

Development of the Integer Operations E-Module *I-Spiringsuite* in Junior High Schools in Makassar City, South Sulawesi

Latri Aras^{1*}, Rahmawati Patta², Ramlan Mahmud³

¹ PGSD Makassar State University, Indonesia

Email: latri@unm.ac.id

² PGSD Makassar State University, Indonesia

Email: rahmapatta@umm.ac.id

³ PGSD Makassar State University, Indonesia

Email: ramlan.mm@umm.ac.id

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Abstract: This type of research is *research and development* which aims to describe the development process of the integer arithmetic operations e-module, describe the quality of the e-module based on the level of validity, practicality and effectiveness, and show the specifications of the integer arithmetic operations e-module. The e-module development process refers to the ADDIE model which includes 5 stages, namely *analysis, design, development, implementation*, and *evaluation*. The product trial respondents were students in class VII 2 MTs Makassar City with a total of 20 students. The research results show that the validator's assessment of the e-module and research instruments received an average score of 4.18 with valid criteria. The results of the questionnaire data analysis of teacher responses to the e-module obtained an average score of 1.89 with the criteria being fully implemented and the learning implementation observation sheet showed a score percentage of 91.7% so that the e-module was declared practical. The results of the analysis of student response questionnaire data showed very good criteria with a percentage of 95.6%, student activity sheets obtained a percentage of 91.8% with very positive criteria, and the learning achievement test reached 90%, so that the integer counting operation e-module declared effective. Referring to the analysis results obtained, it can be concluded that the integer calculation operations e-module can be used in learning activities.

Keywords : ispirig, model, e module, integer

INTRODUCTION

Based on observation Which has done in at one of the MTS in Makassar City, is known that the mathematics textbooks used in learning are still in the form of printed books from publishers and the Ministry of Education and Culture, and are still limited for distribution to all students. So you can only use printed books when students are at school. Thus the subject matter can only be written And studied moment O'clock lesson mathematics taking place Which will reduce the time for teachers to explain the material. Of course such conditions This is considered less efficient, especially in face-to-face learning (PTM) conditions. limited where learning time at school is limited. So it's needed solution others for this problem. Alternative Which Can offered is with use *e-module*. Apart from that, *e-modules* can be distributed to all students and can be used at any time just And in where just, *e-module* Also can streamline time Study in school (Gistituati & Atikah, 2022). Students can be asked to study material is in *the e-module* before

going to school, so that during learning in the teacher's class can directly provide verification of explanations and even group projects to student. Inserting worksheets in modules can also be used as one a form of forming student learning independence to solve problems with The method Alone (Suharman et al., 2021).

Module electronic on basically in structure the writing adaptformat, characteristics and parts contained in the print module on generally. Electronic modules can display text, images, animations and videosthrough device electronic form computers (Laili et al., 2019). *E-module* can make activity learning become more interactive Because in in the presentation can inserted form animation, picture, videos, nor audio (Masruroh & Agustina, 2021). In addition to the components mentioned in Above, the interesting thing that adds value to the e-module is its benefits will get used to Teacher nor student For increase literacy the digital as well as can reduce reduce use paper in process the learning .

Because the use of *the iSpring suite* is quite large and capable give interactions special, so *iSpring suites* can made as The main software in making e-modules. E-module that uses *iSpring The suite* will be more interactive because it can be combined with several sources on line, so that e-module can used in a way on line nor offline. On research _ Which done (Concerned, 2022) proven that material teach interactive Which made use *iSpring suites* capable produce quality material teach interactive Which Good so that worthy For used by Teacher And student. For material Which will taken is operation count number round in class 7. The reason Because material This is material beginning And important For must understood by student. Linkages draft number round with material other in mathematics very important because draft number round is draft precondition Which must mastered by every student before understand draft furthermore on material number fraction, algebra, equality linear One variable, inequality linear One variable, arithmetic social, And comparison (W. P Ramadhani, 2022).

METHOD

Type study Which used is study And development (*Research and Development*) . Study This held on semester odd . ADDIE model design, namely *Analysis* , *Design* (Planning), *Development* (Development), *Implementation* (Application), And *Evaluation* (Evaluation). Technique collection data Which used on study This that is using questionnaires, observations, and learning outcomes tests. Questionnaire used in this research in the form of a student response questionnaire and a teacher response questionnaire. The instruments of this research are e-module validation sheets, questionnaire sheets student responses, teacher response questionnaire sheet, implementation observation sheete-module, and learning outcomes tests

RESULTS AND DISCUSSION

Berda suggests study beginning Which done with observe students' learning activities at MTsN Makassar City and the difficulties experienced in mathematics learning activities, including material that is felt to be lacking mastered participant educate. Observation addressed on class VII MTs Makassar City with acquisition that source Study Which used only book package mathematics Which Still print and its distribution limited For all participant educate (1 book package used by 3 participant educate). O'clock lesson mathematics Alsomost were spent taking notes on material rather than listening to explanations Teacher Because book package only Can used moment in school.

Based on the validation data above, an average overall score was obtained from validator 1 it was 4.13 and the overall score from validator 2 was 4.5. So the average score obtained from the two validators is 4.33 of the score maximum 5. Meanwhile, from the validation results above, an average overall score was obtained from validator 1 was 4.4 and the average overall score from validator 2 was 3.6. So the average score obtained from the two validators is 4.03 maximum score 5. Based on the practicality criteria that have been determined, then can withdrawn conclusion that e-module operation count number round through evaluation implementation learning called "Practical. Data was obtained from the results of the students' responses percentage average total effectiveness response positive participant educate in using the E-Module for integer arithmetic operations, namely 95.6%. Based on criteria effectiveness so can withdrawn The conclusion is that the E-Module calculates integer operations from the questionnaire assessment response participant learner is called "Very Effective".

A situation analysis was carried out to determine the current learning situation at MTs Makassar City. The information obtained by researchers is that learning in Makassar City MTs has been implemented completely *offline*. But in activities studying certain subjects, students are still permitted to use gadgets to support the learning process. This information is even more strengthening and supports the solution offered, namely the creation of teaching materials in the form of e-modules as another learning resource besides the books already available in schools. It is hoped that it will be able to improve student learning outcomes. As the results research by Rochsun & Agustin (2020) shows that student learning outcomes increase in a way effective through application e-module mathematics, effectiveness. This happens because involvement active knowledge mathematics participant educate. Which built from context real life to digital.

design stage is carried out by designing all the necessary things in making e-module like description general channel e-module And draft other. Which required (Syahroni & Nurfitriyanti, 2018). Referring on opinion these make it draft form description general from channel component e-module in the form of an e-module *flowchart*. Apart from that, the application (*software*) is also determined. used to create e-modules, namely Canva (Canva Pro), determination Reference sources in the form of 3 mathematics books that refer to the 2013 Curriculum and also the Independent Curriculum. preparation of e-module content texts (material texts, making videos, And script question exercise), making lesson plan And LKPD, And a number of instrument study.

Components e-module designed so that has an attractive appearance in terms of text, sound, images and video thus encouraging students' interest in learning mathematics through e-module And give description Which Actually on participant educate. Matter their line with the opinion expressed by Bardi & Jailani (2015) that learning media that combines text, images, graphics, audio, and so on videos, as well as interactive delivery methods that can create an experience Study for student just like in real life around him.

Stage *development* started with making e-module in a way intact along with The supporting component uses the Canva application. All material texts, question scripts, videos, LKPD, and learning outcome test instruments used as evaluation end input to Canva. No just input component from stage design, But also made several modifications to the appearance, sound, image quality, features, e-module page design, as well as other components that are not yet available, such as title page, foreword, table of contents, and conclusion. This is also supported by opinion Cahyadi (2019) ie objective from stage *development* is make and modify product until Ready For tested try it. After That done validation of e-modules and several

instruments. As explained Mariani et al. (2021) that this validation is important to find out and correcting errors in the product being developed, as well with the instruments used. The research continued to the next stage after validator acknowledges validity from e-module and instruments.

The implementation stage is the stage of implementing or testing the operational e-module count number round in class VII 2 MTs Makassar City. Stage This important done For know is product Which developed Correct capable become solution to problem Which stated on stage analysis (Cahyadi, 2019). Guided on opinion the, so done test try in MTs Makassar City as much 4 meeting learning And 1 meeting test evaluation at a time charging questionnaire response counted start date 21-29 November 2022. Application e-module produce data Which capable reflect level practical And its effectiveness e-module operation count number round.

Data This obtained from obtaining scores on observation sheets, questionnaires, and learning outcomes tests given at the end of the meeting. Stage *evaluate* is stage processing data to all over evaluation Which obtained on four stage previously. It means stage This analyze data on the validity, practicality and effectiveness of the arithmetic operations e-module integers. Not only that, revisions were also carried out at the final stage of the operations e-module calculate integers based on suggestions or input provided by participants educate, Teacher, And observer. Matter This in line with opinion Syahrini & Nurfitriyanti (2018) states that the evaluation stage means evaluating the shortcomings of the product made so that produce product Which more Good. In the process, done a number of revision related appearance list fill e-module, presentation each sub material operation count Which added with sentence "Activity Study", presentation objective learning in each learning activity, and the addition of pages related to motivation For build a new paradigm for participants educate towards mathematics.

Making e-modules is a development of previous products Which Once made by researcher other. Like study Which done by Safitri (2022) who created a geometric transformation module and Azhari (2022) who also create a module learning mathematics on principal discussion set. However In their explanation, the two researchers did not include the specifications of the module which are made. In contrast to Rahmatin et al. (2019) in their research Already include specification the product that is material teach module with using the CPS method. Complementing the research of Rahmatin et al. (2019) however with dish Which different, so made specification e-module operation count an integer consisting of the display of the product name, product description, year creation, product area, tier, content, and developer. In accordance with the the material, e-module this is given Name KICOM (acronym from Khusnah-Integer Counting Operation e-Module). An e-module for number calculation operations was also designed round with value novelty. The e-module developed meets practical classification if possible give convenience to its users (Milala et al., 2022). Evaluation This taken based on analysis data from teacher response questionnaires to e-modules and results observation implementation learning use e-module. Evaluation Similar practicality has also been carried out by Faradayanti et al. (2020) who assessed appearance media, suitability curriculum, And usefulness e-module To use know the practicality of the medium.

The results of the teacher response questionnaire to the e-module show an average score as big as 3.7 from score maximum 4. Based on table 4.27, on indicator learning use e-module obtained score 16, indicator appearance e-module get a score 22, indicators of usefulness The e-module component obtained a score of 20, as well as the curriculum suitability indicator which received a score of 8. These scores are accumulated to obtain a response percentage Positive feedback from teachers was 91.7%, meaning that

teachers gave high appreciation very good regarding the provision of this e-module which is able to help students understand the material provided more quickly. These results are in line with research Ramadanti et al. (2021) which Also get mark very Good from response Teacher related to e-modules mathematics which he developed. Temporary That, from results observation implementation learning use e-module obtained average score as big as 1.89 with criteria accomplished entirely. Matter This show that during test try e-module, process learning went smoothly. Thus in general e-module operations calculating integers meets practical qualifications. These results complement the findings Mariska (2022), namely the e-module she created using Canva is fulfilling qualification practicality However just based on response Teacher And participant educate.

Effectiveness learning is Study Which beneficial And aim for participant educate Which possible participant educate For Study Skills specifics, knowledge and attitudes easily, pleasantly, and can completed learning objectives according to expectations (Andini & Supardi, 2018). By Therefore, the effectiveness of the e-module for integer calculation operations is measured from the results evaluation observation activity participant educate, questionnaire response participant educate, And acquisition mark test results Study. In the assessment of student activity observation sheets, the average score was obtained an average of 87% with all criteria met. This means e-module operation Counting integers is able to stimulate positive activities from students in class VII 2 MTs Makassar City like the courage to express opinions, mutually exchange information with peers, encourage each other to be brave appearing to speak, and other aspects that are assessed in this research. On The student response questionnaire assessment obtained a percentage score of 95.6%. This matter shows that students really mean it and feel very happy when learn to use the e-module for integer arithmetic operations because they include things new and interesting for them. This agrees with Sari et al. (2022) that The existence of interesting learning media can attract student motivation For Study. On data results test Study show percentage completeness classic as big as 90%, It means that e-module Which developed capable provide a good understanding to students which has an impact on enhancement results learn it. Findings This strengthened by Amasha et al., (2021) And Sun & Pan (2021) obtained the same findings where use technology in effective learning improves understanding and learning outcomes participant educate. With thereby e-module has meet effective qualifications.

From the description of the three assessment aspects above, the e-module has valid qualities, practical and effective. This proves that classically the e-module operates Counting integers is suitable for use as an internal learning resource mathematics learning process. However, there are still things that matter If seen in a way separated, so evaluation Which Still not enough is students' activities because they still have to be encouraged by friends or teachers to Can brave come on stage ask, answer, put forward opinion, And Work The same in a way active. Thereby Also charging test results Study Which No close possibility still happening cooperation between participant educate

CONCLUSIONS AND SUGGESTIONS

Based on the results of research and discussion on the development of e- module arithmetic operations number round, then it is obtained conclusion that the e-module development process for integer arithmetic operations refers to stages model development ADDIE, that is analysis need, analysis curriculum, analysis situation, designing script draft And instrument study, making e-

module And process validation, test try, do analysis data, as well revision end e-module , The e-module specification for integer calculation operations consists of an online LKPD using liveworksheets, telegram study room, e-module access, videos learning, and update capabilities automatic anytime , and E-module operation count number round fulfil qualification valid, practical, Andeffective, meaning the e-module is able to provide a true picture of the data in field that material teach This easy used And capable increasemastery of students' understanding based on test result evidence. With thereby e-module worthy used as source Study specifically using a *cooperative learning model* with a learning approach scientific method discussion And ask answer. Although in a way classic level the effectiveness of the e-module is met, but individually the student's activities There is still a lack of activities, especially asking questions and concluding material. Second activity This only realized If there was encouragement from friends group an. The suggestion in the research is that only those activities should be observed on student activities done moment in school, so that For study furthermore perhaps can be measured Also activity participant educate when use e-module in his house.

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