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Paper review
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Traditional Games in Physical Education and Beyond: A Systematic Review of Experimental Research

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Abstract: *This systematic literature review investigates the application of traditional games within school education. Employing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, the study analyzed 18 experimental research articles that utilized traditional games as the independent variable. Data was sourced from four prominent databases: Scopus, Web of Science, ProQuest, and ScienceDirect. Key findings reveal a broad implementation of traditional games across diverse subjects, extending beyond the commonly associated Physical Education domain to encompass Mathematics, Physics, Art, and Science education. This practice is evident in various countries such as Indonesia, Malaysia, the Philippines, Tunisia, Spain, Kazakhstan, and Macedonia. The research emphasizes the interplay between game selection, intervention duration, and participant characteristics in determining the effectiveness of traditional game interventions. While this review highlights the significant potential of traditional games in enhancing educational outcomes, it underscores the need for further research. Exploring the application of traditional games in higher education and broader community contexts is crucial to fully comprehend their impact across different age groups and sociocultural settings. By expanding the scope of inquiry, future studies can contribute to a more comprehensive understanding of the multifaceted benefits of traditional games and inform the development of effective educational strategies.*
Keywords: *traditional games, physical education, systematic review, PRISMA, experimental research*

Introduction

Education is very important to improve the ability of human resources. The phenomenon of 'learning loss' due to the Covid-19 pandemic continues to be felt even today. This phenomenon arose due to the disruption of educational activities during the pandemic (Jakubowski et al., 2023). Learning and teaching activities at schools had to be halted to prevent the spread of Covid-19, which was then gradually adjusted through online learning (Alhazmi, 2023). Online learning was not beneficial for developing countries (Vit, 2023), including Indonesia. The uneven access to the internet and communication devices in Indonesia caused some Indonesian students, especially in remote areas, to be unable to access education at all (Syaukani et al., 2023). In general, the decline in education in Indonesia as a result of the Covid-19 pandemic can be seen from the decline in PISA scores. In December 2023, the Organization for Economic Co-operation and Development (OECD) reported that the PISA scores of Indonesian students had declined compared to previous years (Ismawati et al., 2023). This indicates that education in Indonesia has declined due to the Covid-19 pandemic. Currently, as the Covid-19 pandemic ends and schools are opened for students and teachers to learn, it has had an impact on improving the educational conditions. However, there are still shortcomings that need to be immediately addressed, namely the low interest of students in learning. Several studies have revealed that several years after the Covid-19 pandemic, students' interest in learning is still relatively low (Blain et al., 2022; Manzoor et al., 2022). Emphasis on teacher and student motivation as important because through this game it can also cheer up the mood (S. Susanto et al., 2024).

If this is not taken seriously, then efforts to overcome this learning loss will not be optimal. One strategy that can be made to restore students' interest in learning is to create creative learning, both in terms of material and teaching methods. Traditional games, as a rich cultural heritage, have great potential to answer this challenge. Physical education fosters value-based learning, developing essential 21st-century skills for global competitiveness (Mardiyah et

al., 2024). Traditional games are not only fun but also contain educational values that can develop various cognitive, social, and emotional skills in students(Azlan et al., 2021). Although some studies have mentioned the benefits of traditional games in education, further research is still needed to systematically examine the effectiveness of their implementation. This research is presented to provide a broader picture to readers about the extent to which traditional games have been implemented in the context of learning in schools.

Traditional games are those that have been played for generations across different generations(Fauzi et al., 2023). These games are deeply rooted in the culture of the society that plays them, so it can also be said that traditional games are cultural products. Traditional games were very familiar to children in the past, but now, traditional games tend to be forgotten by the younger generation. The emergence of more modern and interactive games, especially those based on digital technology, has caused traditional games to lose their existence. Therefore, as an effort to improve the quality of education and preserve culture, the implementation of traditional games in schools has become the most strategic step. Structured learning activities in schools will inevitably make students take part in learning activities delivered by teachers. The implementation of traditional games by teachers in learning will certainly open up opportunities for students to learn more deeply about traditional games. The cultural values in traditional games will be a strong foundation for the formation of students' character who have a global perspective and are aware of the culture around them. These are the characters that students must have in 21st century skills(Nazarian et al., 2023).

Although several studies have investigated the implementation of traditional games in educational contexts, a comprehensive literature review reveals several shortcomings. Firstly, most studies have focused on qualitative aspects (Hananingsih et al., 2024), making it difficult to generalize the results. Secondly, some studies are descriptive and associative in nature(Adi et al., 2022; Kristanto & Wibowo, 2023), which can only describe or measure the relationship between variables, but cannot prove that one variable cause another. Thirdly, the contexts in which traditional games are implemented also vary, ranging from formal schools to informal communities, making it difficult to identify the factors that most influence the success of implementation (Suhra, 2023). Therefore, this study aims to fill this gap by conducting a systematic review of experimental studies that specifically test the effectiveness of traditional games in improving students' academic achievement in school settings. Thus, it is expected that this study can provide stronger causal empirical evidence regarding the potential of traditional games as an effective learning tool.

Based on the above background, this study aims to answer several research questions: (1) To what extent have traditional games been implemented in school learning? (2) What learning outcomes are produced from the implementation of traditional games in schools? (3) What is the most effective way to implement traditional games in the learning process? Through this literature review, it is expected that important information will emerge that can serve as a guide for teachers to adopt traditional games in their teaching activities.

Material and Methods

This Systematic Literature Review (SLR) aims to determine the extent to which traditional games have been adapted for use in school learning activities. This research collected articles from four prominent databases that index academic journals in the field of education: Scopus, Web of Science (WOS), ScienceDirect, and ProQuest. In conducting this investigation, the researcher adhered to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(Page et al., 2021). The literature review protocol presented in PRISMA has been widely used in various social research studies and has proven effective in producing comprehensive, transparent, and easily understandable systematic literature reviews. Through the databases used in this study, the researchers searched for articles related to the implementation of traditional games in school curricula.

Search protocol

The search process began by determining the keywords used to form search strings for each database. Search strings were created by combining keywords and Boolean operators such as "AND", "OR", and "NOT" to find articles that matched the research objectives. Additionally, parentheses and quotation marks were used within the search strings to group keywords, and asterisks (wildcards) were used to search for variations of words. The search using the search strings yielded a total of 1064 articles. A breakdown of the results shows that 345 articles were obtained from Scopus, 362 from WOS, 256 from ScienceDirect, and 101 from ProQuest. In this study, there was no limit set on the publication year for the articles. Subsequently, the filtering feature was used in each database to simplify the number

of articles according to the research needs. Based on the search results using filters, 195 articles were obtained, which then entered the title screening stage. At this stage, each title was reviewed and matched against the inclusion criteria to be included in the abstract screening stage. At the title review stage, the number of articles decreased to 37, where most of the analyzed articles had titles that did not align with the research objectives. For example, there was the word "traditional" in the article title, but it did not refer to traditional games but rather to traditional teaching, traditional assessment, etc., which were not related to traditional games. The 37 articles that passed the title screening stage were then screened based on their abstracts. The authors were guided by the inclusion and exclusion criteria to determine the articles suitable for use in this study. There were a total of 28 articles that would then be analyzed in full-text. The remaining 9 articles did not meet the criteria because they were not experimental research (1), were not curricular activities in schools (3), and did not use students as research samples.

Data extraction

At the final stage of article selection, 28 articles were analyzed in full-text. This stage required the authors to read and scrutinize each article individually to determine the alignment between the data presentation and discussion in each article with the data needs of this SLR. A total of 10 articles were found to be ineligible and were excluded from this study. The reasons for exclusion included irrelevance to the context of implementing traditional games for students in schools (3 articles), as the traditional games were applied outside of a school setting and the subjects involved in the study were not students but teachers, parents, and the general public. Additionally, 3 other articles, while studying traditional games in schools, did not employ an experimental research design. Several other articles were not included in the final list of articles because they were still preliminary studies or were not open-access articles. At this final screening stage, Microsoft Excel software was used because it has a simple interface, is easy to operate, and can be used to categorize articles into smaller sections for more detailed analysis of their suitability. In the final stage, 18 articles were selected for further in-depth analysis to identify patterns and data congruence to answer the research questions. The overall flow of this SLR can be seen in Figure 1.

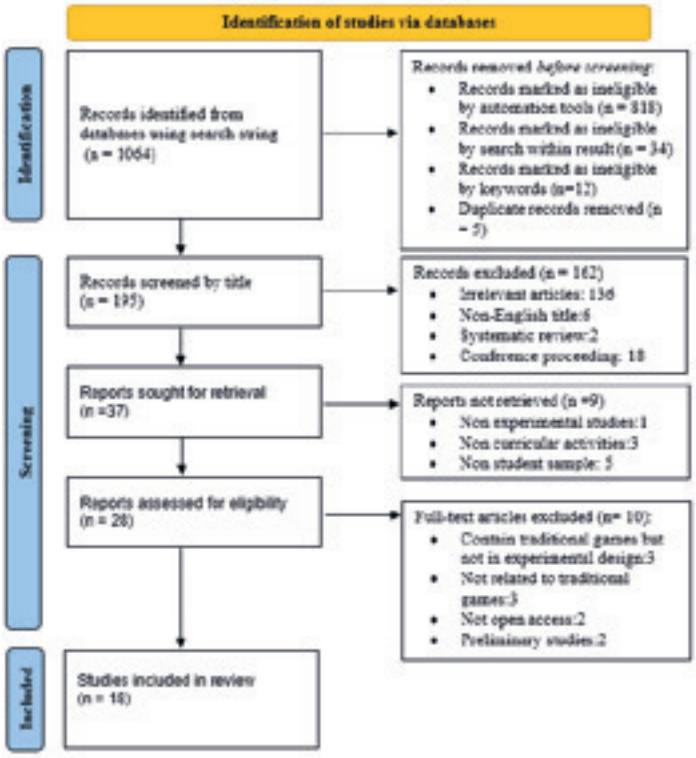

Figure 1. *PRISMA search protocol on this study*

Results

After undergoing a series of search and selection processes adhering to the PRISMA protocol, this research suc-

cessfully selected 18 articles from 7 countries to be analyzed in order to answer the predetermined research questions. The 7 countries involved, along with the number of articles, are Indonesia (8), Spain (4), Macedonia (1), Tunisia (1), Kazakhstan (1), Malaysia (2), and the Philippines (1). The analysis of each article was guided by the research questions to reveal the extent to which traditional sports have been implemented in school curricula.

Scope of implementation

RQ1: To what extent have traditional games been implemented in school learning?

Based on the provided data, traditional games have been primarily implemented in physical education subjects. Analysis of 18 articles reveals that traditional games are predominantly used in physical education (PE) classes, with 13 articles focusing on this application. This emphasis likely reflects the physical nature of these games, which naturally aligns with PE goals like improving fitness, motor skills, and cooperation. Some traditional games used include *Galah Panjang* (Azlan et al., 2021), *Bentengan* (Budiman et al., 2021), *Piko* (Capinding & Remelie Dacumos Salazar, 2023), *Tok Harimau* (Charles et al., 2017), and *Raqassa* (Jebali et al., 2013). Traditional games offer a range of physical benefits, developing speed, agility, power, flexibility, and coordination. Introducing these games into physical education innovatively achieves learning goals while connecting students with local culture. While modern sports like football, volleyball, and basketball are valuable for developing fitness and motor skills, this research highlights the potential of traditional games to achieve these same objectives while simultaneously fostering cultural awareness and values. This approach offers a unique opportunity to enrich physical education beyond its standard curriculum.

This research shows physical education as the primary subject using traditional games. While less common, their use in other subjects like physics, math, and science is a promising trend, suggesting broader recognition of their educational value. This interdisciplinary approach enriches learning by providing culturally relevant contexts for abstract concepts. For example, the growing field of ethnomathematics explores how cultures embed mathematical ideas in their practices, highlighting the connection between mathematics and culture(Nurcahyo et al., 2024; Uula et al., 2024). Ethnomathematics highlights that mathematics is not solely a Western construct but is present in various forms in different cultures. Therefore, it aims to guide students to understand and respect the mathematical knowledge and practices of indigenous and marginalized communities. In this research, there are several articles that highlight the use of traditional games in mathematics learning, including Trajkovik's study (Trajkovik et al., 2018), which uses Macedonian traditional games (Match-box & Hop-scotch) in math classes. Through traditional games, learning can be designed as Game-based learning (GBL) model, which can create a student-centered learning approach that optimize learning engagement. Additionally, another study that adopted traditional games in mathematics learning is Kamid's research(Kamid et al., 2022), which utilizes the educational value of traditional games to improve students' process skills and learning motivation. Regarding RQ1, the diverse nature of traditional games allows teachers to select games appropriate for various subjects and course learning outcomes (CLOs). This versatility explains the wide range of traditional game implementation across school curricula, beyond physical education, including both science and social studies.

Targeted outcomes

RQ2: What learning outcomes are produced from the implementation of traditional games in schools?

This review of experimental studies examined how traditional games (independent variable) affected targeted learning outcomes (dependent variable). Most studies explored how manipulating traditional games impacted these outcomes across the three learning domains: cognitive (intellectual skills like knowledge and critical thinking), affective (emotions, attitudes, and values), and psychomotor (physical skills and coordination). While each subject interprets these domains differently, all aim for holistic education by addressing all three. Although each of the 18 articles had specific target outcomes, all considered cognitive, affective, and psychomotor aspects. Within the cognitive domain, studies used traditional games to improve various cognitive abilities, including learning outcomes, mathematical and scientific thinking, process skills, critical thinking, and creative thinking. The subjects that applied these varied from Physical Education (PE), Mathematics and Science, to Physics(Aliriad et al., 2024; Capinding & Remelie Dacumos Salazar, 2023; Fernández-Oliveras et al., 2021; Khoiri et al., 2023; Trajkovik et al., 2018). Traditional games are not only associated with motor skills but can also be used to achieve cognitive goals. This is due to the wide variety of traditional games that teachers can choose from to suit their desired learning objectives.

For example, a research by Fernández-Oliveras et al., (2021) utilized the Spanish traditional game The Dog and The Goats *"El Perro y las Cabras"*, a traditional board game that involves strategic thinking and planning. Through their research, they identified the various impacts that could result from implementing traditional games in mathematics and science subjects. Their findings concluded that traditional games have successfully promoted the activation of mathematical and scientific content among participants aged 8 to 12 years. The traditional games proved to be effective in mobilizing essential mathematical and scientific concepts, demonstrating their strong didactic potential within the context of primary education. Meanwhile, research by Trajkovik et al., (2018) applied several Macedonian traditional games to different subjects. Specifically, "Matchbox" and "Hop-Scotch" were incorporated into mathematics, "Lady" and "String" into art classes, and "Mosque" and "Hide and Seek" into Nature and Society classes. The results showed that traditional games serve as effective instructional tools that enhance learning outcomes across various subjects, including Mathematics, Art, and Social Science. The study found that these games not only improved test scores but also increased student engagement and interest in the learning process.

Key to effective implementation

RQ3: What is the most effective way to implement traditional games in the learning process?

This review included only experimental studies, as this design is particularly effective for establishing cause-and-effect relationships. By manipulating the independent variable (traditional games) and measuring its impact on the dependent variable (learning outcomes), researchers can confidently determine causality. While the 18 included studies mostly employed a quasi-experimental design, they aim to inform real-world educational applications of traditional games. A key consideration was the duration of the traditional game intervention. Appropriate duration is crucial for accurate results; too short a period may not yield measurable changes, while too long may lead to participant fatigue or boredom, both of which can compromise validity and reliability.

The shortest treatment duration was 12 minutes(Jebali et al., 2013) and the longest duration was 24 sessions with an accumulated time of 1440 minutes (24 hours)(Charles et al., 2017). Studies of both short and long duration confirm the positive impact of traditional games. Jebali's study of the Tunisian game "Raqassa" showed improved cardiovascular response, while Charles found that traditional games enhanced physical fitness. While Jebali's acute study adequately addressed intervention time, Charles, despite having the longest intervention period of the reviewed studies, acknowledged its limitations for chronic response and suggested longer interventions for greater improvement, highlighting the influence of the dependent variable on required intervention length.

Effective program evaluation requires selecting appropriate traditional games. This research identifies diverse games used across subjects, ranging from physically active to mentally stimulating. Research by Capinding & Remelie Dacumos Salazar, (2023) applied the Filipino traditional game *"Tatsing"* or Hit The Cap, which is a game that tests accuracy in hitting a bottle cap target with a stone; players aim to collect bottle caps and answer questions related to science topics. This game does not emphasize physical aspects, similar to the Spanish game *El Perro y las Cabras* (Fernández-Oliveras et al., 2021), this game requires strategic thinking skills so it is suitable to be linked to subjects that involve a lot of thinking skills. This game tends to sharpen cognitive abilities so it will certainly not be suitable if it is linked to the impact on improving physical fitness. If the goal is to improve physical fitness, then the appropriate type of game must be found, such as *Raqassa* (Jebali et al., 2013), *Galah Panjang* (Charles et al., 2017), and *Bentengan* (Fauzi et al., 2023).

The next consideration in ensuring the effectiveness of implementing traditional games is the targeted participants. 17 out of 18 articles (94%) used in this study used children as research subjects. In an educational context, the subjects used were students from elementary to junior high school(Aliriad et al., 2024; Azlan et al., 2021; Capinding & Remelie Dacumos Salazar, 2023; Charles et al., 2017; Ermenova et al., 2020; Fauzi et al., 2023; Fernández-Oliveras et al., 2021; Hartanto et al., 2021; Jebali et al., 2013; Kamid et al., 2022; Khoiri et al., 2023; Luchoro-Parrilla et al., 2021; Muñoz-Arroyave et al., 2021; Saputra et al., 2021; Septianto et al., 2024; Trajkovik et al., 2018). This indicates that one of the positive outcomes of these studies is the suitability of the target participants. Traditional games are objects to fill children's playtime. Traditional games are often played outdoors, use inexpensive and easily obtainable equipment, and have fairly simple rules. For children who are still closely connected to the world of play, traditional games are certainly still able to satisfy their level of enjoyment, while for adults, traditional games may not be as attractive as modern games that have more complex rules that can add challenge and excitement when playing.

Therefore, through this research, it can be concluded that the greatest opportunity for the success of implementing traditional games is when applied to children aged elementary to junior high school.

Discussion

This study highlights the potential of traditional games to enhance learning across disciplines. While their use in physical education is expected, their integration into subjects like math and science is promising. In PE, these games promote fitness, motor skills, and cooperation, enriching curricula and fostering cultural appreciation. In math, games like Match-box and Hop-scotch offer engaging, culturally relevant learning experiences that improve understanding and problem-solving, aligning with ethnomathematics principles. Overall, a game-based learning approach using traditional games can boost student engagement. Research by Kamid et al. (2022) highlight the positive impact of these games on students' process skills and learning motivation.

This review highlights the potential of traditional games to enhance student learning across cognitive, affective, and psychomotor domains. Beyond physical education, these games can be integrated into various subjects to promote holistic development, especially cognitive and affective growth. By engaging in traditional games, students are challenged to think critically, make strategic decisions, and problem-solve, thereby stimulating their cognitive abilities. Studies such as Fernández-Oliveras et al. (2021) and Trajkovik et al. (2018) exemplify how these games can be employed to activate mathematical and scientific concepts, thereby enriching the learning experience. Moreover, these games often involve teamwork, cooperation, and fair play, fostering essential social and emotional skills that contribute to overall well-being. In addition to being beneficial for academic achievement, traditional games also contribute to the preservation of local culture, which is crucial amid modernization and globalization(Narimo et al., 2019; Sulistyanto et al., 2023). Developing culturally aware youth is crucial for producing competent individuals with strong cultural identities, prepared for a globalized world. Traditional games offer a valuable means of fostering such well-rounded development.

This review concludes that the effectiveness of traditional games in education depends on game selection, intervention duration, and target participants. Careful game selection is crucial, given the diverse nature of traditional games. As demonstrated by studies such as Capinding & Remelie Dacumos Salazar (2023) and Fernández-Oliveras et al. (2021), certain games are inherently suited to specific learning objectives. While *"Tatsing"* and *"El Perro y las Cabras"* excel in fostering cognitive skills, games like *"Raqassa," "Galah Panjang,"* and *"Bentengan"* are more aligned with physical development. The alignment of traditional games with desired educational outcomes is crucial for maximizing their effectiveness. Intervention duration significantly influences results; while positive effects were observed across varying lengths, from short sessions to extended programs, the specific outcomes were dependent upon this duration. Acute responses, such as changes in heart rate, were evident even in short-term interventions, as demonstrated by Jebali et al. (2013). Conversely, chronic outcomes like physical fitness, as measured by Charles et al. (2017), required more extended periods. This review highlights the need for careful consideration of intervention duration and participant selection, particularly given the prevalence of child participants. While traditional games' physical and playful nature aligns well with children's development, generalizing these findings to adults may be limited due to potentially different preferences and engagement.

Conclusion

This research concludes that traditional games are widely used in primary and secondary schools across various subjects. This review suggests that all subjects consider incorporating these games, given their potential for both academic achievement and cultural preservation. The reviewed articles demonstrate how to select appropriate games and determine effective intervention durations to achieve specific learning targets. Traditional games offer educators an interactive and culturally enriching alternative learning experience. Future research should explore their application in higher education to understand their impact on older learners.

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References:

Adi, B. S., Irianto, D. P., & Sukarmin, Y. (2022). Teachers' perspectives in motor learning with traditional game approach for early childhood. *Cakrawala Pendidikan*, *41*(1), 1–11. Scopus. https://doi.org/10.21831/cp.v41i1.36843

Alhazmi, A. A. (2023). "The pandemic of distance learning": How Arab high school students see online-learning during Covid-19. *Psychology in the Schools*, *60*(11), 4394–4403. https://doi.org/10.1002/pits.22763

Aliriad, H., Adi, S., Manullang, J. G., Endrawan, I. B., & Satria, M. H. (2024). Improvement of Motor Skills and Motivation to Learn Physical Education Through the Use of Traditional Games. *Physical Education Theory and Methodology*, *24*(1), 32–40. Scopus. https://doi.org/10.17309/tmfv.2024.1.04

Azlan, A., Ismail, N., Fauzi, N. F. M., & Talib, R. A. (2021). Playing traditional games vs. Free-play during physical education lesson to improve physical activity: A comparison study. *Pedagogy of Physical Culture and Sports*, *25*(3), 178–187. Scopus. https://doi.org/10.15561/26649837.2021.0306

Blain, D. O., Standage, M., & Curran, T. (2022). Physical education in a post-COVID world: A blended-gamified approach. *European Physical Education Review*, *28*(3), 757–776. https://doi.org/10.1177/1356336X221080372

Capinding, A. T. & Remelie Dacumos Salazar. (2023). Revitalizing Science Education: Harnessing the Power of Traditional Filipino Games in the Classroom. *TEM Journal*, *12*(4), 2241–2250. Coronavirus Research Database; Publicly Available Content Database. https://doi.org/10.18421/TEM124-35

Charles, Md. A. G., Abdullah, M. R., Musa, R. M., Kosni, N. A., & Musawi Maliki, A. B. H. (2017). The Effectiveness of Traditional Games intervention program in the Improvement of Form One School-Age Children's Motor Skills Related Performance Components. *Movement, Health & Exercise*, *6*(2). https://doi.org/10.15282/mohe.v6i2.142

Ermenova, B. O., Ibragimova, T. G., Sovetkhanuly, D., Duketayev, B. A., & Bekbossynov, D. A. (2020). Health-improving and educational effect of gamified physical activities. *Retos*, *39*, 737–742. Scopus. https://doi.org/10.47197/RETOS.V0I39.82548

Fauzi, R. A., Suherman, A., Saptani, E., Dinangsit, D., & Rahman, A. A. (2023). The Impact of Traditional Games on Fundamental Motor Skills and Participation in Elementary School Students. *International Journal of Human Movement and Sports Sciences*, *11*(6), 1368–1375. https://doi.org/10.13189/saj.2023.110622

Fernández-Oliveras, A., Espigares-Gámez, M. J., & Oliveras, M. L. (2021). Implementation of a Playful Microproject Based on Traditional Games for Working on Mathematical and Scientific Content. *Education Sciences*, *11*(10), 624. https://doi.org/10.3390/educsci11100624

Hananingsih, W., Isnaini, L. M. Y., & Irmansyah, J. (2024). The Role of Traditional Sports in Establishing Student Character through Physical Education, Sports, and Health Learning. *International Journal of Human Movement and Sports Sciences*, *12*(3), 538–545. https://doi.org/10.13189/saj.2024.120310

Hartanto, D., Kusmaedi, N., Mamun, A., & Abduljabar, B. (2021). Integrating Social Skills in Traditional Games with Physical Education Interventions. *International Journal of Human Movement and Sports Sciences*, *9*(5), 921–928. https://doi.org/10.13189/saj.2021.090513

Ismawati, E., Hersulastuti, H., Amertawengrum, I. P., & Anindita, K. A. (2023). Portrait of Education in Indonesia: Learning from PISA Results 2015 to Present. *International Journal of Learning, Teaching and Educational Research*, *22*(1), 321–340. https://doi.org/10.26803/ijlter.22.1.18

Jakubowski, M., Gajderowicz, T., & Patrinos, H. A. (2023). Global learning loss in student achievement: First estimates using comparable reading scores. *Economics Letters*, *232*, 111313. https://doi.org/10.1016/j.econlet.2023.111313

Jebali, T., Moalla, W., Elloumi, M., Padulo, J., Baquet, G., & Chamari, K. (2013). The relevant use of the traditional Tunisian game "raqassa" for cardiovascular stimulation in schoolchildren. *Biology of Sport*, *30*(3), 219–225. Scopus. https://doi.org/10.5604/20831862.1059304

Kamid, K., Rohati, R., Hobri, H., Triani, E., Rohana, S., & Pratama, W. A. (2022). Process Skill and Student's Interest for Mathematics Learning: Playing a Traditional Games. *International Journal of Instruction*, *15*(3), 967–988. https://doi.org/10.29333/iji.2022.15352a

Khoiri, N., Ristanto, S., & Kurniawan, A. F. (2023). Project-Based Learning Via Traditional Game in Physics Learning: Its Impact on Critical Thinking, Creative Thinking, and Collaborative Skills. *Jurnal Pendidikan IPA Indonesia*, *12*(2), 286–292. https://doi.org/10.15294/jpii.v12i2.43198

Kristanto, W., & Wibowo, H. (2023). Use of Engklek in Character Education: Early Childhood Education. *International Journal of Early Childhood Learning*, *30*(2), 53–72. Scopus. https://doi.org/10.18848/2327-7939/CGP/v30i02/53-72

Luchoro-Parrilla, R., Lavega-Burgués, P., Damian-Silva, S., Prat, Q., de Ocáriz, U., Ormo-Ribes, E., & Pic, M. (2021). Traditional Games as Cultural Heritage: The Case of Canary Islands (Spain) From an Ethnomotor Perspective. *FRONTIERS IN PSYCHOLOGY*, *12*. https://doi.org/10.3389/fpsyg.2021.586238

Manzoor, S. R., Mohd-Isa, W.-N., & Dollmat, K. S. (2022). Post-pandemic e-learning: A pre-protocol to assess the impact of mobile VR on learner motivation and engagement for VARK learning styles. *F1000Research*, *10*, 1106. https://doi.org/10.12688/f1000research.73311.2

Muñoz-Arroyave, V., Pic, M., Luchoro-Parrilla, R., Serna, J., Salas-Santandreu, C., Damian-Silva, S., Machado, L., Rodríguez-Arregi, R., Prat, Q., Duran-Delgado, C., & Lavega-Burgués, P. (2021). Promoting Interpersonal Relationships through Elbow Tag, a Traditional Sporting Game. A Multidimensional Approach. *Sustainability*, *13*(14), 7887. Publicly Available Content Database. https://doi.org/10.3390/su13147887

Narimo, S., Sutama, S., & Novitasari, M. (2019). Pembentukan Karakter Peserta Didik dalam Pembelajaran Pendidikan Pancasila dan Kewarganegaraan Berbasis Budaya Lokal. *Jurnal VARIDIKA*, *31*(1), 39–44. https://doi.org/10.23917/varidika.v1i1.8902

Nazarian, M., Alsheikh, N., & Alhosani, M. (2023). Between Vision and Revision: English Language Teachers Accentuating Their Voices about 21st Century Skills. *The International Journal of Learning in Higher Education*, *31*(1), 25–50. https://doi.org/10.18848/2327-7955/CGP/v31i01/25-50

Nurcahyo, A., Ishartono, N., Pratiwi, A. Y. C., & Waluyo, M. (2024). Exploration of mathematical concepts in Batik Truntum Surakarta. *Infinity Journal*, *13*(2), 457–476. https://doi.org/10.22460/infinity.v13i2.p457-476

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, n71. https://doi.

org/10.1136/bmj.n71

Rillo-Albert, A., Sáez de Ocáriz, U., Costes, A., & Lavega-Burgués, P. (2021). From Conflict to Socio-Emotional Well-Being. Application of the GIAM Model through Traditional Sporting Games. *Sustainability*, *13*(13), 7263. https://doi.org/10.3390/su13137263

Saputra, H., Hanif, A. S., Sulaiman, I., Ningrum, D. T. M., & Razali, R. (2021). The Effect of Traditional Games and Drill with Motor Ability on Skills (Running, Jumping, Overhand Throw and Catching) at Elementary School. *International Journal of Human Movement and Sports Sciences*, *9*(6), 1097–1103. https://doi.org/10.13189/saj.2021.090603

Septianto, I., Sumaryanti, S., Nasrulloh, A., Sulistiyono, S., Nugraha, H., Ali, M., Ramadhani, A. M., Dewantara, J., Haniyyah, N., Fauzi, F., Suryadi, D., Ardian, R., & Subarjo, S. (2024). Traditional games for physical fitness: An experimental study on elementary school students. *Retos*, *54*, 122–128. https://doi.org/10.47197/retos.v54.104177

Suhra, S. (2023). Character Education Values in The Bugis Traditional Game of Mappasajang: An Islamic Perspective. *Ulumuna*, *27*(1), 390–415. Scopus. https://doi.org/10.20414/ujis.v27i1.573

Sulistyanto, H., Djumadi, D., Sumardjoko, B., Haq, M. I., Zakaria, G. A. N., Narimo, S., Astuti, D., Adhantoro, M. S., Setyabudi, D. P., Sidiq, Y., & Ishartono, N. (2023). Impact of Adaptive Educational Game Applications on Improving Student Learning: Efforts to Introduce Nusantara Culture in Indonesia. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *5*(3), 249–261. https://doi.org/10.23917/ijolae.v5i3.23004

Susanto, S., Setyawan, H., García-Jiménez, J. V., Pavlovic, R., Nowak, A. M., & Susanto, N. (2024). Analysis of One-Hole Game Tools in Developing Fine Motor Skills in Early Childhood. *Sportske Nauke i Zdravlje*, *14*(5), 135–139. https://doi.org/10.7251/SSH24V135S

Syaukani, A. A., Subekti, N., Khuddus, L. A., Zoki, A., & Bimantoro, A. P. (2023). Challenge and barriers: Teacher reflection on teaching physical education and sports during Covid-19 pandemic. *Journal of Physical Education*, *34*(1). https://doi.org/10.4025/jphyseduc.v34i1.3434

Trajkovik, V., Malinovski, T., Vasileva-Stojanovska, T., & Vasileva, M. (2018). Traditional games in elementary school: Relationships of student's personality traits, motivation and experience with learning outcomes. *PLOS ONE*, *13*(8), e0202172. https://doi.org/10.1371/journal.pone.0202172

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*. 020040. https://doi.org/10.1063/5.0183039

Vit, E. (2023). The ability of low- and High-SES schools to inhibit learning losses during the COVID-19 pandemic. *Social Sciences & Humanities Open*, *7*(1), 100393. https://doi.org/10.1016/j.ssaho.2022.100393

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