JP2M (Jurnal Pendidikan dan Pembelajaran Matematika)
9 (1), 2023, 12-19

http://jurnal.stkippgritulungagung.ac.id/index.php/jp2m

DEVELOPMENT OF NUMERACY LITERACY MODULE ON MEASUREMENT MATERIAL IN ISLAMIC ELEMENTARY SCHOOL

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Diserahkan: 24-10-2022; Direvisi: 16-01-2023; Diterima: 26-02-2023

Abstrak: Penelitian ini bertujuan untuk mengembangkan desain dan menguji kelayakan modul literasi numerasi, serta melihat respon peserta didik. Modul merupakan hal yang penting dalam proses pembelajaran akan tetapi guru masih menyampaikan konsep secara lisan, buku bacaan yang terbatas, sumber belajar yang kurang memadai sehingga kemampuan literasi numerasi siswa rendah. Penelitian ini melibatkan 29 peserta didik kelas III PKBM Quins Tulungagung untuk uji coba. Jenis penelitian dan pengembangan pada penelitian ini adalah menggunakan *Research and Development* (R&D) dengan model ADDIE (*Analyze, Design¸ Develop, Implement, and Evaluate*). Instrumen dalam penelitian ini adalah wawancara, observasi, dokumentasi, angket penilaian ahli materi dan ahli bahan ajar, serta angket respon peserta didik. Hasil penelitian menunjukan bahwa (1) hasil validasi menunjukkan bahwa modul pembelajaran layak digunakan dalam proses pembelajaran dengan rata-rata skor 3,7 dan 3,8. (2) hasil uji coba lapangan awal menunjukkan bahwa modul pembelajaran layak digunakan dalam proses pembelajaran dengan rata-rata skor 1,97 sedangkan hasil uji coba lapangan operasional menunjukkan bahwa modul pembelajaran layak digunakan dalam proses pembelajaran dengan rata-rata skor 1,92. Untuk itu, kepada peneliti selanjutnya dapat mengambangkan modul literasi numerasi konsep materi yang lain serta melakukan uji coba yang lebih luas.

***Kata Kunci**: Modul, Literasi Numerasi, Pengukuran*

Abstract: *This study aims to develop a design and test the feasibility of numeracy literacy modules, as well as see the response of students. Modules are important in the learning process but teachers still convey concepts orally, limited reading books, inadequate learning resources so that students' numeracy literacy skills are low. This research involved 29 students of class III PKBM Quins Tulungagung for the trial. The type of research and development in this study is using Research and Development (R&D) with the ADDIE model (Analyze, Design¸ Develop, Implement, and Evaluate). The instruments in this study were interviews, observations, documentation, questionnaires assessed by material experts and teaching material experts, and student response questionnaires. The results showed that (1) the validation results showed that the learning module was feasible to use in the learning process with an average score of 3.7 and 3.8. (2) the results of the initial field trial showed that the learning module was feasible to use in the learning process with an average score of 1.97 while the results of the operational field trial showed that the learning module was feasible to use in the learning process with an average score of 1.92. For this reason, future researchers can develop numeracy literacy modules for other material concepts and conduct wider trials.*

***Keywords :** Modul, Numeracy Literacy, Measurement*

https://doi.org/10.29100/jp2m.v9i1.3551

Kutipan: Nafi'an, Muhammad Ilman., (2023). Development of Numeracy Literacy Module on Measurement Material in Islamic Elementary School. *JP2M (Jurnal Pendidikan dan Pembelajaran Matematika), Vol.9 No.1,* (12-19). https://doi.org/10.29100/jp2m.v9i1.3551

INTRODUCTION

Modules are teaching materials whose specific contents are prepared to achieve learning objectives (Meyer; 1978), systematically designed, referring to a specific curriculum and packaged in the form of the smallest learning units and allow independent study in a certain unit of time so that students master the competencies taught (Daryanto, 2013). Meanwhile, Winkel (2009) explains that the module is the smallest teaching and learning program unit, which is studied by students themselves individually or taught by students to themselves (self-instructional). Indriyanti (2010) states that the way of organizing subject matter that pays attention to the educational function is with modules, because in it there is a strategy of organizing learning materials containing squencing which refers to making the order of presentation of subject matter, and synthesizing which refers to efforts to show learners the relationship between facts, concepts, procedures and principles contained in learning materials.

Based on observations at PKBM Quins Tulungagung, the involvement of students in the learning process is still lacking, in learning the teacher still conveys concepts orally, limited reading books, inadequate learning resources so that the independence of students in exploring the material is still minimal, besides that the numerical literacy skills of students are still low due to the lack of reading available. If students are only given teaching materials and conventional methods in learning, it will reduce the ability to think logically, creatively and systematically. So that they do not explore their potential (Sonia; 2022). Therefore, it is necessary to have a numeracy literacy module so that students' numeracy literacy skills increase, because based on the results of the Program for International Student Assessment (PISA) in the field of Mathematics in 2012, Indonesian students ranked 64th out of 65 sample countries. This means that the ability of Indonesian students to solve numeracy literacy problems is still very low, even though on the other hand numeracy literacy skills are very important for students to have, with literacy students have the power to use mathematical thinking for solving everyday life problems (Purwasih, 2018) to be better prepared to navigate the challenges of life (Stecey & Tuner; 2007).

Some research on the development of learning modules, among others, Sirate (2017) has developed a literacy-based learning module with validity results of 3.73 and shows practical criteria, with a percentage of implementation of 94% based on implementation criteria in the very good category, the average student response of 3.37 which is categorized as good. The effectiveness of the learning module is based on the results of the math literacy posttest showing the percentage of completeness reaching 76.19% which is in the good category.

Putri & Anggraeni's (2021) on the development of literacy modules in science subjects with the ADDIE module development model has entered the criteria very feasible or very practical in improving science literacy in students with a percentage between 75%-100%. Then Sonia (2022), has developed a numeracy literacy module for elementary schools with 4D development, From the results of this study, it can be concluded that the numeracy literacy-based mathematics learning module is valid and very practical to use in learning mathematics, so it can be used as one of the teaching materials in learning in grade VI SD. In the study, the overall validity average was 87.64% with valid criteria, while for the average practicality by teachers and students, the overall average was 94.31% with very practical criteria.

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

Based on the results of these studies, the development of numeracy literacy modules still needs to be developed more deeply, because there is still little research on the development of numeracy literacy modules, especially measurement materials. So this research aims to develop numeracy literacy modules and these findings will be important for scientific contributions to the field of madrasah Ibtidaiyah.

METHODS

This type of research and development on numeracy literacy learning module uses Research and Development (R&D). The model used to conduct this research is the ADDIE model (Analyze, Design, Develop, Implement, and Evaluate) Branch, (2009). The development procedures in this study are (1) Analyze, namely needs analysis, curriculum analysis, analysis of learner characteristics, (2) Design, namely determining the type of module with learning content, compiling a draft of module development and making a basic outline of the module to be adjusted to the characteristics of students, (3) Develop, namely structuring modules and materials, (3) Develop, namely structuring modules and materials, making modules, making material expert validation instruments and learner responses, and carrying out validation (4) Implement, namely the implementation of implementation is carried out by preparing lesson plans (RPP), preparing a learning environment by involving students, implementation (5) Evaluate, namely assessing the instructional quality of products and processes, before and after implementation.

The trials carried out were the main field trial (small group) involving 14 students and the operational field trial (large group) involving all students totaling 29 students. While the types of data obtained in the development of this module are qualitative data in the form of interviews, observations, documentation and comments and suggestions for improving learning modules from material experts and module experts, and quantitative data in the form of assessment scores from material experts, teaching material experts and student response questionnaires. Quantitative data is obtained from the results of calculating the average score of each aspect of the assessment both from material experts, teaching materials experts and student response questionnaires. From these results it will be known whether the learning module that has been developed is feasible or not.

According to Sudijono (2006), the results of the assessment of the validation and questionnaire responses of students will be averaged and calculated by the following formula:

$$\text{Mean Procentase} = \frac{\text{Skor yang didapat}}{\text{Jumlah instrumen}}.$$

In distributing questionnaires, it is necessary to determine an assessment scale that needs to be interpreted qualitatively, namely, very feasible, feasible, inappropriate, and very inappropriate. According to Sugiyono (2016), the Likert scale used in making variables can use four levels. In addition, interpretation in quantitative form with scoring from 1-4 for the feasibility category of the analysis results from module experts and material experts, while interpretation in quantitative form with scoring from 1-2 for the feasibility category of student responses. From the percentage obtained,

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

the feasibility of the learning module can be determined by calculating the average score and looking at the learning module feasibility criteria (Widiyoko, 2012).

Table 1. Score Range For Material and Module Experts

Score	Score Range	Categori	Convert
4	$3{,}25 \leq \bar{x} \leq 4{,}00$	Very good	Eligible
3	$2{,}5 \leq \bar{x} < 3{,}25$	Good	
2	$1{,}75 \leq \bar{x} < 2{,}5$	Not good	Not feasible
1	$1 \leq \bar{x} < 1{,}75$	Very unfavorable	

Table 2. Score Range for Learners Response

Score	Score Range	Categori	Convert
2	$1 < \bar{x} \leq 2$	Agree	Eligible
1	$0 < \bar{x} \leq 1$	Disagree	Not feasible

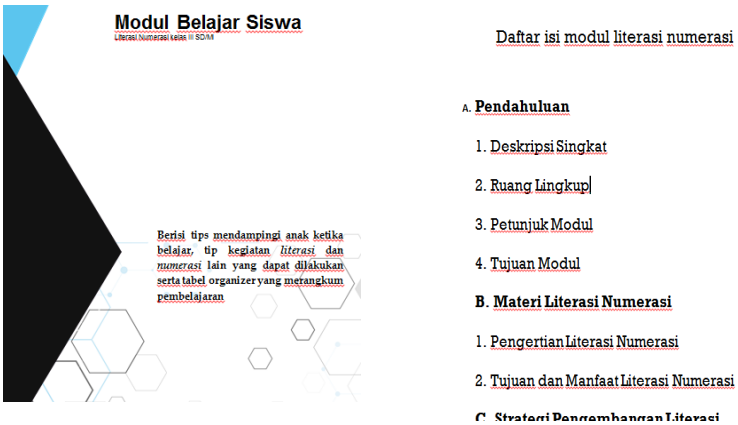

Figure 1.1 Cover design of numeracy literacy module

RESULTS AND DISCUSSION

The development of numeracy literacy modules at PKBM Quins Tulungagung is carried out in accordance with the stages of the ADDIE model (Analyze, Design, Develop, Implement, Evaluate). The results of this research and development are in the form of numeracy literacy modules, The results of the module development products that have been developed by researchers are presented in the following figure.

The steps taken by researchers in developing numeracy literacy titles includes several stages as follows:

1. Analyze

The researcher analyzed the needs analysis, curriculum analysis, learner analysis). An interview is the collection of information by asking a number of questions orally to be answered orally (Margono, 2005). Based on interviews conducted on October 14, 2021 to the homeroom teacher II-D, that learning modules are also needed by educators who can be adjusted to the

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

material being taught. Constraints such as time, methods, limitations make educators less innovative in developing learning modules. Researchers focus more on measurement material. The curriculum used at PKBM Quins Tulungagung is the 2013 curriculum. The character of students who are happy with new experiences in learning makes educators required to have fun learning for students.

2. Design

Researchers can conduct documentation studies for the design stage. Documentation study or often called documentation is a data collection technique by collecting and analyzing documents related to research purposes, both in the form of written documents, images and electronics (Sukmadinata, 2005). Researchers design module designs that have been associated with measurement material. Researchers also drafted the necessary modules, minimized the obstacles that might occur, made a storyboard or basic framework of the numeracy literacy module. This design includes an introduction, target competencies, Islamic integration and learning activities, following the numeracy literacy module design.

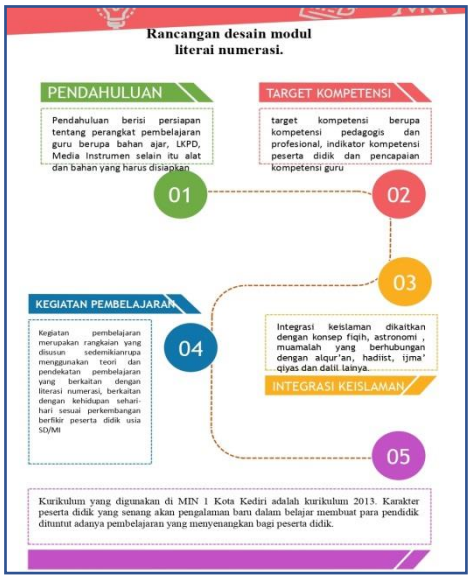

Figure 1.2 Draft design of numeracy literacy module

3. Develop

Develop or product development, can be done by producing numeracy literacy modules and validating the modules. Researchers made arrangements in the numeracy literacy module both in terms of design and material and made instructions for using the module. After the module was developed, researchers made validation instruments to be validated by module experts (1 lecturer and 1 teacher), material experts (1 lecturer and 1 teacher), and made a student response questionnaire.

4. Implement

Implementation is done by preparing the learning environment by involving learners. Before carrying out implementation activities with this numeracy literacy module, researchers can condition students and prepare lesson plans so that they can follow the learning well. Implementation was carried out at PKBM Quins Tulungagung with 29 grade III students. The

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

trial phase was carried out in the form of a small group involving 14 students and a large group trial with 29 students. This stage is carried out to determine whether or not the numeracy literacy module is feasible in the development of measurement material modules.

5. ***Evaluate***

The last stage is evaluation by assessing the instructional quality of products and processes, before and after implementation. Researchers reviewed some input and suggestions from experts and the results of learner responses. The results of the validation and pilot test stated that the numeracy literacy module was feasible to use in the learning process.

The assessment of the module expert validator, material expert, learner response questionnaire is as follows:

Table 3. Validation Results from Module Experts

No	Module Expert	Criteria	Mean
1.	Teaching material expert 1	Eligible	3,7
2.	Teaching material expert 2	Eligible	3,8

The assessment of the module experts related to the display aspects of the module development is intended to determine whether or not revisions are needed with these assessment guidelines. Teaching material expert 1 who is in charge of assessing the research and development of this learning module is a mathematics education lecturer with the criteria of having developed national level modules and teaching MI mathematics learning courses. The results of the overall assessment of the teaching material expert validator 1 with a total score of 134 in the feasibility category stated very well with the score results from the score range $3.25 \leq \leq 4.00$. From the conversion results, it can be stated that the numeracy literacy module from the overall assessment of the content aspects and learning aspects is "feasible" with an average score of 3.7. Teaching material expert validator 2 in charge of assessing the development of this learning module is the third grade teacher at PKBM Quins. The results of the overall assessment of the module expert validator 2 with a total score of 134 in the feasibility category stated very well with the score results from the score range $3.25 \leq \leq 4.00$. From the conversion results it can be stated that the numeracy literacy module from the overall assessment of the content aspects and learning aspects is "Feasible" with a total score of 3.8, in this case in accordance with the results of the feasibility of the numeracy literacy module proposed by Sonia (2022) that the feasibility of the literacy module is feasible to use for learning in elementary schools.

Table 4. Validation Results from Material Experts

No	Material Expert	Criteria	Mean
1.	Material Expert 1	Eligible	3,6
2.	Material Expert 2	Eligible	3,5

The assessment of material experts related to the content and learning aspects of the numeracy literacy module development is intended to determine whether or not revisions are needed with these assessment guidelines. Material expert validator 1 in charge of assessing the research and development of this learning module is a Madrasah Ibtidaiyah Teacher Education lecturer who has developed national level modules and teaches elementary mathematics courses. The results of the overall assessment of the material expert validator 1 with a total score of 37 in the feasibility category stated very well with the score results from the score range $3.25 \leq \leq 4.00$. From the conversion results, it can be stated that the numeracy literacy module from the overall assessment of the content aspects and learning aspects is "feasible" with a total score of 3.7. Material expert validator 2 in charge of

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

assessing the research and development of this learning module is one of the class teachers at PKBM Quins. The results of the overall assessment of the material expert validator 2 with a total score of 35 in the feasibility category stated very well with the results of the score from the score range 3.25 ≤ ≤ 4.00. From the conversion results it can be stated that the numeracy literacy module from the overall assessment of the content aspects and learning aspects is "feasible" with an average score of 3.5.

In this case, it is in accordance with the results of the feasibility of the numeracy literacy module proposed by Sirate (2017), that the feasibility of literacy-based modules from the material expert assessment is feasible to use in learning.

Table 5. Learner Response Results

No	Field Trial	Criteria	Mean
1.	Initial Trial	Eligible	1,96
2.	Operational Trial	Eligible	1,93

The results of the overall assessment of learner responses in the initial field trial in small groups with a total score of 276 and in the feasibility category stated that they agreed with the score results from the score range 1 < ≤ 2. From the conversion results it can be stated that the numeracy literacy module from the overall assessment of content aspects, appearance aspects and learning aspects is feasible with an average score of 1.97. The results of the overall assessment of learner responses in the operational trial in large groups with a total score of 562 and in the feasibility category stated that they agreed with the score results from the score range 1 < ≤ 2. From the conversion results it can be stated that the numeracy literacy module from the overall assessment of content aspects, appearance aspects and learning aspects is "feasible" with an average score of 1.93. In this case, it is in accordance with the opinion of Putri & Anggraeni (2021) which states that literacy-based modules are feasible to use in learning and produce good responses from students.

CONCLUSION

The results of the development of numeracy literacy modules on measurement material at PKBM Quins Tulungagung have been produced and are feasible to use with the process of research and development (R&D) stages using the ADDIE model (Analyze, Design¸ Develop, Implement, and Evaluate). The results showed that (1) the validation results of 2 teaching material experts showed that the learning module was feasible to use in the learning process with an average score of 3.7 and 3.8 from the score range of 3.25 ≤ ≤ 4.00, while the validation results of 2 material experts showed that the learning module was feasible to use in the learning process with an average score of 3.6 and 3.5 from the score range of 3.25 ≤ ≤ 4.00. (2) The results of the initial field trial show that the learning module is feasible to use in the learning process with an average score of 1.96 from the score range of 1 < ≤ 2, while the results of the operational field trial show that the learning module is feasible to use in the learning process with an average score of 1.93 from the score range of 1 < ≤ 2. Suggestions for further research to test on a wider subject.

REFERENCES

Branch, R. M. (2009). Instructional Design-The ADDIE Approach. New York:Springer

Daryanto. 2013. Menyusun Modul. Yogyakarta: Gava Modul .

Margono. (2005). *Metodologi Penelitian Pendidikan*. Jakarta: Rineka Cipta.

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)

Meyer, R. (1978). Designing learning modules for inserrice teacher education. Australia: Centre for Advancement of Teaching.

OECD.2013. PISA 2012 Assessment and Analytical Framework: Mathematics,Reading, Science, Problem Solving and Financial Literacy. Paris: OECD Publishing

Putri, D. P., Setiyani., & Anggraeni, R. (2021). Pengembangan bahan ajar modul berbasis literasi sains pada organpernapasan hewan dan manusia.Pedagogi: JurnalPenelitian Pendidikan, 8 (2), hlm. 57-68.DOI:10.25134/pedagogi.v8i1.3771

Purwasih, Ratni. Sari, Novi Rahma. Agustina, Sopia .2018. *Analisis Kemampuan LiterasiMatematik Dan* Mathematical *Habits Of Mind Siswa SMP Pada Materi Bangun RuangSisi Datar. Jurnal Numeracy*. 05 (01): 67 – 76

Rochmad. (2012). Desain Model Pengembangan Perangkat Pembelajaran Matematika. Kreano: Jurnal Matematika Kreatif-Inovatif, 3(1), 59–72.

Siti Fatimah S. Sirate & Risky Ramadhana .(2017). Pengembangan Modul Pembelajaran Berbasis Keterampilan Literasi. Jurnal UIN Alaudin Makasar, Volume VI, Nomor 2, Hlm. 316-335.

Stecey, K & Tuner, R., Assessing Mathematical Literacy: The PISA experience, Australia: Springer, 2015

Sonia, Gita (2022). Pengembangan modul pembelajaran matematika berbasis Literasi numerasipada materi penjumlahan dan Pengurangan pecahan campuran di kelas vi Sd negeri 09 surau gadang,. Jurnal Fakultas Keguruan dan Ilmu Pendidikan, vol 15. No. 1 hal 1-12

Sudijono. (2006). *Pengantar Statistik Pendidikan*. Jakarta: Rajagrafindo Persada.

Sugiyono. (2016). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Sukmadinata. (2005). *Metode Penelitian* Pendidikan. Bandung: Remaja Rosdakarya

Winkel, W. S. (2014). Psikologi pengajaran. Yogyakarta: Sketsa.

ISSN 2460-7800 (*print*) | 2580-3263 (*online*)