Validity Of Numeration Akm Based Module Development To Improve Problem Solving Abilities Of Elementary School Students

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Abstract

The PISA score for Indonesian mathematics in 2018 shows 71% of students are below the minimum competency. This is because the students' ability to solve problems is still low. Students' problem-solving abilities can be improved using numeracy AKM-based modules. How to develop numeracy AKM based modules to improve students' problem-solving skills? This study aims to produce quality numeracy AKM-based modules to improve students' problem-solving abilities. This research is development research by adapting the Plomp development model with four phases, namely the initial investigation phase, the design phase, the realization/construction phase, and the test, evaluation, and revision phases. There were 3 product tests carried out, namely the validity test, the practicality test, and the effectiveness test. However, in this study, the proposed product test only reached the validity test. Based on the results of the validation analysis of numeracy based AKM module development, the assessment scores obtained are as follows: title 4.3, preface 4.4, description of chapter 4.4, appropriateness of content 4.4, presentation of content 4.4, language rules and illustrations 4.5, Exercise 4.4, reference 3.8, other calibrations 4, so that the final score is 4.3. Thus, the numeracy AKM-based module is declared valid, so it is suitable for use by elementary school students in learning.

Keywords: validity, numeration module, problem-solving.

1. Introduction

Education in the 21st-century must be able to ensure that students have the skills to learn and innovate, the skills to use and utilize information technology and media, and be able to work using life skills. These life skills became known as the concept of 21st-century skills (Ministry of Education and Culture's AN coordination, 2020). The US-based Partnership for 21st-Century Skills (P21) identifies the competencies needed in the 21st-century are "The 4Cs: communication, collaboration, critical thinking, and creativity". One of the prerequisites for realizing 21st-century life skills is the literacy ability of students. The National Institute for Literacy explains that literacy is a person's ability to read, write, speak, calculate, and solve problems at the level of expertise required in work, family, and society. World Economic Forum (2015) defines six basic literacy, namely (a) literacy literacy, (b) numeracy literacy, (c) scientific literacy, (d) digital literacy, (e) financial literacy, and (f) cultural literacy and citizenship.

It is important to know that math skills are not inherited, anyone can learn math (Karp & Bay-Williams, 2013). The world in which we live and work has changed, and will continue to change. In particular, the mathematics we need for careers and personal finance today is very different from 25 years or 50 years ago (Karp & Bay-Williams, 2013). The skills needed in the workplace in the 21st century are less numeracy and

more ability to devise solution strategies. The main priorities today are critical thinking skills, communication, collaboration, and creativity, as well as being able to use technology (Karp & Bay-Williams, 2013). The need to understand and be able to use mathematics in everyday life and in the workplace will continue to increase, for example mathematics for life, mathematics as part of culture, mathematics for the workplace, and mathematics for the scientific and technical community (Ferrini-Mundy, 2000). In this changing world, those who understand and can use mathematics will have the opportunity to shape their future. Mathematical competence opens the door to a productive future. All students should have the opportunity and support necessary to study significant mathematics with depth and understanding (Ferrini-Mundy, 2000). Students have the opportunity to use knowledge in various situations and different contexts to identify solutions to a problem using procedural knowledge, namely an understanding of "how" an activity should be carried out and how to carry out a series of activities so that it can achieve certain goals. Procedural knowledge is very useful in solving complex problems (Sujak, 2000). In mathematics problem-solving abilities are very important for every student, because: 1) problem solving is a general goal in learning mathematics, 2) problem solving which includes methods, procedures, and strategies is a core and main process in the mathematics curriculum, 3) solving problem is a basic skill in learning mathematics (Branca, 1980 in (Roza, 2019). Problem solving as a process is an activity that prioritizes procedures and strategic steps taken by students in solving problems until finally they can find answers to the questions (Sumartini 2016). in (Juliana et al., 2017). Problem solving is a person's attempt to use his knowledge, skills, and understanding to find a solution or answer to a problem (Ilyas 2015 in (Juliana et al., 2017). There are 4 steps in problem solving which are summarized in the book Elementary and Middle School Mathematics Teaching Developmentally (2019), yes that: 1) understand the problem, 2) formulate a plan, 3) complete the plan, 4) look back. As for the problem solving strategy, there are 7 steps, although not all of the steps must be used, the 7 steps are: 1) visualize, 2) look for patterns, 3) predict and examine, 4) formulate conjectures and justify claims, 5) make lists, table, or chart, 6) simplify or change the problem, 7) write the equation (Karp & Bay-Williams, 2013).

The facts that occur in learning mathematics in schools are too formal, lack of connection with the meaning between understanding and applying mathematical concepts, and paying less attention to problem solving. In general, the teacher only transfers what is written in the language of the textbook and does not accommodate the students' own abilities (Syaban, 2018). So that the problem solving ability of elementary school students is still low, therefore the government is trying to improve students' problem solving abilities by implementing the 2013 curriculum which implements discovery learning processes, problem based learning, and project based learning (Kurniasih & Sani, 2014). In addition, the government also provides a lot of training and technical guidance to teachers. There is a PLPG program which was later replaced by the PPG program, the conditions for which to be eligible are to have a saijana (S-1) or diploma four (D-IV) academic qualification; Teachers in position or civil servants who get teaching assignments that have been appointed up to end of 2015; Have a Unique Number of Educators and Education Personnel (NUPTK); and Registered on the basic education data of the Ministry of Education and Culture (Permendikbud no. 27 of 2017), all of which aim to improve teacher competence.

In fact, with all the efforts that have been made by the government, Indonesia's PISA scores have shown a decline, as well as teachers' UKG scores, for primary school teachers the average UKG score is only 54.8. The PISA score for Indonesian mathematics in 2018 shows 71% of students are below the minimum competency (Ministry of Education and Culture, World Bank TIMSS Study, Kearney analysis, in(Kemendikbud, 2020). This is because the students' ability to solve problems is still low.

In order to prepare students who have good problem-solving skills and have 21st century skills, the government will conduct a minimum ability assessment (AKM) in 2021 which includes an assessment of reading and numeracy literacy, namely an assessment of the ability to reason using language (literacy). reading) and assessment of the ability to reason using mathematics (numbering). Reading literacy is not just the ability to read literally without knowing the content / meaning of the reading, but the ability to understand reading concepts. Meanwhile, numeracy is not just the ability to count, but the ability to apply the concept of counting in a context, both abstract and real. AKM can produce skill maps on reading literacy and numeracy of students in grades 5, 8, and 11 that can be used to improve the learning process in education units. Therefore, the questions developed for AKM are contextual, take various forms of questions, measure problem-solving competence, and stimulate students to think critically. The AKM assessment refers to the benchmarks contained in the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS). AKM questions will make students generate analytical power based on information, not make students memorize / memorize material(Kemendikbud, 2020).

Students' problem solving abilities can be improved using numeracy AKM-based modules. The module is a book written with the aim that students can learn independently without teacher direction or guidance (Diknas in the book General Guidelines for Selection and Utilization of Teaching Materials (2004), in (Imran, 2014). The module has 4 main functions, namely: 1) as an independent teaching material, 2) as a substitute for the teacher's function, 3) as an evaluation tool, 4) as a reference material (Prastowo, 2012: 107, in (Imran, 2014). Numeration is an ability to apply number concepts and arithmetic skills in everyday life (for example, at home, work, and participation in community life and as citizens) and the ability to interpret quantitative information that is around us. numbers and being able to use mathematical skills practically to meet the demands of life. This ability also refers to the appreciation and understanding of information expressed mathematically, such as graphs, charts, and tables (GLN, 2020). Problem solving prioritizes the processes and strategies used by students in solving problems rather than just the results, so that it will have a positive impact on students' understanding of concepts and creativity.(Saifuddin, 2019)

Modules are learning packages that contain a concept or material (Russell and Johanningsmeier, 1981; Ahmad, Sulaiman, Abdullah, Shamsuddin, 2009). In order to prove whether the modules compiled are in accordance with the purpose of manufacture, a series of test processes are needed for the module. Russell & Johanningsmeier (1981) describe that there are six steps in designing, developing and validating a learning module. The six steps are: (1) The specific aims or objectives of the module; (2) Appropriate competency measurement tools; (3) Subject characteristics; (4) Design and learning methods; (5) Experiment on the subject; and (6) Evaluation of

the learning process. Content validation is part of the fourth stage in designing, developing and validating a learning module according to Russell and Johanningsmeier (1981) (Wulandari, 2018).

In this study, the researcher will develop a numeracy AKM-based module to help students improve their problem-solving skills, so that they are ready to face the national AKM 2021. This research is a development research using the plomp model with 4 phases, namely prelimenary investigation, design, realization / construction. , and test, evaluation and revision, and implementation. How do you develop a numeracy AKM based module to improve students' problem solving skills? In this study, how to develop a numerical AKM-based module will be carried out until the module validity test is only. This study aims to produce a quality AKM numeracy-based module to improve the problem solving abilities of 5th grade elementary school students. It is hoped that this module based on the numeracy AKM can be useful to assist grade 5 elementary school students in preparing themselves independently to face the numeracy AKM. Due to time constraints, the development of numeracy AKM-based modules in this study only reached the module validity test.

2. Research Method

This research is a development research. Development research is an attempt to develop an effective product for school use, and not to test theory (Kay, in Navel 2013, in Fahman Lupojo Abdul, 2016). The research and development method is a research method used to produce products and test the effectiveness of these products (Sugiyono, 2018).

The subjects of this study were 5A grade students of SD Bina Anak Sholeh Tuban for the academic year 2020/2021, totaling 25 people.

The development model used in this research is the Plomp model development research with 4 stages. Some education experts who have or have conducted development research in the field of learning include: Rechey, and Nelson; Greeno, Colins and Resrick (Van den Akker, 1999, in (Fahman Lupojo, Abdul; Rosadi, Asep;Luden Pagiling, 2016). Van den Akker, Nieveen, Berg, Moonen, and Plomp from the University of Twente in the Netherlands; Gustafson, Reevers of the University of Georgia, is an educational expert who put forward theories of development research. The development design varies, one of which may differ from another influenced by the characteristics of the research and the research approach used (Kreano, 2012).

Educational experts view research and development differently from other types of research. Research approaches such as experiments, surveys, and correlational analysis by van den Akker (1999: 2) are classified as traditional research approaches that focus on descriptive knowledge and less emphasis on practicality (Kreano, 2012). In contrast to traditional research, development research emphasizes both practical contribution and scientific contribution. According to Visscher-Voerman, Gustafson, and Plomp (1999: 17) the development research paradigm consists of four paradigms: (1) instrumental paradigm; (2) communicative paradigm; (3) pragmatic paradigm; and (4) artistic paradigm (Fahman Lupojo, Abdul; Rosadi, Asep;Luden Pagiling, 2016).

Plomp (1997: 5) states: "We are characterized by educational design in short as method within which one is working in a systematic way towards the solving of a

make‟ problem." The general model for solving problems in education as proposed by Plomp (1997: 5) is described as follows:

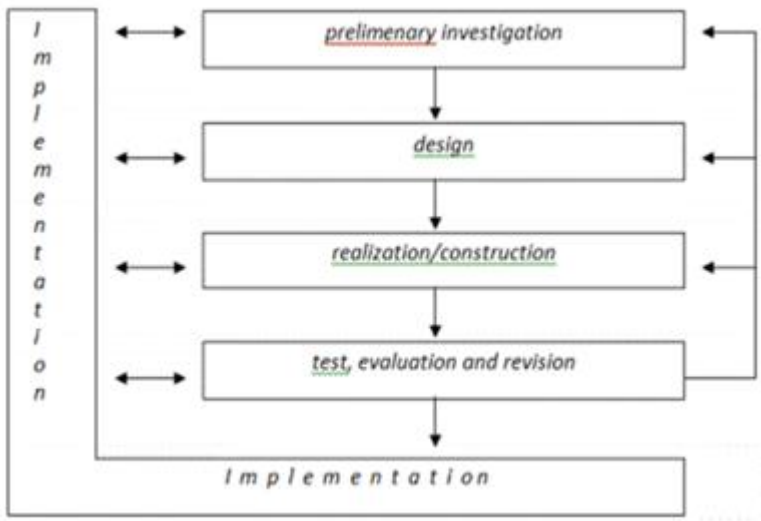

Fig 1. General model for solving educational problems (Plomp, 1999)
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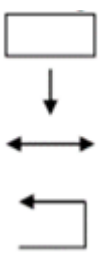


Development activities

Development stage activity flow

The direction of reciprocal activities between the stages of development and implementation of on going learning models

Development activity cycle

2.1 Research phases

The Plomp model above consists of preliminary investigation, design, realization/construction, and test, evaluation and revision, and implementation. A description of the description of the activities contained in each phase is presented as follows:

1. Prelimenary investigation
   One of the important elements in the design process is defining the problem. The term preliminary investigation is also called needs analysis or problem analysis. Plomp and van de Wolde (1992: 8) stated: "in this investigation important elements are the gathering and analysis of information, the definition of the problem and the planning of the possible continuation of the project."

In this study, in the preliminary investigation phase, researchers conducted an analysis of how to develop a numeracy AKM-based module to improve the problem-solving abilities of elementary school students.

2. Design
   In this phase, the solution is designed, starting from the definition of the problem. Activities in this phase aim to design solutions to the problems raised in the initial investigation phase. The result of the design is the blueprint of the solution. Plomp (1997: 6) states: "characteristic activities in this phase are the generation of alternative (part) solutions and comparing and evaluating these alternatives, resulting in the choice of the most promising design or blue print for the solution."
   In this research, in the design phase, the researcher began to design a numeracy AKM-based module starting from the title, preface, chapter descriptions, practice questions, and references.
3. Realization/construction
   Design is a work plan or blueprint to be realized in order to obtain a solution in the realization/construction phase. Plomp (1997: 6) states: "in fact, the design is a written out or worked out plan which forms the departure point for the phase in which the solution is being realized or made. This is often entail construction or production activities such us curriculum development or the production of audio-visual material. "
   In this research, at the realization / construction phase, the researcher printed a module based on AKM numeration.
4. Test, evaluation and revision
   A solution developed must be tested and evaluated in practice. Evaluation is the process of collecting, processing and analyzing information systematically, to obtain the realizable value of the solution. Plomp and van den Wolde (1992: 11) stated: "without evaluation it can not be determined whether a problem has been solved satisfactorily, in other words, wether the desired situation, as described in the definite formulation of the problem, has been reached ." This means that supplementary activities may be required in the previous phases and are called the feedback cycle. The cycle is carried out repeatedly until the desired solution is achieved (Rochmad, 2016).
   In this study, in the test, evaluation and revision phase, the researcher evaluated and revised the numeracy AKM-based module 4 times until the module was made valid, practical, and effective. However, due to time constraints, in this study the modules made were only valid.
5. Implementation
   After evaluating and obtaining valid, practical, and effective products; then the product can be implemented for a wider area. Plomp (1997: 6) states: "Solutions have to be introduced, in other words, have to be implemented." This implementation can be done by conducting further research on the use of product development in a wider area.
   In this research, in the implementation phase, the researcher used numeracy AKM-based modules for the learning of 5th grade students of SD BAS Tuban.

2.2 Quality of Development Results

In development research, the development result can be in the form of a prototype model. To obtain quality development results, an assessment is required. To determine the quality of product development results, three criteria are generally required: validity, practicality, and effectiveness. These three criteria refer to the quality criteria of development research results proposed by Van den Akker (1999) and product quality criteria proposed by Nieveen (1999). According to van den Akker (1999: 11) and Nieveen (1999: 128) in product development research, quality criteria are needed, namely validity, practicality, and effectiveness. Nieveen (1999: 127) states: "we have been referring to quality of educational products from the perspective of developing learning materials. However, we consider the three quality aspects (validity, practically and effectiveness) also to be applicable to a much wider array of educational products. "

Due to time constraints, in this study the module quality test only reached the validity aspect. The following are indicators to determine the validity of the numeric AKM-based module in this study. Validity in a development research includes content validity and construct validity. Van den Akker (1999: 10) states: "validity refers to the extent that design of the intervention is based on state-of-the art knowledge (" content validity ") and that the various components of the intervention are consistently linked to each. other ("construct validity"). "

Validity refers to the level of intervention design based on state-of-the art knowledge and the various components of the intervention related to each other (construct validity) (Kreano, 2012).

According to Nieveen (1999) aspects of validity can be seen from: (1) whether the modules developed are based on state-of-the art knowledge; and (2) whether the various components of the module are consistently related to one another. The practical aspect is seen from the user point of view: (1) whether the experts and practitioners think that what has been developed can be used under normal conditions; and (2) whether the reality shows that what has been developed can be applied by teachers and students.

The developed module is said to be valid if the module is based on adequate theory (content validity) and all module components are consistently related to each other (construct validity) (Kreano, 2012).

The indicators used to state that the learning model developed is valid, the following indicators can be used.

a. Content validity.
   This study conducted a descriptive study of the modules created by testing the content validity of the numeracy AKM-based modules. The content validity test is carried out by involving experts who are competent in the field under study (Arip, Bakar, Ahmad & Jais, 2013) which is referred to as professional judgment (Supractic, 2014) (Wulandari, 2018). In this study, there were 4 professional judgment people to see and provide assessments related to the concepts, principles and techniques given in the module whether they were in accordance with the objectives made. The four experts were selected based on their interests, competencies, experience in the field of reading mentoring and training for adults.
   Due to time constraints, the content of this module is only numerical material.
b. Construct validation.
   Construct validation shows internal consistency between model components (Kreano, 2012). According to Djaali and Pudji (2008) construct validity is the validity that questions how far the test items are able to measure what they really

want to measure in accordance with a specific concept or conceptual definition that has been set (Gede Pernawinadi, 2019).

3. Result and Discussion

Based on the research on the development of the Plomp model, the following research phases were carried out by the researchers in this study:

3.1 Preliminary investigation

The prelimenary investigation phase contained activities to determine the product to be developed and its specifications. This activity is in the form of a needs analysis carried out through research and literature study. The researcher conducted an interview with Ustadzah Dwi Maria Rusli (one of the 5th grade math teacher at SD BAS Tuban) to analyze, including:

a. Student Needs Analysis
b. Curriculum Analysis
c. Material Analysis

Based on these problems, the researchers developed a numeracy AKM-based module for grade 5 students of SD BAS Tuban. The module contains numeracy AKM material related to daily life, examples of quiz questions for students to practice so that students can easily understand the material on numeracy AKM.

3.2 Design

This phase contains activities to make a design for the product that has been determined.

a. Material preparation
   At this stage the researcher collected material for numeracy AKM from mathematics textbooks for grades 4 and 5 and the internet. Researchers also design materials and questions related to students' daily lives.
b. Product design
   Researchers use problems related to students' daily lives as a basis for making the material and the questions in the module so that in addition to students being able to understand the material, students are also able to know the application of mathematics in everyday life. The product design is divided into several parts. Here's the explanation:

1) Cover

On this cover page, there is a picture of a floating market to show the context used in the learning module, the title is Mathematics Module with a Realistic Mathematical approach, Two-Variable Linear Equation System Material. In addition there are sub-chapters of learning and materials, and there is the name of the product maker (researcher). The following cover display is shown in Fig 2 below:

Figure 2. Front View

2) Preface

The foreword page is a form of gratitude for the author in this module and thanks to those who have helped in making this module. Here is the display of Fig 3:

KATA PENGANTAR

Puji syukur penulis ucapkan kepada Allah SWT yang telah memberikan karunia-Nya sehingga penulis dapat menyelesaikan modul berbasis AKM numerasi ini dengan lancar. Modul ini dibuat sebagai produk yang dikembangkan dalam penelitian untuk artikel ICONEST tahun 2021.

Ucapan terima kasih penulis sampaikan kepada Bapak Dr. Wachi, M.Pd selaku dosen pembimbing serta semua pihak yang telah terlibat secara langsung maupun tidak langsung dalam menyelesaikan modul berbasis AKM numerasi ini.

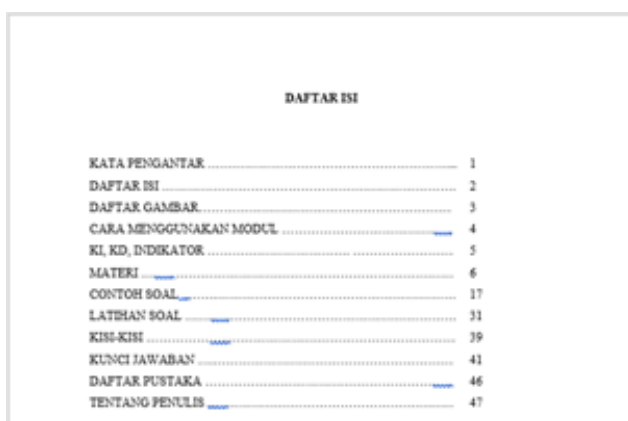
Penulis menyadari bahwa modul ini masih jauh dari sempurna. Oleh karena itu, kritik dan saran yang membangun sangat penulis harapkan demi perbaikan modul ini, semoga menjadi bermanfaat untuk kemajuan di bidang pendidikan dan mendapatkan keberkahan dari Allah SWT.

Penulis

Fig 3 Preface Display

3) Table of Contents

The table of contents contains the Preface, Table of Contents, How to learn modules, KI, KD, Indicators, Materials, Sample questions, Practice Questions, Grids, Answer keys, Bibliography, and About the Author.



DAFTAR ISI

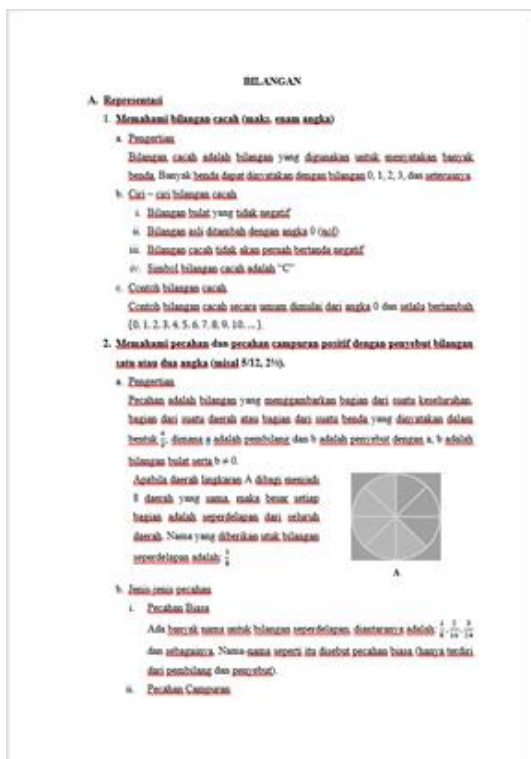
Fig 4 Table of Contents Display

4) KI, KD and Indicator Pages

The KI, KD and Indicator pages contain information about the Competencies to be studied and the indicators to be achieved. So that students know what will be learned in the lesson.

5) Material Page

The Material page contains material on Numbers, understanding whole numbers (max. six digits), understanding fractions and positive mixed fractions with one or two-digit number denominators (eg 5/12, 2⅗), recognizing the number line and knowing the position of whole numbers and fractions on the number line Comparing two whole numbers (max. three numbers), comparing two fractions, including comparing fractions and whole numbers, calculating the sum / subtraction / multiplication / division of two whole numbers (max. six digits), including calculating the square of a whole number (max. three digits), determines the multiple (max. 5) multiples of a whole number n with $n \leqslant 10$. (Equivalent to skip counting), determines the LCM, factor of a whole number, and GCF.



BILANGAN

A. Representasi

1. Memahami bilangan cacah (maks. enam angka)

a. Pengertian

Bilangan cacah adalah bilangan yang digunakan untuk menyatakan banyak benda. Banyak benda dapat dinyatakan dengan bilangan 0, 1, 2, 3, dan seterusnya.

b. Ciri – ciri bilangan cacah

i. Bilangan bulat yang tidak negatif

ii. Bilangan asli ditambah dengan angka 0 (nol)

iii. Bilangan cacah tidak akan pernah bernilai negatif

iv. Symbol bilangan cacah adalah "C"

c. Contoh bilangan cacah

Contoh bilangan cacah secara umum dimulai dari angka 0 dan selalu bertambah (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ...).

2. Memahami pecahan dan pecahan campuran positif dengan penyebut bilangan satu atau dua angka (misal 5/12, 2⅗).

a. Pengertian

Pecahan adalah bilangan yang menggambarkan bagian dari suatu keseluruhan, bagian dari suatu daerah atau bagian dari suatu benda yang dinyatakan dalam bentuk $\frac{a}{b}$, dimana a adalah pembilang dan b adalah penyebut dengan a, b adalah bilangan bulat serta $b \neq 0$.

Apabila daerah lingkaran A dibagi menjadi 8 daerah yang sama, maka besar setiap bagian adalah seperdelapan dari seluruh daerah. Nama yang diberikan untuk bilangan seperdelapan adalah $\frac{1}{8}$.

A

b. Jenis-jenis pecahan

i. Pecahan Biasa

Ada banyak nama untuk bilangan seperdelapan, diantaranya adalah $\frac{1}{8}, \frac{2}{16}, \frac{3}{24}$ dan sebagainya. Nama-nama seperti itu disebut pecahan biasa (hanya terdiri dari pembilang dan penyebut).

ii. Pecahan Campuran

Fig 5 Display material understanding whole numbers

6) Sample Questions page

The question practice page contains examples of problems and solutions related to numeracy AKM questions.

Contoh Soal dan Pembahasan

Domain	Soal 1 – 3. Bilangan
Konteks Stimulus	Soal 1 – 3. Personal
Kompetesi	Soal 1. Membandingkan dua bilangan cacah (maks tiga angka) Soal 2. Mengenal garis bilangan dan menuliskan posisi bilangan cacah pada garis bilangan. Soal 3. Menghitung hasil penjumlahan pengurangan dua bilangan cacah (maks. enam angka)
Level Kognitif	Soal 1. *Knowing* Soal 2. *Reasoning* Soal 3. *Applying*
Bentuk Soal	Soal 1. Pilihan ganda Soal 2. Pilihan ganda kompleks Soal 3. Pilihan ganda kompleks

Bacalah teks berikut untuk menjawab pertanyaan nomor 1 – 3.

Lomba Lari

Di sebuah lintasan lari, terlihat ada lima anak yang sedang melakukan persiapan untuk final lomba lari. Posisi peserta di lintasan tersebut diatur mengikuti urutan nomor punggung yang mereka kenakan dari bilangan terkecil. Nomor punggung kelima peserta tersebut adalah sebagai berikut:

Sumber: Pixabay.com

456	463	472	448	437
Ahmad	Yusuf	Ibrahim	Musa	Adam

Peserta dengan nomor punggung terkecil menempati lintasan nomor 1, begitu seterusnya hingga peserta dengan nomor punggung terbesar menempati lintasan nomor 5. Setelah pertandingan, diperoleh catatan waktu para peserta sebagai berikut:

Fig.6 Tampilan contoh soal

7) Practice Questions page

The question practice page contains examples of problems and solutions related to numeracy AKM questions.

Paket Simulasi Numerasi

Bacalah teks berikut untuk menjawab pertanyaan nomor 1 – 3.

Lomba Renang Gaya Bebas 800 Meter

Renang 800 meter merupakan salah satu nomor lomba renang gaya bebas. Pemenang dalam lomba renang ditentukan berdasarkan atlet tercepat yang menyelesaikan jarak lintasan sesuai nomor yang diikuti.

Dalam sebuah kejuaraan lomba renang gaya bebas 800 meter nasional diikuti oleh 8 peserta.

Sumber: Pixabay.com

Berikut adalah data hasil kejuaraan tersebut:

Atlet	A	B	C	D	E	F	G	H
Waktu (detik)	152	157	153	158	150	155	156	154

Pertanyaan 1. Lomba Renang Gaya Bebas 800 Meter

Berdasarkan informasi pada teks di atas, berilah tanda centang (✓) di kolom **Benar** atau **Salah** pada setiap pernyataan yang sesuai.

Pernyataan	**Benar**	**Salah**
(1) Atlet yang berada di posisi pertama sampai keempat jika disajikan dalam garis bilangan adalah sebagai berikut: Atlet E A C H Posisi ke- 1 2 3 4		
(2) Posisi keenam pada garis bilangan tersebut ditempati oleh atlet F.		

Figure 7 display of practice questions

8) Bibliography

The contents of this module are equipped with a bibliography showing the sources of the material used in this module.

3.3 Realization / construction

This phase contains activities to make designs into products and print them.

Making media

After the material has been collected and the design has been determined, the researcher then makes the product that has been designed into a numeracy AKM-based module.

3.4 Test, evaluation and revision

This phase contains the product validity test repeatedly until the product is produced in accordance with the specified specifications.

Expert Validation, At this stage the researcher determines the expert / validator to test the media, namely media experts and material experts. Expert validation is needed to assess the feasibility of the media. The selected validators are experts who are competent and understand their respective fields. The assessment and suggestions given by the validator will be material for revising the media to make it even better.

The expert validation instrument contains several aspects of the assessment that have a score of 5: Very Valid, Score 4: Valid, Score 3: Fairly valid, Score 2: Less valid, Score 1: Invalid. The results of the device validation analysis are described (Tabel1)

Table 1. Validation analysis result

No	Aspects of the Assessment	Validators				Appropriateness	Criteria
		1	2	3	4		
1.	Title	4.3	4.4	4.3	4.3	4.3	Valid
2.	Foreword	4.4	4.4	4.4	4.4	4.4	Valid
3.	Descriptio of Chapter	4.4	4.4	4.4	4.4	4.4	Valid
4.	Eligibility Content	4.4	4.4	4.4	4.4	4.4	Valid
5.	Presentation of Content	4.4	4.4	4.4	4.4	4.4	Valid
6.	Language Rules and Ilustrations	4.5	4.4	4.5	4.5	4.5	Valid
7.	Exercise	4.4	4.4	4.4	4.4	4.4	Valid
8.	Reference	3.7	3.8	3.8	3.9	3.8	Valid
9.	Other Accessories	3.9	4	4	4	4	Valid
	Final Score	4.3	4.3	4.3	4.3	4.3	Valid

Information: Invalid (1-1,5), less valid (1,6 -2,5), Valid enough (2,6 -3,5), Valid (3,6 – 4,5) Very Valid (4,6 -5,))

The following is a graph of the results of the validation analysis of the numeric AKM-based module:

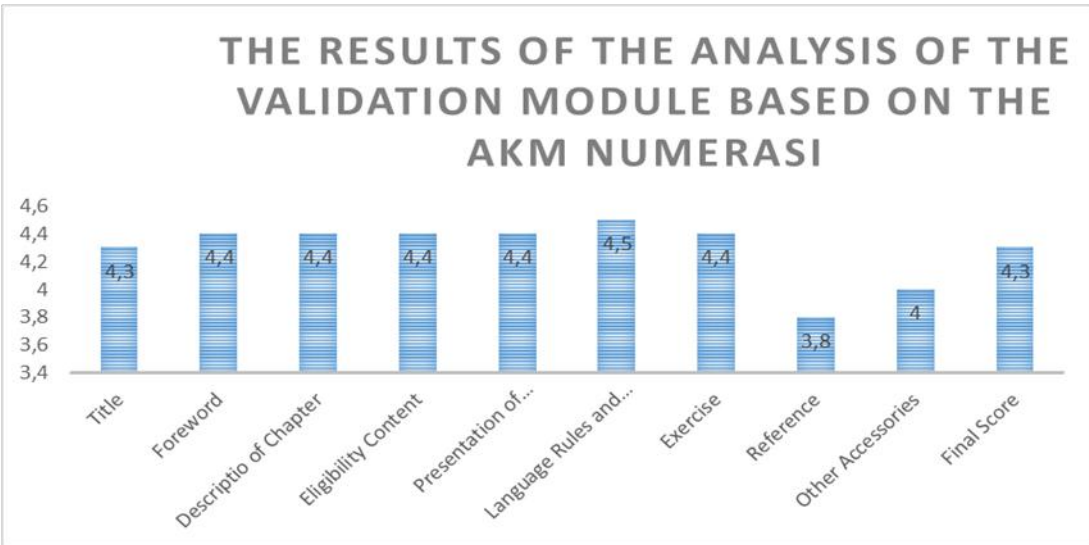


Figure 8. Graph of validation analysis results

Based on the results of the validation analysis of the development of the numeric AKM-based module, the assessment scores obtained are as follows: title 4.3, foreword 4.4, chapter description 4.4, content feasibility 4.4, content presentation 4.4, language rules and illustrations 4.5, Exercise 4.4, reference 3.8, other criteria 4, so that the final score is 4.3. Thus, the numeracy AKM-based module is declared valid, so it is suitable for use by grade 5 elementary school students in learning.

Because in this study only the validity test was carried out, the effectiveness and practicality of the module had not been tested.

3.5 Implementation

It is planned that in this phase the researcher will disseminate tested products for use by others after the product has been tested and declared valid, practical and effective, then the product is distributed to grade 5 mathematics teachers.

4. Conclusion

Based on the research phases above, this numeracy AKM-based module is declared valid, after going through the stages of validity testing by an expert validator. This research is not perfect, suggestions from researchers, this research can be continued by other researchers by improving things that are still lacking and adding material that needs to be added so that the resulting module is more perfect.

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