JURNAL PENDIDIKAN DAN PENGAJARAN
Volume 57 Nomor 2 2024, 457-468
E-ISSN: 2549-2608; P-ISSN: 2301-7821
DOI: https://doi.org/10.23887/jpp.v57i2.75767

Traditional Ethnomathematics Games: Integrated Learning Tools to Improve Understanding of Mathematical Concepts

Lora Devian[1*], Ahmad Fauzan[2], Syafri Ahmad[3], Melva Zainil[4], Nevi Novelita[5]

[1,2,3] Universitas Negeri Padang, Padang, Indonesia
*Corresponding author: loravian3@gmail.com

Abstrak

Pemahaman konsep matematis belum sesuai dengan yang diharapkan. Siswa mengalami kesulitan dalam mempelajari konsep matematika. Berdasarkan hal tersebut, maka tujuan penelitian ini yaitu untuk mengembangkan perangkat pembelajaran terintegrasi etnomatematika permainan tradisional. Jenis penelitian ini yaitu penelitian pengembangan dengan menggunakan model pengembangan Plomp dengan tiga tahap. Subjek dalam penelitian pengembangan ini meliputi validator instrumen; validator ahli (2 ahli materi, 1 ahli bahasa, dan 1 ahli budaya); guru sebagai ahli praktisi; peserta didik kelas III di tiga sekolah dasar. Metode yang dilakukan dalam pengumpulan data adalah observasi, wawancara, angket dan tes. Instrumen pengumpulan data yaitu lembar kuesioner dan soal tes. Teknik analisis data dilakukan secara kualitatif dan kuantitatif dan statistik inferensial. Hasil penelitian yaitu pertama, hasil validasi dari para ahli dengan kategori sangat valid. Kedua, hasil praktikalitas peserta didik dengan kategori sangat praktis. Ketiga, hasil praktikalitas guru dengan kategori sangat praktis. Hasil uji N Gain score menunjukan peningkatan hasil belajar dengan pengembangan LKPD terintegrasi etnomatematika pada materi operasi hitung bilangan cacah terhadap pemahaman konsep matematis pada peserta didik kelas III SD. Disimpulkan bahwa perangkat pembelajaran terintegrasi etnomatematika pada materi operasional hitung bilangan cacah sangat valid dan sangat praktis untuk meningkatkan pemahaman konsep matematis peserta didik kelas III sekolah dasar. Implikasi penelitian ini yaitu perangkat pembelajaran terintegrasi etnomatematika permainan tradisional yang dikembangkan dapat digunakan dalam pembelajaran.

Kata Kunci: *Perangkat Pembelajaran, Terintegrasi Etnomatematika, Pemahaman Konsep*

Abstract

Understanding of mathematical concepts is different than expected. Students need help learning mathematical concepts. Based on this, this research aims to develop an integrated learning tool for the ethnomathematics of traditional games. This type of research uses the Plomp development model with three stages. Subjects in this development research include instrument validators, expert validators (2 material experts, 1 language expert, and 1 cultural expert), teachers as expert practitioners, and third-grade students in three elementary schools. The methods used in collecting data were observation, interviews, questionnaires and tests. Data collection instruments are questionnaire sheets and test questions. Data analysis techniques were carried out qualitatively and quantitatively, as well as inferential statistics. The research results are validation results from experts in the very valid category. Second, the practical results of students are in the convenient category. Third, the results of teacher practicality are in the convenient category. The results of the N Gain score test show increased learning outcomes by developing an integrated worksheet on ethnomathematics on whole numbers counting operations to understand mathematical concepts in class III elementary school students. It was concluded that the integrated learning tools for ethnomathematics in the operational material for calculating whole numbers were valid and practical for increasing the understanding of mathematical concepts for class III elementary school students. This research implies that the traditional game ethnomathematics integrated learning tools developed can be used in learning.

Keywords: Learning Tools, Integrated Ethnomathematics, Understanding Concepts

History:
Received : February 20, 2024
Accepted : July 06, 2024
Published : July 25, 2024

Publisher: Undiksha Press

1. INTRODUCTION

Learning is a process of interaction between students, teachers and learning resources in a learning environment. Learning can also be said to be a conscious effort to apply and apply the skills possessed to achieve learning goals (Prasetya & Syahrial, 2018; Rositayani & Surya Abadi, 2019). Quality learning implies an interactive process between students, educators, teaching materials, learning environment and other resources that support optimizing the development of students' potential. The learning process must be meaningful

so that learning objectives can be achieved well (Amirudin & Seju, 2018; Fauzan et al., 2020; Suriadi et al., 2021).The learning process must be carried out in an innovative, interactive, fun and motivating way so that students can participate in developing their abilities in learning mathematics (Cecep et al., 2019; Hastuti et al., 2018; Kartika et al., 2019).Mathematics is a science that is very useful in all aspects of life. This subject contributes to achieving national education goals and developing productive, creative and innovative human resources (Chandra & Royanto, 2019; Ilmi et al., 2021; Wang et al., 2023).

However, in reality, understanding of mathematical concepts is not as expected. Previous research findings show that students are less able to understand mathematical concepts by showing that students understand mathematical concepts in the high category as much as 3%, in the medium category as much as 10%, and in the low category as much as 87%.(Fajar et al., 2019).Other research also confirms that there are still many students who get low mathematics learning outcomes (Astuti, 2018; Purba & Harahap, 2022; Wulandari et al., 2020). This problem was also found in Cluster III, Ampek Nagari District, Agam Regency. The results of the interviews found that mathematics learning material on counting whole number operations was learning that had started with the real world context of students doing addition, subtraction, multiplication and division. However, the presentation of material to students is still dominated by educators, so that students do not find for themselves how to solve problems in counting whole number operations. As a result, students often forget what they have learned, learning becomes uninteresting and boring.

The results of the analysis of daily tests for Theme 4 class III also found that students had not achieved the specified criteria, which indicated that the learning objectives had not been achieved. The results of interviews with educators showed that students had difficulty solving these questions because students were not fluent in explaining the material that had been discussed, students' understanding of mathematical concepts was short-term. The educator also said that he often lacked ideas for developing learning in the classroom. The lesson plans that educators have are learning plans prepared by the educators themselves, but are not fully implemented in the lesson. Results of needs analysisFrom both the perspective of educators and students, it is concluded that there is a need to develop learning tools that are interesting and close to students' lives so that they can increase students' understanding of mathematical concepts.

One solution to improve the ability to understand interesting concepts in arithmetic operations is to carry out learning activities that are fun and close to students' daily lives, namely traditional games.Traditional games contain cultural values such as fun, freedom, democracy, leadership, togetherness, honesty and sportsmanship (Lumbin et al., 2022; Nurwahidah et al., 2021; Pertiwi et al., 2018).In addition, learning activities are made closer to students' lives, such as involving culture in the environment so that they can foster students' interest and motivation in learning (Aini & Fathoni, 2022; Maharani et al., 2018). Therefore, it is necessary to have a learning approach that links local culture in mathematics learning, which is then called Ethnomathematics.

Ethnomathematicsis an alternative in bridging students' understanding of mathematical concepts through learning with culture and everyday life in the surrounding environment (Anam et al., 2019; Mahendra, 2017; Widiantari & Suparta, 2022). One culture that can be used as an object for ethnomathematics learning is traditional games. An interesting traditional game that can be played in groups and is fun is the game of balancing lots of stones, lots of stones (Nugraha & Manggalastawa, 2021; Nurwahidah et al., 2021; Suyeni et al., 2016). Therefore, this balancing game is very appropriate to apply in learning because it contains educational value which makes the learning process not monotonous. The traditional game of Simbang Batu Banyak is very possible to use as a context for learning mathematics, because it has many benefits for children, especially in terms of learning

mathematics (Balqis, 2019; Musjalanun et al., 2019). In this game, children can learn counting operations on whole numbers and whole numbers, namely addition, subtraction, multiplication and even division. Apart from that, this game introduces children to the shape of space, namely balls.

Previous research findings state that well-developed learning tools can maximize student learning outcomes (Rahayu & Festiyed, 2018; Setyasto & Wijayama, 2017). Other research also states that ethnomathematics-based learning can make it easier for students to learn mathematics (Fauzi & Lu'luilmaknun, 2019; Muhammad et al., 2021; Utami et al., 2018). The development of learning tools that integrate ethnomathematics shows that the category is very practical and effective (Badariah et al., 2022; Erni Hastuti & Fauzan, 2022).Based on this, it can be concluded that an integrated learning tool for traditional ethnomathematics games is needed to improve understanding of mathematical concepts. However, there has been no study regarding the development of integrated learning tools for ethnomathematics in traditional games.Learning tools that are integrated through culture using an ethnomathematics approach are really needed because they help students discover mathematical learning concepts.Based on this, the aim of this research is to develop an integrated learning tool for ethnomathematics of traditional games.

2. METHODS

This type of research is research & development (R&D). The development stages are divided into three phases, namely the initial investigation phase, the development or prototyping phase, and the assessment phase (Plomp & Nieveen, 2013).In the initial investigation phase (preliminary research), research was carried out at SDN 06 Balai Badak, SDN 16 Kampung Parit, and SDN 09 Kampung Melayu. The activities carried out in this phase are analyzing problems and studying literature. The result of this stage is a prototype design. The prototype development phase (development or prototyping phase), the activities carried out at this stage are trials and revisions based on formative evaluation. Next, the assessment phase is assessing the effectiveness of the product.

The subjects in this research include instrument validators; expert validators (2 material experts, 1 language expert, and 1 cultural expert); teachers as expert practitioners; Class III students in three elementary schools, namely SD Negeri 09 Kampung Melayu as subjects in large groups consisting of 15 people, SD N 16 Kampung Parit as small groups, namely one to one and small groups. SD N 06 Balai Badak was one of the schools taken for the initial investigation phase (preliminary research). The methods used in collecting data were observation, interviews, interviews and tests. Observation and interview methods are used to find out problems that occur in the field related to learning. The questionnaire method is used to collect data in the form of assessment results given by experts, teachers and students. The test method is used to measure the effectiveness of the ethnomathematics integrated student worksheet (LKPD). Data collection instruments are questionnaire sheets and test questions. The research instrument grid is presented in Table 1, and Table 2.

Table 1. The Aspects of RPP Aspects Validated by Experts

Rated aspect	Objective
RPP components and format RPP identity Indicators of Competence Achievement Learning objectives Teaching materials Learning approaches, models and methods Learning steps Learning Resources Evaluation Language and writing	To determine the construct validity of the ethnomathematics integrated lesson plan that has been designed to obtain information about the inclusion of all aspects of the development of the ethnomathematics integrated lesson plan

Table 2. The Aspects of LKPD Aspects Validated by Experts

Rated aspect	Objective
Aspel Content/Material Linguistic Aspect Presentation Aspect Graphic Aspect	To determine the validity of the Ethnomatics integrated LKPD that has been designed, obtain information about the inclusion of all aspects of the development of the Ethnomathematics integrated LKPD

Data analysis techniques were carried out qualitatively and quantitatively and inferential statistics. This data analysis technique includes analysis at the preliminary stage or initial investigation phase, validity data analysis from experts, and practicality analysis in the form of observation sheets and questionnaires. The activities carried out in this data analysis are reducing the data, presenting the data and drawing conclusions. Inferential statistics are used to analyze product effectiveness. The effectiveness of a product is measured to see whether or not there is an effect or influence of the device being developed on students. The effectiveness test is carried out to determine whether the Learning Tools can be used to achieve effective learning objectives in improving the quality of learning.

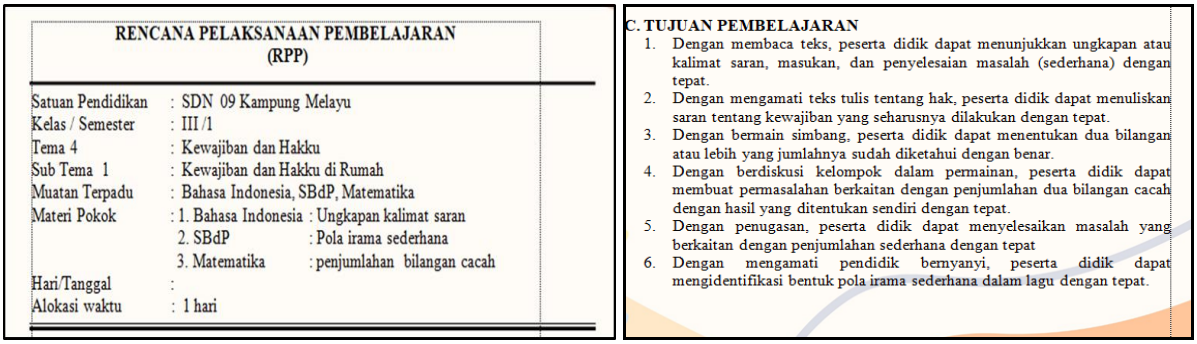
3. RESULTS AND DISCUSSION

Result

The results of research on the development of integrated learning tools for traditional ethnomathematics games in class III elementary school using the Plomp development model which consists of 3 stages, namely the initial investigation stage (preliminary research), the development or prototyping phase (development or prototyping phase), and the assessment stage (assessment phase). The first, the initial investigation phase. In this phase, analysis was carried out at 3 schools in cluster 3 of Ampek Nagari District, Agam Regency, namely SD Negeri 06 Balai Badak, SD Negeri 16 Kampung Parit, and SD Negeri 09 Kampung Melayu. The analysis activities carried out were needs analysis, curriculum analysis, concept analysis, student analysis, and ethno-mathematical analysis of the traditional game Simbang Batu Banyak. The results of the analysis are that educators have difficulty implementing interesting strategies for enjoyable mathematics learning. Educators have designed lesson plans in accordance with the 2013 curriculum, but they are still in a general form, the activities or steps taken are not very clear which are close to students' daily lives, and the implementation of the lesson plans has not been implemented well. LKPD is not always used in every lesson, it is more about carrying out the practice exercises in the student's packet book

Based on the results of the student questionnaire, information was obtained that students were familiar with many traditional games, including the game of balancing many stones with many stones. For this reason, researchers looked for learning resources and literature regarding the elements of the traditional game Simbang Batu, many of which are known to students, which can be integrated into mathematics learning. Many of the elements contained in each traditional game of Simbang Batu can be integrated into mathematics learning after analysis is carried out according to Bishop's classification, namely Counting, Locating. and Playing (playing). This is very appropriate to the age phase and character of students in class III in fun learning mathematics.

The second, Prototype development phase (development prototyping phase). At this stage, the activities carried out were designing learning tools in the form of lesson plans and LKPD integrated with ethnomathematics. The traditional game of Simbang Batu Banyak for operational material for Class III mathematical whole numbers. The integrated ethnomathematics learning implementation plan (RPP) for the traditional game Simbang Batu is prepared in as much detail as possible and systematically so that it is easy for teachers to understand and implement at school. This RPP was prepared referring to Minister of Education and Culture Regulation number 22 of 2016. The design of the RPP for Mathematics for class III integrated with ethnomathematics is presented in Figure 1.



RENCANA PELAKSANAAN PEMBELAJARAN
(RPP)

Satuan Pendidikan	: SDN 09 Kampung Melayu	
Kelas / Semester	: III /1	
Tema 4	: Kewajiban dan Hakku	
Sub Tema 1	: Kewajiban dan Hakku di Rumah	
Muatan Terpadu	: Bahasa Indonesia, SBdP, Matematika	
Materi Pokok	: 1. Bahasa Indonesia	: Ungkapan kalimat saran
	2. SBdP	: Pola irama sederhana
	3. Matematika	: penjumlahan bilangan cacah
Hari/Tanggal	:	
Alokasi waktu	: 1 hari	

Figure 1. Results of Ethnomathematics Integrated RPP Design

Student Worksheets (LKPD) integrated with ethnomathematics of the traditional game Simbang Batu Banyak are designed in accordance with the scientific approach and ethnomathematics learning approach with the characteristics of the LKPD developed which consists of first, a cover which already illustrates that the LKPD developed has integrated ethnomathematics of the traditional game Simbang Batu Banyak. The images and colors are in accordance with the wishes of the students, the letters that are easy to read are Times New Roman with size 16. The dominant colors in this LKPD are white, orange and blue which are expected to be able to create an active, interesting and enthusiastic learning atmosphere. The instructions for the LKPD that integrate ethnomathematics contain steps that require students to work in groups and discuss, so that students are able to practice communication well, retell events that occurred in activities related to culture so that they are able to increase understanding of mathematical concepts in class. III Elementary School. The development of an integrated ethnomathematics Student Worksheet (LKPD) is presented in Figure 2.

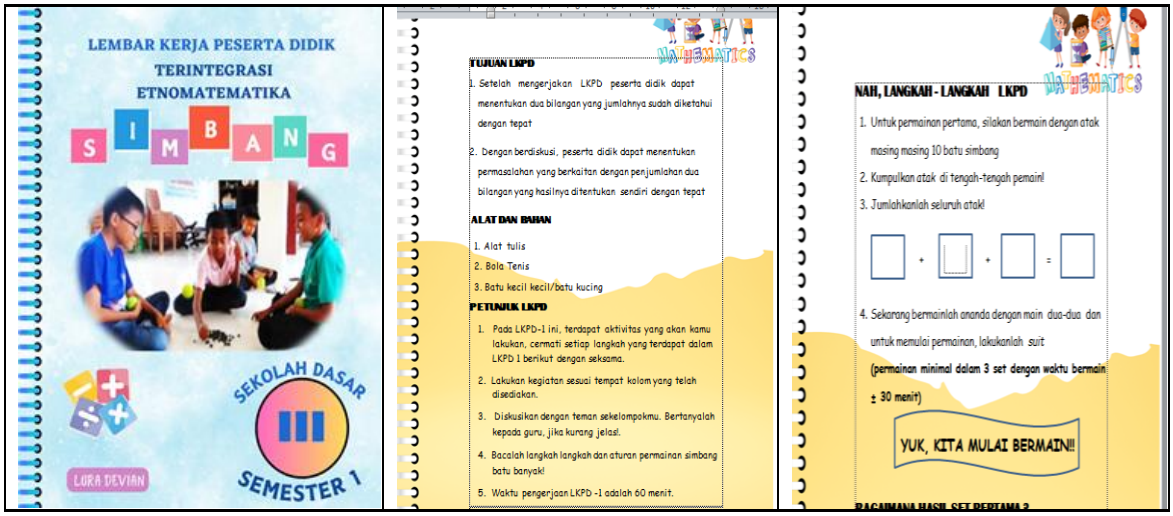


Figure 2. Results of Ethnomathematics Integrated LKPD Development

The third,Assessment phase (Assessment Phase). Third, the assessment phase. In this phase, validation of ethnomathematics integrated learning tools that have been developed by experts, teachers and students is carried out. Based on the results of the development of an integrated learning tool for ethnomathematics of the traditional game Simbang Batu Banyak in the material on operations for calculating whole numbers, starting from making designs, validating the presentation and appropriateness of the content, language and graphics of learning tools in the form of lesson plans and LKPD for mathematicians, Indonesian language experts, art experts, and elementary school teachers/practitioners. The results of the RPP assessment were validated by mathematicians, language experts, and one elementary school teacher/mathematics practitioner with the results presented in Table 3.

Table 3. The Expert Validation Results Regarding the Learning Implementation Plan (RPP)

Expert	Average Value	Information
Mathematician I		
Mathematician II	3.55	Very Valid
Indonesian Language Expert	3.45	Valid
Elementary School	3.50	Very Valid
Teacher/Mathematics Practitioner	3.55	Very Valid

The RPP validation result given by mathematician I was 3.55 so it was categorized as very valid. The assessment results given by mathematician II were 3.45 which was categorized as valid. The assessment results given by language experts were 3.50, including the very valid category. The assessment from elementary school teachers/practitioners gave a score of 3.55 in the very valid category. Based on the results of the validator, many ethnomathematics integrated learning tools for the traditional game Simbang Batu have been developed that are suitable for use in learning. Furthermore, the LKPD assessment, validated by mathematics experts, Indonesian language experts, arts and culture experts, and elementary school teachers/mathematics practitioners, is presented in Table 4.

Table 4. The Expert Validation Results Regarding Student Worksheets (LKPD)

Expert	Average Value	Information
Mathematician I		
Mathematician II	3.68	Very Valid
Indonesian Language Expert	3.52	Very Valid
Arts and Culture expert	3.75	Very Valid
Elementary School	3.67	Very Valid
Teacher/Mathematics Practitioner	3.68	Very Valid

The LKPD assessment results from mathematicians, language experts, arts and culture experts, and from elementary school teachers/mathematics practitioners are ≥ 3.50, which means the LKPD is in the Very Practical category. It was concluded that the LKPD integrated with the ethnomathematics of the traditional game Simbang Batu Banyak is very valid and suitable for use in learning. Next, the Ethnomathematics Integrated LKPD is tested for practicality by students. The results of the individual trials obtained a score of 90.25, so getting a very practical qualification. The results of the small group trial were 93.05 so getting a very practical qualification. It was concluded that the LKPD integrated traditional game ethnomathematics in number counting operations material was very practical to use.

The LKPD integrated ethnomathematics into whole number counting operations and then tested its effectiveness using the T-test. The results of the data normality test obtained a value of 0.93 > 0.05, so the data was normally distributed. The homogeneity test result is 0.073, so 0.073 > 0.05 so the data is homogeneous. Next, a t-test was carried out. The results of data analysis obtained a significance value of 0.000, so that 0.000 < 0.05. Based on these results, there is an influence of ethnomathematics integrated LKPD on whole number counting operation material on the understanding of mathematical concepts in class III elementary school students.

Discussions

The results of data analysis show that the RPP and LKPD developed received very good qualifications from experts and practitioners. This is caused by several factors, namely as follows. First, the developed ethnomathematics integrated lesson plan makes it easier for teachers to carry out mathematics learning activities. Ethnomathematics integrated lesson plans make it easier for teachers to carry out learning activities because the lesson plans can be adapted to the culture and reality around students. This causes learning activities to become more relevant and interesting for students (Noto et al., 2018; Rewatus et al., 2020; Widiantari & Suparta, 2022). Previous research findings also confirm that lesson plans that are developed in accordance with student characteristics and learning will facilitate learning activities (Hernawati, 2016; Mawardini & Ningsih, 2022; Salim Nahdi & Cahyaningsih, 2018). Apart from that, ethnomathematics can also help teachers develop students' critical thinking skills through the application of mathematics in local cultural contexts, so that the learning process becomes more meaningful and effective (Ishartono & Ningtyas, 2021; Nur et al., 2020). It was concluded that the integration of ethnomathematics in lesson plans can improve the quality of mathematics learning and student involvement in the learning process.

Second, LKPD integrated with ethnomathematics can make it easier for students to learn. Ethnomathematics integrated LKPD can make it easier for students to learn because the LKPD is adapted to the culture around the students. This causes students to more easily understand the mathematical concepts being taught (Aini & Fathoni, 2022; Purwasi & Fitriyana, 2020).Apart from that, ethnomathematics LKPD also helps students develop creative skills through the application of mathematics in local cultural contexts. This makes it

easier for students to relate mathematical concepts to everyday life (Gustin et al., 2020; Sari et al., 2020).Previous research also states that integrating ethnomathematics in learning will make it easier for students to understand mathematical concepts (Herawaty et al., 2020; Ishartono & Ningtyas, 2021; Nur et al., 2020).It was concluded that the integration of ethnomathematics in LKPD can increase students' interest and motivation in learning mathematics and make it easier for students to understand the mathematical concepts being taught..

Third, the RPP and LKPD are integrated with ethnomathematics to create a pleasant learning atmosphere. A pleasant learning atmosphere in integrated ethnomathematics learning includes several aspects that can increase student involvement and interest in learning mathematics (Hayu et al., 2023; Putra & Mahmudah, 2021). Ethnomathematics integration makes mathematics material more relevant and interesting for students because it combines mathematical concepts with local culture (Irawan & Kencanawaty, 2017; Ishartono & Ningtyas, 2021; Nur et al., 2020). Ethnomathematics integration can increase students' motivation towards learning mathematics because it makes learning more meaningful and interesting. Apart from that, the use of ethnomathematics-based LKPD can also create a more interactive and interesting learning atmosphere for students.

Previous research also states that creative use of LKPD can make it easier for students to learn independently (Aini & Fathoni, 2022; Gustin et al., 2020). Other research findings also confirm that LKPD are adapted to the local cultural context and students' experiences, so that learning becomes more relevant and meaningful (Sari et al., 2020; Septian et al., 2019). It can be concluded that the use of RPP and LKPD integrated with ethnomathematics can make it easier for students to learn mathematics. Understanding concepts at primary school level is very important, because it forms the basis for further understanding in various subjects and students' daily lives. The limitation of this research is that the development of learning tools is only intended for third grade elementary school students and specifically for mathematics lessons. The implication of this research is that the development of integrated ethnomathematics learning tools. Traditional games can make it easier for students to learn mathematical concepts. The results of this research can be used as context in designing mathematics learning tools so as to create mathematics learning designs that are fun and close to students' daily lives so that they can increase students' understanding of mathematical concepts.

4. CONCLUSION

Ethnomathematics integrates learning tools. The traditional game of Simbang Batu has a very valid validity category. These results provide an illustration that the product developed has very valid characteristics in the aspects of content, language, didactics, and presentation, as well as graphics, so that it is suitable for application in learning data presentation in Class III elementary school. Based on the stages of developing learning tools and trials, very practical results were obtained, and the results of teacher practicality were in the very practical category. The results of the t-test also show that there is an influence of ethnomathematics-integrated LKPD on whole number counting operations material on the understanding of mathematical concepts in class III elementary school students. It was concluded that the LKPD integrated ethnomathematics into whole number counting operations material could improve understanding of mathematical concepts.

5. REFERENCES

Aini, H. N., & Fathoni, A. (2022). Pengembangan Lembar Kerja Peserta Didik (LKPD) Matematika Berbasis Budaya Lokal Siswa Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 6167–6174. https://doi.org/10.31004/basicedu.v6i4.3191.

Amirudin, A., & Setuju, S. (2018). Development of multimedia-based learning media interactive on a subject of cooling systems in Vocational School of Industry Yogyakarta. *Jurnal Taman Vokasi*, *6*(2), 176. https://doi.org/10.30738/jtv.v6i2.4169

Anam, A. C., Surabaya, U. N., Abdussakir, A., Islam, U., Maulana, N., Ibrahim, M., & Rofiki, I. (2019). Integrasi Etnomatematika Dengan Model Pembelajaran Probing-Prompting Untuk Melatih Komunikasi Matematis Siswa. *MaPan: Jurnal Matematika dan Pembelajaran*, *7*(1), 20–21. https://doi.org/10.24252/mapan.2019v7n1a1.

Astuti, A. (2018). Penerapan Realistic Mathematic Education (Rme) Meningkatkan Hasil Belajar Matematika Siswa Kelas Vi Sd. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *2*(1), 49–61. https://doi.org/10.31004/cendekia.v2i1.32.

Badariah, B., Pristiwanti, D., & Rosmilawati, I. (2022). Pemanfaatan Permainan Tradisional Bola Bekel dalam Meningkatkan Motivasi dan Hasil Belajar Siswa. *Journal on Teacher Education*, *4*(2), 1252–1259. https://doi.org/10.31004/jote.v4i2.10001.

Balqis, P. (2019). Implementasi Permainan Tradisional Patak Suku dalam Pembelajaran Matematika. *Jurnal Pendidikan Matematika dan Sains*, *7*(1), 10–15. https://doi.org/10.21831/jpms.v7i1.29027.

Cecep, Mutaqin, & Pamungkas. (2019). Pengembangan Modul Quick Math Berbasis Mobile Learning sebagai Penunjang Pembelajaran Matematika di SMA. *Prisma Sains: Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, *7*(2). https://doi.org/10.33394/j-ps.v0i0.1761

Chandra, T., & Royanto, L. R. M. (2019). Pengaruh Math Self-Efficacy dan Math Anxiety terhadap Performansi Matematika pada Siswa Kelas V SD. *Analitika*, *11*(2), 126. https://doi.org/10.31289/analitika.v11i2.2878.

Erni Hastuti, & Fauzan, A. (2022). Pengembangan LKPD Berbasis Pendekatan Etnomatematika Pada Materi Penyajian Data. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, *11*(1), 267–275. https://doi.org/10.33578/jpfkip.v11i1.8711.

Fajar, A. P., Kodirun, K., Suhar, S., & Arapu, L. (2019). Analisis Kemampuan Pemahaman Konsep Matematis Siswa Kelas VIII SMP Negeri 17 Kendari. *Jurnal Pendidikan Matematika*, *9*(2), 229. https://doi.org/10.36709/jpm.v9i2.5872.

Fauzan, A., Tasman, F., & Fitriza, R. (2020). Exploration of Ethnomathematics at Rumah Gadang Minangkabau to Design Mathematics Learning Based on RME in Junior High Schools. *Advances in Social Science, Education and Humanities Research*, *504*, 279–283. https://doi.org/10.2991/assehr.k.201209.234.

Fauzi, A., & Lu'luilmaknun, U. (2019). Etnomatematika Pada Permainan Dengklaq Sebagai Media Pembelajaran Matematika. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *8*(3), 408. https://doi.org/10.24127/ajpm.v8i3.2303.

Gustin, L., Sari, M., Putri, R., & Putra, A. (2020). Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Realistic Mathematic Education (RME) pada Materi Persamaan dan Pertidaksamaan Linear Satu Variabel. *Mathline : Jurnal Matematika dan Pendidikan Matematika*, *5*(2), 111–127. https://doi.org/10.31943/mathline.v5i2.154.

Hastuti, T. D., Sari, D. R., & Riyadi. (2018). Student profile with high adversity quotient in math learning. *Journal of Physics: Conference Series*, *983*(1). https://doi.org/10.1088/1742-6596/983/1/012131.

Hayu, E., Saragih, S., & Kartini. (2023). Pengembangan Modul Matematika Berbasis Etnomatematika Menggunakan Model Problem Based Learning pada Materi

Segiempat dan Segitiga SMP. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *07*(03), 3006–3017. https://doi.org/10.31004/cendekia.v7i3.2633.

Herawaty, D., Widada, W., Adhitya, A., Sari, R. D. W., Novianita, L., & Falaq Dwi Anggoro, A. (2020). Students' ability to simplify the concept of function through realistic mathematics learning with the ethnomathematics approach. *Journal of Physics: Conference Series*, *1470*(1). https://doi.org/10.1088/1742-6596/1470/1/012031.

Hernawati, F. (2016). Pengembangan Perangkat Pembelajaran Matematika Dengan Pendekatan Pmri Berorientasi Pada Kemampuan Representasi Matematis. *Jurnal Riset Pendidikan Matematika*, *3*(1), 34. https://doi.org/10.21831/jrpm.v3i1.9685.

Ilmi, R., Arnawa, I. M., Yerizon, & Bakar, N. N. (2021). Development of an Android-Based for Math E-Module by using Adobe Flash Professional CS6 for Grade X Students of Senior High School. *Journal of Physics: Conference Series*, *1742*(1). https://doi.org/10.1088/1742-6596/1742/1/012026.

Irawan, A., & Kencanawaty, G. (2017). Peranan Kemampuan Verbal Dan Kemampuan Numerik Terhadap Kemampuan Berpikir Kritis Matematika. *AKSIOMA Journal of Mathematics Education*, *5*(2), 110. https://doi.org/10.24127/ajpm.v5i2.669.

Ishartono, N., & Ningtyas, D. A. (2021). Ethnomathematics: An Exploration of Mathematical Concepts in Batik Sidoluhur Solo. *International Journal on Emerging Mathematics Education*, *5*(2). https://doi.org/10.12928/ijeme.v5i2.20660.

Kartika, Y., Wahyuni, R., Sinaga, B., & Rajagukguk, J. (2019). Improving Math Creative Thinking Ability by using Math Adventure Educational Game as an Interactive Media. *Journal of Physics: Conference Series*, *1179*(1), 1–6. https://doi.org/10.1088/1742-6596/1179/1/012078.

Lumbin, N. F., Yakob, R., Daud, N., Yusuf, R., Rianti, R., & Ardini, P. (2022). Permainan tradisional gorontalo ponti dalam menumbuhkan nilai-nilai karakter anak usia 5-6 tahun. *Jurnal Pendidikan Anak*, *11*(1), 52–59. https://doi.org/10.21831/jpa.v11i1.41219.

Maharani, H. R., Ubaidah, N., & Aminudin, M. (2018). Efektifitas Model Concept Attainment Ber-Budaya Akademik Islami Berbantuan Pop-Up Book pada Materi Bangun Ruang Sisi Datar. *Kreano: Jurnal Matematika Kreatif-Inovatif*, *9*(1), 100–106. https://doi.org/10.15294/kreano.v9i1.12693.

Mahendra, I. W. E. (2017). Project Based Learning Bermuatan Etnomatematika Dalam Pembelajar Matematika. *JPI (Jurnal Pendidikan Indonesia)*. https://doi.org/10.23887/jpi-undiksha.v6i1.9257.

Mawardini, I. D., & Ningsih, S. S. (2022). Pembelajaran Matematika Kelas IV Madrasah Ibtidaiyah Masa Pandemi Covid – 19. *Jurnal Basicedu*. https://doi.org/10.31004/basicedu.v6i2.2426.

Muhammad, A. F. N., Marsigit, M., & Soeharto, S. (2021). Konsep luas daerah bangun datar sederhana melalui artefak Candi Borobudur untuk matematika sekolah dasar. *Ethnomathematics Journal*, *2*(2), 43–50. https://doi.org/10.21831/ej.v2i2.39885.

Muslihatun, A., Cahyaningtyas, L., Khaimmudin, R. N. L. H., Fijatullah, R. N., Nisa', E. U., & Sari, C. K. (2019). Pemanfaatan Permainan Tradisional untuk Media Pembelajaran: Congklak Bilangan sebagai Inovasi Pembelajaran Matematika Sekolah Dasar. *Transformasi: Jurnal Pengabdian Masyarakat*, *15*(1), 14–22. https://doi.org/10.20414/transformasi.v15i1.915.

Noto, M. S., Firmasari, S., & Fatchurrohman, M. (2018). Etnomatematika pada sumur purbakala Desa Kaliwadas Cirebon dan kaitannya dengan pembelajaran matematika di sekolah Ethnomathematics at the sumur purbakala Kaliwadas Village of Cirebon and relationship with mathematics learning in school. *Jurnal Riset Pendidikan*

Matematika, *5*(2), 201–210.
Nugraha, Y. A., & Manggalastawa, M. (2021). Pengaruh Permainan Tradisional Terhadap Motivasi Belajar Siswa Pada Pembelajaran Ips Sd. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan dan Hasil Penelitian*, *7*(1), 31–37. https://doi.org/10.26740/jrpd.v7n1.p31-37.
Nur, A. S., Waluya, S. B., Rochmad, R., & Wardono, W. (2020). Contextual learning with Ethnomathematics in enhancing the problem solving based on thinking levels. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, *5*(3), 331–344. https://doi.org/10.23917/jramathedu.v5i3.11679.
Nurwahidah, Maryati, S., Nurlaela, W., & Cahyana. (2021). Permainan Tradisional Sebagai Sarana Mengembangkan Kemampuan Fisik Motorik Anak Usia Dini. *PAUD Lectura: Jurnal Pendidikan Anak Usia Dini*, *4*(02), 49–61. https://doi.org/10.31849/paud-lectura.v4i02.6422.
Pertiwi, D. A., Fitroh, S. F., & Mayangsari, D. (2018). Pengaruh permainan tradisional engklek terhadap perkembangan kognitif anak usia 5-6 tahun. *Jurnal PG-PAUD Trunojoyo: Jurnal Pendidikan dan Pembelajaran Anak Usia Dini*, *5*(2), 86–100. https://doi.org/10.21107/pgpaudtrunojoyo.v5i2.4883.
Plomp, T., & Nieveen, N. (2013). *An Introduction Educational Design Research*. Enshede : Netherlands Institute For Curiculum Development (SLO).
Prasetya, & Syahrial. (2018). Pengaruh model pembelajaran dan minat belajar terhadap hasil belajar statistik. *Jurnal Teknologi Pendidikan*, *20*(2), 87–104. https://doi.org/10.21009/jtp.v20i2.7788.
Purba, Y. A., & Harahap, A. (2022). Pemanfaatan Aplikasi Canva Sebagai Media Pembelajaran Matematika Di SMPN 1 NA IX-X Aek Kota Batu. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1325–1334. https://doi.org/10.31004/cendekia.v6i2.1335.
Purwasi, L. A., & Fitriyana, N. (2020). Pengembangan Lembar Kerja Peserta Didik (Lkpd) Berbasis Higher Order Thinking Skill (Hots). *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(4), 894. https://doi.org/10.24127/ajpm.v9i4.3172.
Putra, E. C. S., & Mahmudah, F. N. (2021). The Implementation of Ethnomathematics Based-Learning for Students. *Supremum: Journal of Mathematics Education*, *5*(2), 162–169. https://doi.org/10.35706/sjme.v5i2.4827.
Rahayu, C., & Festiyed, F. (2018). Validitas Perangkat Pembelajaran Fisika SMA Berbasis Model Pembelajaran Generative Dengan Pendekatan Open-Ended Problem Untuk Menstimulus Keterampilan Berpikir Kritis Peserta Didik. *JPF (Jurnal Pendidikan Fisika) Universitas Islam Negeri Alauddin Makassar*, *7*(1), 1–6. https://doi.org/10.24252/jpf.v7i1.5363.
Rewatus, A., Leton, S. I., Fernandez, A. J., & Suciati, M. (2020). Pengembangan Lembar Kerja Peserta Didik Berbasis Etnomatematika Pada Materi Segitiga dan Segiempat. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *4*(2), 645–656. https://doi.org/10.31004/cendekia.v4i2.276.
Rositayani, N. P. E., & Surya Abadi, I. B. G. (2019). Pengaruh Model Pembelajaran Children'S Learning in Science Berbantuan Media Audio Visual Terhadap Kompetensi Pengetahuan Ipa. *Mimbar Ilmu*, *24*(1), 63. https://doi.org/10.23887/mi.v24i1.17452.
Salim Nahdi, D., & Cahyaningsih, U. (2018). Pengembangan Perangkat Pembelajaran Matematika Sd Kelas V Dengan Berbasis Pendekatan Saintifik Yang Berorientasi Pada Kemampuan Pemecahan Masalah Siswa. *Jurnal Cakrawala Pendas*, *5*(1), 1–7. https://doi.org/10.31949/jcp.v5i1.1119.
Sari, N. M., Pamungkas, A. S., & Alamsyah, T. P. (2020). Pengembangan Lembar Kerja

Peserta Didik Matematika Berorientasi Higher Order Thinking Skills Di Sekolah Dasar. *SJME (Supremum Journal of Mathematics Education)*, *4*(2), 106–123. https://doi.org/10.35706/sjme.v4i2.3406.

Septian, R., Irianto, S., & Andriani, A. (2019). Pengembangan Lembar Kerja Peserta Didik (Lkpd) Matematika Berbasis Model Realistic Mathematics Education. *Jurnal Educatio FKIP UNMA*, *5*(1), 59–67. https://doi.org/10.31949/educatio.v5i1.56.

Setyasto, N., & Wijayama, B. (2017). Penerapan Perangkat Pembelajaran IPS Model TPS dengan Media Video untuk Meningkatkan Karakter, Aktivitas, dan Hasil Belajar Siswa. *Jurnal Pendidikan Teori Dan Praktik*, *2*(2). https://doi.org/10.26740/jp.v2n2.p128-133.

Suriadi, H. J., Firman, F., & Ahmad, R. (2021). Analisis Problema Pembelajaran Daring Terhadap Pendidikan Karakter Peserta Didik. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(1), 165–173. https://doi.org/10.31004/edukatif.v3i1.251.

Suyeni, P. W., Wirya, N., & Ujianti, P. R. (2016). Penerapan Metode Demonstrasi Melalui Permainan Tradisional Magoak-Goakan Untuk Meningkatkan Kemampuan Kerjasama. *Jurnal Pendidikan Anak Usia Undiksha*, *4*(2). https://doi.org/10.23887/paud.v4i2.7805.

Utami, R. E., Nugroho, A. A., Dwijyanti, I., & Sukarno, A. (2018). Pengembangan E-Modul Berbasis Etnomatematika Untuk Meningkatkan Kemampuan Pemecahan Masalah. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *2*(2), 268. https://doi.org/10.33603/jnpm.v2i2.1458.

Wang, H., Chen, Y., Yang, X., Yu, X., Zheng, K., Lin, Q., Cheng, X., & He, T. (2023). Different associations of parental involvement with children's learning of Chinese, English, and math: a three-wave longitudinal study. In *European Journal of Psychology of Education* (Vol 38, Number 1, bll 269–285). https://doi.org/10.1007/s10212-022-00605-0.

Widiantari, K., & Suparta, I. N. (2022). Meningkatkan Literasi Numerasi dan Pendidikan Karakter dengan E-Modul Bermuatan Etnomatematika. *Jurnal Ilmiah Pendidikan Matematika*, *10*(2), 331–343. https://doi.org/10.25273/jipm.v10i2.10218.

Wulandari, N. P. R., Dantes, N., & Antara, P. A. (2020). Pendekatan Pendidikan Matematika Realistik Berbasis Open Ended Terhadap Kemampuan Pemecahan Masalah Matematika Siswa. *Jurnal Ilmiah Sekolah Dasar Universitas Pendidikan Ganesha*, *4*(2), 153–164. https://doi.org/10.23887/jisd.v4i2.25103.