http://dx.doi.org/10.18623/rvd.v22.n3.3591

NYONG BUNGAH DADI WONG TEGAL: AN ETHNOMATHEMATICS MODULE INCORPORATING LOCAL WISDOM OF SARUNG GOYOR IN ELEMENTARY STUDENTS' PROBLEM-SOLVING AND CREATIVE THINKING LEARNING

NYONG BUNGAH DADI WONG TEGAL: UN MÓDULO DE ETNOMATEMÁTICAS QUE INCORPORA LA SABIDURÍA LOCAL DE SARUNG GOYOR EN EL APRENDIZAJE DE LA RESOLUCIÓN DE PROBLEMAS Y EL PENSAMIENTO CREATIVO DE LOS ESTUDIANTES DE PRIMARIA

Article received on: 30/6/2025
Article accepted on: 29/9/2025

Indriana Eko Armaidi*
*Universitas Negeri Yogyakarta
Yogyakarta, Indonesia
Orcid: https://orcid.org/0009-0008-8437-5382
indrianaeko.2021@student.uny.ac.id

Heri Retnawati*
*Universitas Negeri Yogyakarta
Yogyakarta, Indonesia
Orcid: https://orcid.org/0000-0002-1792-5873
heri_retnawati@uny.ac.id

Puji Yanti Fauziah*
*Universitas Negeri Yogyakarta
Yogyakarta, Indonesia
Orcid: https://orcid.org/0000-0002-7673-4049
puji_yanti@uny.ac.id

The authors declare that there is no conflict of interest

Abstract
Abstract: This study aims to develop an ethnomathematics module titled Nyong Bungah Dadi Wong Tegal based on the local wisdom of Sarung Goyor to improve elementary students' creative thinking and problem-solving skills. The research and development process follows the ADDIE model by Dick, Carey, and Carey. The findings indicate that the module's feasibility, as evaluated by content experts, achieved an average score of 68 (97%), categorized as very good. Evaluation experts awarded a perfect score of 100 (100%), also classified as very good. The module development expert rated the module with a score of 83 (93%), indicating good quality. Teacher practicality assessments resulted in an average score of 88 out of 100, categorized as good, while student practicality scored 42 out of 50, also classified as good. The effectiveness test for creative thinking skills yielded a significance value of p=0.01 (p<0.05), indicating that the module effectively enhances students' creative

Resumo
Resumo: Este estudo teve como objetivo desenvolver um módulo de etnomatemática intitulado Nyong Bungah Dadi Wong Tegal, baseado na sabedoria local de Sarung Goyor, para aprimorar o pensamento criativo e as habilidades de resolução de problemas de alunos do ensino fundamental. O processo de pesquisa e desenvolvimento seguiu o modelo ADDIE de Dick, Carey e Carey. Os resultados indicam que a viabilidade do módulo, avaliada por especialistas no assunto, alcançou uma pontuação média de 68 (97%), classificada como muito boa. Os especialistas em avaliação atribuíram a pontuação máxima de 100 (100%), também classificada como muito boa. O especialista em desenvolvimento do módulo avaliou o módulo com uma pontuação de 83 (93%), indicando boa qualidade. As avaliações de praticidade do professor resultaram em uma pontuação média de 88 em 100, classificada como boa, enquanto a praticidade do aluno

thinking. Similarly, the problem-solving effectiveness test showed a significance value of p=0.01 (p<0.05), confirming the module's effectiveness in improving students' problem-solving skills. Overall, the effectiveness tests for both creative thinking and problem-solving skills demonstrated a significance value of p=0.01 (p<0.05), indicating that the ethnomathematics module effectively enhances these essential student competencies.

Keywords: Nyong Bungah Dadi Wong Tegal Module. Ethnomathematics. Problem-Solving. Creative Thinking. Local Wisdom of Sarung Goyor.

obteve 42 em 50, também classificada como boa. O teste de eficácia para habilidades de pensamento criativo apresentou um valor de significância de p=0,01 (p<0,05), indicando que o módulo efetivamente aprimora o pensamento criativo dos alunos. Da mesma forma, o teste de eficácia na resolução de problemas apresentou um valor de significância de p=0,01 (p<0,05), confirmando a eficácia do módulo no aprimoramento das habilidades de resolução de problemas dos alunos. No geral, os testes de eficácia tanto para o pensamento criativo quanto para as habilidades de resolução de problemas demonstraram um valor de significância de p=0,01 (p<0,05), indicando que o módulo de etnomatemática aprimora efetivamente essas competências essenciais dos alunos.

Palavras-chave: *Módulo Nyong Bungah Dadi Wong Tegal. Etnomatemática. Resolução de problemas. Pensamento Criativo. Sabedoria Local de Sarung Goyor.*

1 INTRODUCTION

Over the past five years, scholars worldwide have developed numerous ethnomathematics modules for elementary schools. These include a 3D Geometry-based ethnomathematics module aimed at enhancing elementary students' metacognitive skills (Sutarto *et al*., 2022), the Pancasila Student Profile Strengthening Project (P5) module with ethnomathematics content for Phase A in Indonesia's Merdeka Curriculum (Amreta *et al*., 2023), an ethnomathematics module incorporating Lombok's cultural heritage for improving fourth-grade students' mathematical literacy in Indonesia (Khair *et al*., 2023), a Problem-Based Learning (PBL) ethnomathematics module for enhancing problem-solving skills in elementary schools (Ula *et al*., 2024), a basic geometry education module based on ethnomathematics for elementary schools (Bidiyah *et al*., 2024), and an ethnomathematics module serving as a mathematics teaching resource for elementary schools (Uji *et al*., 2024). Despite these developments, no elementary school ethnomathematics module has been found that incorporates the local wisdom of *Sarung Goyor*, a traditional heritage from Tegal Regency, Central Java, Indonesia, to support students' problem-solving and creative thinking skills. Therefore, developing an ethnomathematics module infused with *Sarung Goyor*'s cultural values is essential to enhance these critical skills among elementary school students.

Ethnomathematics learning in elementary schools needs to be reinforced through modules that integrate local wisdom (Patri & Heswari, 2021). Mathematics is inherently connected to social and cultural life, making ethnomathematics a practical approach for helping students understand mathematical concepts through their surrounding culture via well-designed didactic and module-assisted learning. This approach makes learning more contextual, meaningful, and relevant (Supriadi, 2019). Elementary mathematics learning should be enriched with an ethnomathematics approach that links mathematical concepts with students' culture and everyday experiences (Moloi *et al*., 2021). This strategy prepares students to face the Fourth Industrial Revolution (Moloi & Matabane, 2020). It supports the achievement of the fourth Sustainable Development Goal (SDG), which emphasizes quality education (Olasoji *et al*., 2023). Thus, mathematics becomes more than abstract; it becomes accurate, contextual, relevant, and meaningful to students. Local wisdom-integrated ethnomathematics modules serve as practical tools for implementing meaningful learning. Such modules allow students to learn mathematics while appreciating and recognizing their culture (Kurnia *et al*., 2022).

In general, ethnomathematics learning modules can achieve the core goals of ethnomathematics education: making mathematics more accessible, increasing learning motivation, developing critical and creative thinking skills in solving math-related problems, and fostering a love for one's own culture (Paramita *et al*., 2024). Local wisdom-based ethnomathematics modules can enhance the quality of mathematics learning in elementary schools, encouraging students to become more active and engaged learners (Arion, 2024; Salmia *et al*., 2024). However, the implementation of ethnomathematics learning in elementary schools needs to be improved due to a lack of awareness about the importance of integrating mathematics and culture and insufficient innovation in module development (Bunga *et al*., 2018; Pratama & Yelken, 2024). Further research on developing and implementing realistic mathematics learning models and teaching modules in elementary schools is essential (Yuliana *et al*., 2022).

Several studies highlight the potential of ethnomathematics-based teaching modules in achieving 21st-century learning objectives and improving students' mathematical literacy (Masruroh & Amir, 2024; Wirawan *et al*., 2024; Castro, 2024). Further research bridging education, culture, and mathematics is urgently needed to explore the impact of ethnomathematics-based learning media on students' creative thinking skills, particularly in geometry learning, which remains a critical issue (Yayuk,

2020; Fernandes *et al*., 2024). Ethnomathematics can enhance students' creative thinking abilities through the development of modules based on local wisdom in their respective regions (Novelita *et al*., 2024).

Ethnomathematics learning in elementary schools should aim to improve students' problem-solving abilities (Suryawan *et al*., 2023). One major issue in elementary schools today is that many students struggle to generate effective solutions, often merely replicating methods demonstrated by teachers. They face difficulties when dealing with real-life problems, prefer receiving direct answers from teachers, and make little effort to find solutions independently (Kristiantari *et al*., 2022). This indicates a lack of perseverance, as students give up easily when attempting to solve problems (Sengupta-Irving & Agarwal, 2017). Such challenges may stem from teaching practices where students memorize information provided by teachers without being encouraged to apply their knowledge to real-life problems (Hobbs & Porsch, 2021). As a result, students need help to identify what is known and what is being asked when encountering problem-solving tasks (Samosir *et al*., 2024). Moreover, using problems requiring minimal cognitive engagement further weakens students' mathematical problem-solving skills. Teachers often prioritize correct answers over the problem-solving process and students' reasoning steps (Phonapichat *et al*., 2014).

The integration of local wisdom and cultural values, such as traditional woven fabrics or batik, into ethnomathematics learning for character development in elementary schools remains an area requiring further exploration (Ramlan *et al*., 2023). This issue is essential for understanding how ethnomathematics can contribute to students' holistic development (Adiraharja & Suhartini, 2023). Exploring local wisdom from various ethnic groups related to mathematics education and applying these insights to geometry learning is a critical field of study. The potential for integrating diverse cultural perspectives into mathematics education at the elementary level is vast. Traditional fabrics like *sarung* and batik not only possess artistic value but also embed mathematical concepts that can be integrated into learning, especially in teaching geometry and geometric transformations (Faiziyah *et al*., 2020; Marsya *et al*., 2023; Uula *et al*., 2024).

One notable example of Indonesian cultural heritage is *Sarung Goyor*, a traditional woven fabric from Central Java, particularly the Tegal Regency. Its unique patterns distinguish it from similar fabrics in nearby regions like Pemalang Regency (Waspiah *et al*., 2020), *Sarung Goyor* is made from flexible, smooth rayon threads using handlooms

rather than machines. It features distinctive motifs such as *Botolan* (bottle-like patterns), *Prilik* (abstract patterns), *Lung* (floral designs), *Balian* (large floral motifs), and *Ceplok* (central symmetrical motifs), all of which contain embedded mathematical elements. Despite its cultural richness, no prior research has explored developing an ethnomathematics module based on *Sarung Goyor* to enhance elementary students' problem-solving and creative thinking skills in Tegal Regency, Central Java, Indonesia (Harsono *et al*., 2023). The scarcity of research on *Sarung Goyor* in educational contexts highlights the need for studies and development of ethnomathematics modules that incorporate its local wisdom. A preliminary study involving 35 teachers and elementary students in the Tegal Regency found that 92% of respondents strongly needed an ethnomathematics module featuring *Sarung Goyor* to improve students' problem-solving and creative thinking skills. They emphasized the importance of a concrete, contextual, and aligned module with everyday life. This study aims to develop an ethnomathematics module based on *Sarung Goyor*'s local wisdom to enhance elementary students' problem-solving and creative thinking skills. To achieve this objective, the following research questions were formulated:

1. What is the feasibility of the *Nyong Bungah Dadi Wong Tegal* module?
2. How practical is the *Nyong Bungah Dadi Wong Tegal* module?
3. How effective is the *Nyong Bungah Dadi Wong Tegal* module?
4. How does the module impact elementary students' problem-solving and creative thinking skills?

2 LITERATURE REVIEW

2.1 Ethnomathematics Module *Nyong Bungah Dadi Wong Tegal*

The ethnomathematics module titled *Nyong Bungah Dadi Wong Tegal* stems from the concept that a module is a key instructional resource designed to assist students in learning (K. *et al*., 2024). As an essential learning component, the module facilitates students' understanding of instructional material. The title *Nyong Bungah Dadi Wong Tegal*, meaning "I Am Happy to Be a Tegal Native," reflects the unique local language of Tegal Regency, Central Java. The availability of such modules helps students access learning materials effectively (Made *et al*., 2021). One of a module's primary functions

is to represent the teacher by delivering instructional content to students (Hartley, 2022). An ethnomathematics module is a systematically structured, engaging, and contextually relevant teaching resource to support independent learning. The *Nyong Bungah Dadi Wong Tegal* module incorporates elements and motifs from *Sarung Goyor*, aiming to enhance student's creative thinking and mathematical problem-solving skills through culturally relevant materials and real-life examples (Marchisio *et al*., 2022; Pornpimon *et al*., 2014). Existing mathematics modules often present overly broad content or emphasize nationally relevant issues, overlooking students' everyday cultural contexts. Learning modules provided by the government are frequently abstract and disconnected from students' daily lives (Yuliana *et al*., 2022). The *Nyong Bungah Dadi Wong Tegal* module bridges this gap by integrating local cultural elements, making mathematics learning more concrete, contextual, and meaningful.

Previous studies have explored how ethnomathematics approaches influence mathematics learning (Pratama & Yelken, 2024). Furthermore, ethnomathematics modules enable students to learn contextually, increasing their interest in mathematics education (Chrisnawati, 2024). Through promoting higher-order thinking, Ethnomathematics modules based on local wisdom can enhance curiosity, foster a love for one's culture, and develop critical and systematic thinking skills (Sa'dijah *et al*., 2024). Ethnomathematics-based modules have demonstrated feasibility, effectiveness, and practicality, making them suitable for students (Milenia dkk., 2022). A development model is employed to produce effective learning media, highlighting the significance of this model in the development of educational modules. Using a development paradigm, the module has been tested for its feasibility and effectiveness, ensuring its quality and appropriateness in education.

In the context of this research, the developed module is an ethnomathematics module based on the local wisdom of Tegal, specifically the *Sarung Goyor* motifs, aimed at enhancing creative thinking and mathematical problem-solving skills in elementary students. The production of *Sarung Goyor* in Tegal Regency is not limited to large-scale factories but also occurs in home industries, making the *Sarung Goyor* culture familiar to students. From the analysis above, the *Nyong Bungah Dadi Wong Tegal* module is an instructional resource systematically organized, structured, unique, and engaging for students. It is designed to assist in teaching mathematics, incorporating the distinctive local wisdom motifs of *Sarung Goyor* from Tegal.

2.2 Local wisdom of *Sarung Goyor*

As a form of artistic creation, the *Sarung Goyor* weaving motif represents one of Indonesia's local wisdom elements. *Sarung Goyor* is a traditional product unique to Tegal Regency, Central Java, Indonesia, with a significant cultural value that can be integrated into the *Nyong Bungah Dadi Wong Tegal* ethnomathematics module. Conceptually, local wisdom encompasses knowledge, values, norms, and practices developed within a community through experiences, adaptation, and interaction with natural, social, and cultural environments passed down from generation to generation. This wisdom can be integrated into ethnomathematics learning modules Local wisdom reflects a way of life that harmonizes with the environment while embodying moral, social, cultural, and spiritual values that shape community identity (Safrijal *et al*., 2024; Mar'atussolichah *et al*., 2024). Integrating *Sarung Goyor* motifs into the *Nyong Bungah Dari Wong Tegal* module contextualizes mathematics learning, enhances appreciation for local culture, and strengthens regional identity among students. Previous studies on *Sarung Goyor* have focused on its history, motifs, and production process without exploring its ethnomathematical aspects (Armaidi *et al*., 2024). Research addressing the integration of *Sarung Goyor*-based ethnomathematics into learning remains scarce and lacks in-depth analysis (Ashari *et al*., 2023; Ashari *et al*., 2024). Local wisdom holds strategic value as a teaching tool that connects students with their cultural heritage while fostering long-term cultural preservation (Zainuri *et al*., 2024).

In the context of this research, the local wisdom of *Sarung Goyor* refers to the knowledge, values, norms, and practices of the Tegal community in crafting traditional *Sarung Goyor* woven fabrics. This local wisdom focuses on the patterns and symmetries found in *Sarung Goyor* motifs. The specific motifs of *Sarung Goyor* from Tegal are limited to woven fabrics made from flexible, smooth, non-stiff rayon threads using traditional handlooms (non-mechanical). These motifs include *Botolan* (bottle-like patterns), *Prilik* (abstract patterns), *Lung* (floral motifs), *Balian* (large floral patterns), and *Ceplok* (geometric-centered motifs), all of which contain mathematical elements. In Tegal, many students' parents work as artisans and craftsmen producing *Sarung Goyor*.

2.3 Problem-solving and creative thinking in elementary school students

Problem-solving is applying previously acquired knowledge to unfamiliar situations (Fassbender *et al*., 2022). It represents the highest type of learning compared to other learning types (Chikkamath *et al*., 2024). Problem-solving is an application of concepts and skills, usually involving a combination of these in a new situation (Borah *et al*., 2024). Problem-solving skills are crucial for students and their future (Susanti *et al*., 2023). Problem-solving ability is discovering a combination of applicable rules to address a novel situation (Mellon *et al*., 2024). In this study, problem-solving ability is limited to mathematical problem-solving, a mental and intellectual process of identifying and solving a problem based on accurate data and information to draw precise and correct conclusions (Kelly *et al*., 2022). Developing mathematical problem-solving skills is one of the primary learning objectives in mathematics education (Rézio *et al*., 2022). Mathematical problem-solving depends significantly on problems within the context of mathematics itself (Torres *et al*., 2022). A problem is a situation where students have a specific goal and must find ways to achieve it meaningfully (O'Connor *et al*., 2024).

In addition to problem-solving skills, fostering creative thinking is essential in elementary mathematics education (Astuti *et al*., 2020). Creative thinking involves generating new ideas by applying existing knowledge (Eteokleous, 2020). It is a critical approach to adapting to changes and addressing increasingly complex problems (Hanfy *et al*., 2022). Creative thinking enables individuals to create innovative solutions with significant societal value. It encompasses various abilities, including (1) Sensitivity, Students exhibit heightened awareness of their surroundings, (2) Fluency: Students can generate diverse and accurate responses to problems, (3) Flexibility: Students demonstrate the ability to solve problems using multiple correct methods, (4) Originality: Students provide unconventional solutions derived from their unique thinking processes, and (5) Elaboration: Students combine elements, principles, and concepts into a cohesive and integrated whole (Yasa *et al*., 2023).

In this research and development context, problem-solving skills are confined to mathematical problem-solving and creative thinking abilities, which are developed through the *Nyong Bungah Dadi Wong Tegal* module. This module is designed based on the ethnomathematics approach and aims to enhance both problem-solving and creative thinking skills. The *Sarung Goyor*-based mathematics module highlights mathematical

concepts, mainly geometric materials in *Sarung Goyor* patterns. Through this module, students are given opportunities to develop creative thinking and problem-solving skills by engaging with mathematical problems relevant to their daily lives, particularly in geometry concepts found in *Sarung Goyor* motifs. The *Nyong Bungah Dadi Wong Tegal* module, rooted in the local wisdom of *Sarung Goyor*, serves as an effective teaching material for training students in solving challenging geometry-related problems.

3 METHODOLOGY

3.1 Research design

This research and development method refers to the analysis, design, development, implementation, and evaluation (ADDIE) model by Dick, Carey, and Carey (Dick *et al*., 2014), as it is relevant to the product being developed, namely the *Nyong Bungah Dadi Wong Tegal* module based on the local wisdom of *Sarung Goyor*. The scope of this study is the development of the Nyong Bungah Dadi Wong Tegal module, based on *Sarung Goyor* motifs, to enhance elementary school students' creative thinking and problem-solving skills.

3.2 Sample and data collection

The respondents used were selected through the purposive sampling method. It was found that the results of school administration were several fourth grades in public elementary schools in Tegal Regency with students between the ages of 10 and 11 and taught by teachers who had the same qualifications and socioeconomic status. Needs analysis and implementation were carried out in two elementary schools with 4 teachers and 132 elementary school students in Tegal Regency, Indonesia, with an experimental class of 66 students and a control class of 66 students.

The experimental group was taught using the *Nyong Bungah Dadi Wong Tegal* module while the control group was trained using conventional methods, and all students were guided by expert instructors. This research was conducted in September and October 2024, which is an even school year.

3.3 Analyzing of data

Based on the needs analysis results, the *Nyong Bungah Dadi Wong Tegal* module was designed, focusing on material, images, colours, and the selection of questions. The development results included feasibility tests conducted by module experts (Prof. Dr. Ali Muhtadi), mathematics content experts (Dr. Ferry Muhammad Firdaus), and learning evaluation experts (Dr. Herwin). In the implementation stage, a limited-scale trial was conducted in a control class and an experimental class at elementary schools in Tegal Regency to assess the impact of the *Nyong Bungah Dadi Wong Tegal* module. In the evaluation stage, the researcher made revisions to the *Nyong Bungah Dadi Wong Tegal* module based on suggestions, criticisms, and feedback from teachers and students during the implementation stage, resulting in the final version of the module.

Data collection techniques included needs analysis questionnaires, expert validation questionnaires for module experts, content experts, and evaluation experts, effectiveness test questionnaires, structured observations, in-depth interviews, and document studies. Structured observations were carried out in the classroom during the needs analysis and effectiveness tests. In-depth interviews were conducted with fourth-grade teachers to gather data on facilities and infrastructure, the curriculum applied, and the material on flat geometry. Document studies were conducted to review teaching module documents (lesson plans), the Merdeka Curriculum, and the mathematics learning material on flat geometry. Data processing was done using the Jamovi version 2.3.2 application. The data findings regarding the feasibility, practicality, and effectiveness of the module, as well as the impact of the *Nyong Bungah Dadi Wong Tegal* module on elementary students' creative thinking and problem-solving abilities, are presented in the form of tables and narratives.

A *p-value* of <0.05 indicates that the data is valid and reliable. In addition, the Shapiro-Wilk and Levene tests were used to determine the normality and homogeneity of the test consisting of three hypotheses. The *One sample t-test* was used to test whether the average score of the student's creative thinking ability or mathematical problem solving test was significantly greater than or equal to the minimum score (75), as well as the calculation of *the effect size* to assess how strong the difference between the average student's post-test score and the minimum score was. The *Paired Sample T-Test* was used to test whether there was a significant increase between the average pretest score to the

posttest, the student's creative thinking ability or mathematical problem solving. And the Manova test was used to determine the effectiveness of *the Nyong Bungah Dadi Wong Tegal* module on improving students' creative thinking skills and mathematical problem solving.

4 FINDINGS/RESULTS

4.1 Development of the *Nyong Wong Bungah Dadi Tegal* Module

The *Nyong Bungah Dadi Wong Tegal* module is an ethnomathematics module featuring *Sarung Goyor* motifs for elementary school students. It includes activities to enhance students' problem-solving skills and mathematical creativity. Below, we present images related to the *Nyong Bungah Dadi Wong Tegal* module.

Figure 1.

Nyong Bungah Dadi Wong Tegal Module Cover

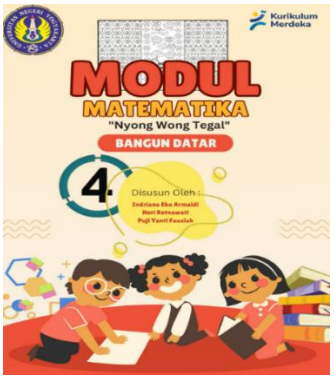

Figure 2.

Instructions Using the Module

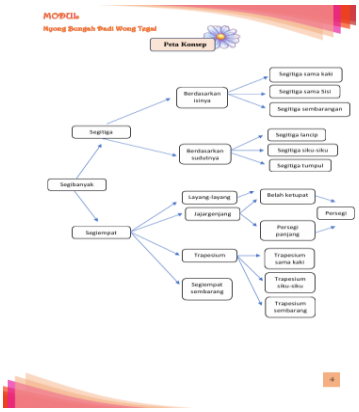

Figure 3.

Sarung Goyor Explanation Material


MODUL
Nyong Bungah Dadi Wong Tegal

Sarung Goyor

Hai jakwir Tegal, kalian tahu tidak kalau Kota Tegal dan Kabupaten Tegal dahulunya merupakan satu letak administratif?

Ya, benar sekali. Kabupaten Tegal dan Kota Tegal baru berpisah pada tahun 1984.

Sebelumnya, ibu kota Kabupaten Tegal berada di Kota Tegal yang terletak di sudut barat laut kabupaten ini, tetapi secara administratif terpisah dan membentuk wilayah sendiri kemudian digantikan oleh Kota Slawi sebagai ibu kota Kabupaten Tegal hingga saat ini, yang terletak sekitar 20 km dari selatan pusat kota dan dalam batas kabupaten.

Tegal sangat kaya akan budaya, sejarah, artefak serta bahasanya. Jakwir Tegal tahu tidaksalah satu kerajinan khas budaya Tegal yang paling tua sejarahnya?

Apakah Jakwir Tegal pernah mendengar tentang "Sarung Goyor?"

Ya, tepat sekali, sarung goyor merupakan sebuah sarung khas dari Masyarakat Tegal. Sejarahnya yang sangat tua menjadikan sarung goyor sebagai suatu kebudayaan Tegal yang harus dilestarikan.

Sarung goyor merupakan sarung yang dibuat menggunakan teknik ATBM (Alat Tenun Bukan Mesin". Alat ini memiliki bingkai-bingkai persegi yang mengikat sejumlah kawat berlubang tempat lewatnya benang-benang lungsin atau lusi.

Sarung Goyor mempunyai beberapa nama yakni sarung ikat, sarung botolan, sarung balian, sarung alusan, sarung kasaran dan sarung toldem.

Sarung goyor diyakini oleh Masyarakat Tegal merupakan sebuah enkulturasi budaya yang dibawa oleh Masyarakat timur Tengah, khususnya adalah Masyarakat Yaman. Namun perbedaan dengan sarung khas yaman dengan sarung goyor Tegal terletak pada motif unik dan khas yang terdapat pada sarung goyor. Motif pada sarung goyor telah mengadaptasi budaya lokal Tegal dengan filosofinya yang sangat kental.

Motif saru goyor senantiasa mengalami perkembangan sesuai dengan berkembangnya zaman dan perubahan selera konsumen. Motif sarung goyor lebih

3

Figure 4.

Sarung Goyor Motif


MODUL
Nyong Bungah Dadi Wong Tegal

Sarung Goyor

Hai jakwir Tegal, kalian tahu tidak kalau Kota Tegal dan Kabupaten Tegal dahulunya merupakan satu letak administratif?

Ya, benar sekali. Kabupaten Tegal dan Kota Tegal baru berpisah pada tahun 1984.

Sebelumnya, ibu kota Kabupaten Tegal berada di Kota Tegal yang terletak di sudut barat laut kabupaten ini, tetapi secara administratif terpisah dan membentuk wilayah sendiri kemudian digantikan oleh Kota Slawi sebagai ibu kota Kabupaten Tegal hingga saat ini, yang terletak sekitar 20 km dari selatan pusat kota dan dalam batas kabupaten.

Tegal sangat kaya akan budaya, sejarah, artefak serta bahasanya. Jakwir Tegal tahu tidaksalah satu kerajinan khas budaya Tegal yang paling tua sejarahnya?

Apakah Jakwir Tegal pernah mendengar tentang "Sarung Goyor?"

Ya, tepat sekali, sarung goyor merupakan sebuah sarung khas dari Masyarakat Tegal. Sejarahnya yang sangat tua menjadikan sarung goyor sebagai suatu kebudayaan Tegal yang harus dilestarikan.

Sarung goyor merupakan sarung yang dibuat menggunakan teknik ATBM (Alat Tenun Bukan Mesin". Alat ini memiliki bingkai-bingkai persegi yang mengikat sejumlah kawat berlubang tempat lewatnya benang-benang lungsin atau lusi.

Sarung Goyor mempunyai beberapa nama yakni sarung ikat, sarung botolan, sarung balian, sarung alusan, sarung kasaran dan sarung toldem.

Sarung goyor diyakini oleh Masyarakat Tegal merupakan sebuah enkulturasi budaya yang dibawa oleh Masyarakat timur Tengah, khususnya adalah Masyarakat Yaman. Namun perbedaan dengan sarung khas yaman dengan sarung goyor Tegal terletak pada motif unik dan khas yang terdapat pada sarung goyor. Motif pada sarung goyor telah mengadaptasi budaya lokal Tegal dengan filosofinya yang sangat kental.

Motif saru goyor senantiasa mengalami perkembangan sesuai dengan berkembangnya zaman dan perubahan selera konsumen. Motif sarung goyor lebih

3

The *Nyong Bungah Dadi Wong Tegal* module is an ethnomathematics teaching material based on the local wisdom of *Sarung Goyor*, designed for fourth-grade elementary (SD/MI) students by the Merdeka Curriculum. The focus of the learning includes the concept of flat geometry, covering characteristics, composition, and decomposition, as well as the calculation of area and perimeter. This module consists of 111 pages, with the main content including an introduction describing *Sarung Goyor* and its connection to flat geometry. It also includes the learning objectives and expected

outcomes. The primary material covers flat shapes: triangles, quadrilaterals, parallelograms, rectangles, rhombuses, kites, and trapezoids; composition and decomposition: combining and separating flat shapes from the *Sarung Goyor* motifs, area and perimeter: calculating the area and perimeter of flat shapes in the context of the motifs, exercises and evaluation: practice problems, remedial tasks, and evaluations to assess students' understanding. The cultural values aspect introduces the history, philosophy, and distinctive motifs of *Sarung Goyor*, such *as Lung, Botolan, Balian, Prilik,* and *Ceplok,* as applications of ethnomathematics. This module integrates mathematical concepts with local culture to make learning more contextual, enjoyable, and meaningful.

The *Nyong Bungah Dadi Wong Tegal* module is a mathematics teaching material that integrates the local wisdom of *Sarung Goyor*, a traditional product unique to Tegal, into flat geometry lessons for fourth-grade elementary students. This module is designed by the Merdeka Curriculum, presenting mathematical material within a cultural context to facilitate student understanding. Through the *Sarung Goyor* motifs, such as *Lung, Botolan, Balian, Prilik,* and *Ceplok,* students are introduced to the concept of flat shapes such as triangles, squares, rectangles, parallelograms, rhombuses, and trapezoids. Activities include the composition and decomposition of flat shapes and the calculation of area and perimeter, all directly linked to traditional weaving motifs. The module has practice problems, evaluations, and remedial exercises, fostering students' critical thinking, problem-solving skills, and creativity. In addition to strengthening mathematical skills, this module also instils a sense of pride and love for local cultural heritage.

5 DISCUSSION

5.1 Feasibility of the Nyong Bungah Dadi Wong Tegal module

Based on the feasibility test of the *Nyong Bungah Wong Tegal* module by content experts, media experts, and evaluation experts who are competent in their fields, it has been shown that this module is suitable for use in elementary schools. The feasibility test by the experts was conducted using the ADDIE model by Dick, Carey, and Carey, leading to the conclusion that this module is appropriate for use in elementary schools. The module developed by the researcher is deemed suitable for trial after revisions. The *Nyong*

Bungah Wong Tegal module was validated by three experts: a module expert, a mathematics content expert, and a school learning evaluation expert specializing in elementary school mathematics. The assessment by the content expert, a doctor in elementary school mathematics at Universitas Negeri Yogyakarta, rated it as suitable with a score of 97%. The media expert, a professor in Educational Science at Universitas Negeri Yogyakarta, gave it a score of 93% and assessed the feasibility of the *Nyong Bungah Wong Tegal* module. The third expert, an evaluation expert in learning and a doctor in basic education at Universitas Negeri Yogyakarta scored 100% and assessed the feasibility of the module. Based on the validation results from these three experts, the *Nyong Bungah Wong Tegal* module is deemed suitable in terms of media, flat geometry material, and its ability to foster creative thinking and problem-solving skills in elementary school students, making it applicable in both limited and wide-scale trials in elementary schools.

According to the results of the feasibility test, which received an "excellent" rating from the mathematics content expert, ethnomathematics module expert, and learning evaluation expert, the *Nyong Bungah Wong Tegal* module has successfully addressed the research questions regarding its feasibility for use by elementary school students. The *Nyong Bungah Wong Tegal* module has been declared suitable for improving elementary school students' problem-solving and creative thinking skills. Additionally, the *Nyong Bungah Wong Tegal* module stands out from other modules due to its concrete, contextual characteristics, which align with students' everyday lives.

The research findings on the *Nyong Bungah Wong Tegal* module show outstanding results based on feasibility tests conducted by three experts: a mathematics content expert, an educational media expert, and a learning evaluation expert. This module has been declared suitable with an average evaluation score ranging from 93% to 100%, making it one of the modules ready for implementation in elementary schools. Regarding the feasibility of the content and learning evaluation aspects, the research findings confirm that the mathematics content expert scored 97%, indicating that the flat geometry content in this module aligns with elementary school mathematics learning standards. Recent research in the development of mathematics teaching materials emphasizes the importance of using context-based cultural media to enhance student engagement (Kadonsi *et al*., 2023; Supriyadi *et al*., 2024). This module aligns with the

ethnomathematics approach, which is seen as effective in improving understanding of mathematical concepts.

The educational media expert awarded a score of 93%, indicating that the visual media and module design have been crafted according to principles of readability and student engagement. According to several studies, context-based visual media modules can enhance learning engagement by up to 85%, significantly impacting student learning (Pertiwi *et al*., 2024; Rosmaria & Heryani, 2024; Firdaus *et al*., 2024). This module utilizes the *Sarung Goyor* motif as a visual medium, reflecting the application of locally-based cultural learning design from Tegal Regency, Indonesia. The evaluation expert gave a perfect score (100%), assessing that this module effectively measures critical thinking and problem-solving skills. Recent studies also emphasize the importance of formative and summative evaluation modules to assess problem-solving abilities and creative thinking (Shirawia *et al*., 2024; Pokhre *et al*., 2024; Sousa *et al*., 2024). This module includes both evaluation forms through contextual activities based on real-life scenarios.

The *Nyong Bungah Wong Tegal* module offers innovation through a concrete and contextual ethnomathematics approach. This innovation includes the integration of local culture (*Sarung Goyor* local wisdom) as a teaching medium for flat geometry, which is rarely found in conventional mathematics modules, a contextual approach where every activity in the module is designed to reflect students' real-life experiences, thus increasing the appeal and relevance of the material, including in-depth evaluations to measure critical thinking, problem-solving, and creativity skills. With excellent validation results, supported by the latest research in contextual teaching material development, the *Nyong Bungah Wong Tegal* module can become an innovative model for mathematics learning in elementary schools.

5.2 Practicality of the *Nyong Bungah Dadi Wong Tegal* module

Based on the practicality test of the *Nyong Bungah Dadi Wong Tegal* module by education practitioners, namely teachers and elementary school students, it was shown that this module is suitable for use in elementary schools. The *Nyong Bungah Dadi Wong Tegal* module developed by the researcher is deemed appropriate for trial after revisions. Two education practitioners and a group of 4th-grade students conducted the practicality

test. The assessment from Practitioner 1 indicated that the module is practical, with a score of 99%. Practitioner 2 gave a score of 100% and evaluated the practicality of the *Nyong Bungah Dadi Wong Tegal* module. According to student assessments, the module's practicality received a score of 42 out of 50, which falls into the "good" category, and students evaluated the module's practicality. Regarding implementing learning activities, each learning activity in the *Nyong Bungah Dadi Wong Tegal* module received a score above 85%. Based on the results from the practitioners and students, the *Nyong Bungah Dadi Wong Tegal* module is practical in terms of media, flat geometry content, and fostering creative thinking and problem-solving skills in elementary school students, making it applicable for both small- and large-scale implementation in elementary schools.

Based on the practicality test results, which received an "excellent" rating from the teachers and a "good" rating from the students, the *Nyong Bungah Dadi Wong Tegal* module effectively addresses the research questions regarding the practicality of using this module for elementary school students. The *Nyong Bungah Dadi Wong Tegal* module is declared practical for improving elementary school students' problem-solving and creative thinking skills. The module also offers innovation compared to other modules, as it features concrete, contextual characteristics that align with the student's daily lives.

The practicality of the *Nyong Bungah Dadi Wong Tegal* module shows excellent results based on tests conducted by teachers and elementary school students. The evaluations from education practitioners include high scores from two teachers (99% and 100%) and a good category rating from 4th-grade students (score of 42 out of 50). Each learning activity in the module received an implementation score above 85%, indicating a high level of practicality. From the teachers' perspective, they gave scores of 99% and 100%, assessing that the module is easy to use and supports the learning process. Several studies have shown that teachers consider mathematics modules with structured designs, step-by-step guidance, and project-based activities practical and facilitate their use (Suryani *et al*., 2020; Scramim *et al*., 2024; Elijah, 2024). The *Nyong Bungah Dadi Wong Tegal* module utilizes an active learning approach based on the local wisdom of *Sarung Goyor*, which makes it easier for teachers to deliver the material.

From the student's perspective, a 42 out of 50 score was obtained, indicating that the module is practical in the "good" category. Recent studies show that students tend to give positive assessments of mathematics modules that involve visual media and

activities relevant to their daily lives (Linda *et al*., 2019; Klapwijk *et al*., 2024; Aprilia *et al*., 2024). The *Nyong Bungah Dadi Wong Tegal* module uses the *Sarung Goyor* motif as a visual learning tool, making the mathematics content more concrete and easier to understand. Regarding the implementation of learning activities, each activity in the module received an implementation score above 85%. Recent research reveals that high implementation scores correlate with the effectiveness of project-based mathematics modules and student engagement in learning activities (Ali *et al*., 2022; Fitriyani *et al*., 2023; Sevani & Ramadan, 2023; Tirado-Morueta *et al*., 2024). This module includes activities such as the composition and decomposition of flat shapes relevant to students' lives.

The *Nyong Bungah Dadi Wong Tegal* module offers practical and contextual design innovation. Its concrete and easy-to-use design enables teachers and students to engage in learning actively. The activities based on the local wisdom of the *Sarung Goyor* motif as a teaching medium strengthen the concept of flat shapes within the cultural context close to the students. This module also includes formative and summative evaluations to measure critical thinking, problem-solving, and creativity skills. With excellent practicality validation results supported by the latest research, the *Nyong Bungah Dadi Wong Tegal* module can potentially enhance mathematics learning in elementary schools.

5.3 Effectiveness of the Nyong Bungah Dadi Wong Tegal module

The effectiveness test of the Nyong Bungah Dadi Wong Tegal module was processed using the Jamovi 2.3.2 application. The first hypothesis test was used to assess the effectiveness of the Nyong Bungah Dadi Wong Tegal module in improving elementary school students' problem-solving skills. Before conducting the first hypothesis test, a normality test was performed to determine whether the students' creative thinking test scores followed a normal distribution. The normality test results for the first hypothesis showed *p value* of 0.532 which is greater than 0.05. The decision criterion for H_0 is accepted if the significance is more significant than 0.05, indicating that the data come from a population that follows a normal distribution. After confirming that the data were normally distributed, the next test was an independent sample t-test, which resulted in a p-value of < 0.01. Therefore, H_0 was rejected because the p-value was

less than 0.05. This means there is a significant difference in the average creative thinking skills between the experimental and control classes based on the class averages. The mathematics module based on the *Sarung Goyor* motif effectively facilitates students' creative thinking skills.

The effectiveness test for the second hypothesis was conducted to determine the effectiveness of the *Nyong Bungah Dadi Wong Tegal* module in improving elementary school students' problem-solving skills. Before this, a normality test was performed, and the results obtained were *p value*= 0.841, which is greater than 0.05, the decision criterion H_0 is accepted if the significance is greater than 0.05, which means the data comes from a normally distributed population. After stating that the data is normally distributed, the next test is to use the independent sample t-test to obtain the value results p value = < 0.01, so that H_0 declared rejected because of value p *vaule* < 0.05. This means there is a difference in the average creative thinking skills between the experimental and control classes when looking at the class averages. Furthermore, it indicates that the mathematics module based on the *Sarung Goyor* motif effectively facilitates students' creative thinking skills.

The effectiveness test for the third hypothesis was conducted to determine the *Nyong Bungah Dadi Wong Tegal* module's effectiveness in improving elementary school students' problem-solving and creative thinking skills. The ANOVA test resulted in a p-value < 0.01. Therefore, H_0 rejected (because the value of p < 0.05) and H_1 accepted. There is a difference in the average problem-solving and creative thinking abilities between the experimental and control classes. This means that learning using the *Nyong Bungah Dadi Wong Tegal* module is more effective than learning without it in mathematics education when assessed based on these skills.

Based on the results of the effectiveness tests on the three hypotheses, the *Nyong Bungah Dadi Wong Tegal* module is deemed effective in enhancing problem-solving and creative thinking abilities in elementary school students. This confirms that *Nyong Bungah Dadi Wong Tegal* addresses the issues examined in this study, offering an ethnomathematics module based on *Sarung Goyor* motifs for elementary school students and contributes to the field by developing ethnomathematics modules that can improve problem-solving and creative thinking skills in elementary school students.

The results of the effectiveness test for the *Nyong Bungah Dadi Wong Tegal* module show significant improvements in enhancing creative thinking and problem-

solving skills in elementary school students. The hypothesis tests conducted using Jamovi 2.3.2 included three main hypotheses, with results supporting the module's effectiveness. Regarding effectiveness in enhancing creative thinking, the normality test yielded a p-value of 0.532 (> 0.05), indicating that the data are typically distributed. The independent sample t-test produced a p-value < 0.01, signifying a significant difference in creative thinking abilities between the experimental and control classes. Several studies have shown that culturally based modules effectively develop higher-order thinking skills (Hikmawati *et al*., 2021; Salmia *et al*., 2024b). This module utilizes *Sarung Goyor* motifs as a concrete context, aligning with the ethnomathematics approach recommended in recent research (Bauer & Müller-Hill, 2024; Karashtranova *et al*., 2024). Regarding the effectiveness in enhancing problem-solving skills, the second hypothesis test showed that the data were normally distributed, with a p-value of 0.841 (> 0.05). The t-test results yielded a p-value < 0.01, indicating a significant difference in problem-solving abilities between the experimental and control classes. Recent studies suggest that using context-based learning media accelerates mastery of problem-solving skills (Tesfaw *et al*., 2024; Jannah *et al*., 2025; Parhan *et al*., 2024). This module is designed with contextual mathematical activities based on *Sarung Goyor* motifs, which have proven relevant in previous research. Regarding the combined effectiveness of creative thinking and problem-solving, the MANOVA test showed a p-value < 0.01, meaning there is a significant difference between the experimental and control classes in both creative thinking and problem-solving abilities. Recent research indicates contextual learning approaches with authentic task designs can enhance critical thinking and problem-solving skills (Thamrin *et al*., 2024; Mwangi & Njeri, 2024). This module integrates authentic activities based on *Sarung Goyor* motifs, creating meaningful learning experiences. The *Nyong Bungah Dadi Wong Tegal* module presents innovation as an ethnomathematics-based learning media that leverages the local wisdom of *Sarung Goyor* motifs, incorporating the development of creative thinking and problem-solving skills through contextual mathematical activities.

5.4 Impact on elementary school students' problem solving and creative thinking learning

The impact on mathematical problem-solving skills can be elaborated through the results of hypothesis testing, which examines the significant difference between the average pre-test and post test scores of elementary school students' problem-solving abilities and the calculation of effect size to assess the strength of the improvement, as shown in Table 1 below.

Table 1

Paired Sample T-Test of Students' Problem Solving Ability

Paired Sample T-Test								
			Statistic	p	Mean Diff	SE Diff		Effect Size
Post	Pre	*Studen's t*	8.21	<0.001	23.5	1.69	*Cohen's d*	3.43

Based on the table, it was found that the p-value = <0.001, which is smaller than 0.05. This means that there is an improvement in students' problem-solving abilities after using the *Nyong Bungah Dadi Wong Tegal* module. The mean difference obtained was 23.5, indicating that the average difference between the posttest and pretest scores was 23.5 points higher, and the effect size was 3.43, which is greater than 1.30. In addition to being statistically significant, the effect size value of 3.43 demonstrates that the *Nyong Bungah Dadi Wong Tegal* module dramatically facilitates students' mathematical problem-solving skills. The average score for the students' mathematical problem-solving test was 83.0, with 63 out of 66 students completing the test. This indicates that 90.625% of the students exceeded the minimum competency standard (KKTP). This shows that the *Nyong Bungah Dadi Wong Tegal* module significantly improves students' mathematical problem-solving abilities.

Meanwhile, the impact on creative thinking skills refers to the results of hypothesis testing to determine whether there is a significant improvement between the average pre-test and post test scores of students' creative thinking abilities and the calculation of effect size to assess the strength of the improvement, as shown in Table 2 below.

Table 2.

Paired Sample T-Test of Students' Creative Thinking Ability

Paired Sample T-Test								
			Statistic	p	Mean Diff	SE Diff		Effect Size
Post	Pre	*Studen's t*	14.1	<0.001	30.2	0.53	*Cohen's d*	3.45

Based on the table, the result shows a Mean Difference of 30.2, indicating that the average difference between the post-test and pre-test scores is 30.2 points higher. The effect size value is 3.45, which is greater than 1.30. Therefore, in addition to being statistically significant, the effect size value of 3.45 also demonstrates that the *Nyong Bungah Dadi Wong Tegal* module dramatically facilitates students' creative thinking abilities. Furthermore, the average score for students' creative thinking ability is 87.0, with 63 out of 66 students achieving mastery. This indicates that 90.625% of students surpassed or met the test's Learning Achievement Criteria. Based on these results, the *Nyong Bungah Dadi Wong Tegal* module significantly impacts creative thinking skills.

The impact on mathematical problem-solving skills is evidenced by the results of hypothesis testing, which show a significant improvement in students' problem-solving abilities after using the *Nyong Bungah Dadi Wong Tegal* module. According to the Paired Sample T-Test table, the p-value < 0.001 indicates a significant difference between pretest and post-test scores. The mean difference of 23.5 demonstrates an average score improvement, while the effect size (Cohen's d) of 3.43 (> 1.30) indicates a considerable impact. Recent studies suggest that context-based modules with real-world activities, such as cultural motifs, effectively improve problem-solving skills (Rahman *et al*., 2024; Alwi *et al*., 2024). Regarding the impact on creative thinking skills, the results indicate a significant improvement in students' creative thinking abilities. The Paired Sample T-Test table shows a mean difference of 30.2 and an effect size (Cohen's d) of 3.45 (> 1.30), indicating a considerable impact. The p-value < 0.001 further supports the conclusion that the module has a significant effect. Recent research emphasizes that culturally-based teaching can stimulate student creativity by encouraging them to explore concepts relevant to their lives (Sartika *et al*., 2024; Lin *et al*., 2024).

According to recent studies, the ethnomathematics approach facilitates the development of creative thinking skills by involving authentic exploration and problem-solving activities (Payadnya *et al*., 2024). Integrating *Sarung Goyor* motifs as a teaching

medium distinguishes this module from conventional modules. With very high effect sizes in both measured aspects, this module has a more substantial impact than other general learning media. Moreover, in-depth statistical tests, such as the Paired Sample T-Test with Cohen's d, lend high validity to these findings, demonstrating a highly significant influence. With outstanding results in enhancing problem-solving and creative thinking abilities, the *Nyong Bungah Dadi Wong Tegal* module could be a model for innovative, context-based, locally grounded mathematics teaching in elementary schools.

6 CONCLUSION

The *Nyong Bungah Dadi Wong Tegal* module is highly feasible for teaching mathematics on plane geometry topics, with a feasibility score ranging from 97% to 100%. The practicality test for teachers scored 88 out of a maximum of 100, categorized as “very good,” while the students' practicality score was 50, categorized as “good.” Additionally, the implementation score reached 90%, indicating that the *Nyong Bungah Dadi Wong Tegal* module is practical for classroom use. The effectiveness test yielded a p-value of 0.01 ($p<0.05$), demonstrating that the *Nyong Bungah Dadi Wong Tegal* module effectively enhances elementary students’ problem-solving and creative thinking skills. The mean difference was 34.5, indicating that the average post-test score was 30.2 points higher than the pre-test score. The effect size was 3.88, significantly exceeding the threshold of 1.30, confirming the module's substantial impact on improving students’ creative thinking skills. Similarly, the mean difference for mathematical problem-solving ability was 23.5, meaning the average post-test score was 23.5 points higher than the pre-test. The effect size was 3.43, indicating a significant positive effect on enhancing students’ mathematical problem-solving skills.

Recommendations

Additionally, the research involved a limited number of schools and participants, which may affect the generalizability of the results. Future research should include module implementation across various educational levels and subjects to evaluate its broader validity and effectiveness. Studies involving more participants from diverse regions are also recommended to enhance the generalizability of the research findings.

Limitations

This study was limited to teaching mathematics on plane geometry topics at the elementary school level, meaning its findings may not apply to other subjects or educational levels.

References

Adiraharja, M. I., & Suhartini, S. (2023). The Implementation Of "Maneuh Di Sunda" Local Wisdom in Character Education At Purwakarta Regency. *Jomantaara: Indonesian Journal of Contemporaary Culture, 3*(1). https://doi.org/10.23969/jijac.v3i1.7099

Ali, A. R., Upu, H., & Talib, A. (2022). Development of Project-Based Learning Mathematics Module for Grade IX Junior High School. *Proceeding of International Conference on Science and Advanced Technology*.

Alwi, N. A., Kenedi, A. K., Arwin, Anita, Y., Handrianto, C., & Rasool, S. (2024). Socio-Cultural Approach through Digital Teaching Modules: A Solution to Improve Beginning Reading Skills in Elementary Schools. *Journal of Ecohumanism, 3*(7).

Amreta, Yuli, M., & Giat, A. (2023). Ethnomathematics-Based Pancasila Student Profile Strengthening Project Module in the Merdeka Curriculum Phase A in Elementary Schools. *Prisma Sains, 11*(4). https://doi.org/10.33394/j-ps.v11i4.9007

Aprilia, V. A., Effendi, M. M., & Rosyadi, A. A. P. (2024). Development of Project-Based E-Module to Facilitate Student's Mathematics Collaboration and Communication in Boarding School. *Kreano*, *15*(1). https://doi.org/10.15294/517pn340

Arion, K. (2024). Exploring local wisdom: utilizing ethnomathematics to improve mathematical creative thinking skills. *Jurnal THEOREMS (The Original Research of Mathematics), 9*(1). https://doi.org/10.31949/th.v9i1.9538

Armaidi, I. E., Retnawati, H., & Fauziah, P. Y. (2024). Goyor Sarong: The Symbolic and Cultural Meaning of Gloved Contemporary Society. *Preprints.Org*. https://doi.org/10.20944/preprints202408.1023.v1

Ashari, I. A., Purwono, P., & Arfianto, I. (2024). Monitoring the pH Levels of Well Water in the Home Industri Sarung Goyor Village, Pemalang, Using IoT Technology and Inverse Distance Weight Method. *JITEKI, 9*(4). https://doi.org/10.26555/jiteki.v9i4.27388

Ashari, I. A., Sandi, A. S., Triwibowo, D. N., Arfianto, I., & Arweina, P. B. (2023). Overcoming the Home Industry Crisis in Goyor Sarong Wanarejan Utara: Training on Digital Marketing, Product Packaging and Sales Management. *JPPMI, 3*(10). https://doi.org/10.59247/jppmi.v3i10.223

Astuti, A., Waluya, S. B., & Asikin, M. (2020). THE IMPORTANT OF CREATIVE THINKING ABILITY IN ELEMENTARY SCHOOL STUDENTS FOR 4.0 ERA. *International Journal of Educational Management and Innovation*, *1*(1), 91. https://doi.org/10.12928/ijemi.v1i1.1512

Bauer, T., & Müller-Hill, E. (2024). Enabling teachers to enact core elements of mathematics in the classroom: a retrospective design-research analysis of interrelated course conceptions and their development phases. *International Journal of Mathematical Education in Science and Technology*. https://doi.org/10.1080/0020739X.2024.2315110

Bidiyah, A., Trisniawati, Muanifah, M. T., & Ardhian, T. (2024). Development of ethnomathematics-based educational modules for elementary geometry. *Advances in Mobile Learning Educational Research*, *4*(2). https://doi.org/10.25082/AMLER.2024.02.010

Borah, N., Paudel, S., & Stivers, A. (2024). Comparing the effectiveness of case-based learning and problem-based learning in a core finance class. *Journal of Education for Business*, *99*(2), 113–124. https://doi.org/10.1080/08832323.2023.2277272

Bunga, M. H. D., Zaenuri, & Isnaeni, W. (2018). Ethnomathemtical Exploration of Palue Cultural Tribe and Its Integration Toward Learning Process at Elementary School in Nusa Tenggara Timur. *Journal of Primary Education*, *7*(1). https://doi.org/10.15294/jpe.v7i1.21980

Castro, R. S. de. (2024). Weaving The Harmony of Cultures Into The Infinite Tapestry of Mathematics. *ARACÊ Journal*, *6*(1). https://doi.org/10.56238/arev6n1-013

Chikkamath, A., Hegade, P., & Shettar, A. (2024). Reflections and Decomposition in Problem Based Learning. *Journal of Engineering Education Transformations*, *37*(Special Issue 2), 914–920. https://doi.org/10.16920/jeet/2024/v37is2/24139

Chrisnawati, H. E. (2024). Development of Ethnomathematics-Based E-Module from Dukutan Tradition of Karanganyar Community to Improve Students' Mathematics Learning Outcomes on Linear Equations nd Inequalities. *Journal of Mathematics and Mathematics Education (JMME)*, *14*(1). https://doi.org/https://doi.org/10.20961/jmme.v14i1.90011

Dick, W., Carey, L., & O., C. J. (2014). *The Systematic Design of Instruction* (7th ed.). Pearsons Education Limited.

Elijah, O. (2024). Innovative Pedagogical Practices in Mathematics Education. *Impacts of Globalization and Innovation in Mathematics Education*. https://doi.org/10.4018/979-8-3693-2873-6.ch004

Eteokleous, N. (2020). Creativity Thinking Skills Promoted Through Educational Robotics. In *Advances in Intelligent Systems and Computing* (Vol. 946, pp. 57–68). https://doi.org/10.1007/978-3-030-18141-3_5

Faiziyah, N., Khoirunnisa', M., Azizah, N. N., Nurrois, M., Prayitno, H. J., Desvian, Rustamaji, & Warsito. (2020). Ethnomathematics: Mathematics in Batik Solo. *Journal of Physics: Conference Series*, *1720*. https://doi.org/10.1088/1742-

6596/1720/1/012013

Fassbender, U., Papenbrock, J., & Pilz, M. (2022). Teaching entrepreneurship to life-science students through Problem Based Learning. *International Journal of Management Education*, *20*(3). https://doi.org/10.1016/j.ijme.2022.100685

Fernandes, A. C., Lima, J. F., Silva, A. P. A. da, Silva, D. A. da, Lima, R. M., Rodrigues, R. R., Silva, A. C. da, Rodrigues, M., Viana, L. N. C., Neto, J. X. da S., & Moura, L. F. W. G. (2024). Contextualized education in the teaching of Mathematics: a case study at the Kindergarten and Elementary School Manoel Rodrigues do Nascimento. *Research, Society and Development*, *9*(10). https://doi.org/10.33448/rsd-v9i10.9207

Firdaus, M., Mukhtar, M., & Darari, M. B. (2024). Effectiveness of Case-Based Interactive Videos in Online Discussion Forums to Improve Critical Thinking Skills of Prospective Mathematics Teachers. *Cognizance Journal of Multidisciplinary Studies*, *4*(1). https://doi.org/10.47760/cognizance.2024.v04i01.003

Fitriyani, Su'ad, & Sumaji. (2023). The effectiveness of mathematics teaching materials with project based learning models in improving students' mathematical communication skills. *AIP Conference Proceedings*, *2733*(1). https://doi.org/10.1063/5.0140509

Hanfy, H., Daleure, G., Abuquad, K., & ... (2022). Enhancing Critical and Creative Thinking Skills in Math at Post-secondary Level: Examining STEM Versus STeM for Efficiency and Effectiveness. *English Language and …*. https://doi.org/10.1007/978-981-16-8888-1_9

Harsono, Sutama, Sari, Y. R. N., & Septiana, L. (2023). Marketing Reorientation of Traditional Goyor Woven Sarong Using ATBM in Home Industry Beautiful World. *Proceedings of the 3rd International Conference on Education for All (ICEDUALL 2023)*. https://doi.org/10.2991/978-2-38476-226-2_30

Hartley, K. (2022). *education sciences Smartphones and Learning : An Extension of M-Learning or a Distinct Area of Inquiry*.

Hikmawati, Gunawan, Sahidu, H., & Kosim. (2021). Effect of Local Culture-Based Learning in Science on Critical Thinking and Student Communication Skills. *Journal of Science and Science Education*, *2*(1). https://doi.org/10.29303/jossed.v2i1.713

Hobbs, L., & Porsch, R. (2021). Teaching out-of-field: challenges for teacher education. *European Journal of Teacher Education*, *44*(5), 601–610. https://doi.org/10.1080/02619768.2021.1985280

Jannah, G. F., Robicha, N., Syarifah, K. I., & Rasilah, R. (2025). Introduction To Basic Mathematical Concepts Through Learning Media. *Journal of Mathematics Instruction, Social Research and Opinion*, *4*(1). https://doi.org/10.58421/misro.v4i1.290

K., L. R., Gardner, R., M., Cartwright, Döring, T., & K., A. (2024). Engagement in a

virtual learning environment predicts academic achievement in research methods modules: A longitudinal study combining behavioral and self-reported data. *Scholarship of Teaching and Learning in Psychology*, *10*(2). https://doi.org/10.1037/stl0000281

Kadonsi, K., Kenneth, M. K., & Magdalene, S. (2023). Empowering Mathematical Minds through Indigenous Pedagogies in Teaching Mathematics in Southern Province, Zambia. *International Journal of Research and Innovation in Social Science (IJRISS)*, *VII*(X). https://doi.org/10.47772/IJRISS.2023.701176

Karashtranova, E., Goldreich, Aharon, & Borisova, N. (2024). On Integration of STEM Modules in Mathematics Education. *Mathematics & Informatics*, *67*(2). https://doi.org/10.53656/math2024-2-2-oni

Kelly, D., Conway, C., Harney, S., & McKeague, H. (2022). Temporary Transitions to Online Problem-based Learning: Advice for Tutors and Learners. *Journal of Problem Based Learning in Higher Education*, *10*(1). https://doi.org/10.54337/ojs.jpblhe.v10i1.6362

Khair, S., Kartono, & Susilaningsih, E. (2023). Development of Lombok Culture-Based Ethnomathematics Module to Improve Mathematical Literacy of Class IV Elementary School Students. *International Journal of Research and Review*, *10*(3). https://doi.org/10.52403/ijrr.20230327

Klapwijk, R., Duffy, G., Lagoudaki, E., Caballero, N. S., Mishra, R., Zhu, C., Westerhof, M., Bufasi, E., Leung, C., Malkogeorgou, S., Lin, T. J., Gamarra, E., & Nguyen, T. (2024). Making SPACE for Spatial Thinking in STEAM education: Teacher Professional Development Modules. *Faculty of Engineering and Built Environment*. https://doi.org/10.21427/kgnt-zj24

Kristiantari, M. G. R., Wayan Widiana, I., Tristiantari, N. K. D., & Rediani, N. N. (2022). Impact of Prezi Media-Assisted Problem-Based Learning on Scientific Literacy and Independence of Elementary School Students. *Journal of Education and E-Learning Research*, *9*(3), 184–191. https://doi.org/10.20448/jeelr.v9i3.4185

Kurnia, L., Azmi, R. D., Yuberta, K. R., Maris, I. M., & Apriliani. (2022). Development of ethnomathematics module using blended learning for undergraduate students. *AIP Conference Proceedings*, *2524*(020004). https://doi.org/10.1063/5.0112553

Lin, Z., Zhan, Z., & Zhang, H. (2024). Exploring the Effectiveness of Reverse Engineering Pedagogy in a Culture-Oriented STEAM Course: From Heritage to Creativity. *Social Education Research*, *5*(1). https://doi.org/10.37256/ser.5120243559

Linda, V., Xie, Y., & Han, M. (2019). Designing Visually Interactive Learning Modules to Promote Students' Critical Thinking in Mathematics. *IEEE Frontiers in Education Conference (FIE)*. https://doi.org/10.1109/FIE.2018.8658568

Made, N., Puspita, M., Suarjana, I. M., Putu, L., & Mahadewi, P. (2021). *Assessing Science Learning Outcomes Using Assessment Instruments Based on Higher Order Thinking Skills*. *5*(2), 242–249.

Mar'atussolichah, M., Ibda, H., Hakim, M. F. Al, Faizah, F., Aniqoh, A., & Mahsun, M. (2024). Benkangen game: Digital media in elementary school Indonesian language. *Journal of Education and Learning (EduLearn)*, *18*(2). https://doi.org/10.11591/edulearn.v18i2.21091

Marchisio, M., Remogna, S., Roman, F., & Sacchet, M. (2022). *education sciences Teaching Mathematics to Non-Mathematics Majors through Problem Solving and New Technologies*.

Marsya, T., Fauzan, A., & Musdi, E. (2023). Development of Geometry Learning Tools Integrated Transformation of Ethnomathematics of Jambi Batik. *JPPIPA*, *9*(12). https://doi.org/10.29303/jppipa.v9i12.6096

Masruroh, M., & Amir, M. F. (2024). Innovative Learning Media: Ethnomathematics-based Modules for Third-Grade of Elementary School Students. *Journal for Lesson and Learning Studies*, *7*(1). https://doi.org/10.23887/jlls.v7i1.68306

Mellon, M., Dunn, N., Azim, A., Chan, T. M., & Sibbald, M. (2024). From Slow Shifts to Fast Flips: Unraveling problem-based learning group function dynamics. *BMC Medical Education*, *24*(1). https://doi.org/10.1186/s12909-024-05542-8

Moloi, T. J., & Matabane, M. E. (2020). Reimagining the Sustainable and Social Justice Mathematics Classrooms in the Fourth Industrial Revolution. *International Journal of Learning, Teaching and Educational Research*, *19*(12). https://doi.org/10.26803/ijlter.19.12.15

Moloi, T. J., Mosia, M. S., Matabane, M. E., & Sibaya, K. T. (2021). The Use of Indigenous Games to Enhance the Learning of Word Problems in Grade 4 Mathematics: A Case of Kgati. *International Journal of Learning, Teaching and Educational Research*, *20*(1). https://doi.org/10.26803/ijlter.20.1.13

Mwangi, D., & Njeri, E. (2024). Challenging the Status Quo: Rethinking Assessment Practices in Education for Authentic, Meaningful Learning Outcomes. *Integrated Journal of Science and Technology*, *1*(5).

Novelita, N., Fauzan, A., Yerizon, Fitria, Y., & Devian, L. (2024). Ethnomathematics Integrated Student Worksheet on Area Measurement Material Improves Elementary School Students' Creative Thinking Ability. *Ability. International Journal of Elementary Education*, *8*(1). https://doi.org/10.23887/ijee.v8i1.74807

O'Connor, S., Power, J., Blom, N., & Tanner, D. (2024). Engineering students' perceptions of problem and project-based learning (PBL) in an online learning environment. *Australasian Journal of Engineering Education*. https://doi.org/10.1080/22054952.2024.2357404

Olasoji, O. V., Ugwu, U. F., & Onoh, D. O. (2023). The Role of Mathematics Education in Achieving Sustainable Development Goals (SDGs). *ESUT Journal of Education (EJE)*, *6*(1).

Paramita, P. Y., Suharta, I. G. P., & Sudiarta, I. G. P. (2024). E-Module Containing Ethnomathematics to Improve Mathematical Problem-Solving Ability. *International Journal of Social Science, Management and Economics Research*,

2(5). https://doi.org/10.61421/IJSSMER.2024.2506

Parhan, M., Syahidin, S., Somad, M. A., Abdulah, M., & Nugraha, R. H. (2024). Developing a Contextual Learning Model in Islamic Education to Improve Applicable Knowledge and Foster Knowledge-Based Virtues. *Jurnal Pendidikan Islam*, *10*(1), 75–86. https://doi.org/10.15575/jpi.v10i1.35205

Patri, S. F. D., & Heswari, S. (2021). Development of ethnomathematic-based on mathematics e-module to improve students' logical thinking skills. *AIP Conference Proceedings*, *2330*(040005). https://doi.org/10.1063/5.0043250

Payadnya, I. P. A. A., Wulandari, I. G. A. P. A., Puspadewi, K. R., & Saelee, S. (2024). The significance of ethnomathematics learning: a cross-cultural perspectives between Indonesian and Thailand educators. *Journal for Multicultural Education*, *18*(4). https://doi.org/10.1108/JME-05-2024-0049

Pertiwi, N. P., Saputro, S., Yamtinah, S., & Kamari, A. (2024). Enhancing Critical Thinking Skills through STEM Problem-Based Contextual Learning: An Integrated E-Module Education Website with Virtual Experiments. *Journal of Baltic Science Education*, *23*(4). https://doi.org/10.33225/jbse/24.23.739

Phonapichat, P., Wongwanich, S., & Sujiva, S. (2014). An Analysis of Elementary School Students' Difficulties in Mathematical Problem Solving. *Procedia - Social and Behavioral Sciences*, *116*, 3169–3174. https://doi.org/10.1016/j.sbspro.2014.01.728

Pokhre, M., Sharma, L., Sharma, T., Prasad, M., Poudel, & C., L. G. (2024). Enhancing Mathematics Learning through Self-Directed Pedagogy: Strategies and Evaluation Techniques for Effective Student Engagement. *Journal of Computational Analysis and Applications*, *33*(8).

Pornpimon, C., Wallapha, A., & Prayuth, C. (2014). Strategy Challenges the Local Wisdom Applications Sustainability in Schools. *Procedia - Social and Behavioral Sciences*, *112*, 626–634. https://doi.org/10.1016/j.sbspro.2014.01.1210

Pratama, R. A., & Yelken, T. Y. (2024). Effectiveness of ethnomathematics-based learning on students' mathematical literacy: a meta-analysis study. *Discov Educ*, *3*(202). https://doi.org/10.1007/s44217-024-00309-1

Putri, A. R. H., Wiryanto, Ekawati, R., & Srinivasarao, U. (2024). The Implementation of Ethnomathematics-Based Student Worksheet "Surya Majapahit" on the Circle Elements Material to Build Creative Thinking of Elementary Students. *IJORER : International Journal of Recent Educational Research*, *5*(6). https://doi.org/10.46245/ijorer.v5i6.712

Rahman, S. N. S. A., Abdullah, A. H., & Ibrahim, N. H. (2024). Does GeoGebra-assisted contextual learning strategy enhance form one students' Higher Order Thinking Skills (HOTS)? *AIP Conference Proceedings*, *3189*(1). https://doi.org/10.1063/5.0224377

Ramlan, R., Iskandar, D., Permana, J., & Husin, M. R. (2023). Character Values of Elementary School Education from the Perspective of Local Wisdom of Sundanese

Culture. *Journal of Educational and Social Research*, *13*(3). https://doi.org/10.36941/jesr-2023-0062

Rézio, S., Andrade, M. P., & Teodoro, M. F. (2022). Problem-Based Learning and Applied Mathematics. *Mathematics*, *10*(16). https://doi.org/10.3390/math10162862

Rosmaria, & Heryani, N. (2024). Development of Multimedia Learning Based on Digital Virtual Reality to Improve Students' Skills in Delivery Service. *Health Education and Health Promotion*, *12*(2). https://doi.org/10.58209/hehp.12.2.189

Sa'dijah, C., Anwar, L., Hidayah, I. R., Abdullah, A. H., & Cahyowati, E. T. D. (2024). Mathematics learning models based on local wisdom of Malang to support critical and creative thinking of secondary school students. *AIP Conference Proceedings*, *3235*(1). https://doi.org/10.1063/5.0234944

Safrijal, S., Saiful, M., & Azmi, U. (2024). Implementation Of Pancasila Student Profile Through Projects Contained Local Wisdom. *Proceedings of the International Conference on Educational Technology and Social Science (ICoETS 2023)*. https://doi.org/10.2991/978-2-38476-200-2_12

Salmia, Nursalam, & Bancong, H. (2024). Effectiveness of Local Wisdom-Based Independent Curriculum Teaching Modules in Improving Learning Outcomes Indonesia. *Journal of Ecohumanism*, *3*(6). https://doi.org/10.62754/joe.v3i6.4131

Samosir, C. M., Herman, T., Prabawanto, S., Melani, R., & Mefiana, S. A. (2024). Students' Difficulty in Understanding Problems in the Contextual Problem-Solving Process. *PRISMA*, *13*(1), 20. https://doi.org/10.35194/jp.v13i1.3726

Sartika, E., Salam, & Semiaji, T. (2024). Local Culture-Based Education: Creating A Learning Environment That Promotes Local Integrity. *International Journal of Teaching and Learning*, *2*(6).

Scramim, F. C. L., Lima, R. M., Ching, H. Y., & Rieg, D. L. (2024). Applicability of the design thinking process to the development of capstone project proposals. *International Journal of Continuing Engineering Education and Life Long Learning*, *34*(6). https://doi.org/10.1504/IJCEELL.2024.143311

Sengupta-Irving, T., & Agarwal, P. (2017). Conceptualizing Perseverance in Problem Solving as Collective Enterprise. *Mathematical Thinking and Learning*, *19*(2), 115–138. https://doi.org/10.1080/10986065.2017.1295417

Sevani, O., & Ramadan, Z. H. (2023). The Effectiveness of Project-Based Learning Model in Increasing Understanding of Mathematical Concepts in Fourth-Grade Elementary School Students. *Journal of Education Research and Evaluation*, *7*(3). https://doi.org/10.23887/jere.v7i3.66664

Shirawia, N. H., Qasimi, A. B., Tashtoush, M. A., Rasheed, N. M., Khasawne, M. A. S., & Az-Zo'bi, E. A. (2024). Performance Assessment of the Calculus Students by Using Scoring Rubrics in Composition and Inverse Function. *Applied Mathematics & Information Sciences*, *18*(5). https://doi.org/10.18576/amis/180511

Sousa, A. V., Afonso, L., Mendonça, J., & Viamonte, A. J. (2024). Enhancing Education with The Stack Plugin in Moodle: Remarks From Distinct Mathematics

Course Applications. *Conference Name: 17th Annual International Conference of Education, Research and Innovation*. https://doi.org/10.21125/iceri.2024.1469

Supriadi. (2019). Didactic Design of Sundanese Ethnomathematics Learning for Primary School Students. *International Journal of Learning, Teaching and Educational Research*, *18*(11). https://doi.org/10.26803/ijlter.18.11.9

Supriyadi, E., Turmudi, T., Dahlan, J. A., & Juandi, D. (2024). Development of Sundanese Gamelan Ethnomathematics E-Module for Junior High School Mathematics Learning. *Malaysian Journal of Learning and Instruction*, *21*(2). https://doi.org/10.32890/mjli2024.21.2.6

Suryani, A., Anwar, A., Hajidin, & Rofiki, I. (2020). The practicality of mathematics learning module on triangles using GeoGebra. *Journal of Physics Conference Series*, *1740*(1). https://doi.org/10.1088/1742-6596/1470/1/012079

Suryawan, I. P. P., Jana, P., Pujawan, I. G. N., Hartawan, I. G. N. Y., & Putri, P. E. W. (2023). Ethnomathematically Controversial Problem-Based Multimodal Approach in Terms of Students' Critical Thinking Ability. *Pegem Journal of Education and Instruction*, *13*(3), 323–336. https://doi.org/10.47750/pegegog.1

Susanti, M., Suyanto, S., Jailani, J., & Retnawati, H. (2023). Problem-based learning for improving problem-solving and critical thinking skills: A case on probability theory course. *Journal of Education and Learning*, *17*(4), 507–525. https://doi.org/10.11591/edulearn.v17i4.20866

Sutarto, Muzaki, A., Hastuti, I. D., Fujiaturrahman, S., & Untu, Z. (2022). Development of an Ethnomathematics-Based e-Module to Improve Students' Metacognitive Ability in 3D Geometry Topic. *International Journal of Interactive Mobile Technologies (IJIM)*, *16*(3). https://doi.org/10.3991/ijim.v16i03.24949

Tesfaw, B. K., Ayele, M. A., & Wondimuneh, T. E. (2024). Context-based problem-posing and solving instructional approach and students' engagement in learning data handling. *Cogent Education*, *11*(1). https://doi.org/10.1080/2331186X.2024.2389486

Thamrin, L., Gustian, U., Suhardi, S., Zhongfulin, W., & Suryadi, D. (2024). The implementation of contextual learning strategies to stimulate students' critical thinking skills. *Retos*, *63*.

Tirado-Morueta, R., Ceada-Garrido, Y., Barragán, A. J., Enrique, J. M., & Andujar, J. M. (2024). The association of self-determination with student engagement moderated by teacher scaffolding in a Project-Based Learning (PBL) case. *Educational Studies*, *20*(5). https://doi.org/10.1080/03055698.2021.2003185

Torres, A., Hu, J., Sriraman, V., Martínez-Ortiz, A., & Membrillo-Hernández, J. (2022). Assessing the Effectiveness of Problem-Based Learning Across Two Concrete Construction Courses. *International Journal of Instruction*, *15*(4), 473–496. https://doi.org/10.29333/iji.2022.15426a

Uji, W. D., Mariana, N., Wiryanto, & Amien, M. S. (2024). Integration of Ethnomathematics Teaching Materials in Mathematics Learning in Elementary

School. *IJORER : International Journal of Recent Educational Research*, *5*(1). https://doi.org/10.46245/ijorer.v5i1.542

Ula, M., Mastur, Z., & Ridlo, S. (2024). Development of an e-module containing ethnomathematics in the Problem Based Learning (PBL) model to improve elementary school students' problem solving abilities. *Tennessee Research International of Social Sciences*, *6*(2).

Uula, N. R., Ishartono, N., Faiziyah, N., Kholid, M. N., Nurcahyo, A., Machromah, I. U., & Setyaningsih, R. (2024). Ethnomathematics: Geometrical concept in Batik Sidomulyo solo. *AIP Conf. Proc.*, *2926*(020040). https://doi.org/10.1063/5.0183039

Waspiah, W., Rodiyah, R., Latifiani, D., & Setiaji, D. A. (2020). Advanced Training of Intellectual Property Documents of Industrial Designs for Goyor Sarong Craftsman in Pemalang District. *Indonesian Journal of Advocacy and Legal Services*, *1*(2), 169–192. https://doi.org/10.15294/ijals.v1i2.33961

Wirawan, N., Syamsuri, Nindiasari, H., & Fatah, A. (2024). Meta-analysis: Ethnomathematics approaches in mathematical learning in Indonesia. *World Journal of Advanced Research and Reviews*, *22*(3). https://doi.org/10.30574/wjarr.2024.22.3.1778

Yasa, A. D., Kumala, F. N., Wibawa, A. P., & Hidayah, L. (2023). Evaluation of Creative Thinking Skills in the Development of Elementary Science Learning in Elementary Schools: A Mix Method Study. *Journal of Education Research and Evaluation*, *7*(4), 559–568. https://doi.org/10.23887/jere.v7i4.68255

Yayuk, E. (2020). Primary school students' creative thinking skills in mathematics problem solving. *European Journal of Educational Research*, *9*(3), 1281–1295. https://doi.org/10.12973/eu-jer.9.3.1281

Yuliana, Y., Usodo, B., & Riyadi, R. (2022). The New Way Improve Mathematical Literacy in Elementary School: Ethnomathematics Module with Realistic Mathematics Education. *AL-ISHLAH: Jurnal Pendidikan*, *15*(1), 33–44. https://doi.org/10.35445/alishlah.v15i1.2591

Zainuri, B. N. S., Gunawan, G., & Kosim, K. (2024). Local Wisdom Integration in Problem-Based Learning E-Modules: Impact on Science Literacy and Science Process Skills. *Indonesian Journal of STEM Education*, *6*(1).

Authorship Contribution Statement

Armaidi: Generating ideas and conceptualization, developing the research design, writing, data analysis, and managing the entire research process. Retnawati: Translating, and supervising the research. Fauziah: Editing/reviewing, supervision, and results composition.

Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

How to cite this article (APA):

Armaidi, I. E., Retnawati, H., & Fauziah, P. Y. NYONG BUNGAH DADI WONG TEGAL: AN ETHNOMATHEMATICS MODULE INCORPORATING LOCAL WISDOM OF SARUNG GOYOR IN ELEMENTARY STUDENTS' PROBLEM-SOLVING AND CREATIVE THINKING LEARNING. Veredas Do Direito, e223591. https://doi.org/10.18623/rvd.v22.n3.3591