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The Implementation of Ethnomathematics-Based Student Worksheet "Surya Majapahit" on the Circle Elements Material to Build Creative Thinking of Elementary Students

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ABSTRACT

Objective: The application of an ethnomathematics-based student worksheet can be associated with Surya Majapahit's cultural heritage in the material of the elements of a circle. The purpose of this study is to describe the application of Surya Majapahit ethnomathematics-based worksheet as a mathematics learning resource, in addition to knowing the perceptions of teachers and students on the results of the application of Surya Majapahit ethnomathematics-based student worksheet carried out, as well as knowing the effect of applying Surya Majapahit ethnomathematics-based student worksheet in building students' creative thinking skills through the evaluation stage **Method:** This research uses descriptive qualitative research. This study's research subjects were 6th-grade students of Lengkong II Public School, Mojokerto Regency. **Results:** The results of data analysis through material validation in this study show that geometry concepts and values in Surya Majapahit ethnomathematics are seen through values and patterns in each period of government and culture that entered the archipelago. Student learning outcomes show "complete" above the criteria for achieving learning objectives. The results showed an average summative evaluation of 90 and a formative of 92.8, so students can optimize creative thinking skills on local wisdom content with geometry material elements. **Novelty:** The research innovatively incorporates ethnomathematics, precisely the "Surya Majapahit" Circle elements, into elementary school mathematics learning. This cultural integration can enhance students' engagement and understanding of mathematical concepts. The study seeks to foster a more imaginative and innovative approach to creative problem-solving using ethnomathematics and engaging activities.

INTRODUCTION

Mathematics is a field of science that includes measurements, numbers, and symbols (Daga, 2020). The purpose of implementing mathematics learning is to be carried out so that students can understand the concept of counting and more easily understand symbolic material and its benefits for daily activities. Students are the main subject of the purpose of making the learning media. So that students do not only receive information (Kurniawan et al., 2023; Magdalena et al., 2020). However, in learning, there can be active interaction between students, both with teachers and students, as well as students with other students in teaching and learning activities.

Teaching materials support learning and realize the goal of learning mathematics. Teaching materials are all types of resources used by instructors, lecturers, and teachers as teaching materials to help deliver lessons and learning activities in the classroom to achieve mathematics learning goals. Student worksheets are one type of teaching material used by teachers. The student worksheet is a written learning facility

That contains information, two summaries, and instructions to complete the learning tasks needed by students to meet the achievement of essential competencies (BC) (Bilad & Ekawati, 2022; Ekawati et al., 2022; Novferma et al., 2021).

Learner Worksheets (SW) are a form of teaching aid media that can be given to students to deepen their understanding of the material. (Helmina et al., 2022; Oktaviane & Ekawati, 2022; Siami et al., 2023; Wiryanto et al., 2024) The use of SW is increasingly being used, especially in mathematics learning. Based on observations made at Elementary School Lengkong II, its use has several problems, one is that the structure needs to emphasize memorization skills and answer standard questions. As a result, there is less room for students to develop skills in the aspects of the Pancasila Learner Profile Strengthening Project (P5) creative thinking dimension (Budimansyah et al., 2024; Tiyani et al., 2024; Jannah et al., 2024; Rasidah et al., 2024; Waruwu et al., 2024). In addition, some of the content on SW is also considered less contextual. This is inversely proportional to the needs of students, especially in the Merdeka curriculum, where learning is expected to be a valuable experience for students. Hence, it needs to be addressed and innovated by existing developments.

Humans leave behind the creation of cultures that have many different languages and traditions in their societies (de Groot et al., 2023; Surat, 2018). Culture includes politics, language, religious systems, buildings, customs, artworks, clothing, tools, and food. Indonesia is an archipelagic country with a wide variety of tribes and cultures (Rizal & Bahrun, 2022; Asteria et al., 2021; Fatmawati, 2021; Maulidyna et al., 2021; Sinay et al., 2021). This causes cultural differences in each region that need to be considered, especially regarding education and learning. For students to feel the relevance of the subject matter to their own life experiences, the education system must accommodate cultural diversity. Ethnomathematics is one of the learning approaches that can connect the two (Febrianti & Indrawati, 2021).

Ethnomathematics aims to create more relevant, meaningful, and applicable learning in the real world (Risdayanti & Prahmana, 2020). This emerged in response to the need for more contextual education related to students' daily lives (Wiryanto et al., 2024). On the other hand, ethnomathematics includes encouraging local communities and understanding students (Firmandani et al., 2022; Sari et al., 2022). The use of culture means that the community is actively involved in creating and implementing the educational curriculum. By understanding the culture, primarily the culture around the student, educators can embrace different learning styles and ensure that every student has an equal chance of success. Education should not only prepare students for jobs in a growing world, but it should also provide them with knowledge and skills that they can use to face life's challenges. Ethnomathematics aims to build a foundation for sustainable learning that is integrated with several multidisciplinary fields, one of which is mathematics(Age, 2024; Ashari & Alimuddin, 2024; Payadnya et al., 2024; Risnanosanti et al., 2024; Rosa & Orey, 2021).

Talking about the heritage of culture, the researcher will explain the cultural background of the researcher. The researcher comes from Mojokerto, and judging from his place of birth, relatives, and school history, he has resided since 2000. Mojokerto City and Mojokerto Regency are the names of two administrative regions in the Mojokerto region. Jombang Regency borders it to the west; Sidoarjo and Pasuruan Regencies to the east; and Malang Regency to the south. Mojokerto is famous in East Java, the center of the Majapahit kingdom, Trowulan. Mojokerto has much local

wisdom, some of which comes from the Majapahit kingdom (Raharjo et al., 2024; Dew et al., 2022; Ridhoi et al., 2022; Wahyudie et al., 2021; Rachmadyanti et al., 2020). The researcher thinks of connecting learning with Surya Majapahit as a learning resource based on the above cultural problems and ethnomathematical perspectives.

Researchers are familiar with the cultural heritage of the Majapahit Kingdom, including one of the Surya Majapahit. When the Mayor of Mojokerto Hj. Ika Puspitasari, S.E., took office, and Surya Majapahit was revived. Surya Majapahit, rengkik fish, Majapahit boats, and the Mojokerto Square monument are among the many relics that have been raised. According to (Adisukma, 2019), Surya Majapahit has philosophical and sociological meaning about the symbols that govern the universe, people's beliefs about things beyond human power, and the guidelines for human life from birth to confrontation with God. Surya Majapahit is one of the Hindu-Buddhist symbols Majapahit uses. Mandala is a majapahit ornamentic concept related to Hindu-Buddhism (Eka Putri et al., 2023). Surya Majapahit is one of the relics placed in a strategic area that can be seen by many Mojokerto people, one of which is the gate of public buildings, ornaments on the walls of government buildings, and located in the city center so that Surya Majapahit is expected to provide a contextual approach that is close to students.

Using Surya Majapahit is expected to increase students' interest in learning mathematics by associating it with local history and culture. Surya Majapahit is integral to Indonesia's rich and magnificent history (Cahyono et al., 2024; Mandaka et al., 2024; Seriadi et al., 2024). The existence of the Majapahit Kingdom as the largest kingdom in the archipelago reflects the glory and cultural richness that is a national pride. Investigating values philosophically and characteristically is essential to shaping the personality of diverse students. However, Surya Majapahit can be abstracted through existing patterns to learn the elements of the circle. In the context of Surya Majapahit, it can provide a deep understanding of how Indonesian culture has developed and contributed to world civilization. The Indonesian educational curriculum emphasizes the importance of mastering mathematical concepts at the elementary level, including the concept of geometry in building circles (Zahra et al., 2024; Widodo et al., 2024).

Several similar studies show the importance of instilling the aspects contained in ornaments in both student worksheets to improve learning activity quality. Research by (Rosmana et al., 2024) developing appropriate teaching materials is one step to meet independent curricula's challenges. By creating exciting and creative teaching materials, teachers can use them in learning activities. One of the types of teaching materials is the Learner Worksheet (SW). This study is a literature review of various publications from various sources, such as journal articles and books. The results of the study show that in the learning process, teaching using SW can promote the effectiveness of learning because the basic abilities of learners can be awakened and correspond to the competence indicators (Sari et al., 2024; Widianti et al., 2024; Elfrida et al., 2023; Sinaga et al., 2023; Zulyusri et al., 2024).

Other research contained both student worksheets based on Ethnomathematics by Nisa (2024). This study aims to develop an interactive Student Worksheet (SW) that combines local culture with mathematical concepts. It was created using Canva and Liveworksheet to overcome students' difficulties connecting the two. The validation results show that this SW is very feasible for learning.

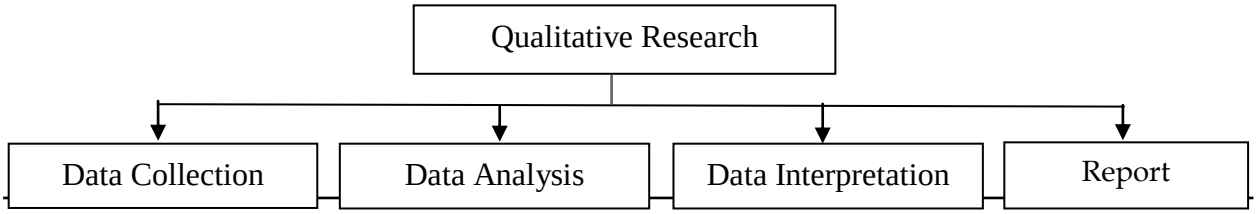
Other research in implementing student worksheets with mathematics realism and ethnomathematics was presented (Wiryanto et al., 2024) and grounded in the Ethnomathematics of the traditional Gedrik game in teaching the concept of area of flat shapes. By incorporating contextual learning activities based on the Gedrik game, such as cutting, measuring, calculating, and comparing, the research aims to enhance student understanding. The findings indicate a strong alignment between the Actual Learning Trajectory and the Hypothetical Learning Trajectory, suggesting that the RME-based student worksheets effectively facilitate students' comprehension of area concepts (Khairunnisak et al., 2024; Wawro et al., 2023; Ningtyas et al., 2022).

Other that discusses mathematics reasoning, especially in creative thinking (Yulaichah et al., 2024). To enhance students' critical and creative thinking, mathematics can be taught using a realistic approach that connects to real-life situations (Ismunandar et al., 2024; Winarso et al., 2020). This approach encourages students to apply their knowledge practically, fostering organized and innovative thinking beyond academic subjects. The research demonstrated that using media can significantly enhance students' critical thinking and creativity in mathematics. PjBL significantly outperforms traditional teaching methods to enhance cognitive abilities. PjBL fosters a deeper understanding of mathematical concepts by engaging students in real-world projects and stimulating innovative thinking. These study findings advocate for the widespread adoption of PjBL in elementary education to nurture creative and critical thinkers.

After seeing the results of these various studies, research on implementing SW that can develop creative thinking, especially in the spatial ability of student geometry material, has yet to be developed and is expected to be a novelty in this study. The object of this research is focused on learning activities using Student Worksheets with Surya Majapahit content, where researchers will explore the application of the values contained in Surya Majapahit from time to time using an ethnomathematics approach (Wulandari et al., 2024; Hendriyanto et al., 2023; Lidinillah et al., 2023; Mosimege et al., 2022; Mania et al., 2021). On the other hand, researchers will also see how to implement learning outcomes through Surya Majapahit on elements of a circle elements material using student worksheets. Researchers will see the results of SW implementation by looking at creative answers produced by students. This research carefully tentatively integrates ethnomathematics into elementary mathematics learning, especially the 'Surya Majapahit' circle elements.

RESEARCH METHOD

This type of research is qualitative research. This research was conducted at Lengkong II Public School, Mojokerto Regency. The subjects of the study were 27 Grade 6 students. The necessary data can be obtained through literature studies, observations, interviews, and documentation carried out directly in the field, and the data must be interconnected. This research was conducted to obtain in-depth data or information about Surya Majapahit through a literature study. Furthermore, the material contained in it will be analyzed. This will be the development of materials that can be used in local content-based learning in elementary schools likely in Figure 1.



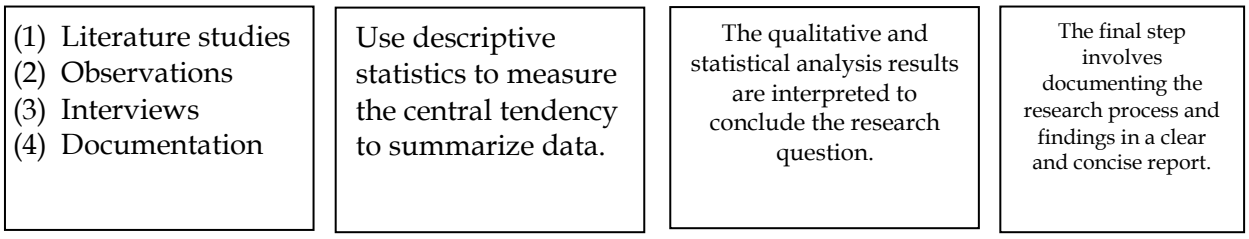


Figure 1. Qualitative research flow.

This study also uses triangulation techniques, which combine several data collection techniques, such as participatory observation, interviews, and document analysis. These techniques support research in the natural environment, i.e., without a setting. This is done to obtain in-depth data and various perspectives. Participatory observation allows researchers to observe and understand what they are doing. In addition, interviews are conducted using a semi-structured approach. This is because the interviews allow the researcher to ask additional questions for more information. Verification is done by combining the study's initial results with the research's final results. The initial conclusions made by the researcher are provisional and may change according to the data and information obtained in the field. However, in contrast to the conclusions made by researchers, they can be considered trustworthy by the facts in the field.

RESULTS AND DISCUSSION

Results

Implementation of Student Worksheet-based Ethnomathematics Surya Majapahit on the Circle Elements Material

a. Learning Plan

Surya Majapahit Cultural Heritage, as an ethnomathematical content, implements learning resources by integrating materials that can be found in thematic learning in elementary schools into the 2013 Curriculum towards the "Merdeka Belajar" Curriculum implemented at Lengkong II Public School, Mojokerto Regency. The 2013 curriculum is a form of integrated learning, and teachers, as curriculum developers, can develop materials using the Competency Standards and Basic Competencies.

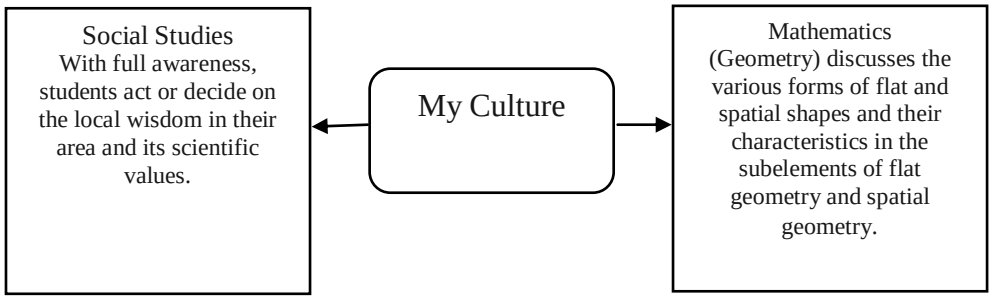


Figure 2. Integration of basic competencies grade 6.

The theme can be determined through cultural identification carried out between teachers and students and selected from things close to students, and this is also integrated with the implementation of the revised "Merdeka Belajar"

curriculum in 2022. The BC selected is adjusted to its connection with the symbolic and philosophical values of Surya Majapahit's motifs/patterns analyzed from various periods. Through the BC that has been mentioned, the following learning objectives are prepared:

3.1 Connecting cultural values in local wisdom with national values.

3.2. Identify the center point, radius, diameter, arc, bowstring, statement, and jurying through the local wisdom of Surya Majapahit.

4.4 Showing the elements of the circle through the abstraction of the geometric concept of the archetype of local wisdom of Surya Majapahit

Diagnostic Assessment can identify students' strengths and weaknesses so that learning can be adjusted to students' abilities and conditions. Based on the results of interviews with class teachers, several data can be used to develop a lesson plan. Application analysis is adjusted to student conditions in the field, as shown in Figure 3.

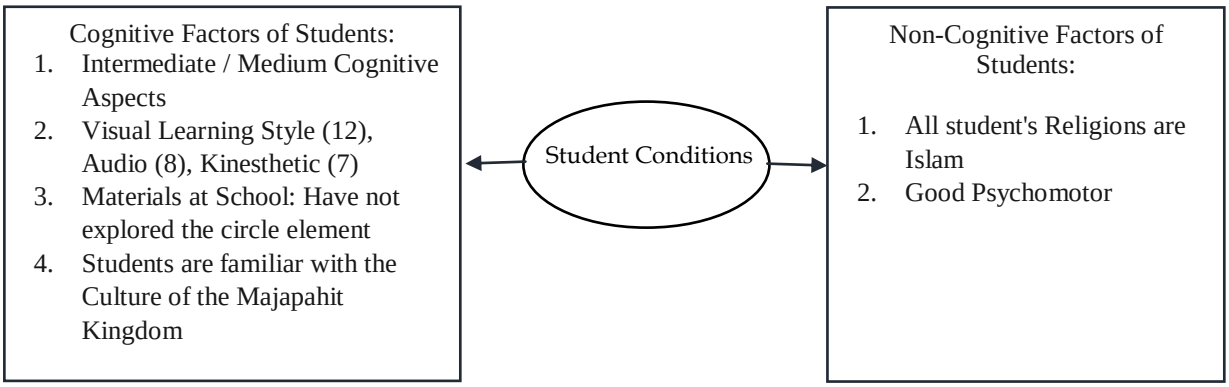


Figure 3. Student conditions before implementation.

From the results mentioned above, the researcher follows up by using the method depicted in Figure 4:

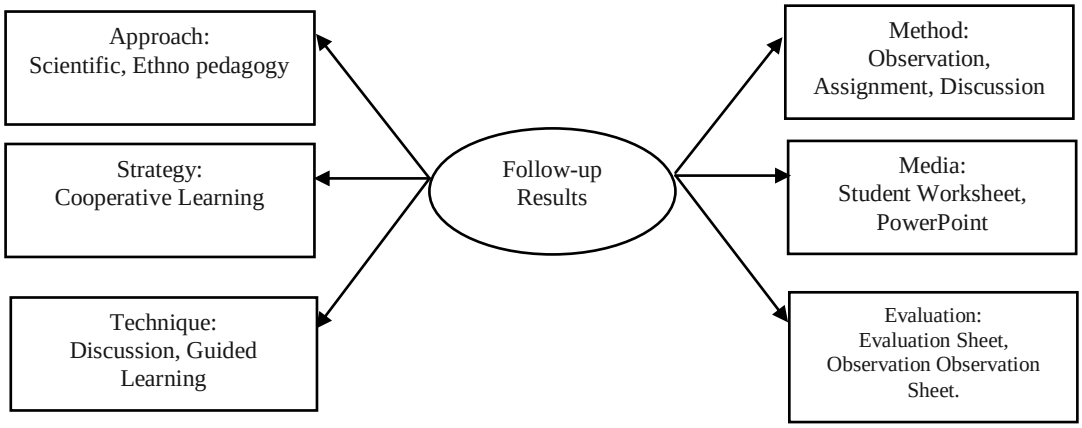


Figure 4. Results of strategy before implementation.

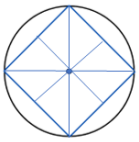
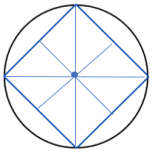
b. Exploration of Student Worksheet-Based Ethnomathematics Surya Majapahit on The Circle Elements Material

The results of the ethnomathematics-based student worksheet exploration in Surya Majapahit had previously been validated by Muhammad Assegaf B, S.Pd,

M.Pd. on November 1, 2023. The elements used are mathematics and material of circle elements integrated with the values of local wisdom of a region. The exploration is illustrated in Table 1:

Table 1. Exploration of ethnomathematics student worksheet Surya Majapahit.

No	Elements of Student Worksheet	The Concept of Local Wisdom	Learning Implementation
1.	Heading	Surya Majapahit and Its Relationship with Circle Elements	Used as a theme to increase student motivation before going to the core of learning
2.	Study Guides	Learning guides are available in several sections of the student worksheet, such as Let's Observe, Let's Understand, Let's Identify, and Let's Explore.	Study instructions help students understand the material and make it easier for them to complete assignments.
3.	General Information		Some of the pictures of the building that show Surya Majapahit were used by Aperception so that students would know the ethnomathematics content raised. Students are given a trigger question to find out how familiar they are with Surya Majapahit
4.	Quick Information:	Majapahit adopted Hindu-Buddhist religious symbols, which refer to the Mandala of Hindu-Buddhist culture. The explanation of Surya Majapahit occasionally also includes the values relevant to the times that can be taken from Surya Majapahit.	Students are invited to learn the content of ethnomathematics before abstracting it into the primary material, namely the elements of circles.
5.	Essential Competencies/Subject Matter:	The basic pattern of Surya Majapahit is seen in its formation. 	Identify the elements of the circle through the Majapahit Solar Design during the time of the queen Tribhuwanna Tungga Dewi by associating them with some geometric archetypes

No	Elements of Student Worksheet	The Concept of Local Wisdom	Learning Implementation
6.	Basic Instructions	 Dokumentasi Peneliti (Gambar 12. Lambang Surya Majapahit) Sekarang perlahan kita buang persegi diluarnya!  Dokumentasi Peneliti (Gambar 13. Pola Abstraksi Surya Majapahit) Sekarang Bandingkan dengan gambar dibawah ini!	Abstraction of archetypes and circle elements through instruction is carried out with the help of the teacher's explanation.
7.	Essential Competencies/Subject Matter:	 	After students identify geometric elements and abstract the elements of Surya Majapahit, then students are invited to abstract the essential pattern elements in the material of circle elements

The implementation was carried out as many as 2 JP, namely 2x35 minutes, on November 6, 2023. Two students could not attend the implementation, so the previously planned subject of 27 was changed to 25. On the other hand, learning is carried out a little by the body after hours, which makes students tired. The implementation began with the following initial activities: (1) The class began by opening with a greeting, (2) Asking for news to check the attendance of students and non-cognitive diagnostic assessments, (3) The class continued with a prayer led by one of the students. (4) Providing motivation, (5) Providing the profile of Pancasila students by singing the national anthem, (6) Perception using the image media of the Surya Majapahit Gate.

Core activities in learning are carried out through 5 stages following the scientific approach: (1) At the stage of observing students, they observe the explanation of the teacher, Surya Majapahit, starting from the philosophy, the form, the pattern, and its values associated with the material of the circle elements, using power point and using of student worksheets. The teacher explained the local wisdom of Surya Majapahit. (2) Next, the stage of asking the teacher provides an opportunity for students to ask about the material to be delivered; students ask the teacher's explanation that they need help understanding the local wisdom of Surya Majapahit. (3) Reasoning: Students try to discuss ethnomathematics with their friends from the learning source Surya Majapahit in the material of values in local culture and circle elements. Students explain the results of the discussion about the elements of the circle with the guidance of the teacher. Teachers provide justification and input on whether things could be improved for students. The teacher stated that the students understood the elements of the circle. (4) Trying at this stage, the teacher gave practice questions on the student worksheet. Regarding the elements of the circle to the students, the teacher asks the students to work on the exercises in groups according to their type of learning style; in addition, the teacher appoints several

students to explain the results of their work in front of the class in turn. (5) Student representatives are asked to present the elements of circles orally to their friends; students convey the benefits of learning the elements performed orally in front of friends and teachers.

Final Activity. In the implementation of the final activity, students were given an evaluation sheet to measure student achievement, after which students and teachers together concluded the learning on this day; students conducted questions and answers with the guidance of teachers students and reflected on learning today, the last thing was a greeting and closing prayer led by one of the students.

Result of Student Worksheet based Ethnomathematics Surya Majapahit on the Circle Elements Material to Enhance Creative Thinking Skills

The evaluation is carried out through 2 stages, namely formative and summative. The summative evaluation assesses the program's success and how far the program goals have been achieved. The researcher sees this through the evaluation sheet. Through the student worksheet, the formative evaluation checks whether the implementation is progressing according to plan and whether there are signs of progress toward learning goals. The student worksheet and evaluation Sheet emphasize creative thinking skills in solving reasoning problems. Each evaluation stage has criteria for indicators of students' creative thinking skills. The following table shows the relationship between the categories of creative thinking and critical reasoning between the three:

Table 2. Application of creative thinking stages to critical thinking aspects.

No	Steps of Skills Applied	Category
1.	In learning activities at Student Worksheet, students examine problems from various perspectives and generate creative solution ideas.	Problem Analysis
2.	In activities on the Student Worksheet, students can solve problems using innovative solutions.	Troubleshoot
3.	Students can consider various options for the most effective solutions through assessment activities.	Making a Decision
4.	Through learning activities, students identify information critically and objectively.	Evaluation

The learning completeness criteria are based on the class, namely KKTP, which follows the school standard of 70. Figure 5 and 6are the results of the summative and formative evaluation carried out.

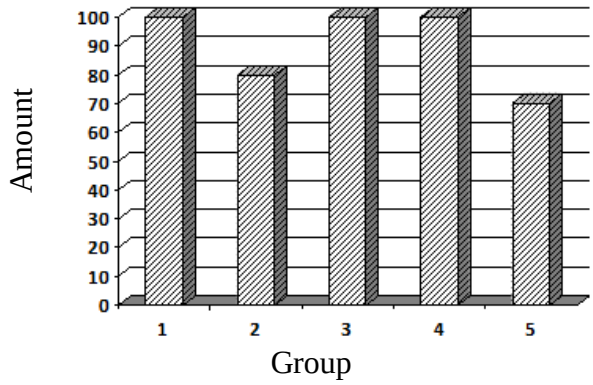


Figure 5. Learning outcomes through student worksheets.

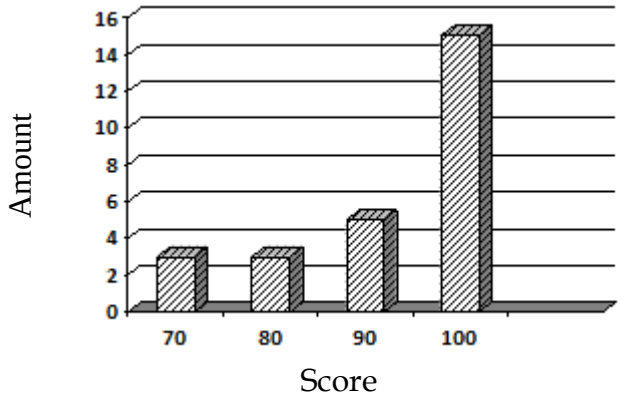


Figure 6. Individual student learning outcomes through evaluation sheets.

Student learning outcomes through formative evaluation through the student worksheet showed an average of 90.0, and summative evaluation through the Evaluation Sheet showed an average of 92.8. Based on the formative completeness of students with 25 students, the percentage is 100.0%. By applying Ethnomathematics of local wisdom Surya Majapahit as a media source, grade VI students are "very complete" because they achieve the completeness of students' learning outcomes above the minimum criteria of learning achievement.

1. *Teacher and Student Response*
   a. *Observation Results*
   1) *Initial Activities*
   Through Apperception :
   HAAD: "*I know you often see it on Jalan Gajah Mada, but I do not know its name.*"
   Students had never known about the name of the symbol of Surya Majapahit but often saw it at gates and government buildings.
   2) *Core Activities*
   During learning:
   Students are interested in the Student Worksheet and the explanations presented because they already know or are familiar with the content of local wisdom.
   3) *Final Activity :*
   Through the conclusion drawn:
   RES: "*Today we learn about Social Studies and Circle Elements*"
   DMS: "*Surya Majapahit teaches about the character of each of its various symbols that can also be used as mathematics lessons*"
   TJ: "*The elements of the circle are obtained from the Majapahit solar pattern*"
   Through Reflection :
   DMS: "*Mam, why don't we use Surya majapahit anymore?*"
   4) *Interview Results*
   It was carried out to determine the teachers' response to this ethnomathematics-based learning process. Code P is for interviewers, (A) is for classroom teachers, and I is for Principals.
   Q: "Responses regarding the learning carried out?"
   A: "For 2 JP time, it is good enough because it integrates culture in its learning so students can also get to know the form of building more flat with the experience of students seeing the culture directly."

Q: "Have you ever done something similar to integrate learning with the culture of the surrounding area?"
A: "I have never included a detailed culture in mathematics learning. But in other lessons, especially during outing classes."
Q: "How enthusiastic are the students you see, especially in learning activities using Ethnomathematics-based Student Worksheet?"
A: "Students are especially enthusiastic about using Student Worksheet because they rarely use similar cultural-based learning in mathematics subjects.."
Q: "To your knowledge, do teachers often do ethnomathematics-based learning?"
I: "If what is meant is about local wisdom often, especially the independent curriculum because we also hold P4."
Q: "How do students respond or show enthusiasm for doing their learning?"
I: "Children tend to be happy, especially for practice-based learning"
Q: "What is your response to the study I did earlier?"
I: "It is more or less the same, so the children look excited, especially using the context of local wisdom. So the children learn mathematics and the values of the major solar."

The results of students' observations during learning showed enthusiasm about the ethnomathematical concepts applied. This can be seen from the students' activeness in answering questions related to Surya Majapahit's learning resources. Students are interested in the Student Worksheet media given to them in the learning process because Surya Majapahit has been encountered in several places. The conclusion provides several suggestions from students about what has been done in the learning process by student representatives. Reflection shows that there is a critical sense of thinking about cultural sustainability so that the problems raised by researchers regarding using culture in learning to preserve culture are answered.

The interviews with teachers and principals at Lengkong II Public School show that ethnomathematics-based learning has been applied in this school. They said the findings were interesting to teach in the classroom, inspired teachers, and added to their insights, especially about ethnomathematics and the local culture and wisdom of Mojokerto. Before this, the two respondents needed to think deeply about applying local wisdom in the classroom using local wisdom media sources. After knowing the connection between the two, the instructor intends to apply it as the learning progresses. Both parties argue that these findings make learning more exciting and interactive and can be associated with cultural literacy. As a result, this learning is thematic and successfully applied in learning.

Discussion

Implementation of Student Worksheet-based Ethnomathematics Surya Majapahit on the Circle Elements Material

At the planning and learning design stages, researchers are aware that when using learning resources through local wisdom, it is necessary to carry out exploration and analysis through literature studies. Surya Majapahit has character values that adapt to the times. This can be seen through the King's reign in the Majapahit Kingdom and other cultures that entered it. (Adijaya et al., 2023; Hidayat & Aripin, 2023). On the other hand, the elements of mathematical abstraction in the material of circle elements also need to be further examined. Therefore, the researcher used material validation from Muhammad Assegaf B, S.Pd, M.Pd., a Nadhatul Ulama University Sidoarjo

lecturer. The validation of this material obtained the percentage obtained through the calculation of the PSP formula of 90%. This statement is supported by the opinion (Sugiyono, 2021) that validity that obtained a percentage between 81 percent and 100 percent was declared "Valid Without Revision." Even though they obtained valid results without revision, the researcher still made improvements according to the suggestions and input of the material validators, including replacing some words, sentences, and punctuation marks so that the children were more motivated to learn. In addition, in its implementation, researchers focus on diagnostic assessments carried out in previous implementations.

Ethnomathematics has an essential relationship in its idea to find out the role of learning in daily life (Aini & Budiarto, 2022; Firmandani et al., 2022). Therefore, for this understanding, the researcher specializes in the Ethnomathematics group seen in KD 3.1 Understanding Character Values based on the local wisdom of Surya Majapahit; in this KD, students understand character and symbolic values through the indicators in Table 1. Ethnomathematical Exploration of Surya Majapahit: (1) the origin of Surya Majapahit and (2) the values of Surya Majapahit from time to time, the next KD on the learning resources of Surya Majapahit. Majapahit solar patterns and ornaments can be used as a geometric reference closely related to mathematics learning (Liesandra & Nurafni, 2022; Rizki Lestari, 2022). We can see this in the use of KD 3.2 Identifying the center point, radius, diameter, arc, bowstring, barrel, and jurying through the local wisdom of Surya Majapahit, which can be seen from the use of perception, learning process, Student Worksheet, and Evaluation Sheet. KD 4.4 Showing the elements of the circle through the value of Surya Majapahit's local wisdom can be seen from observing the learning process and students' responses during learning and interview results. The understanding of mathematics, especially in culture, must be reviewed through evaluation and process (Wiryanto et al., 2022).

Result of Student Worksheet based Ethnomathematics Surya Majapahit on the Circle Elements Material to Enhance Creative Thinking Skills

Critical and creative thinking are the embodiments of interconnected high-level thinking. Critical thinking is a milestone of creative thinking and is often associated with the stages of creative thinking (Firmandani et al., 2022). In the aspect of creative thinking, the stages of creative thinking are divided based on three aspects, namely: (1) Normal empirical activity stages, (2) Algorithmic (formal) Stages, and (3) Constructive (Creative). From the following stages, the stages of normal empirical activities include student reasoning to solve problems. They can be seen in learning activities using Ethnomathematics-based Student Worksheets, which are listed in several activities in the student answer on Student worksheet form of abstractions of learning circle elements material parts.

As a result, the application carried out to build creative thinking skills can be seen through summative evaluation through the Evaluation Sheet, where there is a reasoning both critical and creative thinking test that will be used to assess students' ability to analyze information and make their own decisions. Creative thinking is how a person identifies, connects, evaluates, and makes ideas to solve problems (Bilad & Ekawati, 2022; Oktaviane & Ekawati, 2022; Puspita & Dewi, 2021). These criteria align with the indicators put forward by (Ishabu et al., 2019; and Ndiung and Jediut, 2021) in the form of fluency, flexibility, and originality emphasized in learning activities.

In the results of using Ethnomathematics-based Student Worksheet used in the legacy of Surya Majapahit. Learners are seen to build their creative thinking at the flexibility level, where they can make an answer eloquently but cannot arrange different ways to get diverse answers. However, learners respond by building creative thinking. This can be seen in the answers to the SW and the response of students who ask, 'Mam, why don't we use Surya Majapahit anymore ?'. The question results from the implementation of essential thinking, critical and creative thinking, described by (Ishabu et al., 2019), that generating a question involves synthesizing ideas, building ideas, applying and generating problem-solving, and problem-posing.

This result shows an average of 90, and for formative evaluation through the Student Worksheet, it shows an average of 92.8. Based on the formative completeness of students, a total of 25 students have a percentage of 100%. By applying Ethnomathematics of local wisdom Surya Majapahit as a media source, grade VI students are "complete" because they achieve the completeness of students' learning outcomes above the minimum criteria of learning achievement. The results of students' observations during learning showed enthusiasm about the ethnomathematical concepts applied. The results that have been presented previously received a positive response so that the problems raised by the researcher regarding the use of culture in learning to be able to preserve culture are answered. This result corresponds to (Anisa, 2022; Hartanti & Ramlah, 2021) Regarding the continuation of education that explores students' needs for culture, which can be found in the learning process that also uses culture as a learning resource. The results of the interviews also showed the researcher's positive response to learning.

CONCLUSION

Fundamental Finding: Based on the results of the exploration of the Ethnomathematics-based Student Worksheet on the local wisdom of the Mojokerto area in the form of Surya Majapahit that the researcher has carried out, it can be concluded that there are mathematical concepts in the elements presented: (1) Students' knowledge about the Surya Majaphit culture which is reintroduced in several building patterns and included in learning. (2) The values of Surya Majapahit's character in each era. (3) The pattern of Surya Majapahit has geometric elements from time to time. (4) Meanwhile, Anas, a teacher at Lengkong II Public School, and Ida, the Principal of Lengkong II Public School, argued that previously, in the elementary school itself, ethnomathematics had been applied using local culture, but in a limited scope. (5) The results of this application can be used for new learning resources in mathematics learning to build the creative thinking skills of grade VI students of Lengkong II Public School through the problems given. (6) The implementation results showed an average summative evaluation that met the learning objectives (KKTP) criteria. **Implication:** As an alternative to mathematics learning resources in elementary schools, the results of the ethnomathematical concept contained in the snacks can be used. Students will not only learn about the geometry of circle elements according to the essential competencies that have been determined, but they will also learn about the history, culture, and values of Surya Majapahit. This makes it more than one learning discipline. The exploration results in this study can also be applied to other local wisdom that adjusts to the elements used so that implementing an ethnomathematics-based Student Worksheet can align with its sustainability following the critical thinking indicators built into learning. **Limitation:** This study highlights several limitations. Firstly, this research

focused on implementing and analyzing previously validated SWs. The focus on mathematics learning is limited to the elements of circles and cultural materials in IPS subjects. It needs to be discussed for other subjects. **Future Research:** Exploring ethnomathematics-based student worksheets, especially ethnomathematics that integrate cultural forms and other subjects, can help develop and become a reference for this research. It is hoped that the next researcher will cover a broader and more in-depth topic.

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