DEVELOPMENT OF A MATHEMATICS TEACHING MODULE BASED ON SASAK ETHNOMATHEMATICS WITH A CRT APPROACH TO IMPROVE ELEMENTARY SCHOOL STUDENTS' MASTERY OF GEOMETRY CONCEPTS

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Abstract

This study aims to develop a mathematics teaching module based on Sasak ethnomathematics using the CRT approach to improve elementary school students' mastery of geometric concepts. This study used the Plomp development model, with stages including preliminary research, prototype creation, and assessment. The subjects were sixth-grade elementary school students. The instruments used included interviews, student response questionnaires, observations, test sheets, expert validation, and practicality and effectiveness instruments. The results showed that the developed teaching module met the criteria of validity, practicality, and effectiveness. The module's validity was obtained from expert assessments on material and language, with the module categorized as very adequate. The module's practicality was demonstrated through positive responses from teachers and students, who stated that the module was easy to understand, engaging, and helpful in the learning process. The module's effectiveness was evident in the increase in elementary school students' mastery of geometric concepts after using the module, as demonstrated by the results of the N-gain test, which categorized as moderate or effective. Therefore, the Sasak ethnomathematics-based mathematics teaching module using the CRT approach is effective in improving elementary school students' mastery of geometric concepts.

Keywords: Teaching Module, Sasak Ethnomathematics, CRT, Mastery of Geometry Concepts

INTRODUCTION

Learning is a process undertaken by individuals to achieve comprehensive behavioral change as a result of their interactions with the environment (Surya, 2014, p. 111), starting from planning, implementation, and evaluation, and emphasizing the 21st-century learning process so that students possess four skills: critical thinking, communication, collaboration, and creativity (Indarta et al., 2021). This is in line with (Minister of Education and Culture Regulation) Number 22 of 2016 concerning Standards for Elementary and Secondary Education Processes, which explains that educators in educational units are obliged to prepare a comprehensive and systematic learning process so that learning takes place interactively, inspiringly, enjoyably, challengingly, efficiently, motivates students to actively participate, and provides sufficient space for initiative, creativity, and independence in accordance with students' talents, interests, and physical and psychological development.

According to Ministry of Education, Culture, Research, and Technology Regulation Number 032/H/KR/2024, the goal of mathematics learning in schools is to equip students with several competencies, namely: 1. understand mathematical learning materials in the form of facts, concepts, principles, operations and mathematical relations and apply them flexibly, accurately, efficiently and appropriately in solving mathematical problems (mathematical understanding and procedural skills); 2. using reasoning on patterns and properties, performing mathematical manipulations in making generalizations, compiling evidence, or explaining mathematical ideas and statements (mathematical reasoning and proof); 3. solving problems which include the ability to understand problems, design mathematical models, complete models or interpret solutions obtained (mathematical problem solving); 4. communicating ideas with symbols, tables, diagrams, or other media to clarify situations or problems, and presenting a situation into mathematical symbols or models (mathematical communication and representation), 5. relating mathematical learning materials in the form of facts, concepts, principles, operations, and mathematical relations in a field of study, across fields of study, across fields of science, and with life (mathematical connections), and 6. having an attitude of appreciating the usefulness of mathematics in life, namely having curiosity, attention, and interest in studying mathematics, as well as a creative, patient, independent, diligent, open, resilient, tenacious, and confident attitude in problem solving (mathematical disposition).

However, in reality, mathematics lessons are often considered lessons that are not easy to understand, boring, and most students sometimes show bored expressions, and tend to have fear because they are often considered difficult (Hasanah & Ansori, 2023). This is thought to be due to various factors, including: students do not understand basic concepts well, lack of ability to answer questions because of the many things that must be solved, from formulas to memorizing or interpreting in mathematical language, fear or anxiety about mathematics subjects. Difficulties faced in understanding mathematics are not seen as a learning opportunity but rather as a burden in learning and cause students to be reluctant to study mathematics. In addition, the way teachers convey material is more focused on material achievement than on students' success in mastering and understanding the material and are less creative in designing learning that can direct students to integrate the construction of everyday life experiences outside the classroom with their knowledge in the classroom, which has an impact on educational goals not being achieved and low learning outcomes. In line with the statement by Insani et al. (2023), teacher creativity is a crucial factor in creating an engaging and meaningful learning environment. Teachers who lack creativity tend to focus solely on material achievement without paying attention to active student involvement, resulting in low motivation and poor learning outcomes.

The results of the researcher's interview with one of the fifth-grade teachers at SDN 4 Danger, Sopian Hadi, S.Pd, revealed: "The teaching materials we use are still limited to textbooks and have never created a mathematics teaching module based on local culture. This is the first time we have heard about a mathematics module based on Sasak ethnomathematics with a Culturally Responsive Teaching (CRT) approach, in addition to other learning resources we also get from the internet and LKS. However, the LKS used also still does not contain contextual material and questions, and the material is not related to local culture, or the crafts of the Lombok community. In addition, students do not know that mathematics exists in everyday life and the school has implemented the independent curriculum but there are no teaching materials based on Sasak culture."

In line with the results of an interview with a fifth-grade teacher at SDN 1 Danger, she stated that: "Mathematics learning in class takes place face-to-face with students who have diverse interests, motivations, and abilities. This diversity is influenced by different individual characteristics. Some obstacles we often encounter during mathematics learning are: (1) Students often lose concentration when the teacher explains the material; (2) Some students tend to be busy themselves, such as drawing, writing, or talking outside the topic of the lesson, resulting in a lack of understanding of the concepts being taught. (3) The methods used in learning are as usual: lectures, demonstrations, and discussions.

The use of teaching modules is considered important because it functions as a guide that helps teachers deliver material in a structured and systematic manner, and makes it easier for students to understand the concepts being taught. The teaching module we use is the independent curriculum teaching module, but we have never used or even created a mathematics teaching module based on Sasak ethnomathematics with a Culturally Responsive Teaching (CRT) approach."

In line with the results of observations conducted by researchers related to the mathematics learning process carried out by teachers at SDN 4 Danger, it shows that: Student learning motivation is low. This is indicated by several students showing low interest in mathematics lessons, students still tend to be passive in the learning process, and lack of understanding of the learning material. And often do not complete the assignments given by the teacher and some students fall asleep during the lesson.

Students' lack of conceptual understanding of mathematics results in difficulty connecting the concepts learned to real-life contexts. When faced with different types of problems, students are unable to solve them, even though they are related to the same material. And low ability to re-explain mathematical concepts in their own words. Poor problem-solving skills are evident in students' difficulty understanding story problems or problems requiring critical thinking; a tendency to use a direct approach without first analyzing the problem; a lack of ability to transform the problem into a mathematical model; a lack of student creativity in solving math problems that allow for more than one method or solution; and limited teacher creativity in teaching methods. This is evident when teachers still use conventional teaching methods, such as monotonous lectures and practice problems, which can lead to students becoming bored. The learning process rarely uses learning media, leading to students' disinterest in learning.

The integration of contextual concepts and local culture in mathematics learning by teachers focuses only on abstract concepts without connecting them to real-life situations or the local culture surrounding the students, and the problems used in learning rarely include local contexts. The connection between mathematics and culture provides opportunities for more meaningful and contextual learning. By linking mathematical concepts to real-life experiences, students will more easily understand them. Furthermore, when learning is tailored to students' cultural backgrounds, their engagement and enthusiasm for the learning process tend to increase (Firdaus et al., 2023), fostering conceptual understanding and increasing active student participation (Muliawan et al., 2024). This confirms that mathematics has a strong relationship with the social and cultural aspects of society, thus becoming the main conceptual foundation for ethnomathematics-based development (Sinta et al., 2025).

The lack of use of learning media that incorporates local culture has resulted in low student learning outcomes. This is consistent with the researcher's observations of fifth-grade students' end-of-semester summative assessments, which were quite low, falling below the required minimum score of 70. The results of the TOFAS Indonesia (Test of Fundamental Academic Skills) basic numeracy test showed that none of the students who took the test achieved a good score or passed.

The differing levels of student ability are evident in the significant differences between high- and low-ability students in mathematics. Students with low abilities often lack special guidance or assistance during learning, tend to neglect students with special needs in mathematics, and struggle to develop remedial and enrichment programs tailored to their abilities. Assessments do not accommodate individual differences, resulting in students with different learning styles (visual, auditory, and kinesthetic) struggling with the assessment methods used. Students are given the same questions without considering the appropriate level of difficulty for each student. They use a single type of assessment, such as written tests, without including performance assessments, projects, or portfolios. Formative assessments that serve as feedback for learning improvement are rarely used.

Based on these issues, the development of ethnomathematics-based CRT (Competitive Recognition) teaching modules is necessary to improve students' conceptual mastery. This is in line with the statement by Hernita et al. (2024:50), who stated that the CRT approach can improve students' understanding of mathematical concepts by linking the material to a familiar cultural context, creating an inclusive learning environment, and using learning strategies appropriate to students' learning styles. Implementing the CRT approach with the help of GeoGebra can improve students' understanding of mathematical concepts (Mina et al., 2024:32686) and is also effective in improving students' mathematics learning outcomes (Sri et al., 2024).

The applied learning approach plays a crucial role in achieving student learning outcomes and can facilitate the construction of deeper conceptual understanding in students, thus potentially improving learning outcomes (Puspitasari & Airlanda; 2021). Furthermore, ethnomathematics-based learning can increase learning effectiveness (Diah Nuryanti et al., 2024), enhance students' understanding of mathematical concepts (Sundap Priyatna and Marsigit, 2024), and can connect students to the culture around them, helping them better understand the learning material (Wafiq et al., 2024: 1908).

The novelty of this research lies in the development of a Culturally Responsive Teaching (CRT)-based learning module that integrates Sasak ethnomathematics as a learning medium. This learning module is highly desirable because it can help elementary school students understand geometry concepts through a local cultural context, specifically through relevant Sasak cultural elements, making the material more understandable and meaningful for students. This approach is also an innovative step in teaching mathematics, because it uses local culture as a learning resource that can increase student relevance and engagement, as well as improve understanding of geometric concepts in depth.

METHOD

This study uses the Research and Development (R&D) method with the aim of producing a product in the form of a mathematics teaching module based on Sasak ethnomathematics with a Culturally Responsive Teaching (CRT) approach and testing its validity, practicality, and effectiveness. The development model used is the Plomp model (Plomp & Nieveen, 2013) which includes three main stages, namely: 1. Preliminary Research (preliminary research): includes needs analysis, curriculum analysis, concept analysis, student analysis, and literature review. Data are obtained through observation, interviews, questionnaires, concept mastery tests, and document studies. 2. Prototyping Phase (prototype development): the design and development of the teaching module are carried out in stages through formative evaluation, namely self-evaluation, expert review, one-to-one evaluation, small group evaluation, until producing a valid and practical prototype. 3. Assessment Phase (assessment): field trials to determine practicality (teacher and student responses, implementation of learning) and effectiveness (increasing students' mastery of mathematical concepts through pretest–posttest).

The data types used were qualitative (observation, interviews, open-ended questionnaires) and quantitative (validation sheets, response questionnaires, concept mastery tests). The research instruments included: 1) Validation sheets to assess the validity of the content and construct of the teaching module. 2) Practicality questionnaires and observation sheets to assess the implementation and practicality of the teaching module. 3) Concept mastery tests (pretest and posttest) to assess effectiveness using N-gain analysis. Data were analyzed descriptively and quantitatively using percentages of validity, practicality, and N-gain calculations to determine the categories of improvement in students' concept mastery (high, medium, low).

RESULTS AND DISCUSSION

Preliminary Investigation Phase

Interviews with mathematics teachers revealed that students struggle to solve problems requiring the application of more than one mathematical concept and experience obstacles in transforming word problems into mathematical models due to a lack of understanding of the relationship between the information in the problem and the relevant mathematical concepts. Teachers revealed that the lecture method is still frequently used, especially when the material is considered difficult. Group discussions are rarely conducted optimally and are only applied to material considered easy.

Teachers also stated that, despite having learning tools such as teaching modules and student worksheets (LKPD), their use in practice is inconsistent. Lesson plans often do not go according to plan, and teachers tend to revert to conventional methods due to time constraints and limited ideas for developing contextual learning. The LKPDs used are generally routine and not tailored to students' characteristics and learning needs. Teachers rarely use self-developed LKPDs due to concerns that students will not have enough time if they are given problems that require a deeper understanding of concepts.

The curriculum analysis revealed that SDN 4 Danger has implemented the Merdeka curriculum. In phase C (grades 5–6 of elementary school), one of the learning outcomes in Mathematics is students' ability to construct and decompose simple geometric shapes, such as cubes, cuboids, and their combinations. The results of the concept analysis indicate that the material studied in the even semester for geometry elements is cubes and cuboids. In mathematics learning, particularly in the geometry of cubes and cuboids, conceptual mastery is crucial for students to be able to: construct and decompose cubes, cuboids, and their combinations; and construct geometric shapes based on two-dimensional representations of objects.

Observations indicate that students still experience difficulty solving word problems, problems requiring higher-level reasoning, and problems related to everyday life situations. Furthermore, elementary school students tend to be more enthusiastic about cooperative or group learning, as they can discuss and collaborate with their peers.

Prototyping Phase

The activities carried out in the prototype phase include designing learning tools. Designing a teaching module is the initial step in product development and includes a structure or content framework that will serve as a guideline for developing the teaching module. This ensures that the module's components are clearly visible and serve as a standard reference and define the scope of the development. At this stage, researchers identify the elements required for the teaching module and develop a framework for the teaching module. The design related to the module to be developed can be seen in the following table:

Table 1. Teaching Module Design

No.	Teaching Module Design	Details
A	Cover	—
B	General Information	• Module Identity • Initial Competencies • Pancasila Student Profile • Facilities and Infrastructure • Target Learners • Learning Model • Learning Approach
C	Core Information	• Learning Objectives • Learning Objectives Flow • Meaningful Understanding • Guiding Questions • Learning Activities • Assessment • Enrichment and Remedial
D	Appendices	• Student Worksheets (LKPD) • Reading Materials for Teachers and Students • Glossary • References

Assessment Phase

Self-validation

After the initial draft was completed, the researcher conducted independent validation to identify and correct any remaining obvious errors. The components focused on by the self-validation included the writing format, the completeness of the teaching module, and the appropriateness of the illustrations to the problems presented.

Based on the self-validation results, the developed teaching module generally complied with the established writing guidelines and the completeness of the components. The only minor improvements made were to technical aspects of the writing, such as typos, the use of capital letters at the beginning of sentences, and adjustments to punctuation in the numbering of learning activities. Meanwhile, other aspects, such as the use of terms, font size, the size and placement of tables, and the completeness of the teaching module components, were deemed appropriate and did not require revision. Therefore, after self-validation, the teaching module can be categorized as suitable for use as teaching material.

Meanwhile, the self-validation results of the developed LKPD essentially met the criteria in accordance with writing rules and component completeness. Revisions were only technical, namely aspects of typing wording in practice questions and improving the use of punctuation. Meanwhile, other aspects such as clarity of writing, use of terms, accuracy of font size, size and placement of tables, illustrations, and component completeness were deemed appropriate and did not require changes. Thus, after going through the self-validation process, the LKPD can be declared suitable for use in learning activities.

Expert Validation

Based on the validation results by material experts, an average percentage of 84.26% was obtained, categorized as very valid. The Sasak ethnomathematics-based teaching module and worksheet were assessed as having strengths in terms of accuracy, currency, and their ability to improve student competency. The presentation of the material was also deemed interactive, communicative, and relevant to local culture. However, several areas needed improvement, such as the completeness of the material, the interconnectedness of the content, and the deductive/inductive presentation techniques.

Validation by language experts resulted in a score of 85.7%, also categorized as very valid. This assessment indicates that the module meets the linguistic criteria for eligibility, although technical improvements are still needed in the use of punctuation and sentence structure to be more effective and in accordance with Indonesian language rules.

After improvements based on input from validators, the Sasak ethnomathematics-based teaching module with the Culturally Responsive Teaching (CRT) approach has been revised and refined, both in terms of content and language. The revision results show that all instrument components have been linked to ethnomathematics elements, with practice questions, cultural meanings, and contextual explanations in the form of stories and histories of local Sasak objects added. In addition, the module is also equipped with supporting media in the form of videos of making traditional Sasak crafts. Thus, it can be concluded that the Sasak ethnomathematics-based teaching module and LKPD developed are categorized as very valid, suitable for use in learning, and ready to be tested without further revision.

One-to-One Test

Based on the results of one-to-one testing, the Sasak ethnomathematics-based mathematics teaching module using the Culturally Responsive Teaching (CRT) approach was declared practical, with a practicality rating of 80%. Students assessed that the worksheets were clear and easy to understand, the language used was communicative, the instructions were easy to follow, and the illustrations supported their understanding. The components in the worksheets were also proven to help students understand the concepts of cubes and cuboids. Therefore, the developed product is suitable for use in learning, although several aspects still need improvement to optimize it. This testing also provided an initial overview of the module's practicality and served as a basis for proceeding to the next stage, namely small group trials.

Small Group Product Trial Results

Based on the results of the small group trial, the Sasak ethnomathematics-based mathematics teaching module using the Culturally Responsive Teaching (CRT) approach achieved a practicality percentage of 77.5%, which falls into the practical category. These results indicate that the teaching module is quite good and can be used in learning. Students assessed that the material was easy to understand, the presentation was clear, and the local cultural context relevant to their lives. Furthermore, learning with this module increased student engagement, group interaction, and understanding of the geometry concepts of cubes and cuboids.

However, the small group trial also revealed several aspects that still need attention and refinement for optimal use. Thus, this trial provides a broader picture than the one-to-one phase and serves as an important basis for revisions before the teaching module is trialed on a larger scale.

Large Group Product Trial Results

Based on the results of the large group trial using a practicality questionnaire completed by students, an average score of 34.42 out of 40 was obtained, with a percentage of 86.05%, categorized as very practical. The majority of students (89.47%) rated the module/LKPD as very practical because the instructions were easy to understand, appropriate to the local cultural context, and able to increase motivation, active engagement, and accuracy in solving problems. Meanwhile, 10.53% of students fell into the practical category, indicating that although the module could be used effectively, there were still minor obstacles such as errors in problem solving and longer completion times. Thus, it can be concluded that the Sasak ethnomathematics-based teaching module and LKPD are very practical and suitable for implementation in mathematics learning, as they have been proven to support the learning process effectively, are engaging, and are appropriate to student characteristics and the local cultural context.

Effectiveness of the Teaching Module

Based on the pretest and posttest analysis, the use of the Sasak ethnomathematics-based teaching module and worksheets (LKPD) proved quite effective in improving sixth-grade elementary school students' understanding of geometric concepts. The average pretest score of 28.64

increased to 70.18 in the posttest, with an average difference of 41.54. The N-gain calculation showed a score of 0.59, which is considered moderate. Therefore, it can be concluded that learning using this teaching module and worksheet significantly improved student learning outcomes. All 28 students experienced improved learning outcomes, confirming that the developed product was not only practical to use but also had a positive impact on students' cognitive competency achievement in the cube and cuboid geometry topic.

Discussion

Validity of the Development Product

The validity of the development product refers to the quality and accuracy of the product being developed, in this case a mathematics teaching module based on Sasak ethnomathematics using the Culturally Responsive Teaching (CRT) approach. Based on the research and development results, the validity of this product was assessed through two main stages: self-validation and validation by a team of experts.

Self-validation is the initial stage of development, beginning with independent validation by the researcher. This is a crucial step in identifying and correcting fundamental errors in the initial design of the teaching module and Student Worksheets (LKPD). Based on the data presented, self-validation successfully identified and corrected various aspects, including:

a. Teaching Module: Typographical errors in wording and the use of lowercase letters at the beginning of sentences were found and corrected in the third learning activity meeting. Furthermore, the numbering in the fourth learning activity meeting was also adjusted to ensure consistency and adherence to writing standards. Other aspects, such as the use of terms, font size, table size and placement, and component completeness, were deemed appropriate from the outset.
b. Student Worksheet: Corrections were made to typos and wording errors in the practice questions in the first meeting of the Student Worksheet. Similar to the teaching module, other aspects such as terminology usage, clarity of writing, punctuation, font size, table size and placement, and the relevance of illustrations were deemed appropriate. Through this self-validation, the teaching module and Student Worksheet underwent initial improvements and were ready as prototype 1 before further review by experts. This stage demonstrated the researcher's commitment to the initial quality of the product by making internal improvements.
c. Expert Review: After self-validation, prototype 1 was validated by four experts. These experts were two lecturers from Hamzanwadi Selong University and two school teachers. The teaching module assessment process was carried out by administering a teaching module validation questionnaire to each validator. Each validator assessed each aspect and provided suggestions and comments in the column provided for improvement of the teaching module.

The validation results by three expert validators showed that the teaching module was very valid with a percentage of 84.26%. This figure places the module in the "Very Valid" category based on a rating range of 81-100%. The aspects assessed included the suitability of the material to learning outcomes (valid and very valid), the accuracy of the material (very valid), the currency of the material (very valid), the systematic delivery of the material (valid and very valid), the potential for increasing student competency (valid and very valid), presentation techniques (valid and very valid), and communicative and interactive (very valid). This indicates that the material substance in the teaching module has met academic standards, is relevant, accurate, and able to support effective learning. The suggestion from the expert to add cultural insights (location, process, and meaning of traditional Sasak crafts) is constructive input to further strengthen the ethnomathematics dimension.

The language expert validator gave a score of 85.7%, which also falls into the "Very Valid" category. This assessment was based on the language's conformity to PUEBI (Indonesian Language and Education Standards), correct spelling and punctuation, clarity of sentences and paragraphs, font choice, the language's ability to motivate, clarity of instructions, and communicative nature. These results confirm that the teaching module has excellent linguistic quality, is easy for students to understand, and is presented in accordance with correct Indonesian language rules. The feedback provided (paying attention to punctuation and sentence structure) has been followed up to produce a more refined final product. Overall, the validation process, both through self-validation and expert review, indicates that this Sasak ethnomathematics-based teaching module is valid for testing.

Module Practicality

In efforts to improve the quality of mathematics learning in elementary schools, developing contextual and easy-to-use teaching materials is crucial. One example is the Sasak ethnomathematics-based teaching module, which utilizes local cultural richness, such as besek (traditional bamboo baskets) and keraken (traditional bamboo baskets). This module is designed using the Culturally Responsive Teaching (CRT) approach which emphasizes the connection between learning materials and students' real experiences.

The practicality of this module lies in its ease of implementation by both teachers and students. Clear and systematic instructions help teachers guide learning activities without requiring complex additional preparation. Meanwhile, the use of the Sasak cultural context makes the geometry material more relatable to students' everyday lives, facilitating students' understanding of the geometric concepts of cubes and cuboids.

Furthermore, the CRT approach in this module encourages active student engagement through hands-on activities and discussions utilizing local objects. This teaching module is not only practical in use but also effective in improving elementary school students' mastery of geometry concepts because it combines contextual, active, and meaningful learning.

An attractive student worksheet design makes students feel interested and happy in learning, which has an impact on increasing motivation and learning outcomes. Student responses in one-to-one, small group, and large group tests were also considered very positive, indicated by student response scores ranging from 77.5% to 86.05%. This score is still included in the very practical category, which means students consider the developed student worksheet interesting and presenting the cultural or environmental context (ethnomathematics) makes students feel closer to the material, so that interest in learning increases (Pranita et al., 2022.1130–1132). Furthermore, research by Wulandari (2022.88-90) shows that an attractive student worksheet increases student enthusiasm, as seen from the average score of increasing student learning motivation (from 68 to 86) and interesting contextual student worksheets, learning activities become more interactive, and students are encouraged to explore themselves, this increases enthusiasm and interest (Rahman, 2021,103–105).

Effectiveness of the developed product

Before widespread distribution, this teaching module was first tested on a limited basis to determine its effectiveness, using a one-group pretest and posttest design. The test results showed an increase in scores, with pretest scores ranging from 20-47 with an average of 28.64 increasing to 60-87 with an average of 70.18 on the posttest. Based on the N-gain criterion, this score increase was in the moderate category (0.59), thus the use of Sasak ethnomathematics-based student worksheets (LKPD) was deemed quite effective (59.03%) in improving students' mastery of geometric concepts. This improvement is inseparable from the use of the LKPD.

LKPD has a significant influence on the learning process, so its preparation must meet several requirements. According to Das Salirawati (2004), there are three criteria that determine the suitability of a LKPD: didactic, constructional, and technical requirements. Didactic requirements relate to the application of effective learning principles in the LKPD. Constructional requirements cover the language used. Meanwhile, technical requirements encompass writing LKPD in accordance with applicable rules and regulations.

Based on this opinion, the requirements have been met, as discussed previously. Learning principles have been integrated through the application of the CRT approach. Constructional and technical requirements have also been met from the initial stage through the implementation of the plomp development model, thus providing a fairly effective impact on improving student test scores.

CONCLUSION

Based on the research findings on the development of a Sasak ethnomathematics-based mathematics teaching module using the Culturally Responsive Teaching (CRT) approach to improve elementary school students' mastery of geometric concepts, the following conclusions can be drawn: 1) The Sasak ethnomathematics-based mathematics teaching module using the Culturally Responsive Teaching (CRT) approach developed in this study has been declared highly valid for use in the learning process. This is evidenced by the assessment results from material experts, which categorized it as very valid, and the assessment from language experts, which categorized it as very good. 2) Student responses to the teaching module in one-to-one, small-group, and large-group tests showed very positive results, with response scores ranging from 77.5% to 86.05%. This percentage falls into the very practical category, making the module suitable for use in learning activities. 3) The results of the one-group pretest and posttest trial showed an increase in students' conceptual mastery scores. Pretest scores ranged from 20–47 with an average of 28.64, then increased in the posttest to 60–87 with an average of 70.18. This improvement resulted in a gain score of 0.59, which is considered moderate, with an effectiveness of 59.03%. This demonstrates that the use of Sasak ethnomathematics-based teaching modules is quite effective in improving elementary school students' mastery of geometric concepts.

REFERENSI

Dinata P, M. et al. (2022). Efektivitas LKPD Berbasis Etnomatematika Dalam Meningkatkan Motivasi Belajar Siswa. Jurnal Educatio. 8(3). 1130–1132. https://doi.org/10.31949/educatio.v8i3.3123

Firdaus, M. K., Fajrie, N., & Purbasari, I. (2023). Pembelajaran Berbasis Budaya Melalui Kegiatan Ekstrakurikuler. Jurnal Educatio FKIP UNMA, 9(1), 402–412.

Hasanah, H., & Ansori, S., (2023). Pengaruh Kecerdasan Sosial Terhadap Minat Belajar Matematika Siswa Kelas VIII MTs Al-Ijtihad Danger. *Schemata: Jurnal Pascasarjana UIN Mataram, 12* (2), 133-144.

Hernita, L, V, dkk. (2024). Peningkatan pemahaman konsep Matematika Siswa Kelas XI-2 SMAN 2 Bantul Dengan Pendekatan Culturally Responsive Teaching (CRT) Berbantuan Google Sites. PROXIMAL: Jurnal Penelitian Matematika dan Pendidikan Matematika. 7(2). https://doi.org/10.30605/proximal.v7i2.3590

Indarta, Y. (2022). Relevansi Kurikulum Merdeka Belajar Dengan Model

Pembelajaran Abad 21 Dalam Perkembangan Era Society 5.0. EDUKATIF: Jurnal Ilmu Pendidikan. 4(2). 3011-3024. https://doi.org/10.31004/edukatif.v4i2.2589

Insani, D., dkk., (2023). Kreativitas Guru Di Abad 21 Dalam Mengatasi Kejenuhan Belajar Matematika Siswa. Jurnal Cendekia: Jurnal Pendidikan Matematika, 7(2), 1532–1545. https://doi.org/10.31004/cendekia.v7i2.4796

Masfiastutik, S. dkk. (2024). Penerapan Pendekatan CRT Pada Materi Pecahan Untuk Meningkatkan Hasil Belajar Siswa Kelas II SD. Journal of Science and Education Research. 3(2). https://doi.org/10.62759/jser.v3i2.134

Muliawan, U., & Nasution, R. (2024). Integrating Mathematics, Community, Culture, And Place: A Conceptual Framework For Instructional Design. Journal of Education, Teaching and Learning, 9(1), 12–23. https://doi.org/10.26737/jetl.v9i1.4859

Nuriyah, S., dkk., (2025). Eksplorasi Etnomatematika Pada Tari Lukat Karya Komunitas Seni Damar Art Banyuwangi. Jurnal Math-UMB.EDU, 12 (3), 2025

Nuryanti1, Diah, dkk. (2024). Pengembangan Modul Ajar Materi Bentuk Aljabar Berbasis Etnomatematika. Jurmadikta. Jurnal Mahasiswa Pendidikan Matematika. 4(2), 44-53. http://dx.doi.org/10.20527/jurmadikta.v4i2.2449

Plomp, T., & Nieveen, N. (2013). Educational design research: introduction and illustrative cases (part a: an introduction). enschede, The Netherlands: SLO, Netherlands Institute for Curriculum Development. 19.

Priyatna, S. & Marsigit, M. (2024). Pengembangan Perangkat Pembelajaran Berbasis Etnomatematika Keraton Yogyakarta Berorientasi Pada Pemahaman Konsep Matematis Siswa. AKSIOMA: Jurnal Program Studi Pendidikan Matematika. 13(2), 458-468. http://dx.doi.org/10.24127/ajpm.v13i2.8825

Puspitasari, R, Y., & Airlanda, G, S. (2021) Meta-analisis pengaruh pendekatan pendidikan matematika realistik (PMR) terhadap hasil belajar siswa sekolah dasar. Jurnal Basicedu, 5(2), https://doi.org/10.31004/basicedu.v5i2.878

Putri, W, A., Alpusari, M., & Fendrik, M. (2024). Pengembangan Modul Ajar Berbasis Etnomatematika Pada Materi Geometri Untuk Siswa Sekolah Dasar 3. Didaktik : Jurnal Ilmiah PGSD FKIP Universitas Mandiri. 10(1). https://doi.org/10.36989/didaktik.v10i1.2730

Rahman, M. (2021). Pengaruh LKPD Kontekstual Terhadap Peningkatan Minat Belajar, Tirai Edukasi. 4(2). 103–105.

Salirawati, D. (2004). Kontekstual Sains Kimia untuk SMP kelas IX. Jakarta: Erlangga.

Selviana, M, T. dkk. (2024). Penerapan Pendekatan Culturally Responsive Teaching Untuk Meningkatkan Pemahaman Konsep Berbantuan Geogebra (Materi Persamaan Garis Singgung Lingkaran Kelas X SMK). Jurnal Pendidikan Tambusai, 8(2).

Surya, M. (2014). Psikologi guru: konsep dan aplikasi . Bandung: Alfabeta, 2014.

Wulandari, E. (2022). Pengaruh LKPD Menarik Terhadap Motivasi Belajar Siswa, Jurnal Pendidikan dan Inovasi, 6 (1). 88–90