

Utilization of an Ethnomathematics-Based Quantum Learning Model in Elementary Schools for the Realization of Indonesia's Sustainable Development Goals (SDGs)

Ach. Eka Hendriawan ✉, Universitas Negeri Surabaya

Khamiliya Khoirunnisa, State University of Surabaya

Sya'adhatun Ariayah, State University of Surabaya

Hilda Izatun Nafsi, State University of Surabaya

Ni'matur Rohmah, State University of Surabaya

Zaenal Abidin, State University of Surabaya

✉ 24010644211@mhs.unesa.ac.id

Abstract: Mathematics learning in elementary schools still faces challenges due to students' low level of understanding, exacerbated by the impact of the pandemic and less varied learning models. This study aims to describe the implementation of ethnomathematics- based Quantum Learning as an innovative strategy to enhance both conceptual understanding and learning motivation. The method employed was descriptive qualitative, using interviews, documentation, and literature studies, with data reduction, presentation, and conclusion drawing as the stages of analysis. The results show that integrating Quantum Learning with local cultural contexts creates a more enjoyable learning atmosphere, increases student participation, and strengthens conceptual understanding of mathematics. Moreover, ethnomathematics provides added value by presenting learning that is closely related to daily life while fostering cultural appreciation. These findings affirm that ethnomathematics-based Quantum Learning can serve as an effective strategy to support quality education in line with the Sustainable Development Goals (SDGs).

Keywords: Quantum Learning, Ethnomathematics, Elementary Education, SDGs

How to Cite: Hendriawan, A.E., Khoirunnisa, K., Ariayah, S., Nafsi, H. I., Rohmah, N., & Abidin, Z. (2025). Utilization of an Ethnomathematics-Based Quantum Learning Model in Elementary Schools for the Realization of Indonesia's Sustainable Development Goals (SDGs). *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan dan Hasil Penelitian*, 11(3), 360-372. <https://doi.org/10.26740/jrpd.v11n3.p360-372>

© The Author(s) 2025

Article Info:

Received: 29 June 2025; Accepted: 14 September 2025; Published Online: 28 October 2025

INTRODUCTION

Education plays a highly essential role in human life. In general, education is understood as a process of self-development that enables individuals not only to survive but also to actively contribute to community life ([Rahman et al., 2022](#)). The lack of access to education does not merely have a negative impact on individual development but can also trigger various problems in the social, economic, and cultural domains of a nation. Therefore, improving the quality of education has become one of the priority agendas in supporting the achievement of the Sustainable Development Goals (SDGs) in Indonesia ([Rulandari, 2021](#)). However, in practice, the quality of education in Indonesia still faces a number of complex challenges. Several indicators of these problems include unequal access to education, low learning outcomes, and students' weak comprehension of subject matter. This lack of understanding is caused by several factors. First, the Covid-19 pandemic had a significant impact on the effectiveness of learning. The hybrid learning model implemented during that period proved less than optimal because teachers were unable to directly monitor students' progress, resulting in decreased levels of comprehension. The negative effects of this condition are still being felt today. Second, the use of learning models that are not aligned with students' characteristics and needs has also been a major factor in preventing the optimal achievement of learning objectives.

This condition is similar to the problems found at SDN Lidah Wetan II Surabaya. Difficulties in understanding basic materials such as multiplication and division in mathematics learning are often experienced by upper-grade students. The implementation of less appropriate learning models frequently creates a monotonous learning atmosphere, resulting in low student motivation and challenges in comprehending the concepts being taught. This indicates that the selection of appropriate learning strategies plays a crucial role in creating a conducive, effective, and meaningful learning environment. With the right strategies, students will not only find it easier to understand the material but will also be encouraged to become more active, creative, and motivated in the learning process. One innovative approach that can be applied is the use of an ethnomathematics-based Quantum Learning model. The Quantum Learning model is an approach that combines learning strategies with elements of art, self-potential, and the learning environment ([Emawati et al., 2020](#)).

Through this integration, students' learning processes can become more engaging, enjoyable, and optimally beneficial (Dewi Insiroh et al., 2025). The Quantum Learning model is considered capable of making a significant contribution to enhancing the effectiveness of mathematics learning.

This model is designed to provide a balance between serious cognitive activities and an enjoyable learning atmosphere. By combining internal stimuli, such as students' motivation and interest, with external stimuli, such as a supportive learning environment, Quantum Learning can create a learning process that is faster, more meaningful, and enjoyable (Sanjaya & Budiningsih, 2012). Quantum Learning is believed to be capable of transforming the classroom atmosphere into a more conducive environment, offering joyful learning experiences, and helping students optimally develop their natural potential and talents. This transformation not only has a positive impact on students' academic development and personal growth but also contributes to their surrounding social environment (Ningsih et al., 2021). This indicates that learning through the Quantum Learning approach serves a dual function: improving the quality of the learning process while simultaneously shaping students' character to become more confident, creative, and collaborative. To make learning more meaningful and relevant to students' lives, cultural elements can be integrated into this model. Cultural integration, for example through ethnomathematics, allows students to understand mathematical concepts within contexts closely related to daily life. In this way, learning becomes not only theoretical but also applicable, enabling students to better comprehend the material while fostering a sense of pride in their local wisdom.

METHODS

This study employed a qualitative approach with a descriptive design. This approach was chosen because the research focused on gaining an in-depth understanding of the utilization of an ethnomathematics-based Quantum Learning model in elementary schools and its relation to efforts toward realizing the Sustainable Development Goals (SDGs) in Indonesia. Through descriptive research, the study sought to systematically and factually portray the ongoing learning practices without manipulating the conditions under investigation. The research subjects consisted of elementary school teachers who implemented the Quantum Learning model integrated with ethnomathematics.

Data were collected through interviews, documentation, and literature study. Semi-structured interviews were conducted with teachers to obtain information related to the planning, implementation, and outcomes of the learning model. Documentation was used to gather data in the form of activity records that contained the integration of ethnomathematics. Meanwhile, the literature study was carried out by reviewing various written sources, including books, journals, and scientific articles, in order to strengthen the theoretical framework and deepen the analysis of research findings. The collected data were then analyzed using qualitative analysis techniques, consisting of three stages: data reduction, data display, and conclusion drawing. Data reduction was carried out by selecting and focusing on information relevant to the research objectives. The reduced data were then presented in descriptive form, enabling the researcher to identify patterns and relationships. Finally, conclusions were drawn inductively based on field findings, which were then linked to the concepts of Quantum Learning, ethnomathematics, and their contribution to the achievement of Indonesia’s Sustainable Development Goals (SDGs).

RESULTS

Research Findings

From the 56 articles that were reviewed and analyzed, 28 articles met the inclusion and exclusion criteria. These were categorized into three themes: Quantum Learning model (9 studies), Ethnomathematics (15 studies), and SDG 4 (4 studies). The publication years of the 28 articles that met the criteria ranged from 2021 to 2025. In 2021, there was 1 article (3.5%). In 2022, 6 articles were published (21.4%). In 2023, there was 1 article (3.5%). In 2024, 14 articles were published (50%). In 2025, 6 articles were published (21.4%).

Table 1. Year of Article Publication

Categories	N	%
Publication Year		
2021	1	3,5%
2022	6	21,4%
2023	1	3,5%



2024	14	50%
2025	6	21,4%

A total of 28 articles from the reduction process originated from both national journals (Sinta 5, 4, 3, 2, and 1) and international journals accredited by Scopus. Of these, 11 articles were from national journals, while 17 articles were from international journals. The focus of these 28 articles was divided into three concentrations: (1) Ethnomathematics, (2) Quantum Learning, and (3) SDG 4 or Quality Education. The research methods used in these articles varied, ranging from qualitative and quantitative approaches to meta-analysis and Systematic Literature Review (SLR).

DISCUSSION

Effects of the Covid-19 Pandemic on Education in Indonesia

Covid-19 has caused various negative impacts in Indonesia across multiple sectors, particularly in education. A 2022 study on the effects of Covid-19 on students' learning outcomes indicated that online learning during the pandemic led to both direct and indirect mental stress among students ([Hendriyani et al., 2021](#)). This situation resulted in a significant decline in students' learning quality compared to the pre-Covid-19 period. Furthermore, according to Mrs. Risa, a sixth- grade teacher at SDN Lidah Wetan II, her current students experience difficulties with basic mathematics concepts, namely addition, subtraction, multiplication, and division. This is largely due to students' unfamiliarity with applying these fundamental skills, which is an implication of online learning during the Covid-19 pandemic. In addition, based on the literature review, the use of inappropriate and monotonous learning models has exacerbated the negative effects of Covid-19.

Ineffective Learning Models

Ineffective learning models have become one of the issues in education in Indonesia at the micro level ([Hafizhah & Wardana, 2022](#)). The selection of appropriate learning models falls under the teacher's responsibility in delivering knowledge to students. The use of conventional learning models, where most teachers deliver material

through lectures and students remain passive during the lesson, is considered inadequate. This is because student engagement is low, resulting in less effective comprehension of the material. Such ineffectiveness may prevent the achievement of desired learning outcomes. Therefore, it is crucial for teachers to implement creative and innovative instructional methods to stimulate students' interest in the subject matter. The development of student interest is expected to help them maintain focus throughout the learning process.

Implications of the Covid-19 Pandemic and Ineffective Learning Models on Education

The Covid-19 pandemic and ineffective learning models have caused negative impacts on education at the national level. These negative effects include a decline in students' moral values, learning outcomes, and skills. This can be observed from the relatively modest improvement of Indonesia's PISA ranking from 2018 to 2022, which increased by only five positions, despite the Indonesian government implementing various policies to improve the country's PISA performance. From an economic perspective, the Indonesian workforce lacks the knowledge and skills needed to compete at both national and international levels. Moreover, from social and cultural perspectives, Indonesian society has experienced moral degradation and is beginning to neglect the values of Pancasila in attitudes and behavior. All of these phenomena are due to the fact that the Indonesian education system has not yet fully recovered from the effects of Covid-19, further exacerbated by the use of ineffective learning models.

The Urgency of SDG 4 for Indonesia

The SDGs, as a consensus agreed upon by 193 countries, have various objectives, one of which is Quality Education, targeted to be achieved by 2030. Quality education is expected to bring positive impacts to Indonesia in various aspects, including the economy, society, culture, and security—for instance, in the economic aspect, many Indonesian workers are employed abroad with high salaries. However, Indonesia faces challenges in achieving this goal by 2030. This is reflected in Indonesia's PISA ranking in 2022, which was 69th out of 80 countries, despite having less than five years remaining to reach the target. According to PISA analysis, Indonesian students showed declines in mathematics, reading, and science compared to previous periods. These

declines are caused by various factors, such as the negative effects of Covid-19 and the use of ineffective learning models. Therefore, to achieve the SDG targets, these issues must be addressed promptly by analyzing the factors hindering the realization of SDG 4, namely Quality Education, while simultaneously identifying appropriate solutions.

Effectiveness of the Quantum Learning Instructional Model

One of the factors hindering the achievement of SDG 4 is the use of inappropriate learning models. Ineffective learning models can result in monotonous or boring lessons, causing students to lose focus during the learning process. Therefore, teachers need to be creative in selecting instructional models that can capture students' interest. Engaging students can be achieved by creating a comfortable and enjoyable learning environment so that students do not quickly become bored. Alternative learning models that can foster such an environment are highly needed. One of the instructional models that can be implemented is Quantum Learning. Quantum Learning is a model that makes learning more enjoyable and meaningful, thereby fostering positive student attitudes. It emphasizes the TANDUR concept, which stands for **Tanamkan** (Plant), **Alami** (Experience), **Namai** (Name), **Demonstrasikan** (Demonstrate), **Ulangi** (Repeat), and **Rayakan** (Celebrate).

The Quantum Learning instructional model is founded on the TANDUR concept, which serves as the core of the learning process. TANDUR consists of six main components: 1) **Tumbuhkan** (Grow), 2) **Alami** (Experience), 3) **Namai** (Name), 4) **Demonstrasikan** (Demonstrate), 5) **Ulangi** (Repeat), and 6) **Rayakan** (Celebrate). The implementation of TANDUR begins with identifying students' talents, interests, and needs related to the material to be taught. Next, the teacher identifies concrete phenomena or events that are familiar to students and easily understandable. The teacher then assigns key names related to the concepts and associates them with these phenomena. Subsequently, students are asked to demonstrate these concepts in front of the class while being encouraged to express their opinions about the phenomena. This process aims to develop and enhance students' creativity and critical thinking skills. The teacher then repeats the method with slight reflection to ensure the learning objectives are achieved. The final stage is celebrating with the students their success in understanding the material, aiming to recognize and honor their efforts.

Based on the results of the literature review, Quantum Learning has been shown to have a positive impact on students' learning outcomes across various regions in Indonesia and even at the international level. Khozaei's study (Citation 1) on the implementation of this model for the cognitive and psychomotor development of nursing students at Mashhad University of Medical Sciences in Iran reported positive results (Khozaei et al., 2022). Quantum Learning led to significant improvements in cognition, memory, and affective development in the intervention group compared to the control group. Similarly, K ro lu's study (Citation 3) confirmed the effectiveness of Quantum Learning (K ro lu et al., 2022), showing enhanced academic achievement, emotional engagement, and skill development among Turkish students. At the national level, Hafizhah's study (Citation 4) on the effects of Quantum Learning on first-grade students at SD Nabawi School also demonstrated positive outcomes (Hafizhah & Wardana, 2022). Students in this study exhibited increased critical thinking, expressiveness, and enthusiasm during the learning process.

Quantum Learning has achieved various successes in improving students' learning outcomes due to several distinct advantages. The added value of this model includes student-centered learning, the stimulation of multiple human senses, encouraging students to express their ideas and respect the opinions of others, and recognizing each student's achievements from beginning to end while upholding inclusivity. These advantages make the Quantum Learning model applicable in Indonesia due to its effectiveness and efficiency. In fact, several schools in Indonesia have implemented this model, resulting in positive outcomes in enhancing the quality of students' learning achievements.

Integration of Quantum Learning with Ethnomathematics to Achieve SDGs 4

Quantum Learning, which incorporates the TANDUR concept—Plant, Experience, Name, Demonstrate, Repeat, and Celebrate—has the potential to be integrated with ethnomathematics in order to enhance the quality of students' learning outcomes. Both Quantum Learning and ethnomathematics have their own strengths. When combined, they have the potential to create high-quality and inclusive education.

The integration of digitally-based Quantum Learning with ethnomathematics can serve as an alternative solution to address educational challenges in Indonesia, particularly regarding the effectiveness of learning (Ratnasari & Nugraheni, 2024). This

integration has high potential to create a high-quality learning process. This assertion is supported by the literature review on ethnomathematics and Quantum Learning, as well as direct interviews with an elementary school teacher in Surabaya. A high-quality learning process is directly proportional to the development of students' competencies. Indirectly, implementing a high-quality learning process contributes to achieving SDG 4, Quality Education, and can further support Indonesia's overall progress toward the Sustainable Development Goals, as education serves as a key element in multiple aspects of national development and societal well-being.

CONCLUSION

Based on the analysis, it can be concluded that the implementation of Quantum Learning integrated with ethnomathematics provides a tangible contribution to improving the quality of mathematics education in elementary schools. This approach not only helps students understand concepts more easily but also creates a learning environment that is enjoyable and relevant to their daily lives. The integration of local culture into learning increases students' motivation, self-confidence, and emotional connection to the material. This demonstrates that learning is not solely focused on cognitive aspects but also fosters positive attitudes and a sense of pride in regional culture.

From a scientific perspective, this study enriches previous research by presenting a holistic learning model that integrates cognitive, affective, and contextual aspects. The findings open opportunities for teachers and educational practitioners to implement similar strategies in various regions, with adjustments to local cultural contexts. Future research is recommended with a larger participant pool and a quantitative approach to more rigorously validate the effectiveness of this model. Furthermore, integration with digital technology should also be explored to address 21st-century learning challenges and to expand the impact of its implementation.

REFERENCES

- Ahmad, A. K., Abdul Razzaq, Sitti Rahmayani, Jumrah, J., Hamdana Hamdana, & Muhandi Muhandi. (2024). Analisis Hasil Belajar, Aktivitas Belajar dan Respon Belajar Matematika melalui Quantum Teaching kelas VII3 SMP Negeri 1 Batulappa. *JURNAL PENDIDIKAN MIPA*, 14(3), 668–674. <https://doi.org/10.37630/jpm.v14i3.1733>

- Aprinastuti, C., & Amelia, M. A. (2025). The Relationship Between Mathematical Thinking and Resilience in Number Sequence Lesson Through Ethnomathematics Among Pre-service Primary School Teachers. *ITM Web of Conferences*, 71, 01003. <https://doi.org/10.1051/itmconf/20257101003>
- Astuti, E. P., Wijaya, A., & Hanum, F. (2024). Characteristics of junior high school teachers' beliefs in developing students' numeracy skills through ethnomathematics-based numeracy learning. *Journal of Pedagogical Research*, 8(1), 244–268. <https://doi.org/10.33902/JPR.202423405>
- Dewi Insiyroh, Yesha Tri Anita Utami, & Agus Milu Susetyo. (2025). Peran Pembelajaran Quantum Learning dalam Meningkatkan Literasi Siswa di Kelas. *Katalis Pendidikan : Jurnal Ilmu Pendidikan Dan Matematika*, 2(1), 198–209. <https://doi.org/10.62383/katalis.v2i1.1236>
- Emawati, I. R., Burhendi, F. C. A., Harahap, N., & Sugianta, S. (2020). Efektifitas Model Pembelajaran Quantum Learning di Tinjau dari Metakognitif Fisika Siswa Di SMAN 48 Jakarta. *Jurnal Pendidikan Fisika*, 8(1), 24. <https://doi.org/10.24127/jpf.v8i1.2600>
- Hadley, E. N., Hernández-Agramonte, J., Santos, H., Albertos, C., Grigera, A., Hobbs, C., & Álvarez, H. (2025). The effects of ethnomathematics education on student outcomes: The JADENKÄ program in the Ngäbe-Buglé comarca, Panama. *International Journal of Bilingual Education and Bilingualism*, 28(5), 579–595. <https://doi.org/10.1080/13670050.2024.2446987>
- Hafizhah, I., & Wardana, I. A. (2022). EFEKTIVITAS PENGGUNAAN MODEL PEMBELAJARAN QUANTUM LEARNING DALAM UPAYA MENINGKATKAN KEMAMPUAN PSIKOMOTORIK PADA PELAJARAN MATEMATIKA. *SOSHUMDIK*, 1(1), 11–21.
- Hardiyansyah, W., Turmuzi, M., & Nurmawanti, I. (2024). Efektifitas Pembelajaran Etnomatematika “Permainan Sambat” Terhadap Hasil Belajar Matematika Siswa Kelas II SDN 2 Keker. *Jurnal Ilmiah Profesi Pendidikan*, 9(1), 412–418. <https://doi.org/10.29303/jipp.v9i1.2076>
- Hendriyani, M., Artini, N. M., & Tatyana, T. (2021). DAMPAK PANDEMI COVID 19 TERHADAP DUNIA PENDIDIKAN. *KOMPLEKSITAS: JURNAL ILMIAH MANAJEMEN, ORGANISASI DAN BISNIS*, 10(2), 13–21. <https://doi.org/10.56486/kompleksitas.vol10no2.128>
- Iffah, R. D. L., Subanti, S., Usodo, B., & Nurhasanah, F. (2025). Systematic literature review: Ethnomathematics research in Indonesia. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, 15–27. <https://doi.org/10.23917/jramathedu.v10i1.5621>
- Ketut Murnawan, I. (2021). Penerapan Model Pembelajaran Quantum teaching untuk Meningkatkan Hasil Belajar Matematika. *Journal of Education Action Research*, 5(2), 254–262. <https://ejournal.undiksha.ac.id/index.php/JEAR/index>

- Khan, F., Khan, M. A., & Rahman, H. U. (2024). Perusing sustainable development through education: evidence from Malaysia, Indonesia and Pakistan. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-024-05441-4>
- Khozaei, S. A., Zare, N. V., Moneghi, H. K., Sadeghi, T., & Taraghdar, M. M. (2022). Effects of quantum-learning and conventional teaching methods on learning achievement, motivation to learn, and retention among nursing students during critical care nursing education. *Smart Learning Environments*, 9(1), 18. <https://doi.org/10.1186/s40561-022-00198-7>
- Köroğlu, M., Kızılay, E., & Güneri, E. (2022). A meta-synthesis study for studies adopting the quantum learning model. *Research in Pedagogy*, 12(2), 358–374. <https://doi.org/10.5937/IstrPed2202358K>
- Meeran, S., Kodisang, S. M., Moila, M. M., Davids, M. N., & Makokotlela, M. V. (2024). Ethnomathematics in Intermediate Phase: Reflections on the Morabaraba Game as Indigenous Mathematical knowledge. *African Journal of Research in Mathematics, Science and Technology Education*, 28(2), 171–184. <https://doi.org/10.1080/18117295.2024.2340095>
- Mustakim, A., Wawan, W., Choirudin, C., Ngaliyah, J., & Darmayanti, R. (2023). Quantum Teaching Model: Untuk Meningkatkan Hasil Belajar Matematika Siswa MTs. *Jurnal Penelitian Tindakan Kelas*, 1(1), 06–10. <https://doi.org/10.61650/jptk.v1i1.54>
- Nahar, S., Suhendri, Zailani, & Hardivizon. (2022). Improving Students' Collaboration Thinking Skill under the Implementation of the Quantum Teaching Model. *International Journal of Instruction*, 15(3), 451–464. <https://doi.org/10.29333/iji.2022.15325a>
- Nihaya, A. A., Kesumawati, N., Rizki Dita Dirgantara, M., & PGRI Palembang, U. (2022). PENINGKATAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA MELALUI PEMBELAJARAN MATEMATIKA BERBASIS ETNOMATEMATIKA SEKOLAH DASAR. *Jurnal Cakrawala Pendas*, 8(4). <https://doi.org/10.31949/jcp.v8i2.3265>
- Ningsih, M. P., Sugiyanti, S., & Ariyanto, L. (2021). Pengaruh Model Pembelajaran Quantum Learning dan Active Learning Berbantu Aplikasi Quizizz terhadap Hasil Belajar Matematika Siswa Kelas XI. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 3(5), 366–374. <https://doi.org/10.26877/imajiner.v3i5.7732>
- Nurhayati, A. I., & Susilo, B. E. (2022). Systematic Literature Review: Implementasi Pembelajaran Etnomatematika terhadap Kemampuan Pemecahan Masalah Matematis dan Karakter Cinta Budaya Lokal. *Didactical Mathematics*, 4(2), 368–379. <https://doi.org/10.31949/dm.v4i2.3359>
- Nursyahidah, F., Wardono, Mariani, S., & Wijayanti, K. (2025). Integrating technology, Javanese ethnomathematics, and realistic mathematics education in supporting

- prospective mathematics teachers' numeracy skills: A learning trajectory. *Journal on Mathematics Education*, 16(2), 671–688. <https://doi.org/10.22342/jme.v16i2.pp671-688>
- Payadnya, I. P. A. A., Wulandari, I. G. A. P. A., Puspawati, 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), 508–522. <https://doi.org/10.1108/JME-05-2024-0049>
- Pratama, R. A., & Yelken, T. Y. (2024). Effectiveness of ethnomathematics-based learning on students' mathematical literacy: a meta-analysis study. *Discover Education*, 3(1), 202. <https://doi.org/10.1007/s44217-024-00309-1>
- Putri, I. L., Retnawati, H., Jaedun, A., Murfi, A., & Begimbetova Atymtaevna, G. (2025). Enhancing mathematical skills through multicontextual approaches: a meta-analysis of realistic mathematics, ethnomathematics, and technology integration. *Cogent Education*, 12(1). <https://doi.org/10.1080/2331186X.2025.2548648>
- Rahman, et al., 2022. (2022). Pengertian Pendidikan Ilmu Pendidikan Da. L-Urwatul Wutsqa: Kajian Pendidikan Islam, 2(1), 1–8.
- Ratnasari, D. H., & Nugraheni, N. (2024). Peningkatan Kualitas Pendidikan di Indonesia dalam Mewujudkan Program Sustainable Development Goals (SDGs). *Pedagogi: Jurnal Ilmu Pendidikan*, 24(2), 189–198. <https://doi.org/10.24036/pedagogi.v24i2.2095>
- Rimba, A. B., Sato, I., & Endo, K. (2025). Localization and its impact on achieving SDGs and transitioning to post-SDGs in Indonesia. *Environmental and Sustainability Indicators*, 28, 100926. <https://doi.org/10.1016/j.indic.2025.100926>
- Rizky, V. B., Nasution, A. T., Kunci, K., Etnomatematika, :, Belajar, M., & Dasar, S. (2024). Model Pembelajaran Etnomatematika dalam Menumbuhkan Motivasi Belajar Siswa di Sekolah Dasar. *EDUCOFA: Jurnal Pendidikan Matematika*, 1(1), 57–70. <https://doi.org/10.24952/ejpm.v1i1.11398>
- Rulandari, N. (2021). Study of Sustainable Development Goals (SDGS) Quality Education in Indonesia in the First Three Years. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(2), 2702–2708. <https://doi.org/10.33258/birci.v4i2.1978>
- Şahin, Ş., & Kılıç, A. (2024). Comparison of the effectiveness of project-based 6E learning and problem-based quantum learning: Solomon four-group design. *Journal of Research in Innovative Teaching & Learning*. <https://doi.org/10.1108/JRIT-09-2023-0139>
- Sanjaya, W., & Budiningsih, A. (2012). *Wina Sanjaya, Kurikulum dan Pembelajaran Teori dan Praktik Pengembangan KTSP (Jakarta: Kencana, 2009), h. 82.*
- Siti Apsoh. (2024). Pengaruh Model Pembelajaran Quantum Learning Terhadap Kemampuan Pemahaman Matematis Siswa Kelas IV SD Negeri Sukarame.

JUPENJI : Jurnal Pendidikan Jompa Indonesia, 3(1), 20–30.
<https://doi.org/10.57218/jupenji.Vol3.Iss1.1139>

Supriyadi, E., Turmudi, T., Afgani Dahlan, J., & Juandi, D. (2024). DEVELOPMENT OF SUNDANESE GAMELAN ETHNOMATHEMATICS E-MODULE FOR JUNIOR HIGH SCHOOL MATHEMATICS LEARNING. *Malaysian Journal of Learning and Instruction*, 21(2), 139–178.
<https://doi.org/10.32890/mjli2024.21.2.6>

Yuli, O. :, Nursanti, B., Saputra, A., Gibran, G. K., Keguruan, F., Pendidikan, I., Sebelas Maret, U., Kunci, K., & Etnomatematika, : (2024). Jurnal Education and development Institut Pendidikan Tapanuli Selatan Hal. *JURNAL EDUCATION AND DEVELOPMENT*, 12(3), 107. <https://doi.org/10.37081/ed.v12i3.6367>