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## Improving Elementary Students' Learning Motivation and Physical Fitness

Randy Firman Illahi<sup>1)</sup>, Syamsuar<sup>2)</sup>, Tjung Hauw Sin<sup>3)</sup>, Wilda Welis<sup>4)</sup>, Yovhandra Ockta<sup>5)</sup>

<sup>1)</sup> Faculty of Sport Science, Universitas Negeri Padang, Indonesia  
E-mail: [randyarfi1997@gmail.com](mailto:randyarfi1997@gmail.com)

<sup>2)</sup> Faculty of Sport Science, Universitas Negeri Padang, Indonesia  
E-mail: [syamsyar@fik.unp.ac.id](mailto:syamsyar@fik.unp.ac.id)

<sup>3)</sup> Faculty of Sport Science, Universitas Negeri Padang, Indonesia  
E-mail: [tjunghauwsin@fik.unp.ac.id](mailto:tjunghauwsin@fik.unp.ac.id)

<sup>4)</sup> Faculty of Sport Science, Universitas Negeri Padang, Indonesia  
E-mail: [wildawelis@fik.unp.ac.id](mailto:wildawelis@fik.unp.ac.id)

<sup>5)</sup> Faculty of Sport Science, Universitas Negeri Padang, Indonesia  
E-mail: [yovhandra1999@gmail.com](mailto:yovhandra1999@gmail.com)

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**Abstract.** The development of a game-based learning model for elementary school students aims to enhance both learning motivation and physical fitness. This model addresses key aspects including cognitive, emotional, and psychomotor skills, crucial for effective learning. Overcoming common obstacles such as lack of interest, monotony, and teacher limitations in varied instructional approaches is central to this endeavor. The research employs a research and development (R&D) methodology, spanning pre-development and development phases. Pre-development involves problem identification, literature review, field studies, and initial investigations, while development encompasses drafting the model, expert validation, product testing, and finalization. Subjects from Elementary School of 11 Koto Sungai Sarik, Pariaman, along with expert validators, contribute to data collection through questionnaires and physical fitness tests, analyzed descriptively and quantitatively. Findings indicate the effectiveness of the game-based model in improving both learning motivation and physical fitness, evident in significant pretest-posttest enhancements. This underscores its positive impact on Physical Education learning, offering a viable solution to common educational challenges. The model emerges as a promising tool for enhancing student well-being and physical education learning quality. Physical educators are encouraged to integrate this model to boost learning effectiveness and student welfare, thereby elevating the overall educational experience.

**Keywords:** Elementary Students; Learning Motivation; Physical Fitness; Game Based Learning

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### I. INTRODUCTION

A component that greatly influences the success of children in the future is quality education (Alzahrani and Seth 2021; Komariah and Nihayah 2023; Zainuddin, Fatah, and Junarti 2023). Education in the school environment has a very important role because it helps children acquire the skills, knowledge, and interpersonal skills needed to contribute positively to society as adults (Akour and Alenezi 2022; Jannah, Markhamah, and Rahmawati 2024; Mahoney et al. 2021). Education at school provides lessons that can not only be obtained at home (Agaton and Cueto 2021; Nazhira 2022; Suryaman et al. 2020). As revealed by Insania & Pasaribu (2024) states that students should be trained through learning so that they acquire information, abilities, and competencies that they can apply according to the needs of themselves and their families. One important aspect and compulsory subject in the realm of education is physical education (Corbin 2021;

O'Brien et al. 2020; Umar, Ockta, and Mardesia 2023). Physical education is not just a general education process, but should also be an integral part of education as a whole (Spence et al. 2021). Children have the opportunity to enjoy physical education subjects as they can explore their own physical activity (Ockta et al. 2024; Varea and González-Calvo 2020). In primary school children it is an important time to learn and optimize physical and mental development (Rabillas et al. 2023; Sutapa et al. 2021; Yusmawati, Haqiyah, and Riyad 2020). Generally, children carry out physical activity through play both individually and in groups (Rossi, Behme, and Breuer 2021; Yarımkaaya and Esentürk 2022). As explained by moving, playing, forming groups, and practicing directly are the main characteristics of elementary school-aged children (Rasmitadila et al. 2021; Taylor and Boyer 2020). Therefore, physical activity must be adjusted to the physical and emotional development of the child.

Physical education learning provides opportunities for children to gain movement experience through a child's physical activity (Cruickshank, Pill, and Mainsbridge 2021; Fletcher and Ní Chróinín 2022). Physical education has many objectives, including improving students' motor skills, health and physical fitness, knowledge of healthy living and sportsmanship, as well as children's emotional intelligence (Basuki 2022; Muhtar, Supriyadi, and Lengkana 2020). These goals involve cognitive, emotional, and psychomotor components, which are not much different from educational goals as a whole and in general (Dalkıran, Eryiğit, and Sivri 2020; Fenanlampir, Leasa, and Batlolona 2021; Sari, Sulistiono, and Winingsih 2020). Physical education learning should be a means for students to gain motion experience from their physical activity. Games or games in physical education are one of the physical activities that are not only fun, but can also be an effective learning tool (Barba-Martín et al. 2020; Centeio et al. 2021). So, students can enjoy varied physical activity games so as not to get bored quickly during learning. Games in physical education should contain elements that increase the motivation of students, their skills, and also improve physical fitness (Alaska and Hakim 2021; Sau, Bili, and Lengo 2022). By combining games tailored to students' abilities and characters so that students can meet physical education learning requirements. In the school environment and its surroundings, children can play a wide variety of games either with or without the use of tools. Sports with this type of game are preferred by students because they can do their physical activities freely (Umri Rahman Efendi, Daulat Saragi, and Yakobus Ndonga 2023). These games are not only fun, but also have a positive impact on the physical health of students (Dewi and Verawati 2022).

In addition, physical activity games in physical education also provide opportunities for students to socialize and work in groups with their friends (Mocanu et al. 2021; Shepherd et al. 2021). This socialization helps build positive relationships based on acceptance, respect, and other values such as respect for friends, honesty, and sportsmanship (Hartanto et al. 2021). In addition, physical activity games in physical education can also increase student learning motivation, develop their interest in learning, learning efficiency, and increase student achievement (Fernández-Espínola et al. 2020; Luo et al. 2020). The integration of games in learning has also proven to be effectively used as learning materials in schools (Gil-Arias et al. 2020; Liu, Shaikh, and Gazizova 2020). Based on the independent curriculum, learning physical education, sports, and health can be achieved through various types of games. Teachers are expected to guide students to acquire basic movement skills, methods, and techniques of the game, as well as values such as sportsmanship and cooperation (Yupriskila Dwi Hadassah and Sandra Rosiana Tapilaha 2023).

However, findings from observations and interviews at Elementary School of 11 Koto Sungai Sarik, Pariaman show that the learning potential of physical education has not been fully realized. Problems such as monotonous learning, lack of use of game-based learning models, and lack of teacher experience and creativity become obstacles in achieving

learning goals optimally. Therefore, the development of game-based learning models is important to increase students' learning motivation and physical fitness. This model is expected to help teachers gain insight into their knowledge of new variations in learning, as well as enable students to play an active role confidently and happily. In developing game-based learning models, it is necessary to pay attention to the cognitive, emotional, and psychomotor aspects of students. This model must also be able to overcome obstacles in learning such as lack of interest in learning, monotonous learning, and lack of teacher skills in creating various learning models. Thus, physical education learning using a game-based learning model can be a solution to increase learning effectiveness and overcome existing problems. This will help students become more interested and active in the learning process, so that learning objectives can be achieved optimally.

## II. METHODS

Research and development (R&D) has a very important role in the advancement of science and education, as well as in the progress of human civilization as a whole (Sugiyono 2018). The goal is to discover new knowledge that is more scientifically complete than has been previously collected (Sugiyono 2015). One type of research method used is development research, which includes testing the effectiveness of products and developing new products or refining existing products. In physical education and recreational sports, development research is used to create a new paradigm of game-based learning, with the aim of improving the academic motivation and physical fitness of elementary school students. The development procedure used follows Sugiyono's development model, which consists of several steps that are carried out systematically and sequentially. The pre-development stage involves identifying problems in physical education learning, literature review, field studies, and preliminary investigations. While the development stage includes the preparation of an initial draft of the learning model, validation by experts, product trials, and making the final product.

The subjects of this study were students from Elementary School of 11 Koto Sungai Sarik, as well as three experts who served as test subjects at the validation stage. Data were collected through the use of questionnaires and physical fitness tests, with the aim of obtaining qualitative and quantitative information about the effectiveness of the learning approaches developed. The research instruments used include questionnaires to obtain data on student learning motivation and physical fitness test instruments to assess students' physical fitness levels. The use of these instruments follows data collection methods that are in accordance with the survey strategy. Data analysis is performed using quantitative descriptive analysis, which includes average calculations, difference tests, and normality tests. The data is then presented in the form of a histogram for easy understanding. The research schedule is prepared in detail to regulate each stage of research implementation, from giving research letters to schools to conducting pretests, implementing learning models, posttests, and closing research

meetings. Thus, this research is a systematic effort to develop a game-based learning model in physical education and recreational sports, with the hope of increasing learning motivation and physical fitness of elementary school students.

### III. RESULT

#### Validity and Practicality of Learning Models

This research aims to develop a game-based learning model to increase learning motivation and physical fitness of elementary school students. Researchers expect the resulting product in the form of a game-based learning model to increase learning motivation and physical fitness of students can be a new innovative and fun learning model for students, especially in improving physical fitness skills and student learning motivation with several game variants. Assuming the learning to be developed can be used as an interesting learning model for elementary school students. The basis for the development carried out by the researcher was during the preliminary study by making observations at school, showing that students were actively involved in the early minutes, the rest of the students were not conditioned and joked with their peers, students became lazy and bored because of the limited teaching materials used by teachers to modify physical fitness materials with varied learning, so that the learning process became less effective, The game-based learning model is still rarely done, the lack of ability of physical education teachers in managing classes on physical fitness activities which results in students tends to become quickly saturated in the learning process, and teachers in packaging physical education learning materials are less interesting and fun. Learning that emphasizes learning motivation and physical fitness of students is something that received serious attention in this study. So in the learning process there must be innovation to be able to increase student learning motivation and student physical fitness. The first thing to do is to make a draft, then validate the expert. Validation is carried out by three people who are competent in the field of physical education. Experts involved in this process are presented in the table below:

Table I  
Validators

No	Validator Name	Description of Validation
1.	Dr. Willadi Rasyid, M.Pd.	Material Expert and Learning Expert Validation
2.	Prof. Dr. Agustina, M.Hum.	Linguist Validation
3.	Prof. Dr. Kamal Firdaus, M.Kes., AIFO	Expert Validation of Questionnaire Material

The results of the assessment of material experts and learning experts on the game-based learning model to increase learning motivation and physical fitness of elementary school students are presented in the Table as follows:

Table II  
Validator Assessment Results

No	Indicator	Score	%	Category
1.	Material Expert on Products	40	90	Very Good
2.	Product Learning Experts	50	96	Very Good
3.	Material Expert	10	90	Very Good
4.	Linguists	24	92	Very Good

Table II shows the results of material expert assessment on the game-based learning model to increase learning motivation and physical fitness of elementary school students on average by 90%, included in the very good / very decent category. While the results of the assessment of learning experts on the game-based learning model to increase learning motivation and physical fitness of elementary school students on average by 96%, are included in the very good / very feasible category and the results of linguist assessments for research questionnaires on game-based learning models to increase learning motivation and physical fitness of elementary students on average by 92%. Based on the assessment of experts / experts about the questionnaire and the products developed, then expert advice and input on the validation results and then revised according to the validation results. From the validation results in table 2, it can be concluded that the model that has been developed is declared valid and can be used in the physical education learning process. This also shows an expert assessment of game-based learning model products to increase learning motivation and physical fitness of elementary school students that are made feasible to be tested on a small scale or on a large scale.

The trial in this study was conducted on elementary school 11 Koto Sungai Sarik which is located at Durian Gadang Lareh Nan Panjang, District VII Koto Sungai Sarik, Padang Pariaman Regency, West Sumatra. The trial was conducted with 1 elementary school teacher and 2 classes of 30 students. The trial process begins by explaining to teachers and students about the purpose and purpose of the research to be carried out. Researchers provide game-based learning model products to increase learning motivation and physical fitness of elementary school students to learn, researchers explain about the products that have been developed. Then teachers and students are given the opportunity to learn and practice game-based learning models to increase learning motivation and physical fitness of elementary school students that have been developed. The time used to practice the model for ± 60 minutes. Furthermore, researchers observe and document the research process.

#### Improving Learning Motivation with Game Based Learning Model.

The pre-test is carried out before students are given a game-based learning model to increase the motivation of elementary school students. While the Post-test is carried out after students are given a game-based learning model to increase

student learning motivation. The results of the pretest and posttest data are presented in the figure as follows

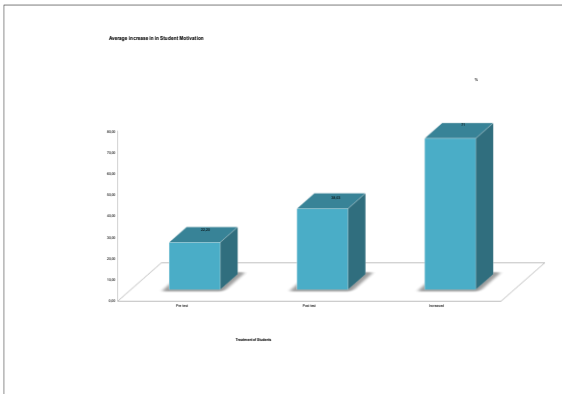


Fig. 1 Pretest and Posttest Data Results of Student Motivation

Based on the data in the figure above, then an analysis was carried out using the t test to find out whether there was an increase in learning motivation between the pretest and posttest. The conclusion of the study is stated to be significant if the t-value is calculated  $> t$  table and the sig value is smaller than 0.05 ( $\text{Sig} < 0.05$ ). Test results between pretest and posttest data in Table III below:

Table III  
 Pretest and Posttest Data Results Learning Motivation with Game Based Learning Model

	Mean	SD	t	df	Sig.
<b>Pretest-Posttest</b>	15.833	1.66264	52.160	29	0.000

Based on the results of the T (T Test) Paired Sample test in Table 3 above, it can be explained that the calculated t value is  $52.160 > t$  table (df 29) 2.045 and the significance value is  $0.000 < 0.05$ , then these results show that there is a significant difference between pretest and posttest of student learning motivation before and after the application of the game-based learning model. Based on the results of the analysis, it can be concluded that the game-based learning model is effective in increasing student learning motivation, with a p value of  $< 0.05$ . Based on Table 3 above, it can be seen that students before applying the game-based learning model have internal and external motivation that tends to be low. These results are influenced by several factor indicators in students used in this study, namely student talent in following physical education, student physical state, student movement skills, student discipline in learning, student knowledge, student hobbies, and student psychological state. This is in accordance with the background of the problem, among others, students are actively involved in the early minutes, the rest of the students are not conditioned and joke with their peers, students are lazy and bored because of the limited teaching materials used by teachers to modify material with varied learning, so that the learning process becomes less effective,

less interesting and fun, the game-based learning model is also still very rarely done, The lack of ability of physical education teachers in managing classes which results in students tends to become quickly saturated in the learning process.

### Improving Physical Fitness with Game Based Learning Model

Based on the data from the study, a picture of students' physical fitness was obtained before and after the application of the *game-based learning* model. After implementing the *game-based learning model*, the results of pretest and posttest data are presented in the following figure:

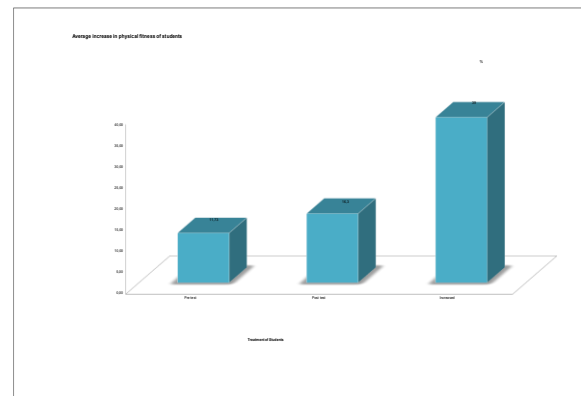


Fig. 2 Pretest and Posttest Data Results of Student Physical Fitness

From the results of the T (T Test) Paired Sample test in table 4 for the scores of each component of the physical fitness test showed that there were significant differences from before and after the application of the *game-based learning model*. As for the total score of the physical fitness test, it can be seen in table IV as follows:

Table III  
 Results of Pretest and Posttest Physical Fitness Data with Game Based Learning Model

	Mean	SD	t	df	Sig.
<b>Pretest-Posttest</b>	4.566	1.10433	22.650	29	0.000

From the results of the T (T Test) Paired Sample test in the Table above, it can be explained that the value of  $t_{hitung} 22,650 > t_{tabel} 2,045$  and significance value  $0,000 < 0,05$ , So these results show that in general there is a significant difference between pretest and posttest of students' physical fitness before and after the application of the *game-based learning* model. From the table above, it can be seen that before the game-based learning model was applied, the level of physical fitness of students tended to be less good or low, but there were already 4 students who had moderate physical fitness level conditions. After learning penjas apply the game-

based learning model, students tend to be more active so that their physical fitness level becomes better with the medium category (already good). It can be seen from the posttest results, there are 7 students with a good physical fitness level and 23 students with moderate physical fitness. Physical fitness is an important indicator of healthy status in children and adolescents, and certainly a good predictor of health status in life. The benefits of knowing your level of physical fitness can be used by the individual, teachers, parents, and the community.

For these individuals, by knowing their level of physical fitness, they can estimate how physically capable they are to be able to carry out daily activities and the consequences obtained from their level of physical fitness, so that they can know how to maintain and even improve their physical fitness level to continue to be able to move and obtain a complete healthy status. For teachers who know the physical fitness level of their students can be used as a basis for creating individual programs that suit each student's physical fitness level. For parents, as a basis for paying more attention to their children's daily behavior. For the "community", as a basis for planning materials for prevention of diseases due to lack of movement and preparing a healthy community

#### IV. DISCUSSION

Based on this study, after the game-based learning model is applied to students are more enthusiastic and motivated to learn physical education. So that the model can increase student learning motivation and physical fitness. The purpose of motivation is to move or arouse someone so that their desire and willingness to do something arises so that they can obtain results or achieve certain goals (Robinson 2022). The motivation of grade IV students in participating in physical education learning at elementary school 11 Koto Sungai Sarik for the 2023/2024 academic year which tends to be low causes a lack of willingness of students to take part in physical education learning so that the results obtained are not optimal.

The characteristics of students aged 10-12 years are happy to play, happy to move, happy to work in groups, and happy to feel or do something directly (Calp 2020). This characteristic is contrary to the reality that exists in the learning process of Physical Education grade IV because students tend to be passive in following learning. This shows that the results of research show that the motivation of grade IV in participating in Physical Education learning tends to be low, thus affecting the level of student activity. Low levels of motivation cause students to be less active in participating in physical education learning. Conditions that affect motivation in physical education and sports include good field facilities and tools as well as teacher teaching methods (Escrivá-Bouley et al. 2021). Inappropriate teacher teaching methods can cause students to be less motivated in physical education learning (Gaspar et al. 2021). So that it can cause students to be less motivated in participating in physical education learning. Teachers can conduct an evaluation to increase student motivation, for example by teaching using a game-based learning model so that student motivation in

participating in physical education learning can be increased. With the increase in student motivation, both internal and external motivation, it is hoped that a good physical education learning process will occur and get maximum results based on physical education goals.

There is a positive relationship between physical fitness and cognitive ability, these results can be explained by both physiological and psychological mechanisms by which physical activity stimulates the development of brain tissue, improves circulation, facilitates blood flow to the brain, maintains levels of norepinephrine and endorphins which together will decrease stress, raise mood, stimulate a sense of calm after exercise, and allow for improved results academic ability (Chen et al. 2020; Law et al. 2020). High levels of physical fitness may be associated with improved neurocognitive processes in children and additional physical activity may increase students' "active" behavior at school time (Hillman, Logan, and Shigeta 2019). In the teaching and learning process of Physical Education, the most important thing is to maximize participation from students (Jeong and So 2020). This can happen if the learning environment supports students to feel safe, comfortable, not feel tense and restless, and valued by the teacher. For this reason, a learning model is needed that is believed to be able to realize the learning objectives that have been set. This game-based learning model can meet all these criteria, if the learning objective is to empower psychomotor abilities, in this case physical fitness then this learning model can be applied to the physical education teaching and learning process. Learning using the development of game-based learning models can improve students' physical fitness as seen from the results of the research that has been described

#### V. CONCLUSION

This study presents the results of a study on the development of a game-based learning model to increase learning motivation and physical fitness of elementary school students. In physical education learning, learning motivation and physical fitness are important aspects that affect the quality of learning and student welfare. The learning model developed aims to overcome several problems in physical education learning, such as low student learning motivation, lack of variety in learning, and obstacles in classroom management by teachers. The learning model developed has gone through the validation stage by experts, which shows that the model is very good and feasible to be implemented in learning. In addition, the results of trials on students showed a significant increase in learning motivation and physical fitness after the application of the game-based learning model. The results showed that the model was effective in increasing students' motivation and improving their physical fitness.

Through a game-based learning approach, students can be actively involved in learning, which results in higher levels of motivation. In addition, this model also provides variety in learning, thus making the learning process more interesting and fun for students. Thus, the game-based learning model can be an effective solution in improving the quality of

physical education learning in elementary schools. This study also shows the importance of learning motivation and physical fitness in physical education learning. Low learning motivation and low levels of physical fitness of students can hinder the learning process and affect overall student well-being. Therefore, the development of learning models that can increase students' learning motivation and physical fitness is very important in increasing the effectiveness of physical education learning. Thus, the role of teachers is very important in implementing the game-based learning model and ensuring that all students are actively involved in learning. Teachers also need to understand the characteristics of students and create a supportive learning environment to increase students' learning motivation and physical fitness. Thus, teachers can maximize learning outcomes and improve the quality of physical education in elementary schools

#### REFERENCES

- Agaton, C. B., & Cueto, L. J. (2021). Learning at home: Parents' lived experiences on distance learning during COVID-19 pandemic in the Philippines. *International Journal of Evaluation and Research in Education*, 10(3), 901–911. <https://doi.org/10.11591/ijere.v10i3.21136>
- Akour, M., & Alenezi, M. (2022). Higher Education Future in the Era of Digital Transformation. *Education Sciences*, 12(11). <https://doi.org/10.3390/educsci12110784>
- Alaska, A., & Hakim, A. A. (2021). Analisis Olahraga Tradisional Lompat Tali dan Engklek Sebagai Peningkatan Kebugaran Tubuh di Era New Normal. *Jurnal Kesehatan Olahraga*, 09(01), 141–150. <https://ejournal.unesa.ac.id/index.php/jurnal-kesehatan-olahraga/article/download/40928/36256>
- Alzahrani, L., & Seth, K. P. (2021). Factors influencing students' satisfaction with continuous use of learning management systems during the COVID-19 pandemic: An empirical study. *Education and Information Technologies*, 26(6), 6787–6805. <https://doi.org/10.1007/s10639-021-10492-5>
- Barba-Martín, R. A., Bores-García, D., Hortigüela-Alcalá, D., & González-Calvo, G. (2020). The application of the teaching games for understanding in physical education. Systematic review of the last six years. *International Journal of Environmental Research and Public Health*, 17(9). <https://doi.org/10.3390/ijerph17093330>
- Basuki, S. (2022). The Role of The Physical Education Supervisor in The Development of Healthy Culture Living for Elementary School Students. *Educational Sciences: Theory and Practice*, 22(2), 179–193. <https://doi.org/10.12738/jestp.2022.2.0013>
- Calp, Ş. (2020). Peaceful and happy schools: How to build positive learning environments. *International Electronic Journal of Elementary Education*, 12(4), 311–320. <https://doi.org/10.26822/iejee.2020459460>
- Camacho-Sánchez, R., Rillo-Albert, A., & Lavega-Burgués, P. (2022). Gamified Digital Game-Based Learning as a Pedagogical Strategy: Student Academic Performance and Motivation. *Applied Sciences (Switzerland)*, 12(21). <https://doi.org/10.3390/app122111214>
- Centeo, E., Mercier, K., Garn, A., Erwin, H., Marttinen, R., & Foley, J. (2021). The success and struggles of physical education teachers while teaching online during the COVID-19 pandemic. *Journal of Teaching in Physical Education*, 40(4), 667–673. <https://doi.org/10.1123/JTPE.2020-0295>
- Chen, F. T., Etnier, J. L., Chan, K. H., Chiu, P. K., Hung, T. M., & Chang, Y. K. (2020). Effects of Exercise Training Interventions on Executive Function in Older Adults: A Systematic Review and Meta-Analysis. *Sports Medicine*, 50(8), 1451–1467. <https://doi.org/10.1007/s40279-020-01292-x>
- Corbin, C. B. (2021). Conceptual physical education: A course for the future. *Journal of Sport and Health Science*, 10(3), 308–322. <https://doi.org/10.1016/j.jshs.2020.10.004>
- Cruikshank, V., Pill, S., & Mainsbridge, C. (2021). 'Just do some physical activity': Exploring experiences of teaching physical education online during Covid-19. *Issues in Educational Research*, 31(1), 76–93.
- Dalkıran, O., Eryiğit, F., & Sivri, S. (2020). Comparison of the effects of constructivist learning on cognitive, affective and psychomotor fields applied in physical education courses. *African Education Research Journal*, 8(2), 327–334. <https://doi.org/10.30918/AERJ.8S2.20.062>
- Dewi, R., & Verawati, I. (2022). The Effect of Manipulative Games to Improve Fundamental Motor Skills in Elementary School Students. *International Journal of Education in Mathematics, Science and Technology*, 10(1), 24–37. <https://doi.org/10.46328/ijemst.2163>
- Escriva-Boulley, G., Guillet-Descas, E., Aelterman, N., Vansteenkiste, M., Van Doren, N., Lentillon-Kaestner, V., & Haerens, L. (2021). Adopting the situation in school questionnaire to examine physical education teachers' motivating and demotivating styles using a circumplex approach. *International Journal of Environmental Research and Public Health*, 18(14). <https://doi.org/10.3390/ijerph18147342>
- Fenanlampir, A., Leasa, M., & Batlolona, J. R. (2021). The development of homogeneity psycho cognition learning strategy in physical education learning. *International Journal of Evaluation and Research in Education*, 10(3), 1047–1059. <https://doi.org/10.11591/IJERE.V10I3.21713>
- Fernández-Espínola, C., Robles, M. T. A., Collado-Mateo, D., Almagro, B. J., Viera, E. C., & Fuentes-Guerra, F. J. G. (2020). Effects of cooperative-learning interventions on physical education students' intrinsic motivation: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health*, 17(12), 1–10. <https://doi.org/10.3390/ijerph17124451>
- Fletcher, T., & Ní Chróinín, D. (2022). Pedagogical principles that support the prioritisation of meaningful experiences in physical education: conceptual and practical

- considerations. *Physical Education and Sport Pedagogy*, 27(5), 455–466. <https://doi.org/10.1080/17408989.2021.1884672>
- Gaspar, V., Gil-Arias, A., Del Villar, F., Práxedes, A., & Moreno, A. (2021). How tgfu influence on students' motivational outcomes in physical education? A study in elementary school context. *International Journal of Environmental Research and Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105407>
- Gil-Arias, A., Claver, F., Práxedes, A., Villar, F. Del, & Harvey, S. (2020). Autonomy support, motivational climate, enjoyment and perceived competence in physical education: Impact of a hybrid teaching games for understanding/sport education unit. *European Physical Education Review*, 26(1), 36–53. <https://doi.org/10.1177/1356336X18816997>
- Haris, F., Fauziah, V., Ockta, Y., Zarya, F., Pranoto, N. W., Rahman, D., Adrian, V., Orhan, B. E., & Karaçam, A. (2024). Observation of stunting status with the motor skills of toddler children Observación del estado de retraso en el crecimiento con las habilidades motoras de niños pequeños Introduction Indonesia faces nutritional problems that have a serious impact on huma. *Retos*, 2041, 103–111.
- Hartanto, D., Kusmaedi, N., Ma'mun, 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>
- Hillman, C. H., Logan, N. E., & Shigeta, T. T. (2019). A Review of Acute Physical Activity Effects on Brain and Cognition in Children. *Translational Journal of the American College of Sports Medicine*, 4(17), 132–136. <https://doi.org/10.1249/tjx.0000000000000101>
- Insani, K., Welis, W., Bahtra, R., Putra, A. N., Ockta, Y., Hasan, H., & Orhan, B. E. (2024). The Impact of Training Methods and Endurance on Developing Basic Football Technical Skills in Extracurricular Football Programs. *Community Practitioner*, 21(5), 1103–1112. <https://doi.org/10.5281/zenodo.11239182>
- Insania, F., & Pasaribu, M. (2024). Implementasi dan Optimalisasi Kurikulum Merdeka terhadap Kemampuan Berfikir Kreatif pada Anak Usia Dini. *Murhum : Jurnal Pendidikan Anak Usia Dini*, 5(1), 278–289. <https://doi.org/10.37985/murhum.v5i1.527>
- Jannah, M., Markhamah, & Rahmawati, F. P. (2024). Effectiveness Of PJBL and PBL Models On Numerative Literacy Based On Local Wisdom in Elementary Schools. *Journal of Education, Teaching, and Learning*, 9(1), 74–80.
- Jeong, H. C., & So, W. Y. (2020). Difficulties of online physical education classes in middle and high school and an efficient operation plan to address them. *International Journal of Environmental Research and Public Health*, 17(19), 1–13. <https://doi.org/10.3390/ijerph17197279>
- Khani, I. R., Simatupang, N., Harahap, N. S., & Ockta, Y. (2024). Stepping Into Vitality: How Brisk Walking Elevates Fitness Among the Elderly in Medan City. *Journal of Physical Education, Sport, Health and Recreations*, 13(2), 357–362.
- Komariah, N., & Nihayah, I. (2023). Improving The Personality Character of Students Through Learning Islamic Religious Education. *At-Tadzkir: Islamic Education Journal*, 2(1), 65–77. <https://doi.org/10.59373/attadzkir.v2i1.15>
- Law, C. K., Lam, F. M., Chung, R. C., & Pang, M. Y. (2020). Physical exercise attenuates cognitive decline and reduces behavioural problems in people with mild cognitive impairment and dementia: a systematic review. *Journal of Physiotherapy*, 66(1), 9–18. <https://doi.org/10.1016/j.jphys.2019.11.014>
- Liu, Z. Y., Shaikh, Z. A., & Gazizova, F. (2020). Using the concept of game-based learning in education. *International Journal of Emerging Technologies in Learning*, 15(14), 53–64. <https://doi.org/10.3991/ijet.v15i14.14675>
- Luo, Y. J., Lin, M. L., Hsu, C. H., Liao, C. C., & Kao, C. C. (2020). The effects of team-game-tournaments application towards learning motivation and motor skills in college physical education. *Sustainability (Switzerland)*, 12(15), 1–12. <https://doi.org/10.3390/su12156147>
- Mahoney, J. L., Weissberg, R. P., Greenberg, M. T., Dusenbury, L., Jagers, R. J., Niemi, K., Schlinger, M., Schlund, J., Shriver, T. P., VanAusdal, K., & Yoder, N. (2021). Systemic Social and Emotional Learning: Promoting Educational Success for All Preschool to High School Students. *American Psychologist*, 76(7), 1128–1142. <https://doi.org/10.1037/amp0000701>
- Mocanu, G. D., Murariu, G., Iordan, D. A., Sandu, I., & Munteanu, M. O. A. (2021). The perception of the online teaching process during the covid-19 pandemic for the students of the physical education and sports domain. *Applied Sciences (Switzerland)*, 11(12). <https://doi.org/10.3390/app11125558>
- Muhtar, T., Supriyadi, T., & Lengkana, A. S. (2020). Character development-based physical education learning model in primary school. *International Journal of Human Movement and Sports Sciences*, 8(6), 337–354. <https://doi.org/10.13189/saj.2020.080605>
- Nazhira, F. (2022). Model of Strengthening School and Family Cooperation in Character Development of Students During the Covid-19 Pandemic (Case At the Indonesia-Malaysia Aruk Border, West Kalimantan). *Journal of Education, Teaching, and Learning*, 7(2), 190–198.
- Nusri, A., Prima, A., Ardi, N. F., Ockta, Y., Setiawan, Y., Orhan, B. E., Adrian, V., Medan, U. N., & Padang, U. N. (2024). Design of basic football skills test instrument for university students Diseño de instrumento de prueba de habilidades básicas de fútbol para estudiantes universitarios. *Retos*, 2041(59), 649–657.
- O'Brien, W., Adamakis, M., O'Brien, N., Onofre, M., Martins, J., Dania, A., Makopoulou, K., Herold, F., Ng, K., & Costa, J. (2020). Implications for European

- Physical Education Teacher Education during the COVID-19 pandemic: a cross-institutional SWOT analysis. *European Journal of Teacher Education*, 43(4), 503–522.  
<https://doi.org/10.1080/02619768.2020.1823963>
- Ockta, Y., Umar, U., Komaini, A., Firdaus, K., Padli, P., & Masrun, M. (2024). Walk, run, jump and learn: Interactive multimedia for teaching locomotor skills in primary schools. *Research and Development in Education (RaDEn)*, 4(1), 1–11.  
<https://doi.org/10.22219/raden.v4i1.31831>
- Owens, D. C., Sadler, T. D., Barlow, A. T., & Smith-Walters, C. (2020). Student Motivation from and Resistance to Active Learning Rooted in Essential Science Practices. *Research in Science Education*, 50(1), 253–277.  
<https://doi.org/10.1007/s11165-017-9688-1>
- Rabillas, A., Kilag, O. K., Cañete, N., Trazona, M., Calope, M. Lou, & Kilag, J. (2023). Elementary Math Learning Through Piaget’s Cognitive Development Stages. *Excellencia: International Multi-Disciplinary Journal of Education (2994-9521)*, 1(4), 128–142.  
<https://multijournals.org/index.php/excellencia-imje/article/view/55>
- Rambe, A. Z. F., Kiram, P. Y., Arsil, Bahtra, R., & Ockta, Y. (2024). Improvement of basic soccer techniques with training methods and physical condition. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 10(1), 76–89.
- Rasmitadila, Widyasari, Prasetyo, T., Rachmadtullah, R., Samsudin, A., & Aliyyah, R. R. (2021). General teachers’ experience of the Brain’s natural learning systems-based instructional approach in inclusive classroom. *International Journal of Instruction*, 14(3), 95–116. <https://doi.org/10.29333/iji.2021.1436a>
- Robinson, C. D. (2022). A Framework for Motivating Teacher-Student Relationships. *Educational Psychology Review*, 34(4), 2061–2094.  
<https://doi.org/10.1007/s10648-022-09706-0>
- Rossi, L., Behme, N., & Breuer, C. (2021). Physical activity of children and adolescents during the COVID-19 pandemic—A scoping review. *International Journal of Environmental Research and Public Health*, 18(21).  
<https://doi.org/10.3390/ijerph182111440>
- Sari, L. S., Sulistiono, A. A., & Winingsih, L. H. (2020). Effect of psychomotor development on physical health, mental health and student achievement. *International Journal of Educational Policy Research and Review*, 7(6), 228–240.
- Sau, R. A., Bili, L. D., & Lengo, M. D. (2022). Permainan Tradisional Hadang Dapat Meningkatkan Motivasi Belajar Siswa Kelas V Sd. *Jurnal Sport & Science* 45, 4(2), 29–36.  
<https://ejournal.upg45ntt.ac.id/jss/article/view/92>
- Shepherd, H. A., Evans, T., Gupta, S., McDonough, M. H., Doyle-Baker, P., Belton, K. L., Karmali, S., Pauer, S., Hadly, G., Pike, I., Adams, S. A., Babul, S., Yeates, K. O., Kopala-Sibley, D. C., Schneider, K. J., Cowle, S., Fuselli, P., Emery, C. A., & Black, A. M. (2021). The impact of COVID-19 on high school student-athlete experiences with physical activity, mental health, and social connection. *International Journal of Environmental Research and Public Health*, 18(7).  
<https://doi.org/10.3390/ijerph18073515>
- Spence, J. C., Rhodes, R. E., McCurdy, A., Mangan, A., Hopkins, D., & Mummery, W. K. (2021). Determinants of physical activity among adults in the United Kingdom during the COVID-19 pandemic: The DUK-COVID study. *British Journal of Health Psychology*, 26(2), 588–605. <https://doi.org/10.1111/bjhp.12497>
- Sugiyono. (2015). *Metode Penelitian dan Pengembangan*. Alfabeta.
- Sugiyono. (2018). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, kualitatif, dan R & D* (27th ed.). Alfabeta.
- Suryaman, M., Cahyono, Y., Muliansyah, D., Bustani, O., Suryani, P., Fahlevi, M., Pramono, R., Purwanto, A., Purba, J. T., Munthe, A. P., Juliana, & Harimurti, S. M. (2020). COVID-19 pandemic and home online learning system: Does it affect the quality of pharmacy school learning? *Systematic Reviews in Pharmacy*, 11(8), 524–530. <https://doi.org/10.31838/srp.2020.8.74>
- Sutapa, P., Pratama, K. W., Rosly, M. M., Ali, S. K. S., & Karakauki, M. (2021). Improving motor skills in early childhood through goal-oriented play activity. *Children*, 8(11), 1–11. <https://doi.org/10.3390/children8110994>
- Taylor, M. E., & Boyer, W. (2020). Play-Based Learning: Evidence-Based Research to Improve Children’s Learning Experiences in the Kindergarten Classroom. *Early Childhood Education Journal*, 48(2), 127–133.  
<https://doi.org/10.1007/s10643-019-00989-7>
- Umar, Ockta, Y., & Mardesia, P. (2023). A Correlational Study: Pedagogical and professional competence of physical education teachers in relation to the implementation of the Merdeka curriculum. *Journal of Physical Education and Sport*, 23(12), 3325–3331.  
<https://doi.org/10.7752/jpes.2023.12380>
- Umri Rahman Efendi, Daulat Saragi, & Yakobus Ndona. (2023). Nilai-Nilai Karakter dalam Permainan Tradisional Pecah Piring. *Perspektif: Jurnal Pendidikan Dan Ilmu Bahasa*, 1(4), 308–318.  
<https://doi.org/10.59059/perspektif.v1i4.758>
- Varea, V., & González-Calvo, G. (2020). Touchless classes and absent bodies: teaching physical education in times of Covid-19. *Sport, Education and Society*, 26(8), 1–15.  
<https://doi.org/10.1080/13573322.2020.1791814>
- Yarımkaya, E., & Esentürk, O. K. (2022). Promoting physical activity for children with autism spectrum disorders during Coronavirus outbreak: benefits, strategies, and examples. *International Journal of Developmental Disabilities*, 68(4), 430–435.  
<https://doi.org/10.1080/20473869.2020.1756115>
- Yupriskila Dwi Hadassah, & Sandra Rosiana Tapilaha. (2023). Peran Guru PAK Dalam Meningkatkan Minat Belajar Peserta Didik Dengan Metode Gerak Lokomotor. *Sepakat: Jurnal Pastoral Kateketik*, 9(1), 90–103.  
<https://doi.org/10.58374/sepakat.v9i1.136>
- Yusmawati, Haqiyah, A., & Riyad, D. N. (2020). The Survey

of 2013 Curriculum Implementation on Physical Education in The Elementary Schools of Bekasi City. *Journal of Education, Teaching, and Learning*, 5(2), 363–368.

Zainuddin, M., Fatah, D. A., & Junarti. (2023). Literacy and Numeracy Research Trends For Elementary School Student: A Systematic Literature Review. *Jurnal of Education, Teaching, and Learning*, 8(2), 164–171.