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Development of Digital Modules Based on Ethnomathematics of Sasak Tribe on Geometry Materials to improve Numeracy Skills of Elementary School Students

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ABSTRACT

This study aims to determine the validity and practicality of the Sasak tribe's ethnomathematics-based digital module on geometry material and its effectiveness in improving elementary school students' numeracy skills. This research is highly urgent given the low numeracy skills of elementary school students and the need for learning innovations that are relevant to the local cultural context. Digital modules are a unique innovation for producing contextual and meaningful mathematics learning by integrating Sasak culture with geometry material through an interactive digital approach. This study employs the Research and Development (R&D) method using the ADDIE development model. Research instruments include expert validation questionnaires for media and materials, numeracy test questionnaires, teacher and student response questionnaires, and evaluation tests. The research subjects are fifth-grade students at SDN Gugus IV Perampuan, while the research object is the Sasak ethnic group-based ethnomathematics digital module on geometry material. The data were analyzed descriptively, quantitatively, and qualitatively, with normality, homogeneity, and t-tests to determine the differences in learning outcomes between the experimental and control classes, as well as N-Gain calculations to measure the improvement in elementary school students' numeracy skills. The results of the study show that the Sasak tribe's ethnomathematics-based digital module is highly valid, practical, and effective in improving elementary school students' numeracy skills. The Sasak ethnic mathematics-based digital module meets the requirements for content, presentation, and language validity. This module can help students understand geometric concepts in a contextual and meaningful way. It is very practical for teachers and students to use and effective in improving numeracy skills. Thus, the Sasak ethnic mathematics-based digital module has been proven effective in improving the numeracy skills of fifth-grade students at SDN Gugus IV Perampuan.

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A. INTRODUCTION

Mathematics education aims to develop analytical, logical, and systematic thinking skills (Arisetyawan et al., 2021), important skills so that students are able to understand concepts, connect ideas, and solve problems in everyday life. Conceptual understanding can be developed through appropriate and efficient problem solving (Minister of Education and Culture of the Republic of Indonesia, 2020). Involving systematic, logical, and creative steps by utilizing the knowledge and skills possessed by students (Agustina et al., 2021). The success of this process is greatly influenced by the use of appropriate media, materials, motivation, and creativity, because without such support, students tend to have difficulty relating concepts to real-world applications, which ultimately results in low numeracy skills among students. Therefore, engaging media, methods, and learning materials need to be designed so that students not only understand mathematical concepts but are also motivated to actively apply them in their daily lives (Cicilia & Vebrianto, 2020).

The facts on the ground show that many students still have difficulty relating mathematical concepts to their application in everyday life, resulting in low numeracy skills among students. This finding is one of the serious issues in the field of education, as students' perceptions of mathematics are often negative due to its abstract and conceptual nature, which includes facts, concepts, operations, and principles. This requires strong intellectual abilities, and students often view mathematics as difficult and boring (Setiani et al., 2024; Yunita et al., 2024). Data from the OECD (2023) PISA 2022 shows that Indonesia's numeracy scores rank 70th out of 79 participating countries. The score dropped by 13 points from the OECD data in 2018, resulting in Indonesia being placed at Level 1, meaning its ability is far below the average. Low numeracy skills are a critical issue that needs to be addressed (Nurgiyanto et al., 2022). This highlights the need for evaluation and improvement of the current mathematics education system to help students better understand concepts. Factors contributing to students' inability to perform calculations include lack of motivation, unengaging learning materials, and teaching methods that do not meet students' needs.

Focusing on field findings based on initial observations and interviews with fifth-grade teachers at SDN Gugus IV Perampuan, Labuapi District, it was found that students' numeracy skills were low. In fact, at one elementary school, 40% of students still achieved only the minimum level in their understanding of geometric concepts, namely flat shapes and three-dimensional shapes, as evidenced by their low ability to solve problems involving flat shapes and three-dimensional shapes. This finding is reinforced by data from educational reports indicating that numeracy skills in the geometry domain remain limited to 57%. Based on research conducted by Hanannika (2022), students' ability to answer numeracy questions is still low. Additionally, research conducted by Istiyani et al., (2018) found that 72.78% of students do not understand the concepts in geometry. As a result, this affects students' mathematical thinking abilities (Kartini & Alawiyah, 2023).

One of the learning approaches applied to address the problem of low conceptual understanding and numeracy skills in mathematics learning is ethnomathematics. Ethnomathematics is an approach used to learn mathematics easily by involving culture (Sarwoedi et al., 2018). Mathematics and culture have a strong integration in the application of mathematics (Subarinah et al., 2022). The ethnomathematics approach provides a learning method that connects mathematical concepts with local culture. Through learning mathematics, students not only learn about numbers, formulas, or abstract structures but also gain an understanding of their own local cultural identity. This approach motivates students to learn because it uses an engaging and contextual approach. Research conducted by Näslund-Hadley et al. (2025) shows that a well-designed ethnomathematics approach will improve students' academic abilities and skills, as well as strengthen and maintain their cultural identity. The integration of culture and mathematics education can provide a more meaningful contextual application (Rosa et al., 2017). This study will delve deeper into Sasak culture, such as traditional food, traditional buildings, traditional arts, and Sasak handicrafts, by applying geometric concepts to every aspect of Sasak culture included in the digital module.

Mathematics is closely related to culture (D'Ambrosio, 2016). Culture-based mathematics learning is a pedagogical innovation in mathematics learning that aims to make students love mathematics more, be motivated, and be able to increase their creativity (Prahmana et al., 2021). Education serves as a means of preserving culture that is passed down from generation to generation, such as values, norms, and traditions (Widyastuti, 2021). The connection between culture and education can also be seen in how education and culture influence each other. Integrating mathematics with culture can introduce students to their own culture and enable them to solve problems directly through the culture they have seen in their daily lives. This approach can certainly be used to foster a sense of identity and pride in one's own culture, while also playing a role in preserving valuable local culture. In line with this, Tijah (2019) emphasizes that culture is one of the region's outstanding potentials and can be used as a source of learning. The results of research over the past five years show that module development is still limited to one flat shape or spatial shape and is limited to practicality tests and areas that are not Sasak tribes, such as the research conducted by Meyundasari et al. (2024), analyzing flat shapes in traditional palace houses in Loka. In addition, Rohmaini et al. (2020) developed ethnomathematics-based print modules on solid shapes.

Developing digital modules is of critical importance for enhancing students' understanding and motivation during the learning process. The development of digital modules is carried out using the Canva application in the form of a Heyzine flipbook, presented in an interactive electronic format and offering practical value. This module has the advantage of being accessible in a flexible manner, featuring animations, text, images, audio, and video content. Additionally, the module's assessment tools utilize Google Forms and the Bamboozle game, which can capture students' attention. The flexible accessibility of the digital module allows students to learn anytime and anywhere, aligning with their needs and helping to foster interest in the learning process. The integration of culture and mathematics content in the module can serve as a new approach to spark students' interest in the subject, guiding them to understand concepts and apply learning experiences in the classroom and their daily lives (Wahyu et al., 2018). Modern teaching materials with content that uses the Sasak tribe's ethnomathematics approach provide students with a good understanding of concepts, train their innovation and creativity in learning so that learning is not monotonous. Teaching materials that use an ethnomathematics approach can enhance students' abilities and foster their innovation and creativity during the learning process (Fajar et al., 2018). Digital modules greatly assist students in exploring information and thinking (Muhammad et al., 2019;Prabawa, 2017).

The Sasak tribe's ethnomathematics-based digital module can be a new way to attract students' interest in lessons, which are innovative, interactive, and flexible. This will guide students to understand concepts and implement learning experiences in the classroom and students' lifestyles (Lubis et al., 2023). This module will focus on geometry, particularly two-dimensional and three-dimensional shapes, in phase III of fifth grade elementary school. The research question is: How valid, practical, and effective is the Sasak ethnic mathematics-based digital module on geometry in improving students' numeracy skills in elementary school.

B. METHODS

The research used the Research and Development (R&D) method with the ADDIE development model, which consists of five stages, namely analysis, design, development, implementation, and evaluation. R&D is one type of research model that is widely developed today (Petousi & Sifaki, 2020). According to Sugiyono (2020), research and development methods are research methods used to produce products and test product feasibility. Apart from being used as a basis for product development, this research method is also used as a test of the effectiveness of a product (Sugiyono, 2020). The product developed is a digital module based on Sasak tribal ethnomathematics which is expected to be the right teaching material as an intermediary in delivering material. The products made will be tested for validity, practicality and effectiveness.

The first stage of analysis consists of two main analyses, namely needs analysis and material analysis. At this stage, researchers seek, collect, and identify data at SDN Gugus IV Perampuan related to the problems found and offer appropriate solutions to these problems. The analysis of needs and materials is obtained during the learning process and through interviews with homeroom teachers. The analysis is related to the characteristics of students during the learning process, which is conducted through interviews with homeroom teachers and observations. The second stage involves designing a digital ethnomathematics module, which includes preparing the necessary equipment to create the digital module, designing the form of the digital module based on Sasak ethnomathematics, and incorporating images that align with the material integrated with Sasak culture. The third stage involves developing the product and testing its validity and practicality. Validity testing was conducted by two expert validators for each instrument, namely subject matter validation, media validation, numeracy test questionnaires, teacher and student response questionnaires, and numeracy tests. Additionally, for the practicality test during the development stage, a small-group test was conducted according to Valente & MacKinnon (2017), where the small-group test involved 4–14 participants and the large-group test involved 15–30 participants. The small-group test was conducted on 10 fifth-grade students at SDN 1 Perampuan. The fourth stage is implementation, which involves the learning process and also includes pretest and post-test assessments to determine student learning outcomes. The final stage is evaluation, which involves large-group testing, teacher response questionnaires, and numeracy tests for the experimental class. The following is an overview of the research process, as shown in Figure 1.

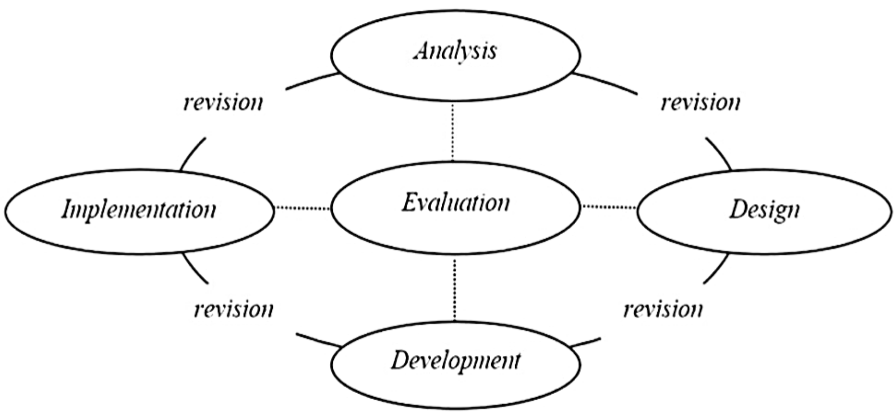


Figure 1. The ADDIE Model

The data analysis techniques used in this study were qualitative and quantitative descriptive techniques. Qualitative data were used to describe the results of observations, responses, and learning processes during the implementation of the digital module, while quantitative descriptive data were used to process students' pretest and post-test data. Quantitative data were analyzed using prerequisite tests, including normality tests to determine whether the data were normally distributed and homogeneity tests to ensure variance equality between groups, as well as t-tests to examine differences in student learning outcomes between the experimental and control classes. Furthermore, the effectiveness test was conducted using the N-Gain test to determine whether the digital module could improve students' numeracy skills. This analysis will strengthen the research results through valid and reliable statistical evidence. The experimental design used in this study is Quasi Experimental Design type Non-equivalent Control Group Design. This type of research compares two unpaired variables (Kartini & Alawiyah, 2023). The research will be conducted in two classes, namely experimental and control classes. SDN 1 Perampuan as the experimental class and SDN 2 Perampuan as the control class. The research design used in this research is pretest post-test control group design. The research instruments included media and material expert questionnaires, numeracy test questionnaires, teacher and student response questionnaires, and evaluation tests. The research subjects were fifth grade students of SDN Gugus IV Perampuan, while the object studied was a digital module based on Sasak ethnomathematics on geometry material. The population in this study was all fifth-grade students at SDN Gugus IV Perampuan. The sample consisted of 61 students, comprising 22 students in the experimental class and 39 students in the control class. This design model is depicted in the following Table 1.

Table 1. Pretest Post-test Control Group Design

	Pretest	Dependent Variable	Post-test
R	O_1	X	O_2
R	O_3		O_4

C. RESULT AND DISCUSSION

1. Development of Digital Modules Based on Ethnomathematics of Sasak Tribe on Geometry Material

Digital modules based on Sasak tribal ethnomathematics are the products produced from this research. Digital module was developed using development research (Research and Development) with the ADDIE model. The development procedure consists of five stages, namely analysis, design, development, implementation, and evaluation. The results and discussion of the development at each stage in this study are as follows:

a. Analysis

The analysis stage carried out in this study has two main components, namely needs analysis and material analysis. Based on the results of the needs analysis, it was found that students' numeracy skills were still low, this finding is reinforced from the educational report card data that numeracy skills in the geometry domain are still limited to 57%. The teacher also revealed that 40% of fifth grade students are still at the minimum achievement in understanding geometry concepts, especially flat and spatial shapes. Students' ability to solve problems of flat and spatial shapes is still low and requires more attention. Whereas there are four goals of mathematics, namely understanding mathematical concepts, forming new knowledge through solving real problems, being active from direct student experience, and using discovery in the learning process (Rafli et al., 2018). Problem solving requires the ability to understand concepts, the ability to make connections between concepts, and mental readiness to dare to solve problems (Subarinah et al., 2022).

Math learning in schools still uses the lecture method, as a result students are less motivated to learn and easily bored. According to Mahmudah (2016), the lecture method is a method that is considered less effective and efficient to use during the learning process, because it makes students' interest and motivation to learn low (Mahmudah, 2016).The Sasak culture that is still strong in SDN Gugus IV Perampuan can be an alternative to provide learning and recognition of one's own cultural heritage. Integration between culture and mathematics can be a solution to solve this problem, this integration is known as the ethnomathematics approach. According to D'Ambrosio (2016), ethnomathematics has the main objective of introducing concepts mathematically by connecting local culture as an effective learning medium. The integration of mathematics and cultural materials has a strong influence on the implementation of effective mathematics learning (Subarinah et al., 2023). Ethnomathematics has been used as a philosophy in mathematics education where numeracy and mathematical literacy are basic rights for all students (Muhammad, 2023; Muhammad et al., 2019). Researchers are interested in creating a digital module based on Sasak tribal ethnomathematics on geometry material to improve the numeracy skills of elementary school students. Learning resources are the main component that plays an important role in improving the quality of learning (Samsinar, 2019).

The second analysis is material analysis. Material content is the first step in applying ethnomathematics to mathematics learning at the elementary school level (D'Ambrosio, 2016). The material chosen in this study is geometry material including flat and spatial shapes. This is because the material of flat and spatial shapes is one of the mathematical materials that is difficult to understand, especially having to recognize its properties and how to solve the problem. Flat and spatial shapes also have many kinds and require strong concepts to be able to learn them. Based on BSKAP Head Decree No. 8 of 2022, mathematics subject matter is categorized within the scope of five content elements, one of which is geometry. According to The National Mathematics Advisory Panel (Novita et al., 2018), geometry has an important role as a basis that will support the understanding of algebraic concepts, numbers and other mathematical concepts, so it is very important to learn. Understanding concepts cannot be done if only using LKS or lecture methods, therefore media is needed that can help visualize this material so that it can be taught contextually. Two analyses, it can be concluded that a digital module based on Sasak tribal ethnomathematics on geometry material is needed to improve the numeracy skills of elementary school students. Digital module will be used as a learning resource for students in learning geometry material that has been integrated with Sasak tribal culture.

b. Design

The design stage was carried out to design the display framework and concept of the Sasak ethnomathematics-based digital module developed. The module developed is a digital module that contains material accompanied by supporting images and integrated between the concept of geometry material and Sasak tribal culture. Creating digital modules involves several websites including Canva, Heyzine, Google form, Wizer.me, Baamboozle. The digital module starts with designing from Canva, then converted on the Heyzine platform. In addition, the digital module is also equipped with images, audio, video from youtube links, edcafe.ai, digital LKPD from the wizer.me web, evaluation from google form, and baamboozle games. The design of this module is developed in an interesting and innovative way so that students are more motivated in the learning process. According to Triwahyuningtyas et al., (2022), digital modules can be used as a medium to assist in achieving learning objectives that can be accessed by students flexibly and will never disappear. In line with this, digital modules can provide easier and wider access for students to learn learning materials (Syah, 2020). According to Hidayah et al., (2023), the majority of students prefer learning resources in the form of digital modules that contain many images and colors to increase their interest and motivation in learning. The integration of geometry and Sasak culture in digital modules can be seen in the following Table 2.

Table 2. Integration of Sasak tribal geometry and ethnomathematics materials in digital modules

Geometry Material	Ethnomathematics of the Sasak tribe
Activity 1: Getting to Know Flat Buildings	
Square	*Sesekan* woven fabric, Bale Lumbung staircase railing, Sukarara woven fabric, Kembang *Komak* fabric and weaving
Rectangle	The ancient Bayan Beleq Mosque, Ende or *presean* instrument, Narmada Park, Kelasa Temple, Telaga Ageng, and Padmawangi Pond
Triangle	Jajar House, Ore House, and *Renggi* Snacks
Trapezoid	Barn House, Farmhouse, Bonter House, and *Kodong* House
Rhombus	*Sapuk* motif, woven cloth and rhombus motif
Parallelogram	Pringgasela Woven Fabric and Barn Bale Stairs
Circle	*Beleq* Drum Instruments, *Serabi*, *Banyumulek* Pottery, *Nyiru* Jaja *Bejangkongan* Tradition, *Nyiru* Woven Bamboo Winnowing Tray and *Tembolak*
Kite	*Sesekan* Cloth
Activity 2: Getting to Know the Buildings of Space	
Beam	*Ceraken* and *Limbungan*
Cube	*Klowok*, *Dedungki* and *Tujak* Snacks
Tube	Pottery, *Timbung*, Gendang Beleq Instruments, and Flutes
Triangular Prism	Limbungan Traditional House
Triangular Limas	Roof of the Ancient Bayan Beleq Mosque
Cone	Spout and *nyale odor* container

The picture in Table 2 there are 14 geometry materials included in the digital module. Each material has one quiz that will be made on the edcafe.ai web, and two evaluations that will also measure students' abilities and understanding based on the material that has been presented in the module. An assignment is an activity given to students aimed at achieving certain learning objectives (Johanda et al., 2019). After all the material and questions included in the module have been designed in the canva application, then it is converted to the Heyzine web and the barcode can be distributed to students. The following is the design of the Sasak tribal ethnomathematics digital module, as shown in Figure 2.

Figure 2. Digital module Design View

Researchers printed barcodes that were already available on the Heyzine web and redesigned them in the Canva application. Product manufacturing is done by printing barcodes with digital module paper size is A4 (21 cm x 29.7 cm), with digital format, there are four fonts used including: Times New Roman, TAN Tagkiwood, Garet and Handy Casual. In addition, the font size is 14.3 to 20.7, with a total of 82 pages. Below is the digital module barcode, as shown in Figure 3.

Figure 3. Barcode of Sasak ethnomathematics-based digital module

c. Development

The development stage is carried out to develop products based on designs that have been made before. Printing the barcode design, then trying to scan it so that it can be seen when testing the product. The development phase will focus on small group validity and practicality testing. Validation activities aim to determine the level of validity of the product that has been developed to determine the accuracy and suitability of the material based on learning objectives (Okpatrioka, 2023). Product validation was carried out with two validators of material experts, media experts, numeracy test experts, teacher response questionnaire experts, and student response questionnaire experts. While practicality is seen from the small group test. The results of media validation from two media expert validators can be seen in the Table 3 below:

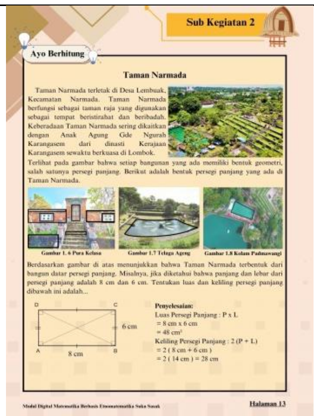
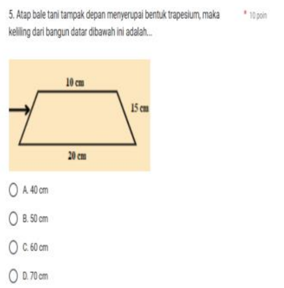
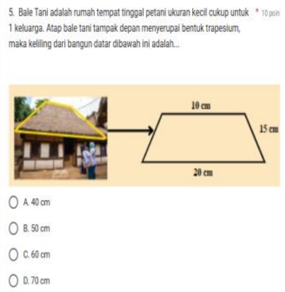
Table 3. Media Expert Validity Test Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Display	4,59	91,8%	very valid
Media Presentation	4,67	93,4%	very valid
Materials	4,33	86,6%	very valid
Overall Percentage		90,5%	very valid

The results of the media validation test, obtained a percentage of the Product validity level of 90.5% so that it is included in the very valid category. The aspects of appearance, media presentation, and materials have been assessed very well, with the highest value on attractive design, complete on integration with Sasak tribal culture, and interactive and flexible module completeness. Module is very valid for use in the learning process to improve numeracy skills and student learning motivation. Note Table 3 there are three criticisms and suggestions for improvement given by validators 1 and 2, the first is to add video files of Sasak culture related to mathematics and include interactive quizzes for each sub-activity, the second is better to use more popular images, and the third is to associate math problems with stories of Sasak buildings or cultural objects in the evaluation. Comments and suggestions for improvement, revisions were made to the module product, revisions or improvements made starting with adding Sasak cultural video files related to mathematics, adding quizzes for each sub-activity, using images that are more popular and describe the characteristics of the Sasak tribe, and linking questions on google form with Sasak tribal story problems. Here's how the digital module looks before and after revision, as shown in Table 4.

Table 4. Digital modules before and after revision

Number	Before revision	After revision
1		

Number	Before revision	After revision
2		
3		

Material validation was carried out by two material expert validators to assess the validity of the material content of the digital module products developed. The following are the results of the material expert validity test, as shown in Table 5.

Table 5. Material Expert Validity Test Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Relevance	4,66	93,2%	very valid
Consistency	4,50	90,0%	very valid
Adequacy	4,50	90,0%	very valid
Accuracy	4,50	90,0%	very valid
Communicative	4,83	96,6%	very valid
Student centered	4,50	90,0%	very valid
Language	4,75	95,0%	very valid
Readability	4,83	96,6%	very valid
Overall Percentage		93%	very valid

The results of the material validity test showed that the validity of the material content in the digital module received a percentage of 93% validity level with a very valid category. Shows that the module very well meets all the criteria mentioned. The material presented in the digital module is considered appropriate to the level of student learning, effective for integrating geometry material with Sasak tribal culture, and can improve numeracy skills. Further, the numeracy test validation was conducted by two expert validators to assess the validity of the numeracy test that would be used for the pretest and post-test during the study. The assessment was carried out on a validation sheet instrument with a rating scale of 1-5 on each indicator. The following are the results of the assessment on the numeracy test validity test for Sasak ethnomathematics-based digital module products on geometry material to improve the numeracy skills of elementary school students, as shown in Table 6.

Table 6. Numeracy Test Validation Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Using numbers and symbols	4,50	90,0%	very valid
Analyzing displayed information	4,38	87,6%	very valid
Interpreting analysis results	4,25	85,0%	very valid
Overall Percentage		87,53%	very valid

Table 6 results of the numeracy test validity test showed that the percentage of validity level was 87.53% with a very valid category. The results show that the module is able to help students understand mathematical concepts well, integrated with appropriate Sasak tribal culture, and improve students' numeracy skills to analyze and solve problems. Next, validation of the teacher response questionnaire was carried out by two expert questionnaire validators to assess the validity of the teacher response questionnaire made. The assessment was carried out on a validation sheet instrument with a rating scale of 1-5 on each indicator. The results of the teacher response questionnaire validation are shown in Table 7.

Table 7. Teacher Response Questionnaire Validation Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
In accordance with learning outcomes, learning objectives	4,50	90,0%	very valid
Integrated Sasak tribal cultural values and geometry material	5,00	100,0%	very valid
Attractive appearance reflects the culture of the Sasak tribe	5,00	100,0%	very valid
The content is relevant and contains Sasak tribal culture	5,00	100,0%	very valid
Help understanding geometry concepts through Sasak tribal culture	4,50	90,0%	very valid
Systematic presentation	4,50	90,0%	very valid
Availability of exercises and activities	4,50	90,0%	very valid
In accordance with the development and needs of students	4,50	90,0%	very valid
Presentation according to student characteristics	4,50	90,0%	very valid
Accessibility and contextuality	4,50	90,0%	very valid
Ease of use	4,50	90,0%	very valid
Efficiency and practicality	5,00	100,0%	very valid
Implementation in learning	4,50	90,0%	very valid
Overall Percentage		92%	very valid

The results of the validity test of the student response questionnaire, it is known that the percentage of validity level is 92% with a very valid category. The results show that the student response questionnaire can measure students' perceptions of digital modules to improve students' numeracy skills. Validators did not submit suggestions for improvement because they considered the student response questionnaire to be very good and meet the validity criteria. The following are the results of the assessment on the validity test of the student response questionnaire, as shown in Table 8.

Table 8. Small Group Test Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Material	4,70	94,00%	very practical
Media	4,79	95,8%	very practical
Overall Percentage		94,9%	very practical

Table 8 shows that the results of the small group test showed that the percentage of practicality level was 94.9% with a very practical category. The results show that students are interested in learning with ethnomathematics-based digital modules because there are images, quizzes, audio, video and games that can be accessed and make it easier to understand lessons. Students look happy in using digital modules, they think that this module makes the atmosphere more conducive and not bored in learning, this can also be seen from how students pay attention to the module and study it at home. Digital modules can be a solution to overcome the problem of students' self-learning difficulties and increase students' learning motivation (Saparuddin, 2022). The small group trial had no suggestions for improvement because they considered the digital module to be very practical.

d. Implementation

The implementation stage is carried out by conducting the teaching and learning process in the experimental and control classes. Implementation is the process of applying ideas, concepts, policies, or innovations in an action so that it can have an impact in the form of changes in knowledge, skills and attitude values (Saraswati & Safitri, 2020). The implementation of the Sasak Ethnomathematics-based digital module was carried out by researchers as implementers, while the teacher acted as an observer. Implementation activities involve teachers and students who refer to the use of these modules in learning. Learning activities carried out at the implementation stage consist of three main activities, namely introductory activities, core activities, and closing activities (Nurhasanah et al., 2022).

The preliminary activities were carried out several activities, namely the preliminary activities began with students greeting the teacher then the teacher greeted and checked the presence of students. Furthermore, the teacher discusses the previous material as a form of apperception then conveys the learning objectives of today's material. The teacher provides an explanation of the importance of understanding the concepts of flat and spatial shapes such as definitions, formulas and properties of flat and spatial shapes. The preliminary activities for the experimental and control classes are different, the difference lies when the teacher explains in the experimental class using the Sasak ethnomathematics approach by showing 2 and 3 dimensional objects. Meanwhile, the control class was limited to the LKS book.

The core activities in the experimental class began with giving the barcode card of the Sasak ethnomathematics-based digital module to students to be able to access learning materials. The material on the first and second days was flat and spatial shapes, respectively, the teacher explained the concept of flat shapes starting from the definition, formula and properties of flat and spatial shapes associated with objects commonly seen by students. The teacher also invites students to watch some traditions and buildings that are similar to flat and spatial shapes. The teacher also directs students to open quizzes on each sub chapter, digital lkpd, google form tests and do baamboozle games.
The core activities in the control class were carried out with the teacher delivering material about the meaning, properties, and formulas of flat shapes through the lecture method. The teacher explained each concept in detail, starting from the definition of flat shapes, various types of flat shapes, to the formulas used to calculate perimeter and area. The explanation is delivered with simple examples that are easily understood by students. In the closing activity, students and teachers together reflect on learning activities, students are given the opportunity to ask questions, after which the teacher closes the lesson then pray together. The closing activities for the experimental and control classes were the same.

e. Evaluation
The evaluation is carried out by processing and analyzing data to provide value to media development at the implementation stage (Cahyadi, 2019). The level of practicality of the digital module based on teacher responses is 95.9% with a very practical category. The following is the teacher response questionnaire Table 9.

Table 9. Teacher Response Questionnaire Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Material	5,00	100,0%	very practical
Media	4,80	96,0%	very practical
Presentation	4,58	91,6%	very practical
Overall Percentage		95,9%	very practical

Table 9 shows that the results of filling out the teacher response questionnaire showed that the percentage of practicality level was 95.9% with a very practical category. The results show that both teachers gave an assessment in the highest score category, which shows that the material is presented with clear language, easy to understand, and supported by interesting illustrations and fun learning activities. Teachers gave an interesting response, that this digital module is very good for and interactive to be used as learning media and a solution for students who often use cellphones at home. Students will find it easier to access it because it is flexible and can be accessed at home. Teachers are also interested in learning how to make it because the games and digital LKPD in the module are very attractive to students. Thus, it can be concluded that the digital module is able to improve the numeracy skills of elementary school students with a very practical category of use.

The level of media practicality based on student responses is 95% with a very practical category. This is in line with (Mahmud, 2016) the percentage of assessment scores that qualify practicality with a very practical category is in the percentage interval of 85.01%-100.00%. The following is a Table 10 of student response questionnaires for the large group test.

Table 10. Large Group Test Results

Aspect	Average Score (V1 & V2)	Percentage	Criteria
Material	4,75	95,0%	very practical
Media	4,75	95,0%	very practical
Overall Percentage		95,0%	very practical

Table 10 shows that the percentage of practicality level is 95.0% with a very practical category. The results showed that the majority of students gave an assessment in the highest score category, which indicated that the material was presented in clear language, easy to understand, and supported by interesting illustrations and fun learning activities. The digital module is considered to be able to increase students' interest and enthusiasm for learning because it looks attractive, well-structured, and relevant to everyday life, during the learning process, students were active in learning. Students are interested in learning it because the pictures can be enlarged, there are videos, and games. Students also look very enthusiastic in doing the questions. Thus, this module is very practical to be used as an effective learning media in supporting the learning process of students in elementary school.

2. Effectiveness Test of Digital Module Based on Ethnomathematics of Sasak Tribe

The effectiveness test is carried out at the product implementation stage, the ADDIE development model at the product implementation stage is the process of applying the developed product in learning activities (Kasturi et al., 2022). The implementation of the digital module is given to the experimental class with a pretest-post-test control group design. The experimental class will be given a pretest and post-test , while the control class is only given a pretest (Valente & MacKinnon, 2017). There are 2 groups in this study, namely the experimental group and the control group. The experimental group in this study were fifth grade students of SDN 1 Perampuan, while the control group were fifth grade students of SDN 2 Perampuan. In the experimental class, the treatment applied was the use of digital modules based on Sasak ethnomathematics on geometry material, while the control class did not use digital modules and only used LKS.

The experimental design is carried out by giving a pretest then given treatment and ending with a post-test. Pretest and post-test value data are processed in the prerequisite test, namely the normality test and homogeneity test. Normally distributed data is a requirement for conducting prometric statistical tests, data that forms a normal distribution is when the amount of data above and below the average is the same (Sugiyono, 2020). The normality test uses the Shapiro-Wilk test formula with a significance level of 0.05. The following are the results of the normality test, as shown in Table 11.

Table 11. Normality test results

	Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Results	Pre-Test Control	.120	39	.169	.963	39	.218
	Post-Test Control	.100	39	.200*	.980	39	.721
	Pre-Test Experiment	.137	22	.200*	.948	22	.293
	Post-Test Experiment	.136	22	.200*	.929	22	.119

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The normality test results for the pretest of the experimental class and control class each obtained a value of 0.293 and 0.218 which means> 0.05, so it can be concluded that the pretest value data of the two groups are normally distributed. As for the post-test values of the experimental and control classes, each obtained a value of 0.119 and 0.721 which means> 0.05, so it was concluded that the post-test values of the two groups were normally distributed. After the normality test, the homogeneity test was carried out using the Levene statistic test. The following are the results of the homogeneity test, as shown in Table 12.

Table 12. Homogeneity test results

		Levene Statistic	df1	df2	Sig.
Results	Based on Mean	.546	1	59	.463
	Based on Median	.435	1	59	.512
	Based on Median and with adjusted df	.435	1	56.911	.512
	Based on trimmed mean	.556	1	59	.459

Table 12 shows that the results of the homogeneity test of the experimental and control class pretest data are 0.459 and 463 which means> 0.05, so it can be concluded that the data is homogeneous. If the data is homogeneous, it can be continued in hypothesis testing (Hasanah & Nasution, 2024). The following is the hypothesis test data, as shown in Table 13.

Table 13. Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	7.707	.007	-8.679	58	.000	-31.567	3.637	-38.847	-24.287
Equal variances not assumed	—	—	-10.221	57.114	.000	-31.567	3.089	-37.751	-25.383

Hypothesis testing using Independent Sample T-Test aims to determine the truth of the research hypothesis. The results of the hypothesis test obtained a sig value. two sided-p = 0.000 or <0.05, which means that there is a significant difference between the learning outcomes of the experimental class and the control class. So it is concluded that Ha is accepted and Ho is rejected or there is a significant effect of using digital modules based on Sasak tribal ethnomathematics on geometry material on the numeracy skills of SDN Gugus IV Perampuan students. Similar results were also found in research by Semtafiani & Sanoto (2024), with a sig value. (2 tailed) 0.000 which shows that there is a significant difference between the experimental and control class scores. In addition to the hypothesis test, the N-Gain test was also conducted to see the improvement of students' numeracy skills (Rizky & Ramadhani, 2023). Here are the N-gain results for the control class, as shown in Table 14.

Table 14. Control Class N-Gain Test Results

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Ngain_Score	39	-.22	.70	.1478	.23013
Ngain_Percent	39	-22.22	70.00	14.7828	23.01270
Valid N (listwise)	39				

The N-Gain test analysis was also carried out on the experimental class to measure the improvement of students' numeracy skills after participating in learning using digital modules based on Sasak tribal ethnomathematics. The results of the N-Gain test analysis are presented in Table 15 below:

Table 15. Experimental Class N-Gain Test Results

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Ngain_Score	22	.40	.91	.6655	.12124
Ngain_Percent	22	40.00	90.91	66.5503	12.12438
Valid N (listwise)	22				

Table 14 and Table 15, it is known that the experimental class N-Gain score of 0.6655 is included in the medium N-Gain value category with a percentage of 66.55% which indicates a fairly effective category. While the N-Gain score for the control class of 0.1478 is included in the low N-Gain value with a percentage of 14.78% including the ineffective category.

D. CONCLUSION AND SUGGESTIONS

Based on the analysis of research data and discussion, the conclusion of the study is that the Sasak tribe's ethnomathematics-based digital module on geometry is considered highly valid by experts and users, making it suitable for use in the learning process. The developed module was deemed highly practical based on small-group trials, large-group trials, and teacher response tests, with results that were well-received by both students and teachers. The module was proven effective in enhancing students' numeracy skills, as evidenced by t-test results showing significant differences between the control and experimental groups, as well as higher N-Gain scores in the experimental group.

Schools are expected to recognize the importance of providing Sasak ethnomathematics-based digital modules in the learning process. Schools also provide guidance to teachers on developing digital modules and ensure the availability and stability of adequate internet connections so that modules can be accessed optimally by students. In addition, this study is expected to serve as a valuable reference for future researchers in developing ethnomathematics-based digital modules, as well as encouraging the emergence of increasingly high-quality learning innovations. Furthermore, future researchers should consider several things, such as providing additional time for using digital modules, providing explanations of local cultural terms, and ensuring that teachers use the developed modules in their teaching.

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