

Physical Education Curriculum in Elementary Schools: Efforts for Sustainable Movement Education

Pungki Indarto^{1✉}, Nasuka Nasuka², M. Furqon Hidayatullah³, Sulaiman Sulaiman⁴, Heny Setyawati⁵

¹²⁴⁵ Universitas Negeri Semarang, Central Java, Indonesia

³ Universitas Sebelas Maret, Surakarta, Central Java, Indonesia

Article Info

History Articles

Received:

January 2025

Accepted:

February 2025

Published:

March 2025

Keywords:

Digitalization
Era, Elementary
School
Curriculum,
Movement
Education,
Physical
Education.

Abstract

This study aims to gain new knowledge about sustainable movement education efforts in the elementary school curriculum. The method used is library research. This study uses secondary data collected through documentation methods. Data from various documents will be collected as literature, with a focus on research on the Physical Education Curriculum to support Sustainable Movement Education Efforts. Article searches were conducted through Google Scholar, GARUDA, and other high-achieving journals. The literature obtained must meet the Inclusion and Exclusion Criteria, and be in accordance with keywords such as Curriculum, Physical Education, Elementary School, Movement Education, and the Digitalization Era. The researcher selected 13 articles and journals on physical education that met the criteria and keywords set. The analysis method used is descriptive analysis. The conclusion of 13 works of literature on the physical education curriculum in elementary schools shows that the independent curriculum is more effective than the previous curriculum, with the support of technology and applications in learning that encourage the progress of physical education. Current movement education with an independent curriculum and innovative technology reflects sustainable movement education in elementary schools.

© 2018 Universitas Negeri Semarang

✉ Address correspondence:

Author Correspondence Address

E-mail: (pi311@students.unnes.ac.id)

INTRODUCTION

Education in Indonesia is rapidly developing with schools that have competent teachers in various fields. Education is a basic necessity that is programmed to prepare competent human resources for the future (Gusdiyanto & Setya Mustafa, 2022). The quality of talent evolves over time, with education continuously improved and adapted to the needs of the era. Good education has a positive impact on national development. Achieving educational goals requires careful planning, approaches, and strategies. In Indonesia, the National Education Standards Agency (BSNP) develops different curricula in each era to achieve national education goals. The curriculum is important for achieving the main goals in learning and will undergo changes according to the needs of students in every era (Mustafa, 2020). Over the past 20 years, the Indonesian Curriculum has undergone four changes: the Competency-Based Curriculum (KBK) in 2004, the School Based Curriculum (KTSP) in 2006, the 2013 Curriculum, and the Independent Curriculum that came into effect in 2022. Every new curriculum change is expected to influence and enhance the learning process. (Yulianto, 2017). Physical education is a mandatory component of education in schools that plays a strategic role in human development. Physical education has a positive impact on the physical, mental, intellectual, emotional, and social growth of children, meaning that social interaction is considered an integral feature of physical education. (Aartun & Standal, 2024) In physical education, the previous curriculum emphasized character education from cognitive, affective, and psychomotor aspects. Therefore, teachers must understand the importance of physical education in this curriculum. (Mustafa, 2020). In the Merdeka Curriculum, the use of e-Learning technology in Physical Education learning is considered a subtle enhancement to the previous Curriculum. (Almaida et al., 2023).

Physical education in the elementary school curriculum is important because it develops motor skills as well as the values of students' personalities. Students are considered successful in physical education class due to the improvement of motor skills during interactions among students. (Kaji & Ono, 2021). A balanced and integrative curriculum at the elementary school level places greater emphasis on understanding and developing concepts of movement and physical activity (Almaida et al., 2023). The process of physical education learning in elementary schools has not been maximized according to the curriculum and is often overlooked, even though it should serve as the foundation for instilling educational values. Research in Sweden shows that physical education teachers are vulnerable to changes in the dynamics of physical education learning. (Larsson & Karlefors, 2015). Physical Education in elementary schools plays a crucial role in intensifying lifelong education by providing students with learning experiences through systematic physical activities. One of the roles of Physical Education in elementary schools is to enhance the physical fitness of students (Sartinah, 2017). The

goal is to cultivate a healthy and active lifestyle from an early age and throughout life. Physical education has important pedagogical goals and is an essential part of education. Movement as a physical activity helps humans to understand the world and themselves in line with the progression of time. Physical education encourages motor skills, physical abilities, knowledge, values, and the habituation of a healthy lifestyle for balanced growth and development (Anwar, 2005).

Physical education in elementary schools must understand the stages of motor development related to individual needs and the environment. Individual factors relate to the unique internal conditions of each child. External environmental factors influence individual development, especially specialization in movement during the ages of 7 to 14, or while still in elementary school (Rukmana, 2008). At the elementary school age stage, there are sub-developments in movement that include: (1) the transition from basic movements to applied movements, (2) the application of movements in the form of specialized skills that require better coordination, and (3) the utilization of movements in various activities that enhance skills with good coordination. In physical education learning, it is important to guide children towards movement development according to their stage, so that by the end of that stage, children possess skills that support their adaptation to the changing times. Physical education and physical activity are essential for the physical well-being of students, encompassing health components such as cardiovascular endurance, muscle strength, flexibility, and body composition. Cardiovascular endurance supports muscle function by delivering oxygen to active muscles (Ho et al., 2017) Ahmed et al., 2017)Ahmed et al., 2016) Cardiovascular endurance is necessary for children to learn, play, and assist their parents. Flexibility is important for students for daily activities and to prevent injuries. Body composition is a parameter for the growth and development of children, which varies among individuals. Physical fitness is important for children's health, supporting growth and development, and enhancing resistance to diseases. The level of physical fitness positively influences students' basic movement skills, including locomotor movements (such as walking, running, jumping) as well as non-locomotor and manipulative movements. Non-locomotor basic movements are movements performed in place without shifting, such as twisting, swinging, and bending. Manipulative basic movements involve the manipulation of objects with force, for example, throwing and catching. Physical Education learning in elementary schools trains children's movement skills through games, athletics, and gymnastics, which effectively enhances their fundamental movement abilities (Sartinah, 2017).

Games and sports are important media in physical education that help students get to know themselves and enjoy movement. Engaging activities, such as games, can develop fundamental movement skills, especially for lower-grade students, as stated by Mahendra (2017), Playing activities are effective in developing children's basic locomotor skills in elementary school, because the world of children is a world of play.

Physical education teachers can use various forms of games to train these skills. Simple games help develop the fundamental movements of elementary school students in accordance with their characteristics (Rejeki & Gunawan, 2021). Meanwhile, the teacher's strategy in creating learning models to facilitate the learning process systematically. The model to be developed is basic locomotor movement learning through simple games. The subject of basic locomotor movement is the teaching material for physical education at the elementary school level. Through the Independent Curriculum, students can take advantage of e-Learning with internet-based applications that are trending in physical education (Almaida et al., 2023) and adding the use of applications in learning. Currently, digital-based learning applications are becoming increasingly effective in the era of the Internet of Things. At this time, efforts are being made to utilize technology in digital form for the purpose of learning in sustainable movement education, from preschool to elementary school and up to higher education (Sari et al., 2023).

METHODS

This research is a library research study that collects data from various sources, such as books, journals, and documents. (Sugiyono, 2010). The literature review, according to Afifuddin (2012), is important as a contact review to provide context and meaning in writing, as well as to explain why a particular research needs to be conducted, both in terms of the subject and its relationship with other relevant research. A literature review is a critical analysis of ideas or findings in academic literature, as well as formulating theoretical and methodological contributions to a specific topic.

The data used in this research is secondary data, which is data obtained without direct observation. The data comes from previous research, in the form of scientific reports in articles or journals regarding the Physical Education Curriculum for elementary schools, as well as related books. The data collection method in this research uses documentation techniques, which involve gathering data from various literature related to the study being examined (Arikunto, 2010). Data from various literature will be collected as documents, and several studies discussing the Physical Education Curriculum will be selected to address the efforts of Sustainable Movement Education.

The article search strategy was conducted through Google Scholar, GARUDA (Digital Reference Garba), and Taylor and Francis using the keywords: Curriculum, Physical Education, Movement Education, Elementary School, and the Digitalization Era. The articles that meet the criteria are then analyzed. This Literature Review utilizes full-text PDF literature and peer-reviewed journals. The journals to be reviewed are national research articles on the Elementary School Physical Education Curriculum, selected according to specific criteria and then reviewed. To better focus the literature obtained must also meet the Inclusion and Exclusion Criteria (Alexander, 2020) which will be presented in the table below:

Table 01 Inclusion and Exclusion Criteria

Inclusion Criteria (Acceptance)	1. Journal or Article Publication on Primary School Physical Education Curriculum, Movement Education, and the Digitalization Era 2. Publications and Books (2015-2024) 3. Full Text
Exclusion Criteria (Rejection)	1. Journals outside the research topic 2. Publications prior to 2015 3. Unfull Text

Research articles that met the criteria were collected and summarized, including researcher name, year of publication, study design, objectives, sample, and summary of results. The summaries were included in tables sorted alphabetically and by year of publication to clarify the analysis of abstracts and full texts. The journal summaries included an analysis of the research objectives and findings, using the journal content analysis method.

RESULTS AND DISCUSSION

Research articles that met the criteria were collected and summarized, including researcher name, year of publication, study design, objectives, sample, and summary of results. The summaries were included in tables sorted alphabetically and by year of publication to clarify the analysis of abstracts and full texts. The journal summaries included an analysis of the research objectives and findings, using the journal content analysis method.(Kuckartz, 2019). The following is a Literature Review table of 13 Articles and Journals:

Table 02. Literature Review

No	Journal Author (Year) and Title	Journal Core	Journal Results
1	(Nugraha, 2015)“ Physical Education for Early	Early physical education to stimulate motor, intellectual & emotional growth, and	The results show that the best age for child stimulation is as early as possible through optimal physical education, in order to achieve a balance of the right and left brain so

	Childhood Sport”	prepare them for future development.	that children remain focused on academics. Early movement development can produce young people with champion physical and mental abilities. Children need to do simple exercises every day at school to strengthen their muscles.
2	(Yulianto, 2017) “Analysis of Curriculum Changes in the Learning Process of Physical Education Sports and Health in Elementary Schools”	Discusses the changes in the PJOK learning process carried out by teachers in line with the demands of Curriculum changes as a teacher's professional competence.	PJOK teachers in Malang City elementary schools have met professional standards and understand the concept of material from various curricula, but the learning process that is applied is not in accordance with the demands of curriculum changes as professional competence.
3	(Mustafa, 2020)“The Contribution of the Physical Education, Sports and Health Curriculum in Indonesia in Shaping 21st Century Skills”	discusses the contribution of the physical education, sport and health (PJOK) curriculum in Indonesia to shape 21st century skills.	The physical education curriculum makes an important contribution in fulfilling the four 21st century skills: critical thinking, communication, collaboration, and creativity and innovation, as well as in character building. Character can be formed naturally through learning physical education that contains positive values such as leadership, sportsmanship, and responsibility.
4	(Siti Rodi’ah, 2021) “Physical Education Learning Strategies Assisted by Digital Book	Discusses the teacher's strategy in using teaching materials in the form of book creators in physical learning, and the impact of using digital book creator media on improving	The results show that the teacher's strategy in using digital Book Creator includes content design that retains printed material that is in accordance with students' learning styles. Such as image and video features help students maximize understanding of correct movement techniques.

	Creator Media in Improving Students' Gross Motor Skills at the Elementary School Level”	students' gross motor skills.	Teachers' strategies in using digital book creators for online learning include utilizing features to present material with text, images, and videos of body movement techniques according to the cognitive development of students, which allows them to practice movements correctly.
5	(Parwata, 2021)“ Motion Learning in Physical Education from an Independent Learning Perspective	Merdeka Belajar in Physical Education focuses on physical activity to develop physical, cognitive, and emotional components in a democratic & humanistic manner and create an enjoyable learning process for educators, students, and teachers.	Physical education focuses on human movement, while sports originate from games. Physical Education emphasizes movement learning as a reflection of the student learning process. The improvement of movement skills is influenced by the learning process through Physical Education, focusing on improving the quality of physical movement to be more efficient in daily activities. Physical Education learning is important to improve students' movement skills through appropriate physical activities, encouraging them to actively move.
6	(Yudaparnita, 2022)“Early Childhood Basic Movement Skills in Physical Education Based on Independent Learning Viewpoints”	Merdeka Belajar in Physical Education focuses on physical activity to develop physical, cognitive, and emotional components in a democratic & humanistic manner and create a fun learning process for educators, students.	Physical education learning of basic movement materials supports the principle of Merdeka Belajar by giving students the freedom to explore physical activities, literacy, sports, and health independently according to teacher direction. Merdeka learning involves face-to-face, online, and offline learning, supported by the abundance of basic motion materials and videos on the internet. There is interesting content about basic movements and sports that can be accessed online or through file transfer.

7	(Wijayanto et al., 2022)“Adapting PE Learning in the Metaverse Era”	Discusses how PE learning in the current era includes digitalization and the metaverse.	Physical education teachers need to adapt to modern learning and implement appropriate strategies, such as involving parents and utilizing technology for distance learning. Affective aspects are important in physical education, and virtual learning via the internet enhances interaction. Metaverse supports online learning by providing a school-like learning experience. Teachers are advised to create animations for students' new experiences. This is where the role of physical education teachers is crucial in improving the quality of student movement in the metaverse era.
8	(Kurniawati, 2022) “Adaptive PE Learning Media Innovation in the Metaverse Era”	Discusses adaptive PE learning with an emphasis on media innovation used in learning.	Teachers in the metaverse era need to have innovations to support learning, especially in adaptive PE, through technology. One example is the use of video as a learning medium. The use of video in learning offers significant benefits, especially in physical education. Technology can facilitate more effective learning, by emphasizing student participation to actively move and develop their movement skills. As educators, it is important to have learning innovations, one of which is through the use of technology.
9	(Dewi, 2022) “Utilization of Augmented Reality-based Motion Learning in Era 5.0”	Discussing technology-based applications that can be a medium for learning motion that is relevant to the development of the era of revolutionary society 5.0	In the future, learning basic movements in elementary schools requires technology integration for effective interaction between teachers and students. In this digitalization era, effective PJOK learning media by utilizing technology in the era of the industrial revolution 4.0. Era Society

			5.0 is virtual technology to represent real and virtual objects. The virtual product in question is Augmented Reality (AR) can offer PJOK teachers in teaching basic movements in elementary schools. The use of Augmented Reality (AR) technology by sports teachers in learning basic movements can help students apply skills according to era 5.0. This AR application uses technology to present learning media that is in accordance with the current and future metaverse era.
10	(Almaida et al., 2023) “Readiness of PE Teachers to Face the Merdeka Curriculum in Elementary Schools”	Discussing the readiness of PE teachers to face the Merdeka Curriculum in elementary schools as a consideration for the government's review of the 2024 Merdeka Curriculum.	The research shows that elementary school PE teachers are not ready to implement the Merdeka Curriculum, so they need special training in the preparation of teaching materials, field practice, and the assessment system. Schools that implement the Merdeka Curriculum need to support PE teachers and ask the government for adequate facilities so that the curriculum goals are achieved.
11	(Sari et al., 2023) “Socialization of Android Applications as Teaching Materials for Locomotor Basic Movements for Elementary School Physical Education Teachers”	The utilization of Android for basic locomotor teaching materials includes theory and practice, aiming to build insights into Android-based learning innovations.	Presentations from two speakers on the theory of basic movement and locomotor movement for elementary school children, as well as the operation of the Locomotor App, showed active interaction between participants and presenters. The methods used included discussion, question and answer, and practice. In conclusion, using the Locomotor App can increase participants' knowledge for teaching activities at school.

12	(Iffah, 2024) “Innovative Learning Model for Physical Education in the Era of Digitalization”	Discussing physical education learning in the era of digitalization can improve the quality of learning by adjusting to the growing technological trends.	The results show that innovative physical education learning today is not only through classroom learning but can use learning via e-learning and blended learning where innovative learning can now be done anywhere according to the development of technology that has developed.
13	(S. A, 2024) “Contemporary Physical Education Perspectives: Traditional vs. Modern”	Discusses traditional and modern physical education based on contemporary perspectives.	Traditional physical education teaching combines national sports and activities, while modern teaching utilizes information technology. Modern physical education is considered more effective due to fitness technologies that improve students' physical condition and motivation.

Elementary School Physical Education Curriculum

Curriculum changes are always followed by changes in the learning process accordingly, but in the previous curriculum, physical education materials were not optimal. Research (Yulianto, 2017) shows that learning methods are different in each Curriculum, the Merdeka Curriculum adds modern learning methods, such as blended learning and e-learning, which follow the development of the digitalization era, in the Merdeka Curriculum (Marron & Coulter, 2021) Technology integration is very important in the progress of a curriculum. Every change in the physical education curriculum requires teachers to understand their competencies, so teachers need to develop more innovative teaching methods (Iffah et al., 2024). In addition to being innovative current and future teacher practitioners need to consider how to utilize theoretical models of education to support effective physical education and can create an environment where students can construct meaning in their learning (Usher et al., 2015). Physical education in primary schools is important for improving physical and mental health, as well as sports achievements. It can build a sense of national pride and shape students' character, personality, discipline and sportsmanship. Stimulation should be done early. Physical education for primary school students must be optimized to achieve a balance between the right and left brain, especially in the Merdeka curriculum in the current digitalization era. This balance will help students stay active and can improve concentration in academic activities (Nugraha, 2015).

To equip students in the digital era, teachers need to have learning and innovation skills, including critical thinking, communication, collaboration and creativity. These skills are essential to become a professional teacher in physical education in primary schools. To develop 21st century skills, in the current Merdeka Curriculum, teachers are also expected to create innovative learning by utilizing technology, thus improving professionalism in teaching and understanding technology for physical education in primary schools (Mustafa, 2020). In (Sargent & Calderón, 2021) while technology may continue to improve the quality of teacher instruction, such advancements may be based on the need for technology to further refine the needs of the Curriculum in the field of physical education.

Looking at the differences in the existing Curriculum, it can be said that the Curriculum before the Merdeka Curriculum was like traditional physical education while the current Merdeka Curriculum is like modern physical education, there is a difference between the two, namely the use of technology in modern physical education rather than traditional ones. Currently, it can be said that modern physical education is more effective in learning than traditional physical education, so seeing this assumption, it can be said that the Merdeka Curriculum will be more effectively used for physical education than the previous curriculum (S. A, et al., 2024). The Merdeka Curriculum is seen as modern physical education in the digital era. With rapid technological advances, it is hoped that the physical education curriculum can adapt to face the metaverse era, currently the metaverse itself is still in its early stages and teachers need to develop innovative and effective learning strategies in the metaverse era which is only in its early stages, so teachers must create learning strategies that can improve learners' fitness, including motor skills, as well as cognitive, affective, and social aspects (Wijayanto et al., 2022). Teacher creativity will always be tested, especially in the metaverse era where teachers must have a feasible thought to create effective learning methods in their era and be adept at using technology for physical education, especially adaptive PE subjects (Kurniawati et al., 2022).

Maximizing student motivation is a form of concern for teachers, including physical education teachers (Wijayanto et al., 2024). The challenge of a professional teacher is the need to understand and implement quality assessments (Iannucci et al., 2023) also need to understand the demands of physical education in Merdeka Curriculum in order to help students face challenges innovatively. In addition, the use of Merdeka platform in teaching must be supported by good internet access, but some schools are still experiencing difficulties in this regard. The Merdeka Curriculum was implemented in 2022 after the Covid-19 pandemic, during which time learning was conducted online. In the digital era, the internet is important for schools that want to implement this curriculum. In addition, teachers as drivers need to have an understanding of technology as a basic ability in order to adapt and support the implementation of the Curriculum, especially in physical education. The Merdeka Curriculum implements the theme of

Merdeka Belajar, where students are given the freedom to learn with teacher assistance, where the theme of Merdeka Belajar has its own advantages, namely the learning process is not limited by space and time and can be carried out online and offline (Iffah et al., 2024). Teachers' understanding of technology is important to help students face the times. The Merdeka Curriculum was presented by the government to overcome the lag due to the Covid-19 pandemic and authorize schools to choose the appropriate curriculum. Fourth, the assessment in the Merdeka Curriculum is that some physical education teachers do not understand the indicators and the assessment system. The success of implementing the Curriculum depends on the principal and teachers who (Almaida et al., 2023)

Continuous Motion Education Efforts

Physical education in primary schools promotes children's fitness, optimal movement development and better learning through life-enhancing movement activities. The terms movement and motor are often used in sports. Learning motor skills, both theory and practice, is important in physical education to improve the physical quality of students. The strategic role of physical education is to shape character, physical and mental health, and foster sportsmanship, while improving biomotor components such as strength, endurance, agility, and balance (Rejeki & Gunawan, 2021). Physical education involves the interaction of students with the school environment through physical activity and the process of learning movement. The improvement of movement skills is influenced by physical education, especially basic movement education, which aims to improve the quality of physical movements (such as walking, running and throwing) for efficiency in daily activities. The development of basic movements and their refinement is important for early childhood to learn a variety of movements, including more complex ones. Basic movements are repetitive movements formed from habit and experience, consisting of two types: locomotor movements (movement of place such as walking, running, jumping) and non-locomotor movements (movement of limbs without moving place such as pushing, pulling, bending, twisting). Manipulative includes movements such as throwing, catching, kicking and hitting (Parwata, 2021).

The concept of Merdeka Belajar in physical education allows students to explore physical activity and health independently with the use of technology and teacher assistance, through a combination of face-to-face, online and offline learning. Although there are many advantages in adopting the use of digital technology into the classroom, there are also disadvantages such as time which is one of the biggest influences of a teacher not implementing technology into the classroom and teacher incompetence in technology is also a disadvantage of this technology-based learning (Wallace et al., 2023). The physical education learning design for basic movement materials supports the principle of Merdeka Belajar, with easy access to online materials and videos, assuming professional teachers understand digital technology themselves. Learning basic

movement, both theory and practice, is important to improve students' physical quality and help them express themselves and actualize their potential. Physical education plays an important role in improving students' movement skills through customized activities to achieve goals and encourage effort. It trains students to be active and competitive, focusing on psychosomatic development. Based on the current Merdeka Curriculum, physical education strives for continuous movement education in many ways, from learning using technology, innovative learning, and there is even learning using virtual reality (Yudaparmita, 2022).

Continuous movement education can already be applied to physical education learning in schools and outside, as in research (Siti Rodi'ah, 2021) Book Creator Digital is a learning app that integrates text, images and sound, available on computers and Android devices. It supports adding images, videos and animations for different learning styles. Teacher support for Book Creator Digital is important for sustainable physical education learning, as teachers play a role in curriculum development. This tool improves students' gross motor skills through effective teaching. Book Creator Digital media makes it easy for teachers to organize physical education materials and increase student learning activities through learning videos. The tool allows teachers to design simple online learning strategies, so students can learn independently at home using smartphones. Teachers can monitor students' progress by asking them to submit videos of movement practice from the learning videos. It is clear that the use of digital media in primary school physical education classrooms can provide new possibilities in staging learning (Greve et al., 2022), in the sense that digital media can improve learning objectives in the physical, cognitive, social, and affective domains (Teutemacher et al., 2024).

Media technology can be used in physical education for learning basic movements. Research (Dewi et al., 2022) shows that technological developments require adaptation from physical education teachers. Teachers need to make maximum use of technology to prepare good learning media, especially in physical education, in accordance with the era of the industrial revolution 4. Virtual technology, such as Augmented Reality (AR), effectively represents real and virtual objects so as to provide information, this technology will attract students' interest in physical education learning by combining the real and virtual worlds. AR uses markers such as cards or paper to display simulations in basic motion learning through android. Students need a camera to interact with virtual objects and see simulations of basic motion skills. The use of AR in learning media effectively increases interest and the learning process, as it offers entertainment that involves all the senses and creates real interaction. AR has similar functions as learning media, such as conveying information, clarifying material, and increasing student motivation and interest. Based on the above description, digital technology and tools can be used to motivate students in their learning process (Isgren Karlsson et al., 2023).

CONCLUSION

The conclusion of the literature review on the physical education curriculum in primary schools shows that the current Merdeka Curriculum is effective compared to the previous curriculum. The use of technology and applications in learning also supports the progress of physical education, ensuring continuous development. The current movement education with the Merdeka Curriculum and the innovative and creative use of technology and applications in learning basic movements in primary schools reflect sustainable movement education.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to all those who have contributed to the completion of this journal. In particular, I would like to express my sincere appreciation to my supervisors who have provided invaluable guidance, direction and advice throughout the preparation process. My gratitude also goes to my colleagues for their moral support, and to my beloved family who are always a source of motivation. Hopefully the results of this study can make a significant contribution to the development of science, especially in the field of Physical Education in Elementary Schools.

REFERENCES

- Aartun, I., & Standal, Ø. F. (2024). Exploring the embodied experiences of social relationships in physical education. *Curriculum Studies in Health and Physical Education*, 0(0), 1–18. <https://doi.org/10.1080/25742981.2024.2376154>
- Ahmed, M. D., Ho, W. K. Y., Van Niekerk, R. L., Morris, T., Elayaraja, M., Lee, K. C., & Randles, E. (2017). The self-esteem, goal orientation, and health-related physical fitness of active and inactive adolescent students. *Cogent Psychology*, 4(1), 1–14. <https://doi.org/10.1080/23311908.2017.1331602>
- Ahmed, M. D., Yan Ho, W. K., Zazed, K., Van Niekerk, R. L., & Jong-Young Lee, L. (2016). The adolescent age transition and the impact of physical activity on perceptions of success, self-esteem and well-being. *Journal of Physical Education and Sport*, 16(3), 776–784. <https://doi.org/10.7752/jpes.2016.03124>
- Almaida, F. A., Suherman, A., & Rahman, A. A. (2023). Kesiapan Guru Penjas Menghadapi Kurikulum Merdeka Di Sekolah Dasar. *Journal of SPORT (Sport, Physical Education, Organization, Recreation, and Training)*, 7(1), 54–62. <https://doi.org/10.37058/sport.v7i1.6548>
- Anwar, M. H. (2005). Pendidikan Jasmani Sekolah Dasar Sebagai Wahana Kompensasi Gerak Anak. *Jurnal Pendidikan Jasmani Indonesia*, 3(1), 45–53. <https://journal.uny.ac.id/index.php/jpji/article/view/6171>

- Greve, S., Thumel, M., Jastrow, F., Krieger, C., Schwedler, A., & Süßenbach, J. (2022). The use of digital media in primary school PE—student perspectives on product-oriented ways of lesson staging. *Physical Education and Sport Pedagogy*, 27(1), 43–58. <https://doi.org/10.1080/17408989.2020.1849597>
- Gusdiyanto, H., & Setya Mustafa, P. (2022). Evaluasi Rancangan Pembelajaran Pendidikan Jasmani Dan Kesehatan Di Sekolah Dasar Negeri Bunulrejo 1 Kota Malang. *Jurnal Lentera Pendidikan Pusat Penelitian Lppm Um Metro*, 7(1), 115. <https://doi.org/10.24127/jlpp.v7i1.2116>
- Ho, W. K. Y., Ahmed, M. D., Keh, N. C., Khoo, S., Tan, C., Dehkordi, M. R., Gallardo, M., Lee, K., Yamaguchi, Y., Wang, J., Liu, M., & Huang, F. (2017). Professionals’ perception of quality physical education learning in selected Asian cities. *Cogent Education*, 4(1). <https://doi.org/10.1080/2331186X.2017.1408945>
- Iannucci, C., Fletcher, C., & Scanlon, D. (2023). A teacher’s self-study of digitally-enabled assessment practices to support enhancements in assessment literacy in primary physical education. *Curriculum Studies in Health and Physical Education*, 1–19. <https://doi.org/10.1080/25742981.2023.2265903>
- Isgren Karlsson, A., Alatalo, T., Nyberg, G., & Backman, E. (2023). Exploring physical education teachers’ perceptions and attitudes towards digital technology in outdoor education. *Journal of Adventure Education and Outdoor Learning*, 23(4), 510–524. <https://doi.org/10.1080/14729679.2022.2054835>
- Kaji, M., & Ono, Y. (2021). Study on successful experiences of elementary school students in physical education classes in Japan. *Cogent Education*, 8(1). <https://doi.org/10.1080/2331186X.2021.1997248>
- Kuckartz, U. (2019). Qualitative content analysis: From Kracauer’s beginnings to today’s challenges. *Forum Qualitative Sozialforschung*, 20(3). <https://doi.org/10.17169/fqs-20.3.3370>
- Larsson, H., & Karlefors, I. (2015). Physical education cultures in Sweden: fitness, sports, dancing ... learning? *Sport, Education and Society*, 20(5), 573–587. <https://doi.org/10.1080/13573322.2014.979143>
- Marron, S., & Coulter, M. (2021). Initial teacher educators’ integrating iPads into their physical education teaching. *Irish Educational Studies*, 40(4), 611–626. <https://doi.org/10.1080/03323315.2021.1971103>
- Mustafa, P. S. (2020). Kontribusi Kurikulum Pendidikan Jasmani, Olahraga, dan Kesehatan di Indonesia dalam Membentuk Keterampilan Era Abad 21. *Jurnal Pendidikan: Riset Dan Konseptual*, 4(3), 437–452. https://doi.org/10.28926/riset_konseptual.v4i3.248
- Nugraha, B. (2015). Pendidikan Jasmani Olahraga Usia Dini. *Jurnal Pendidikan Anak*, 4(1), 557–564. <https://doi.org/10.21831/jpa.v4i1.12344>

- Parwata, I. M. Y. (2021). Pembelajaran Gerak Dalam Pendidikan Jasmani Dari Perspektif Merdeka Belajar. *Indonesian Journal of Educational Development*, 2(2), 219–228.
- Rejeki, H. S., & Gunawan, G. (2021). Pengembangan Model Pembelajaran Gerak Dasar Lokomotor Untuk Siswa Sekolah Dasar. *Jurnal Penjaskesrek*, 8(2), 218–232. <https://doi.org/10.46244/penjaskesrek.v8i2.1655>
- Rukmana, A. (2008). Pembelajaran Pendidikan Jasmani di Sekolah Dasar. *Jurnal Pendidikan Dasar*, 9(1), 1–9.
- Sargent, J., & Calderón, A. (2021). Technology-Enhanced Learning Physical Education? A Critical Review of the Literature. *Journal of Teaching in Physical Education*, January, 1–21. <https://doi.org/10.1123/jtpe.2021-0136>
- Sari, E. F. N., Siregar, N. M., Sukiri, S., Susanti, D., & Umar, F. (2023). Sosialisasi Aplikasi Android sebagai Materi Ajar Gerak Dasar Lokomotor bagi Guru Pendidikan Jasmani Sekolah Dasar. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat*, 5(1), 14. <https://doi.org/10.20527/btjpm.v5i1.6613>
- Sartinah, S. (2017). Peran Pendidikan Jasmani Olahraga Dan Kesehatan Dalam Perkembangan Gerak Dan Keterampilan Sosial Siswa Sekolah Dasar. *Pendidikan Jasmani Indonesia*, 5(2), 62–67.
- Siti Rodi'ah, I. H. (2021). Strategi Pembelajaran Pendidikan Jasmani Berbantu Media Book Creator Digital Dalam Meningkatkan Kemampuan Motorik Kasar Siswa Pada Tingkat Sekolah Dasar. *Continuous Education: Journal of Science and Research*, 2(2), 23–35. <https://doi.org/10.51178/ce.v2i2.225>
- Teutemacher, B., Sudeck, G., & Hapke, J. (2024). Pedagogical approaches to health-related physical education (PE) in the context of digitalisation—a scoping review. *Physical Education and Sport Pedagogy*, May, 1–17. <https://doi.org/10.1080/17408989.2024.2352826>
- Usher, W., Edwards, A., & de Meyrick, B. (2015). Utilizing educational theoretical models to support effective physical education pedagogy. *Cogent Education*, 2(1). <https://doi.org/10.1080/2331186X.2015.1094847>
- Wallace, J., Scanlon, D., & Calderón, A. (2023). Digital technology and teacher digital competency in physical education: a holistic view of teacher and student perspectives. *Curriculum Studies in Health and Physical Education*, 14(3), 271–287. <https://doi.org/10.1080/25742981.2022.2106881>
- Wijayanto, A., Priyono, B., Syamsul Taufik, M., Syaifuddin, A., & Kodrat, H. (2024). Sehat dan Bugar Melalui Pendidikan Jasmani dan Olahraga. In *Dasar-Dasar Evaluasi Pembelajaran* (Issue May). <https://doi.org/10.5281/zenodo.11387822>
- Wijayanto, A., Siahaan, J., Tantri, A., Juditya, S., Bangun, S. Y., Ardha, M. A. Al, Kodrat, H., Dewi, R., Miskalena, Rozy, F., Akhmad, I., Fitriady, G., Widyaningsih, H.,

- Ningsih, Y. F., Sinulingga, A., Kamal, M., Zainuddin, M. S., Nurkadri, Sucipto, A., ... Artanty, A. (2022). *Teknologi Metaverse dalam Ilmu Keolahragaan*.
- Yudaparmita, G. N. A. (2022). Keterampilan Gerak Dasar Anak Usia Dini Dalam Pendidikan Jasmani Berdasarkan Sudut Pandang Merdeka Belajar. *Widya Kumara: Jurnal Pendidikan Anak Usia Dini*, 3(1), 21. <https://doi.org/10.55115/widyakumara.v3i1.2069>
- Yulianto, R. S. S. (2017). Analisis Perubahan Kurikulum pada Proses Pembelajaran Pendidikan Jasmani. *Teori, Penelitian, Dan Pengembangan*, 130–140.