Development of Mathematics Module Framed In Nuance Of Islam Through Scaffolding Method

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Abstract

The purpose of this research is in order to know the development, appropriateness, attractiveness and effectiveness of product developed in Al-Kautsar Bandar Lampung senior high school and MAN 2 Bandar Lampung. The procedure used is resert and development with research method and the 4-D development initiated by Thiagarajan. The data collection instrument conducted by spreading appropriateness questionnaires to the subject expert, media expert, religion expert, and education practitioner, deployment of appropriateness questionnaires to students in small scale trial and big scale trial and giving pre post test in effectiveness trial using N-Gain calculation. Obtained effectiveness result in the amount of 3,6 from subject expert, 3,5 from media expert, and 3,7 from religion expert, then its average is 3,6. It gets "very decent barometer". The students' response showed that the module is very interesting with average 3,47 from both schools with "very decent criteria" on small scale trial and 3,3 with "very decent criteria" on big scale trial. The result of effectiveness trial got 0,77 at SMA Al-Kautsar Bandar Lampung and 0,72 at MAN 2 Bandar Lampung. Based on Gain score range that is $G \geq 0,7$, so mathematics module framed in nuance of Islam through *scaffolding* on aljabar function limit subject is categorized with high classification.

Keywords: Development, Module, Islam, Scafflding

INTRODUCTION

Education is a means to increase nation progress. Trhough education, a man will be considered more honored and could have a better career and behave in accordance with applicable norms. Edication is a role to develop and form personalities and behaviour for each individual to be noble, educated, skilled, and religious human being and devote to ALLAH SWT (Fiska, Farida &Syazali, 2016). Therefore we need the education giving us knowledgeable values to form educated and religious personalities and it is Islam. Islamic values can be mixed in learning especially in mathematics learning (Mulya, Netriwati & fraulein, 2018).

Education framed in Islamic nuance and consiting of islamic values in mathematics subject at Madrasah and Islam Universities recently has been developed. According to Supriadi (2007) these islamic values differentiate common schools and universites from Madrasah and IslamicUniversities which are dominated by islamic values applied. Islamic nuance itself is about intergrating mathematical science with in

general with Islam without having to eliminate the uniqeness of those two sciences. The Islamic nuances in this mathematical module are illustrated in the module design with Islamic nuances, the verses of the Qur'an and Muslim scientists as motivations in learning, and mathematical material that is associated with Islamic values without changing the competency standards contained in the curriculum having been applied. Based on preface study, the problem is that the independence of students is still low in the mathematics learning process. This is because the teaching materials used by students so far only consists of mathematical material and questions without the help needed by students so that this problem makes students feel difficult to understand the lesson and to solve math problems if without guidance from educators. Thus, we need a teaching method that can provide assistance gradually so that students want and are able to solve mathematical questions independently both inside and outside the school environment. The method required by students is the scaffolding method.

According to Trianto (2014) Scaffolding provides some assistance to students during the early stages of learning then the students take over the responsibility that is bigger shortly after they are able to do it. The assistance can be in the form of instructions, warnings, motivation, encouragement, describing the problem in the steps of solving, giving examples, or others so that this is possible for students to grow independently. Scaffolding in this study will be applied in the contents of the module.

The research on modules conducted by Lidya Alimah Fitri, Eko Setyadi Kurniawan and Nur Ngazizah with the results of the study showed that the quality of the module developed was categorized good and feasible for physics learning (Lidya, Eko & Nur, 2013). Next, the module framed in nuance of Islam by Mulya Diana received responses from students with an average score 89.0061% with very interesting criteria and responses of educators with an average score of 85.490196% with very decent criteria (Diana, Netriwati & Fraulein, 2016). The research on scaffolding was also carried by Nicke Septriani. Irwan and Meira stated that students' ability with the scaffolding approach is better than students' understanding on mathematics concept with conventional learning (Nicke, Irwan & Meira, 2014).

The use of module can increase knowledge for students in learning process. So, it is necessary to develop module framed in nuance of Islam based onscaffolding. Therefore, the researcher is interested in conducting research entitled Development of Mathematics ModuleFramed in Islam Nuancethrough scaffolding on Material of Algebraic Functions.

RESEARCH METHOD
The study was conducted by using a type of research and development. Sugiono (2017) argued that research and development or Research and Development (R&D) is a research method to produce a particular product and evaluate the effectiveness fro the product. The research model used is 4-D initiated by Thiagarajan, and 4-D model is used in this study because it has been widely used in research and education development and

is more systematic by only having four main stages which are define, design, develop, dessimanate.

Data collection instruments used were validation sheets given to validator and edication parctitioners, while trial questionare sheets on small group trials and field trials as well as pretest and posttest questons to calculate the effectiveness of the products developed. The product developed was validated by material expert, media expert, and education pratitioner, and then the product is improved according to the advice given experts until the product was declared feasible. After being declared feasible, then the product was tested on a small group and field to assess the product attractiveness. The test on a small group and field was conducted by giving products which was declared feasible and giving the product attractiveness questionaires to students. The total assessment score of the validation and trial can be found by using the following formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} xi}{n} \qquad (1)$$

with :

$$x_i = \frac{\text{Total Score}}{\text{Maximum Number of Score}} \ x4$$

Inormation :
$\bar{x}$ =Final average
x_i = The operational test scores of each student's questionnaire
n =The number of students who fiiled out the questionnaire
The result scores from the expertswere counted for the averages and coverted to determine the feasibility of the product developed. The average analysis feasiblity criteria can be seen in Table 1:

Table 1.Criteria Validation (modification).

Quality Score	Eligibility Criteria	Information
$1,00 < \bar{x} \le 1,76$	Invalid	Total Revision
$1,76 < \bar{x} \le 2,51$	Less Valid	Partial Revision
$2,51 < \bar{x} \le 3,26$	Quite Valid	Partial Revision
$3,26 < \bar{x} \le 4,00$	Valid	Not Revised

The results of the assessment of each participant are promoted on average and converted to determine the product attractiveness. The conversion score can be seen in Table 2 below:

Table 2. Criteria for attractiveness test (modification).

Quality Score	Eligibility Criteria
$1,00 < \bar{x} \le 1,76$	Very Less Interesting
$1,76 < \bar{x} \le 2,51$	Less attractive
$2,51 < \bar{x} \le 3,26$	Interesting
$3,26 < \bar{x} \le 4,00$	Very interesting

After the feasibility test by the validators and the attractiveness test by the students, the product is tested for its effectiveness.The effectiveness test was carried out on 30 students of class XI by giving pretest questions before learning with modules, and giving posttest questions after learning with the module.Effectiveness is seen by comparing the results of the pretest and posttest by using the N-Gain calculation.Gain is the difference between the pretest and posttest values to find out an increase in understanding and mastery of concepts of students after the learning process carried out by educators.The effectiveness test of the pretetest and postetest was calculated by using N-Gain with the following formula:

$$NN - Gain = \frac{S_{post}S_{post} - S_{pre}S_{pre}}{S_{maks}S_{maks} - S_{pre}S_{pre}} \tag{2}$$

Information:
S_{post}: final test score
$S_{pre}S_{pre}$: initial test value
S_{maks}: maximum value

The gain value is interpreted into three criteria, namely high, medium, and low. The following are the criteria for gain values shown in Table 3 below.

Table 3. Gain Value Categories

Nilai Gain (G)	Kategori
$G \ge 7$	High
$0,3 < G < 0,7$	Medium
$G < 0,3$	Low

RESULTS AND DISCUSSION

This research produces a product in the form of mathematics module framed in nuance of Islam through *scaffolding*. The material used is the limit of algebraic functions developed based on the scaffolding method.The research model used in this study is 4-D from Thiagarajan which includes four main stages, namely defining, designing, developing and disseminating.Conceptually the 4-D research procedure includes:

a. Defining
   1. Front-End Analysis
     Based on the results of the needs analysis obtained:

a) Students have difficulties in understanding mathematical material both mathematics concpet and calculations.
b) Students have low independence in process of learning mathematics.
c) Educators have not linked mathematics subject with Ilsamic values.
d) Teaching materials usde by students have not been linked beetwen mathematics and verses of Al-Quran.

2. Concept Analysis

In the module developed, the researcher systematically relevantly compiled limitmaterial on algebraic functions relevant in three chapters including the definition of limit, operation on limit and limit teorema.

3. Task Analysis

Obtaining an example of a question and practice on each chapter of the material for limit of algebraic functions using the scaffolding method.

4. Specifications of Intructional Objectives

Formulating objectives by summarizing the results of front-end analysis, concept analysis and task analysis that aims to determine the behavior of research objects.

b. Design

1. Contructing criterion referenced test

The high school mathematics module with a scaffolding-based Islamic nuance was chosen as the teaching material developed, and it aims to facilitate and help students be more independent in the learning process.

2. Format Selection

The product design arrangement in this module has several steps including adjusting core competencies and basic competencies based on the 2013 curriculum (K13).

3. Initial Design

The initial design of the module development product consists of the front cover and back cover, module developer team page, introduction, table of contents, perface, standard content and concept map.While the contents of the module consist of learning activities, verses relating to material limits, Muslim scientific figures as motivation for students, zone of proximal development to see the development of students and scaffolding or assistance that makes it easier for students to understand the material and workmanship questions.

c. Develop

The activities carried out at this stage are validation of experts (material experts, media experts, religious experts and education practitioners), validation is carried out in two stages to obtain the feasibility of the module. The results of evaluations from experts can be seen in Table 4.

Table4. Results of **Product** Assessment by Experts

Validator	Average value	Criteria
Material Expert	3,6	Very Worthy
Media Expert	3,5	Very Worthy
Religionist	3,7	Very Worthy

After being declared feasible, the module is tested on small group trials and large group trials to assess module attractiveness. The results of the assessment of small groups and large groups can be seen in Table 5 below:

Table 5. Trial Results of Small and Large Groups

Trial	Average value	Criteria
Small Group	3,4	Very interesting
Field	3,29	Very interesting

After the module is declared feasible and attractive, the product is tested for effectiveness. The following is the results of calculating the effectiveness of the products presented in Table 6.

Table 6. Conclusion of Effectiveness Test Results

Sekolah	N-Gain	Kriteria
Al-Kautsar B. Lampung High School	0,77	High
MAN 2 B. Lampung	0,72	High

d. Dessiminate

The distribution is carried out to educators in either the print or the Softfile Module while the mass deployment to students is done by sending the softfile modulethrough the group on the WhatsApp application.

CONCLUSION

The conclusion of this study is mathematical modules with Islamic nuances through the scaffold method that has obtained the feasibility value from experts of 3.6 with very feasible criteria and an interesting response from 3.4 small group trials with very interesting criteria and response to large group trials 3.29 with very interesting criteria. In the trial, it obtained a value of 0.77 with high criteria in Bandar Lampung Al-Kautsar High School and 0.72 with high criteria in MAN 2 Bandar Lampung.

Suggestions that can be submitted are mathematical modules with Islamic nuances through the scaffolding method ofthe material presented is only on the limits of algebraic functions so that the development of the next module can be develop

mathematical modules with Islamic nuances through scaffolding methods on wider material.

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