Islamic-Nuanced Calculus Module with Open-Ended Approach in Real Number System Material

R Maskur1*, M Syazali1, L F Utami1

1Raden Intan State Islamic University Lampung, Endro Suratmin St., Sukarame, Bandar Lampung

*ruhbanmaskur@radenintan.ac.id

Abstract. Modules are teaching materials that can be used independently, so that module development is very useful in the learning process. Therefore, this study aims to develop Islamic nuances calculus modules with an open-ended approach to real number system material. The research method used is research and development (R & D) with a 4D model. The 4D model consists of four stages: define, design, development, and dissemination. At the development stage, an assessment is carried out to determine the feasibility of the module. This assessment was carried out by 2 material expert validators, 2 Islamic religious material validators, and 1 media expert validator. The withdrawal of the module was obtained based on limited trials on 10 respondents, namely students of Raden Intan Lampung State Islamic University. The conclusions obtained from this study are Islamic nuanced calculus modules with open-ended approaches to the real number system material is valid and appropriate to use as teaching materials and the attractiveness is in the attractive criteria.

1. Introduction

Every learning process is expected not only as a transfer of knowledge but must form a superior person so that qualify human resources can be created. Human resources that are expected to meet the challenges of progress and global competition are those who have the ability to think logically, critically, creatively and systematically so that they can solve life's problems independently. These efforts can be achieved through mathematics learning that can encourage the development of students' thinking abilities [1]. The benefits of using modules include making it easier for students to learn, feedback or feedback, mastery of material more thoroughly, students are more motivated to complete their own modules according to their abilities, students are more independent and there is cooperation between lecturers and students [2]. Modules contain learning material, methods, boundaries, and evaluation methods that are designed to be interesting and systematic to achieve the expected competencies [1,3]. Through the use of learning modules students are expected to be motivated to learn independently so that lectures will be more effective and efficient because students are able to understand the lecture material themselves that will be studied by themselves. Students are active in learning so there is no need to wait for the lecturer to present the material and be able to solve the problem without full assistance from the lecturer [4].

Some research results indicate that learning by using modules or other teaching materials has been widely used and has a positive impact, such as research by [5] produces calculus 2 modules that can improve student learning activities and outcomes, [2] produce mathematical modules on statistical material and opportunities effective and efficient use in learning, [6] developing loop modules based on open-ended approaches, [7] developing problem-based modules for Calculus lectures, [8]
developing research-based modules in calculus courses to improve student creativity, [9] developing GeoGebra-assisted learning modules (derivative topics), [10] developing mathematical modules with problem solving strategies, [11] developing student worksheets with a scientific approach, [12] developing student worksheets with a Contextual Teaching and Learning approach, [13] developing student worksheets with guided inquiry, [14] developing mathematical modules based on problem-based learning models, and [15] developing e-modules based on learning content development systems.

One effort to foster creativity and independence of student learning is to use an open-ended approach or giving open questions in the learning process [16]. The open-ended approach aims to raise students' creative activities and simultaneous mathematical thinking [17]. According to [18] open questions are questions that can be solved in various ways. Therefore, the thing that needs to be considered is the freedom of students to think in making solving progress according to their abilities, attitudes, and interests so that they will eventually form students' mathematical intelligence [19]. One of the mathematical material that can be delivered by the open-ended approach is calculus with material subgroups of real number systems. The real number system is a sub-section of material that needs to be taught in calculus courses. The open-ended approach steps used are (1) Orientation Phase, (2) Material Briefing Stage, (3) Open-Ended Problem Presentation and Work Phase, (4) Presentation Stage and (5) Conclusion Phase [20].

Previous research has also used many open-ended approaches in developing its products such as research by [3] which produced open-ended based Algebraic teaching materials in the categories of valid, practical, and effective, [21] developing open-ended differential calculus teaching materials, [22] developing SMP geometry learning devices with an open-ended approach oriented to critical thinking skills, [23] developing open-ended approach-based learning tools to improve the mathematical creative thinking skills of junior high school students, [24] developing trigonometric modules characterized by open-ended problems, [1] developing mathematical modules based on open-ended problems as the implementation of KTSP, [25] developing mathematical learning tools using the open-ended method of genius learning, [17] developing third-dimensional teaching materials using an open-ended approach, [26] developing modules with an open-ended approach to facilitate the mathematical literacy, [6] developed a circle module based on an open-ended approach, [27] developed a sheet of student activities assisted by open-ended characterized tangram, and [28] developed teaching materials based on open-ended problems with a realistic approach.

Some other studies have also attempted several ways to facilitate learning mathematics, especially calculus material, as attempted by [29] to develop open-matter self-learning devices, [30] applying artificial packages to overcome the difficulties students determine in completing absolute value inequalities, [31] applying e-learning-based calculus learning to foster student creativity and character, [32] applying problem-based student worksheets in calculus learning, [33] by applying Alberta model inquiry learning to improve mathematical problem solving skills and [34] [35] [36] with efforts to improve understanding, motivation and achievement of learning calculus through maple assisted learning.

This article aims to develop Islamic nuances calculus modules with an open-ended approach to real number system material. The novelty in this article is that researchers develop modules that have Islamic nuances in the material of real number systems where Islamic nuances mean a teaching material that is associated with Islamic values. Islamic values that can be associated with mathematics with the open-ended approach are by mentioning the name of Allah, the use of terms, mathematical applications or examples in Islamic contexts, inserting verses of the Qur'an or relevant hadith, and Islamic history.

The advantages of this study are beside contain learning material, this module contains useful Islamic values as has been done by previous research by [37] and [38] which states that with Islamic
nuanced teaching materials, students are not only able to understand material concepts correctly, but the teaching material is able to become a bridge in the formation of spiritual strength and noble character. The application of Islamic nuanced learning concepts will also increase student knowledge in religious understanding [39].

2. RESEARCH METHOD

The type of research used in this study was Research and Development (R & D). The development procedure used was the 4D model by [40] with four stages, namely (1) Define; (2) Design; (3) Development; and (4) Dissemination.

Data collection techniques were questionnaire in the form of a Likert scale with 4 answers. Scoring used in expert validation assessment can be seen in Table 1.

| Score | Options      |
|-------|--------------|
| 4     | Very Good    |
| 3     | Good         |
| 2     | Poor         |
| 1     | Very Poor    |

While the product attractiveness tests scoring can be seen in Table 2.

| Score | Options           |
|-------|-------------------|
| 4     | Very Interesting  |
| 3     | Interesting       |
| 2     | Less Interesting  |
| 1     | Not Interesting   |

The total scoring score in data analysis can be searched by the following formula:

$$ \bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} $$

With

$$ \bar{x} = \frac{\text{Total Score}}{\text{Optimal Score}} \times 4 $$

$\bar{x}$= the average assessment results from the validators
$\bar{x}$= The Average Score of assessment result of the validator
s = numbers of the validator

In converting feasibility scores and product attractiveness, the following guidelines are used:

**Conversion of Product Feasibility Score**

| Quality Score | Criteria of Feasibility | Description                        |
|---------------|-------------------------|------------------------------------|
| 3,26 < $\bar{x}$ ≤ 4,00 | Feasible                     | No revision                        |
| 2,51 < $\bar{x}$ ≤ 3,26 | Quite Feasible             | Some revision                      |
| 1,76 < $\bar{x}$ ≤ 2,51 | Less Feasible              | Some revision & material review     |
| 1,00 < $\bar{x}$ ≤ 1,76 | Not Feasible               | Total revision                     |
### Convert product test scores

**Table 4** Criteria for the Attractiveness Test (modified) [42]

| Score       | Criterion         |
|-------------|-------------------|
| $3.26 < \bar{x} \leq 4.00$ | very attractive   |
| $2.51 < \bar{x} \leq 3.26$ | Attractive         |
| $1.76 < \bar{x} \leq 2.51$ | Less Attractive    |
| $1.00 < \bar{x} \leq 1.76$ | Not Attractive     |

3. **Results And Discussions**

The results of the development carried out by this researcher were to produce Islamic-nuanced Calculus Modules with an Open-Ended Approach to Real Numbers System Material. This research and development module uses the 4D model development procedure, namely with four stages, including:

1. **Defining Process**
   1.1 First step analysis
   1.2 The process began with data collection using questionnaires at Raden Intan State Islamic University Lampung, Teknokrat University and Lampung University. The questionnaires were distributed to 40 students who were or had obtained calculus courses. Based on the results of the preliminary study questionnaire conducted by the researcher, it was found that the teaching materials used in the form of printed books use language that is too high, the material presented is difficult to understand and there is still a lack of teaching materials such as modules and interesting worksheets to facilitate students in learning.
   1.3 Student analysis
   This student analysis was used to find out the student's needs for the product being developed. Based on the results of questionnaires related to student needs analysis, responses were obtained by students who wanted teaching materials with easy-to-understand language accompanied by steps in solving questions, had many examples and practice questions, interesting designs with not too large books, contained key answers to exercises question.
   1.4 Task analysis
   Task analysis was done by identifying the main parts to be taught and systematically compiling relevant topics. The material presented is real numbers, logic, and quantifiers; inequality and absolute value; rectangular coordinate system and equation graph.
   1.5 Conceptual analysis
   1.6 The results of concept analysis for calculus courses are looking for sources, references or books related to calculus on real number system material such as calculus books written by Koko Martono and Nanang Supriadi, the ninth edition of calculus volume 1 by Dale Varberg, Edwin J. Purcell and Steven E. Rigdon, discrete mathematics and its application to computer science by Jong Jek Siang, and mathematics technology, health, and agriculture groups for class X SMK by Dini Afriyanti.
   1.7 Specifications of Learning Objectives
   The learning objectives in the development of this module refer to the college curriculum.

2. **Designing Process**
   2.1 Media
   The media used in the development of this module is print media designed using Microsoft Word 2007, Corel Draw X7 for making covers, and Geogebra in making graphics.
2.2 Format
The format used in the development of this module is the Islamic Nuance Calculus Module with an Open-Ended Approach to Real Number System Material. The open-ended approach in the module lies in the open process, namely, there are problems that have many correct solutions. The steps of this approach include orientation, debriefing material, presentation and execution of questions, presentations, and conclusions. Modules that have Islamic nuances are generated by giving Islamic elements in the module such as giving verses of the Qur'an that relate to the material, displaying modules with borders with Islamic nuances, motivational words, information about Islam and figures of Islamic mathematics.

2.3 Initial Design
The calculus module with Islamic nuances with an open-ended approach to the material of real number systems uses B5 paper size; scale spacing 1.5; fonts Cambria, Arial, Franklin Gothic Heavy, Lucida Handwriting, and Century751 SeBd BT; the font size varies from 9-36 pt, and the verses of al-Qur'an are entered through the available Add-Ins programs.

Development Process
3.1 Expert Validation
The calculus module with Islamic nuances with an open-ended approach to the material of real number systems that have been designed then validated the initial stage by 5 validators, namely 2 material expert validators, 2 Islamic material expert validators, and 1 media expert validator. This validation aims to produce modules that are feasible to use. In this study, validation is carried out up to 2 stages, namely until the module is said to be valid and feasible to use. The results of expert validation are as follows:

| Aspect                  | Stage 1 | Stage 2 |
|-------------------------|---------|---------|
| Kualitas Isi Quality    | 3       | 3.5     |
| Ketepatan Cakupan       | 3.25    | 3.5     |
| Open Ended              | 3.06    | 3.42    |
| Bahasa                  | 2.9     | 3.4     |

**Figure 1** Results of Stage 1 and Stage 2 Material Expert Validations
The results of the validation assessment of material experts in stage 1 experienced an increase in the validation of the expert material in stage 2. The values for the content quality aspects in stage 1 obtained an average score of 3 with the quite feasible criteria and in stage 2 the average quality score of 3, 5 with valid criteria. Aspects of the accuracy of coverage in stage 1 obtained an average score of 3.25 with the quite feasible criteria and in stage 2 an average of 3.5 was obtained with the feasible criteria. The average open-ended aspect score was 3.06 with the quite feasible criteria and in stage 2 the average open-ended score was 3.42 with the quite feasible criteria, while the average score for the assessment of aspects of
language in stage 1 obtained an average of 2.9 with the quite feasible criteria and in stage 2 the average was 3.4 with the valid criteria.

3.1.2 Validation of Islamic Material Experts

![Chart showing validation results](image)

The results of the validation in stage 1 of Islamic religious experts experienced an increase in stage 2. However, the values for the content quality aspects in stage 1 obtained an average score of 3.71 with feasible criteria and in stage 2 the average score was 4 with valid criteria. The average score for aspects of language in stage 1 was 3.75 with the feasible criteria and in stage 2, the average score of language aspects was 4 with feasible criteria, while the average score aspects of the material emphases was 3.25 with the quite feasible criteria and in stage 2 the average score of the aspects of material emphasis was 4 with the feasible criteria.

3.1.3 Media Expert Validation

![Chart showing media validation results](image)

The results of the evaluation of media expert validation stage 1 experienced an increase in the validation of stage 2 media experts. The values for aspects of module size in stage 1 obtained an average score of 3.5 with "valid" criteria and at stage 2 the average module size score was 4 with "valid" criteria. The average score for the design aspect of the module skin in stage 1 is 3.16 with the criteria "quite valid" and in stage 2 the average score of the module skin design aspect is 4 with the criteria "valid", while the average design aspect score of the module is 3.63 with the criteria "valid" and in stage 2 the average score of the design aspect of the module content is 4 with the criteria "valid".

3.2 Product Trial

The limited product trial of module’s attractiveness was conducted by distributing a questionnaire of attractiveness to 10 students of Raden Intan State Islamic University Lampung.
The results of limited trials obtained an average of 3.61 with the very attractive so that the module was not revised. The following is the data from the trial results limited to 10 students.

**Table 5 Limited Test Result Data**

| Aspect          | Criteria | Scoring |
|-----------------|----------|---------|
|                 | 1 2 3 4 5 6 7 8 9 10 |         |
| Content Quality | 1 3 4 4 4 4 3 3 4 4 |         |
|                 | 2 4 4 4 4 4 3 4 4 4 |         |
| Islamic Values  | 3 3 4 4 3 3 4 4 3 3 |         |
|                 | 4 2 3 4 4 4 3 3 4 3 |         |
| Display         | 5 4 4 4 4 4 4 4 4 4 |         |
|                 | 6 3 4 3 3 4 4 4 4 4 |         |
| Language        | 7 4 4 4 4 4 4 4 4 4 |         |
|                 | 8 2 4 4 4 3 4 3 3 3 |         |
|                 | 9 3 4 4 4 3 4 4 4 3 |         |
|                 | 10 4 4 4 3 4 4 4 4 3 |        |
|                | 11 3 3 4 4 4 3 4 4 3 |        |
|                | 12 3 4 4 4 4 3 3 3 4 |        |
| $\sum \text{skor}$ | 38 46 47 46 44 43 44 45 38 42 |         |
| $\bar{x}_i$ | 3,2 3,8 3,9 3,8 3,7 3,6 3,7 3,7 3,2 3,5 |         |
| $\bar{x}$ | 3,61 |         |

**3. Dissemination Process**

The final stage in this research and development module is dissemination. The Islamic-Nuanced Calculus Module with Open-Ended Approach in Real Number System Material that has been feasible will be disseminated through the website at http://pspm.tarbiyah.radenintan.ac.id.

Based on previous research by [6], it was shown that the module had fulfilled practical criteria, which could be used and implemented in the learning process. Elementary mathematics is appropriate to be used in lectures for PGSD students, this is viewed from the material component, realistic mathematical learning with Islamic nuances and from the media aspect that gets an assessment from experts with good criteria, and research by [43] developed learning outcomes has fulfilled the validity criteria, practicality, and effectiveness.

**4. Conclusion**

Based on the results of the exposure that have been stated, the Islamic-Nuanced Calculus Module with Open-Ended Approach in Real Number System Material is declared valid and feasible to be used as teaching material in the learning process. The feasibility of the product obtained an average of 3.61 from limited trials with the very attractive criteria.

Based on the results of the research and several findings in the field, the authors suggest the following (1) Islamic-Nuanced Calculus Module with Open-Ended Approach in Real Number System Material is hoped to be developed with wider methods. (2) This calculus module was tested with a limited test of 10 students of Raden Intan State Islamic University Lampung so that the development of the next module could be developed using a wider trial. (3) the product still has many shortcomings in its development so that the development of the next module can be developed with a better open-ended approach, in order to motivate and increase students' interest to be actively participating in mathematics.
References

[1] N. Rhosyida & J. Jailani 2014 Pengembangan Modul Matematika SMK Bidang Seni, Kerajinan, dan Pariwisata Berbasis Open-Ended Problem sebagai Implementasi KTSP J. Ris. Pendidik. Mat. 1 35–47

[2] R. D. M, D. Yulianti, & S. Sutiarso, “Pengembangan Bahan Ajar Modul Matematika Kelas XI IPA SMA di Bandar Lampung J. Teknol. Inf. Komun. Pendidik.1 7 1–14

[3] N. Farida & N. Suryadinata Pengembangan Bahan Ajar Mata Kuliah Aljabar Linear Berbasis Open Ended Aksioma J. Progr. Stud. Pendidik. Mat. 5 2 145–151

[4] Melisa 2015 Pengembangan Modul Berbasis Penemuan Terbimbing Yang Valid Pada Perkuliahan Kalkulus Peubah Banyak I Lembar. 1 2 21–27

[5] D. Y. Fitri, T. Septia, & A. Yunita 2013 Pengembangan Modul Kalkulus 2 Pada Program Studi Pendidikan Matematika di STKIP PGRI Sumatera Barat E-Journal Pelangi. 6 11–15

[6] Sulaiman, R. Trisoni, & I. M. Maris 2014 Pengembangan Modul Lingkaran Berbasis Pendekatan Open-Ended Di Kelas VIII SMPN 1 Baso Edusainstikta. 1 1

[7] Y. Harisman, A. Sovia, Rahima, & Husna Revisi Pengembangan Modul Berbasis Masalah Pada Perkuliahan Kalkulus 1 di STKIP PGRI Sumatera Barat Pros. Semin. Nas. Sains dan Pendidik. Sains IX, Fak. Sains dan Mat. UKSW. 5 1 855–863

[8] A. A. P. Rosyadi 2016 Pengembangan Modul Berbasis Riset Pada Mata Kuliah Kalkulus Untuk Meningkatkan Kreativitas Mahasiswa Math Didact. 4 2 128–135

[9] F. K. Sari, F. Farida, & M. Syazali 2016 Pengembangan Media Pembelajaran (Modul) berbantuan Geogebra Pokok Bahasan Turunan Al-Jabar J. Pendidik. Mat. 7 2 135–151

[10] B. S. Anggoro Meningkatkan Kemampuan Berpikir Kreatif Matematis Siswa,” Al-Jabar J. Pendidik. Mat. 6 2 121–130

[11] H. D. Putra, T. Herman, & U. Sumarmo 2017 Development of Student Worksheets to Improve the Ability of Mathematical Problem Posing Int. J. Emerg. Math. Educ. 1 1 1

[12] Zulyadaini 2017 A Development of Students’ Worksheet Based on Contextual Teaching and Learning Int. J. Learn. Teach. Res. 16 6

[13] Mawardi, Repdayanti, & B. Oktavia 2018 The Development of Student Worksheets based on Guided Inquiry by Class and Laboratory Activity for Reaction Rate Material at the 11th Grade in High School Int. J. Progress. Sci. Technol. 8 2 286–294.

[14] N. Angraini & R. Masykur 2018 Modul Matematika Berdasarkan Model Pembelajaran Problem Based Learning Materi Pokok Trigonometri Desimal 1 2 217–228

[15] I. R. Ula & A. Fadila 2018 Pengembangan E-Modul Berbasis Learning Content Development System Pokok Bahasan Pola Bilangan SMP Desimal. 1 2 201–207

[16] Y. Yuniarti, Y. S. Kusumah, D. Suryadi, & G. Bana 2017 The Effectiveness of Open-Ended Problems Based Analytic-Synthetic Learning on the Mathematical Creative Thinking Ability of Pre-Service Elementary School Teachers Int. Electron. J. Math. Educ. (IEJME) Math Didact. 12 7 655–666

[17] Risnawati, W. Mardiana, & R. Rahmawati 2015 Pengembangan Bahan Ajar Dimensi Tiga Menggunakan Pendekatan Open-Ended di Kelas VIII MTs Suska J. Math. Educ. 1 1 45–53

[18] W. B. Sanchez, 2013 Open-ended Questions and the Process Standards Math. Teach. 107 3 206–211

[19] E. Suherman, D. Suryadi, T. Herman, S. Prabawanto, & A. Rohayati 2001 Strategi Pembelajaran Matematika Kontemporer, Revisi (Bandung: JICA)

[20] F. Firdaus, A. R. As’ ari, & A. Qohar 2016 Meningkatkan Kemampuan Berpikir Kreatif Matematis Siswa SMA melalui Pembelajaran Open Ended pada Materi Spldv J. Pendidik. Teor. Penelitian, dan Pengemb. 1 2 227–236

[21] E. K. Gordah & S. Fadillah 2014 Pengaruh Penggunaan Bahan Ajar Kalkulus Diferensial Berbasis Pendekatan Open End ed terhadap Kemampuan Representasi Matematis Mahasiswa J. Pendidik. dan Kebud. 20 3, pp. 340–352, 2014.
[22] A. Ariani & D. B. Widjajanti 2013 Pengembangan Perangkat Pembelajaran Geometri SMP dengan Pendekatan Open-Ended Berorientasi Kemampuan Berpikir Kritis,” PYTHAGORAS J. Pendidik. Mat. 8 1 21–32
[23] N. Anwar, R. Johar, & D. Juandi 2015 Pengembangan Perangkat Pembelajaran Berbasis Pendekatan Open-Ended untuk Meningkatkan Kemampuan Berpikir Kreatif Matematis Siswa SMP J. Didaktik. Mat. 2 1
[24] A. D. Ismail, A. F. Jamil, & O. R. U. Putri 2017 Pengembangan Modul Trigonometri Bercirikan Open-Ended Problem AdMathEdu J. Ilm. Pendidik. Mat. Ilmu Mat. dan Mat. Terap. 7 1 1–8
[25] I. Noviliya, T. B. S & D. Trapsilasiwi 2013 Pengembangan Perangkat Pembelajaran Matematika Metode Genius Learning Dengan Pendekatan Open Ended Pokok Bahasan Sistem Persamaan Linier Dua Variabel Di Sekolah Menengah Pertama (SMP) Kelas VIII Semester Gasal Kadikma. 4 2
[26] A. P. Wijaya 2017 Pengembangan Modul Dengan Pendekatan Open Ended Untuk Memfasilitasi Pencapaian Literasi Matematis Aksioma. 6 2
[27] I. Nurdiansyah, G. Muhsetyo, & A. Qohar 2018 Pengembangan Lembar Kegiatan Siswa Berbantuan Tangram Bercirikan Open-Ended pada Pokok Bahasan Segiempat dan Segitiga Kelas VII SMP J. Pendidik. Teor. Penelitian, dan Pengemb. 3 1
[28] Marzuki, A. Kurim, & R. Marisa 2014 Pengembangan Bahan Ajar Berbasis Open-Ended Problem Dengan Pendekatan Realistik Pada Topik- Topik Esensial Matematika Sekolah Dasar Untuk Meningkatkan Pemahaman Konsep Dan Kemampuan Berpikir Kritis Mahasiswa Calon Guru SD Lentera 14 1
[29] Arianti & Hardiyanto 2018 Pengembangan Perangkat Pembelajaran Mandiri Berbasis Soal Terbuka Dalam Pembelajaran Kalkulus Pada Prodi Pendidikan Matematika Universitas Negeri Makassar J. Mat. dan Pembelajaran 6 1 35–47
[30] A. Hamid & H. M. T. Madeali 2014 Penerapan Paket Buatan Untuk Mengatasi Kesulitan Mahasiswa Menentukan Selesaian Pertidaksamaan Nilai Mutlak Dalam Matakuliah Kalkulus I Aksioma. 3 1
[31] Supandi, W. Kusumaningsih, L. Ariyanto, E. Nurlaelah, & Turmudi 2013 Pembelajaran Kalkulus Berbasis E-Learning Untuk Menumbuhkan Kreativitas dan Karakter Mahasiswa Keano. 4 2 126–130
[32] A. Suwito 2014 Perkuliahan Mata Kuliah Kalkulus I Melalui Self Regulated Learning Dengan Mengembangkan Lembar Kegiatan Mahasiswa (LKM) Berbasis Masalah Program Studi Pendidikan Matematika Universitas Jember JIPM. 2 2
[33] Kartini & Titi Solfiriti 2015 Penerapan Pembelajaran Inkuiri Model Albertantuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Mahasiswa Pada Mata Kuliah Kalkulus 1Proceeding 7th Int. Semin. Reg. Educ. 2
[34] U. Indrajaya 2014 Upaya Meningkatkan Pemahaman Kalkulus Melalui Pembelajaran Berbantuan Maple pada Mahasiswa Teknik Informatika AMIK Garut J. Wawasan Ilm. 5 10. 38–52
[35] D. Apriandi & E. M. Sulistyaningrum 2015 Pemanfaatan Software Maple Untuk Meningkatkan Kemampuan Kalkulus Mahasiswa J. Penelit. LPPM. 3 1
[36] K. R. Puspadewi and I. M. D. Atmaja 2015 Pemanfaatan Program Aplikasi Maple Sebagai Upaya Meningkatkan Motivasi Dan Prestasi Belajar Kalkulus I Mahasiswa Program Studi Pendidikan Matematika Universitas Mahasaraswati Denpasar Tahun Ajaran 2014/2015 J. Bakti Sar. 4 1 40–48
[37] E. Wulantina 2018 Pengembangan Bahan Ajar Matematika Yang Terintegrasi Nilai-Nilai Keislaman Pada Materi Garis Dan Sudut Pros. Semin. Nas. Mat. dan Pendidik. Mat. 1 2
[38] I. N. Isandespha 2015 Pengembangan Bahan Ajar Materi Pembelajaran Bernuansa Islam untuk Mahasiswa Pendidikan Guru Sekolah Dasar Elem. Sch. 2. 2 1
[39] N. T. U. Irha 2018 Pengembangan Modul Pembelajaran Fisika Bernuansa Pendidikan Islam Di Sma Islam Al Azhar 12 Makassar J. Teknol. Pene. Madrasah. 1 1 74–95
[40] 1974 Instructional Development for Training Teacher of Exceptional Children (A Sourcebook.
Bloomington: Indiana University)
[41] 2013 *Skala Pengukuran Variabel-Variabel Penelitian* (Bandung: Alfabeta)
[42] N. W. P. Nurwani, Rizki Wahyu Yunian Putra, & Fredi Ganda Putra 2017 Pengembangan Desain Didaktis Bahan Ajar Materi Pemfaktoran Bentuk Aljabar pada Pembelajaran Matematika SMP Numerical. J. EST 2 193–206
[43] Hardiyanto 2016 Pengembangan Perangkat Pembelajaran Mandiri Berbasis Soal Terbuka Dalam Pembelajaran Kalkulus Prodi Pendidikan Matematika J. EST 2 3