

# **Analysis of The Linkages Between The Standard of Sports Facilities, Allocation of Learning Time, and The Number of Students With The Implementation of Physical Education: A Case Study In Indonesia**

**Baskoro Nugroho Putro<sup>1</sup>, Agus Kristyanto<sup>1</sup>, Mohammad Furqon Hidayatullah<sup>1</sup>,  
I Gusti Ayu Ketut Rachmi Handayani<sup>2</sup>**

<sup>1</sup> Department of Sports Science Doctoral, Faculty of Sports, Universitas Sebelas Maret

<sup>2</sup> Department of Law Masters, Faculty of Law, Universitas Sebelas Maret

Corresponding author: baskoro.np@staff.uns.ac.id

**Abstract.** Indonesia has set standards for conducting learning through the Ministry of Education. Schools must meet the number of facilities, the allocation of study time, and the number of students in one class. Physical education in Indonesia requires students to practice movement. Implementation of physical education is affected by the number of students, learning time, and the ratio of facilities to students. This research uses a case study approach because it examines the phenomenon of implementing physical education if it follows the standards set by the Ministry of Education. The regulations being studied are Regulation of the Minister of Education number 24 of 2007 concerning facilities standards, number 22 of 2016, which regulates the number of students, and number 56 of 2022, which regulates the curriculum. The study time allocation for physical education per week in elementary school is 105 minutes, junior high school is 80 minutes, and senior high school is 90 minutes. The standards listed regarding facilities suggestions are that at all school levels, a minimum of one set of gymnastic equipment, one set of athletic equipment, and six balls for basketball, volleyball, and soccer. The standard of one set does not mention the exact amount, causing multiple perceptions to define the minimum amount. The maximum number of students allowed is 28 for elementary school, 32 for junior high school, and 36 for senior high school. The analysis results show that the opportunity to practice the movements using tools is meager. Each student at the elementary school level only had the opportunity to use a ball 21.3% and other tools 3.5% of the total study time. Each student at the junior high school level only has the opportunity to use the ball 18.75% and other tools 3.125% of the total study time. Each senior high school level student only had the opportunity to use a ball 16.67% and other tools 2.78% of the total study time. It is necessary to carry out studies related to minimum standards, allocation of study time, and the maximum number of students so that the implementation of physical learning can be carried out ideally.

**Keywords:** Policy; Physical Education; Learning Opportunities; Learning Time

## INTRODUCTION

Physical education plays a fundamental role in the overall development and growth of human beings. Physical education can help promote health-related cardiorespiratory fitness in youth (Peralta et al., 2020). Sports activities have a role in alleviating anxiety among middle school students. Physical education teachers believe that sports activities can reduce anxiety levels among students (Mhalhal et al., 2020). Physical education promotes physical fitness and enhances mental and social capabilities. A child's talent can be developed through physical education. Physical education plays a prominent role in the flourishing of creativity, and the connection between space and movement is imperative in nurturing children's creativity (Abedi et al., 2020). Moreover, regular physical activity improves overall health and reduces the risk of chronic diseases. As such, physical education should be prioritized in schools and communities to ensure that individuals can lead healthy and fulfilling lives.

Physical education plays a crucial role in a child's overall development. It promotes fitness and health and enhances cognitive abilities, social skills, and emotional well-being. However, physical education must be supported by proper facilities and learning time to be effective (Obi et al., 2022; Xuan & Wang, 2018). Schools should invest in state-of-the-art gyms, playgrounds, and equipment that cater to the unique needs of each student (Cohen et al., 2015). Additionally, they must allocate enough time for physical education classes to ensure that students have ample opportunity to engage in physical activities. Schools can help students lead healthier, happier, and more productive lives by providing the proper facilities and sufficient learning time (Dahash et al., 2022; Dudley & Burden, 2020; József et al., 2022). Let us all work towards creating a brighter and healthier future by prioritizing physical education and its proper facilities.

Sports facilities are a crucial component of physical education and have a significant role in supporting the creation of physical education teachers in designing learning models. Sports facilities provide a conducive environment for physical education, which involves various activities such as track and field, team sports, and individual sports (Black et al., 2019; Lee et al., 2016). Physical education teachers can effectively utilize sports facilities to help their students learn and develop physical abilities (Habyarimana et al., 2022). A well-equipped sports facility benefits physical education teachers in designing effective learning models (Leeder & Beaumont, 2021; Rodríguez Macías et al., 2021). A good sports facility offers a safe and secure platform for students to participate in physical activities (Boyd, 2019; Hall, 2006; Zakaria et al., 2020). Physical education teachers can use sports facilities to create immersive learning models that involve games, sports,

and physical activities, encouraging students to remain engaged and interested in physical education.

Learning motion requires proper repetition to ensure students understand the movement well (Duijzer et al., 2019; Tomara et al., 2017). Motion is one of the most complex and intricate skills that a human being can possess (Jones, 2022; O., 2020). It requires physical strength, flexibility, mental concentration, and focus. It can be difficult to fully understand and execute a movement precisely and accurately without proper repetition (Mally, 2009; Mawase et al., 2018). Repetition allows for muscle memory to develop. When a movement is repeatedly practiced, the muscles become accustomed to the pattern, and motor pathways become streamlined for efficiency (Ariani et al., 2020; Sutter et al., 2022). Repetition allows for the opportunity to identify and correct mistakes (Bruner, 2001). No one is perfect on their first attempt, and mistakes are bound to happen. Repetition fosters confidence in the student. When a movement is practiced repeatedly, the student gains a sense of familiarity and comfort with the movement.

Regulations that support the implementation of physical education in Indonesia are not ideal. There is an urgent need to revamp physical education regulations in Indonesia (Damayanti, 2019; Houlihan, 2020; Irmansyah et al., 2021). Schools cannot access adequate resources such as sports equipment and trained instructors. This lack of resources compromises the quality of physical education. Many schools in Indonesia place an overwhelming emphasis on academic subjects, neglecting physical education (Ardha et al., 2018; Suherman, 2020). This overemphasis is detrimental to the students' overall development. The infrastructure supporting most schools' physical education is often dilapidated (Peter Barrett & Tigran Shmis, Diego Ambasz, 2019). The lack of proper facilities, such as sports halls and playing fields, negatively impacts the quality of physical education offered (Irawan & Prasetyo, 2019).

## Method

This research uses a case study approach to generate a scientific conclusion. A case study is a research method used to investigate an individual, group, or phenomenon in-depth. It aims to understand complex issues and find solutions to real-world problems comprehensively. The phenomenon to be investigated in this study is the implementation of policies governing sports facilities, study time, and the maximum number of students. These three policies determine the adequate learning time of students when undergoing physical education.

## **METHOD**

The Method section describes how the study was conducted, including conceptual and operational definitions of the variables used. Different types of studies will rely on different methodologies; however, a complete description of the methods used enables the reader to evaluate the appropriateness of your methods and the reliability and validity of your results. It also permits experienced investigators to replicate the study. If your manuscript is an update of an ongoing or earlier study and the method has been published in detail elsewhere, you may refer the reader to that source and give a brief synopsis of the method in this section.

## RESULTS

The results show that students are waiting too long for their turn to do. Waiting time that is too long can affect the process of achieving student competency. Physical education learning is based on motion. Movement learning depends on the number of repetitions of movements carried out to be able to practice the movements properly. At the elementary school level, the learning time allocation is 105 minutes. The analysis results at the elementary school level show that each student only gets 22.5 minutes out of 105 minutes of learning time to use volleyball and soccer balls. In other tools used to carry out gymnastics and athletics lessons, each student only has the opportunity to use them for 3.75 minutes out of 105 minutes of learning time. Detailed results can be seen in Table 1.

Table 1. Opportunity to Use Facilities for Elementary School Students

Facilities	Quantity	Student	Ratio	Opportunity
Volley Ball	6	28	1:4.7	22.5 Minutes
Soccer Ball	6	28	1:4.7	22.5 Minutes
Mattress	1	28	1:28	3.75 Minutes
Skip Crate	1	28	1:28	3.75 Minutes
Skipping Rope	1	28	1:28	3.75 Minutes
Hoop	1	28	1:28	3.75 Minutes
Plastic Ball	1	28	1:28	3.75 Minutes
Stick	1	28	1:28	3.75 Minutes
Javelin	1	28	1:28	3.75 Minutes
Discus	1	28	1:28	3.75 Minutes
Put	1	28	1:28	3.75 Minutes
Baton	1	28	1:28	3.75 Minutes
Sandbox (Long Jump)	1	28	1:28	3.75 Minutes

At the junior high school education level, the learning time allocation is 80 minutes. Within 80 minutes, each student can only use volleyball, soccer ball, and basketball for 15 minutes. Meanwhile, each student can use other tools for athletic and gymnastic activities for only 2.5 minutes. Detailed results can be seen in Table 2.

Table 2. Opportunity to Use Facilities for Junior High School Students

Facilities	Quantity	Student	Ratio	Opportunity
Volley Ball	6	32	1:5.3	15 Minutes
Soccer Ball	6	32	1:5.3	15 Minutes
Basketball	6	32	1:5.3	15 Minutes
Mattress	1	32	1:32	2.5 Minutes
Skip Crate	1	32	1:32	2.5 Minutes
Skipping Rope	1	32	1:32	2.5 Minutes
Hoop	1	32	1:32	2.5 Minutes
Plastic Ball	1	32	1:32	2.5 Minutes
Stick	1	32	1:32	2.5 Minutes
Bar	1	32	1:32	2.5 Minutes
Gymnastics bracelet	1	32	1:32	2.5 Minutes
Javelin	1	32	1:32	2.5 Minutes
Discus	1	32	1:32	2.5 Minutes
Put	1	32	1:32	2.5 Minutes
Baton	1	32	1:32	2.5 Minutes
Sandbox (Long Jump)	1	32	1:32	2.5 Minutes

The opportunity to use the facilities at the senior high school level is less than that of junior high school. Learning time at senior high school is indeed 10 minutes more when compared to junior high school. However, the number of students is also greater, affecting the ratio of tools to students. Each student can use volleyball, soccer ball, and basketball for 16.67 minutes. At the same time, other tools used for gymnastic and athletic activities are 2.78 minutes. Detailed results can be seen in Table 3.

Table 3. Opportunity to Use Facilities for Senior High School Students

Facilities	Quantity	Student	Ratio	Opportunity
Volley Ball	6	36	1:6	16.67 Minutes
Soccer Ball	6	36	1:6	16.67 Minutes
Basketball	6	36	1:6	16.67 Minutes
Mattress	1	36	1:36	2.78 Minutes
Skip Crate	1	36	1:36	2.78 Minutes
Skipping Rope	1	36	1:36	2.78 Minutes
Hoop	1	36	1:36	2.78 Minutes

Plastic Ball	1	36	1:36	2.78 Minutes
Stick	1	36	1:36	2.78 Minutes
Bar	1	36	1:36	2.78 Minutes
Gymnastics bracelet	1	36	1:36	2.78 Minutes
Javelin	1	36	1:36	2.78 Minutes
Discus	1	36	1:36	2.78 Minutes
Put	1	36	1:36	2.78 Minutes
Baton	1	36	1:36	2.78 Minutes
Sandbox (Long Jump)	1	36	1:36	2.78 Minutes

## DISCUSSION

The students are waiting too long for their turn to participate in physical education learning in elementary schools. The lack of physical activity in schools has been a growing concern for educators and researchers alike. Physical education classes have a positive impact on student engagement and behavior. However, the pressure to meet academic standards has reduced recess and physical education time in many schools (Findley, 2017). Students may be waiting too long to participate in physical education learning, which can negatively impact their health and academic performance (García-Hermoso et al., 2021).

An ideal ratio between students and sports facilities ensures that every student has an equal opportunity to participate in physical activities and practice sports regularly. Equal opportunity benefit in physical education is crucial for ensuring that all students have access to physical education programs and resources, which can help promote their physical and mental health (Magias et al., 2017; Osipov et al., 2016; Sospedra Harding et al., 2021). With enough sports facilities, students can train, practice, and compete in sports activities comfortably and efficiently. Generally, the smaller the ratio, the better it is for the student's physical education and sports programs. A smaller ratio between students and sports facilities can have numerous benefits for students, including improved academic performance, better mental health outcomes, and long-term health benefits (Eime et al., 2013).

This delay in students' participation is impacting their ability to acquire competency in different physical activities such as volleyball, soccer, gymnastics, and athletics. Physical education learning is motion-based, and proper practice is essential to master movements. Physical education learning is motion-based because it involves acquiring motor skills through movement and physical activity (Gallahue et al., 2015). This type of learning is essential for developing physical

literacy, which is the ability to move with competence and confidence in various physical activities (Whitehead, 2010). However, insufficient time allocated to each student to practice physical activities hinders learning. This finding further emphasizes the limited time allocation for each student to master various physical activities. Restructuring the time allocation for physical education or adjusting class sizes may be necessary to provide students with good practice and ensure they acquire the desired level of competency in physical activities.

The ideal learning time for physical education can vary depending on age, grade level, activity intensity, curriculum, and school policies. Children and adolescents should have at least 150 minutes of physical education classes per week, which can be distributed throughout the week (Tambalis, 2022). The length of class and frequency of classes can vary depending on the school curriculum, resources, and policies (Baber & Fortenberry, 2008; Nzomo, 2011). Longer classes are more effective in achieving the learning outcomes of physical education classes. Additionally, it is essential to supplement physical education with other physical activities outside of formal classes, such as games, sports, and outdoor activities. Physical activities outside formal classes can reinforce learning, provide a holistic approach to physical development, and promote lifelong physical activity habits.

## **CONCLUSION**

The issue of students waiting too long for their turn to participate in physical education learning in elementary schools is a significant concern that needs to be addressed. The lack of physical activity in schools hinders the development of students' physical literacy and competency in various activities. It impacts their academic performance, mental health, and long-term well-being. Educators, school administrators, and policymakers must consider implementing corrective measures to tackle this problem. Allocating more time for physical education in the school schedule: By giving physical education the importance it deserves, schools can ensure that students receive the necessary practice and instruction to develop skills and participate equally in activities. Reducing class sizes or increasing the number of sports facilities: A smaller student-to-facility ratio allows for better utilization of resources and provides each student with more opportunities to participate, learn, and grow in physical education. Encouraging and supporting extracurricular sports programs: Schools could offer a variety of sports and physical activities as extracurricular options to provide students with additional practice and chances to engage in physical activities outside of regular school hours. Emphasizing the importance of physical education to parents and the community:

Raising awareness about the benefits of physical education can help create a supportive environment for its prioritization in schools. Schools should also consider adopting policies that prioritize physical education and physical activity, such as providing adequate time for students to participate in physical activities during school hours. Parents and families can also significantly promote physical activity habits by encouraging their children to participate in sports, outdoor activities, and hobbies. Schools and families can work to ensure that children and adolescents have access to the physical education and activities they need to learn, grow, and thrive both in and out of the classroom. By taking these measures, schools can work towards bridging the gap between students' need for physical education learning and the available opportunities. Closing the gap will enhance the student's overall physical and mental well-being and contribute to their academic success and personal growth.

## REFERENCES

- Abedi, S., Abbasi, Z., & Ziafat, H. (2020). Explaining the Role of Knowledge-Based Urban Spaces in Nurturing Children's Creativity by Emphasizing on Science and Technology Parks. *Islamic Art*, 16(37), 194–209. <https://doi.org/https://doi.org/10.22034/ias.2020.109372>
- Ardha, M. A. Al, Yang, C. B., Adhe, K. R., Khory, F. D., Hartoto, S., & Putra, K. P. (2018). Multiple Intelligences and Physical Education Curriculum: Application and Reflection of Every Education Level in Indonesia. *2nd International Conference on Education Innovation*, 212(Icei), 587–592. <https://doi.org/10.2991/icei-18.2018.129>
- Ariani, G., Kwon, Y. H., & Diedrichsen, J. (2020). Repetita iuvant: Repetition facilitates online planning of sequential movements. *Journal of Neurophysiology*, 123(5), 1727–1738. <https://doi.org/10.1152/jn.00054.2020>
- Baber, T., & Fortenberry, N. (2008). The academic value of cooperative education: A literature review. *ASEE Annual Conference and Exposition, Conference Proceedings*. <https://doi.org/10.18260/1-2--3148>
- Black, N., Johnston, D. W., Propper, C., & Shields, M. A. (2019). The effect of school sports facilities on physical activity, health and socioeconomic status in adulthood. *Social Science and Medicine*, 220(February 2018), 120–128. <https://doi.org/10.1016/j.socscimed.2018.10.025>
- Boyd, J. (2019). *Keeping Athletes and Fans Safe in Sports Facilities*.
- Bruner, R. F. (2001). *Repetition is the First Principle of All Learning*. November, 1–4.
- Cohen, D. A., Han, B., Isacoff, J., Shulaker, B., Williamson, S., Marsh, T., McKenzie, T. L., Weir, M., & Bhatia, R. (2015). Impact of park renovations on park use and park-based physical activity. *Journal of Physical Activity and Health*, 12(2), 289–295. <https://doi.org/10.1123/jpah.2013-0165>
- Dahash, M. A., Ibrahim, F. S., & Salman, M. A. (2022). Effect of the SWOM strategy on kinetic flexibility and volleyball block accuracy in students of Physical Education and Sports. *SPORT TK-Revista EuroAmericana de Ciencias Del Deporte*, 11, 6. <https://doi.org/10.6018/sportk.509351>
- Damayanti, S. (2019). Why we need to focus on physical education. *Jakarta Post*.
- Dudley, D., & Burden, R. (2020). What effect on learning does increasing the proportion of



- curriculum time allocated to physical education have? A systematic review and meta-analysis. *European Physical Education Review*, 26(1), 85–100. <https://doi.org/10.1177/1356336X19830113>
- Duijzer, C., Heuvel-panhuizen, M. Van Den, & Veldhuis, M. (2019). Embodied Learning Environments for Graphing Motion : a Systematic Literature Review Content courtesy of Springer Nature , terms of use apply . Rights reserved . Content courtesy of Springer Nature , terms of use apply . Rights reserved . *Educational Psychology Review*, 31, 597–629.
- Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for adults: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10. <https://doi.org/10.1186/1479-5868-10-135>
- Findley, J. (2017). *Effects of Recess on Student Engagement*. Northwestern College.
- Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2015). *Understanding motor development: Infants, children, adolescents, adults* (7th ed.). Mc Graw Hill.
- García-Hermoso, A., Ramírez-Vélez, R., & Lubans, R. (2021). Effects of physical education interventions on cognition and academic performance outcomes in children and adolescents: a systematic review and meta-analysis. *British Journal of Sports Medicine*, 22(21), 1224–1232. <https://doi.org/http://dx.doi.org/10.1136/bjsports-2021-104112>
- Habyarimana, J. de D., Tugirumukiza, E., & Zhou, K. (2022). Physical Education and Sports: A Backbone of the Entire Community in the Twenty-First Century. *International Journal of Environmental Research and Public Health*, 19(12). <https://doi.org/10.3390/ijerph19127296>
- Hall, S. (2006). Effective security management of university sport venues. *Sport Journal*, 9(4), 5p.
- Houlihan, B. (2020). Sport and physical education in schools. In *Sport, Policy and Politics* (pp. 238–272). <https://doi.org/10.4324/9780203160640-12>
- Irawan, F. A., & Prasetyo, F. E. (2019). Sport Infrastructure for Physical Education in Senior High School. *International Journal of Multicultural and Multireligious Understanding*, 6(1), 66. <https://doi.org/10.18415/ijmmu.v6i1.491>
- Irmansyah, J., Susanto, E., Lumintuarso, R., Sugiyanto, F. X., Syarif, A., & Hermansyah. (2021). Physical literacy in the culture of physical education in elementary schools: Indonesian perspectives. *International Journal of Human Movement and Sports Sciences*, 9(5), 929–939. <https://doi.org/10.13189/saj.2021.090514>
- Jones, E. (2022). *Literature in motion: Translating multilingualism across the Americas*. Columbia University Press. <https://doi.org/https://doi.org/10.1080/14781700.2022.2100463>
- József, B. B., Iuliana, B.-B., & Éva, S. (2022). The Relation Between Physical Education Curriculum Time Allocation and Obesity in 6-10 Years Old Children: A Cross Sectional Study. *Educatio Artis Gymnasticae*, 67(4), 41–50. <https://doi.org/10.24193/subbeag.6>
- Lee, S. A., Ju, Y. J., Lee, J. E., Hyun, I. S., Nam, J. Y., Han, K. T., & Park, E. C. (2016). The relationship between sports facility accessibility and physical activity among Korean adults. *BMC Public Health*, 16(1), 1–8. <https://doi.org/10.1186/s12889-016-3574-z>
- Leeder, T. M., & Beaumont, L. C. (2021). Lifestyle sports and physical education teachers' professional development in the united kingdom: A qualitative survey analysis. *Education Sciences*, 11(10). <https://doi.org/10.3390/educsci11100642>
- Magias, T., Ridley, K., & Pill, S. (2017). Pedometer step guidelines for physical education settings. *Learning Communities: International Journal of Learning in Social Contexts*, 21, 180–189. <https://doi.org/10.18793/lcj2017.21.14>
- Mally, K. K. (2009). Movement Skill Learning through Repetition, Variety and an Explicit Purpose. *Strategies*, 22(5), 16–19. <https://doi.org/10.1080/08924562.2009.10590835>
- Mawase, F., Lopez, D., Celnik, P. A., & Haith, A. M. (2018). Movement Repetition Facilitates

- Response Preparation. *Cell Reports*, 24(4), 801–808.  
<https://doi.org/10.1016/j.celrep.2018.06.097>
- Mhalhal, H. Q., Sadiq, H. I., & Abd, G. (2020). *THE ROLE OF SPORTS ACTIVITIES IN ALLEVIATING ANXIETY AMONG MIDDLE SCHOOL STUDENTS FROM THE TEACHER 'S POINT OF VIEW*. 7(09), 221–231.
- Nzomo, N. J. (2011). *FACTORS INFLUENCING THE SELECTION AND UTILIZATION OF LEARNING RESOURCES BY TUTORS IN THREE SELECTED PRIMARY TEACHERS ' COLLEGES IN KENYA* Nzioka John Nzomo Research thesis submitted to the Department of Educational Communication and Technology in partial f (Issue October). KENYATTA UNIVERSITY.
- O., H. G. (2020). *Motion in Classical Literature* (1st ed.). Oxford University Press.
- Obi, N. I., Obi, J. S. C., Okeke, F. O., & Nnaemeka-Okeke, R. C. (2022). Pedagogical Challenges of Architectural Education in Nigeria; Study of Curriculum Contents and Physical Learning Environment. *European Journal of Sustainable Development*, 11(4), 32.  
<https://doi.org/10.14207/ejsd.2022.v11n4p32>
- Osipov, A., Vonog, V., Prokhorova, O., & Zhavner, T. (2016). Student learning in physical education in Russia (Problems and development perspectives). *Journal of Physical Education and Sport*, 16(1), 688–693. <https://doi.org/10.7752/jpes.2016.s1111>
- Peralta, M., Santos, D. A., Henriques-Neto, D., Ferrari, G., Sarmento, H., & Marques, A. (2020). Promoting health-related cardiorespiratory fitness in physical education: The role of class intensity and habitual physical activity. *International Journal of Environmental Research and Public Health*, 17(18), 1–11. <https://doi.org/10.3390/ijerph17186852>
- Peter Barrett, A. T., & Tigran Shmis, Diego Ambasz, and M. U. (2019). The Impact of School Infrastructure on Learning. In *INTERNATIONAL DEVELOPMENT IN FOCUS The Impact of School Infrastructure on Learning*.
- Rodríguez Macías, M., Abad Robles, M. T., & Giménez Fuentes-Guerra, F. J. (2021). Effects of Sport Teaching on Students' Enjoyment and Fun: A Systematic Review and Meta-Analysis. *Frontiers in Psychology*, 12(August). <https://doi.org/10.3389/fpsyg.2021.708155>
- Sospedra Harding, A. I., Escamilla Fajardo, P., & Aguado Berenguer, S. (2021). Tecnologías de la Información y la Comunicación en Educación Física: un análisis bibliométrico (Information and Communication Technologies in Physical Education: bibliometric analysis). *Retos*, 42, 89–99. <https://doi.org/10.47197/retos.v42i0.87761>
- Suherman, W. S. (2020). Integrating Physical Literacy into Indonesian Physical Education Curriculum. *Proceedings of the 3rd Yogyakarta International Seminar on Health, Physical Education, and Sport Science in Conjunction*, 1, 224–227.  
<https://doi.org/10.5220/0009309302240227>
- Sutter, K., Wijdenes, L. O., van Beers, R. J., & Pieter Medendorp, W. (2022). Even well-practiced movements benefit from repetition. *Journal of Neurophysiology*, 127(5), 1407–1416.  
<https://doi.org/10.1152/jn.00003.2022>
- Tambalis, K. D. (2022). Physical Activity, Physical Education, and Health Benefits in Children and Adolescents. *European Journal of Public Health Studies*, 5(1), 28–55.  
<https://doi.org/10.46827/ejphs.v5i1.112>
- Tomara, M., Tselfes, V., & Gouscos, D. (2017). Instructional strategies to promote conceptual change about force and motion: A review of the literature. *Themes in Science & Technology Education*, 10(1), 1–16.
- Whitehead, M. (2010). Physical literacy: Throughout the lifecourse. In *Physical Literacy: Throughout the Lifecourse*. <https://doi.org/10.4324/9780203881903>
- Xuan, W., & Wang, H. (2018). *Research on the Operation Mode and Development*

*Countermeasures of University Sports Venues.* 290(Icedem), 400–403.  
<https://doi.org/10.2991/icedem-18.2018.100>

Zakaria, J., Mohamad, N. I., Hasbullah, N. A., & Isa, N. M. (2020). Safety Management Practices of High School Sports Facilities. *European Journal of Molecular and Clinical Medicine*, 7(2), 5972–5976.