Questionnaire**

No.	Comments	Percentage
1.	Use language that is easy to understand	99%
2.	Use of images by image content	74%
3.	The colors and pictures chosen are attractive	67%
4.	Type and size of letters used are	93%
5.	Clarity of contents	93%
6.	The suitability of writing the table of contents with the contents of the learning module	93%
7.	Learning indicators are easy to understand	89%
8.	Clarity of learning indicators as guidelines for material developed	86%
9.	Ease of understanding the concept map	85%
10.	Conformity of concept maps with learning material	90%
11.	Interest in a brief of biography	93%
12.	Language is easy to understand	90%
13.	Accuracy in the placement of layout elements (topics, subtopics, and illustrations)	90%
14.	Clarity of vertical and horizontal spacing so that one part and another appears to be separate	90%
15.	Conformity of all illustrations in the form of images displayed in the learning module	89%
16.	Concept accuracy	92%
17.	Suitability of symbol and unit notation contained in the material with an international system reference	86%

No.	Comments	Percentage
18.	The material presented is closely related to daily life	87,5%
19.	Interest in the matter of Islamic integration trigonometry equations	93%
20.	Conceptual wrangling (presentation of material from simple concepts to more complex ones)	93%
21.	Student-centered (interactive presentation of material that motivates students to learn independently)	90%
22.	Develops students' thinking skills	93%
23.	Language is easy to understand	94%
24.	The quality of the questions corresponds to the level of MA students	86%
25.	Develops students' thinking skills	92%

Based on the percentage of the results of the student response questionnaire above, positive student responses to the learning module of integrated trigonometric equation material in Islamic values.

1. In addition to what has been explained above, this development result module also has several advantages and disadvantages, including:  
The trigonometric equation learning module for class XI can improve student learning outcomes.
2. The learning module of trigonometry equation XI material makes students more interested in following the process of teaching and learning activities because it is equipped with Islamic material and a brief biography of the shop of Islamic mathematicians
3. This module is equipped with illustrations, practice exercises, and contextual material that integrates with Islamic material.

## CONCLUSION

Based on the results of research and data analysis conducted, it can be concluded that student learning outcomes before using the learning module integrated trigonometric equation material Islamic values of 44.44% which indicates that students have not reached the specified classical completeness of 80%. After students use the module learning integrated trigonometric equation

material Islamic values of student learning outcomes of 88.88% which shows that students have reached the classically determined completeness of 80%. Whereas students' responses to the learning module of integrated trigonometric equation material in Islamic values get a response greater than 50%, so it can be said that learning using the integrated learning module of trigonometric equation material in Islamic values gets a positive response from students.

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