

MANUAL OF IDEAS FOR GOOD PRACTICES IN PHYSICAL EDUCATION



Lithuanian Sports University

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Approved by the LSU Publishing Committee 2024-05-13 (Prot. No LK-2)

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The illustrations included in this publication were made by the authors

The cover illustrations were created and edited by Renata Rutkauskaitė using Microsoft Copilot, Adobe Photoshop, and Topaz Photo AI

Nordplus project “Schoolyard affordances for physically literate and active schoolchildren in era of digitalization (SAPLACED)” (NPHZ-2021/10040)

Bibliographic information is available on the Lithuanian Integral Library Information System (LIBIS) portal ibiblioteka.lt.

ISBN 978-609-8200-55-3

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INTRODUCTION

Physical, mental, social, and emotional education are some of the main principles of the modern education system. Education on the basis of these principles promotes the comprehensive development of students. In the modern education system, physical education lessons are aimed at educating students with the help of active movement. Based on this purpose of physical education, it has become an integral part of the modern education system. Post-millennials, or members of Generation Z, are growing up in a technology-saturated world of personal computers, smart phones, social media, artificial intelligence, and the internet, so the concern to raise awareness of physical literacy is increasing. The educators could not avoid the use of digital technologies that change the way everyone interacts with the environment, especially physically, in the educational process. Therefore, with the access to online resources and other digital tools, educators can greatly expand what constitutes pupils' PA enhancement. Using various teaching and learning styles in the other school subjects, teachers could effectively supply the individual student-oriented needs. The necessity to change teaching and learning strategy according to students' needs and their individuality is declared in the European Commission's *Education and Training Monitor 2020* (ET2020). The long-lasting Nordic-Baltic cooperation enabled the participants of this project to rediscover a new place—the schoolyard—as an active play and learning arena and prepare recommendations on how it could be used for schoolchildren's physical activity enhancement (Rutkauskaitė et al., 2021a; 2021b). The aim of this project was to develop and provide recommendations on how schools and schoolyard affordances can be used in an authentic and supportive environment for educating physically literate and active schoolchildren in the era of digitalization and to develop an open platform for primary school teachers and physical educators to share good practices and innovative ideas.

Scientific research results demonstrated that schoolyard design and facilities are characterised by flat terrain covered mostly with asphalt and artificial cover and dominated by sports fields of international standards, which are of limited use apart from physical education lessons. It was also established that pupils prefer vegetation, comfort, and versatility in schoolyards. For pre-service and in-service physical education (PE) teachers, a manual of good practices with an innovative approach to the theoretical and practical skills as well as enhancing attractive, interdisciplinary education possibilities in schoolyards, respect for nature and surroundings, pupils' PA, and well-being has been prepared. At present, outdoor activities in schoolyards and neighbourhoods have increased the high demand to do lessons outdoors. Blended learning has become one of the most accessible forms of education in the current situation. The intention is to support learning and well-being, as well as PA during the school day, by using not only technologies to make schoolchildren more physically active but also to expand the possibilities of schools and schoolyard affordances by making interdisciplinary teaching attractive and usable within the school curriculum.

Project coordinator Assoc. Prof. Dr. Renata Rutkauskaitė

PHYSICAL LITERACY OF SCHOOLCHILDREN

Physical literacy (PL) is increasingly recognised as essential to sustaining physical activity throughout one's life. It encompasses the motivation, confidence, physical competence, knowledge, and understanding needed to maintain an active lifestyle (Whitehead, 2019). As such, PL is becoming a focal point of physical education programmes globally, which now incorporate elements that promote lifelong health and activity (Dudley, 2015; Robinson et al., 2018). Having a wide variety of skills enables a person to participate fully in sport and physical activity, and have enjoyable experiences while staying involved. This in turn helps people stay physically and mentally healthy, reach personal goals, enjoy a sense of achievement, and build strong social connections.

Research underscores the significance of PL, linking it to various health indicators in children. For instance, a longitudinal study of 222 children, with an average age of 10.7 years, revealed significant correlations between PL and health metrics such as body composition, aerobic fitness, and quality of life. Notably, aerobic fitness showed a direct correlation with PL mediated through moderate-to-vigorous physical activity (MVPA), highlighting PL's role in fostering higher levels of physical activity among children (Caldwell et al., 2020).

The importance of PL extends beyond health improvement. A recent intervention in Germany aimed to systematically enhance PL among 8 to 11-year-olds through collaboration with primary schools. The programme, tailored to be holistic and age-appropriate, involved pilot studies to refine and assess its impact. The intervention focused on developing core physical skills such as agility and coordination, facilitated through both structured activities and unstructured play. This approach ensured an inclusive environment conducive to participation from all children, regardless of socioeconomic status or physical ability (Carl et al., 2023). These initiatives demonstrate PL's critical role not only in improving physical health but also in supporting the overall well-being of school-aged children. By nurturing a positive relationship with physical activity from an early age, PL initiatives pave the way for lifelong health benefits and an enhanced quality of life.

Physical education now covers various aspects of a healthy lifestyle, emphasising the influential role of teachers' attitudes and behaviours in shaping students' perspectives towards physical activity. Recognised as a cornerstone of quality physical education by major organisations like UNESCO and the World Health Organization, PL is associated with increased physical activity across the lifespan, ultimately leading to improved health outcomes (Nancy & Jannine, 2015; World Health Organization, 2018; Quennerstedt et al., 2021). A fundamental principle in educating modern students is ensuring that, alongside academic competencies, physical education is prioritised to develop physical literacy. This concept is about mastering fundamental skills through both structured and unstructured play, empowering children to participate confidently and competently in a variety of physical activities that support their holistic development.

In conclusion, integrating physical literacy into school curricula not only boosts children's immediate physical health but also establishes a foundation for ongoing wellness and activity. Future initiatives could further explore diverse and inclusive ways to embed PL into various educational settings, ensuring that all children, irrespective of their backgrounds, could benefit from physically literate education.

SCHOOL AND SCHOOLYARD AFFORDANCES FOR PUPILS' PHYSICAL ACTIVITY

Environmental settings influence children's and adolescents' physical activity (PA) in neighbourhoods and schoolyards. Students spend at least 3,000 hours during their 10-year stay at school and on school premises. The learning environment is defined as the effect of the system on the formation of personality in specific conditions and its development in the social and spatial material environment. The learning environment should be seen as a place where students can acquire not only academic knowledge, but also develop their health and physical condition, which helps to achieve higher learning outcomes. We tend to think of the physical learning environment as just a building. But it is more than that. It is the result of interactions between physical resources, including buildings, technology, and outdoor spaces, learners, educators, content, society, and policy. Indeed, learning itself is complex. Individuals' health and well-being, emotional, social, cognitive, and behavioural characteristics can hinder or enhance learning.

Participation in physical activity (PA) provides pupils with significant physical and social health benefits, including improved well-being and physical fitness (Robinson et al., 2015; World Health Organization, 2020). However, globally, 80% of 13–15-year-old adolescents do not fulfil the recommended minimum level of 60 minutes of moderate to vigorous intensity PA per day (Hallal et al., 2012; Guinhouya et al., 2013). As the majority of children and adolescents spend a large part of the day at school, promoting PA, well-being, and health in the education sector is named as one of the World Health Organization priorities (World Health Organization, 2020; OECD Future of Education 2030, 2024). Organisation of a school day by providing possibilities to develop motor skills is important, as these skills have been found to be positively associated with student academic achievement (Jaakkola et al., 2015; Cameron et al., 2016; Macdonald et al., 2018; Ghasemian & Dulabi, 2020) and well-being (Robinson et al., 2015; World Health Organization, 2020). In addition, motor competence may predict children's higher PA level in the future (Barnett et al., 2016; Barnett et al., 2009). School days can offer a variety of opportunities to be active, such as PE lessons, active breaks during lessons, active commuting to school, and physical activities during recess (Haug et al., 2010; Haug et al., 2008).

Research shows that students engage more easily in active play if areas are clearly defined with special markings (Baquet et al., 2018). To draw attention to the active areas on the school premises, it is recommended to mark them with bright drawings. It can also be a project created and implemented by students. Brittin et al. (2017), who analysed the needs of users and created a school interior improvement project, recommend considering possible areas of activity in corridors, halls, etc. where you can place active video and other games,

exercise equipment, balance boards and stability balls, and Swedish ladders that do not take up much space and do not obstruct pedestrian traffic. A fun, active game that can be played both outside and inside the school is hopscotch. The playing field can be painted or marked on the floor with colourful tape. The furniture selected for sitting also ensures micro-movements that support muscle tone. Research emphasises that children must be taught to use the newly created environment. It is necessary to encourage the use of opportunities for physical activity in everyday life, until physical activity becomes a daily routine, e.g., walking, climbing stairs, going to the gym, etc.

Children find outdoor environments stimulating for physical activities (Haug et al., 2010; Haug et al., 2008; Ward, 2018). The schoolyard may play a crucial role in motivating pupils to be physically active. The schoolyard can be defined as an open space of the total school ground identified as the plot area excluding school buildings, parking places, and other occupied areas. The schoolyard covers the open space with sport areas that are available for the pupils to play, socialise, and be physically active during recess and lessons (Haug et al., 2010; Haug et al., 2008; Thorèn et al., 2019; Andersen et al., 2019). Studies stress the importance of schoolyard structure and variety in used materials to activate pupils physically and develop their motor skills (Anthamatten et al., 2014; Hamer et al., 2017; Dudley, 2015). Schoolyards that include space, topography, and vegetation have a positive effect on pupils' PA during recess (Andersen et al., 2019; Pagels et al., 2014; Bell & Dymont, 2006; Fjørtoft et al., 2009), stimulate physically active play more than inbuilt environment (Bates et al., 2018) and increase the variety of games played by both genders at different ages (Dymont et al., 2009). Furthermore, versatile schoolyards seem to promote creativity and reduce stress symptoms among pupils (Chawla et al., 2014). Results from a review by Morton et al. (2016) showed that lack of equipment was considered a barrier, and enough space was considered important for promoting PA. Intervention studies have also provided some evidence that allocating space, play equipment, playground markings, and physical structures for team games may improve PA behaviour in schoolyards among pupils (Broekhuizen et al., 2014). Gibson's theory of affordances (Gibson, 1986) explains how the physical environment can provide a context for human behaviour and learning. Physical environments may afford possibilities that are linked to the specific environment. The affordances of an environment can be potential and/or actualized (Gibson, 1986; Kytä, 2004). Potential affordances refer to all the possibilities that the environment offers (e.g., rocks can afford climbing, an open field may afford running, jumping, etc.). The actualized affordances are the possibilities that are used by the children, as exemplified by children playing soccer on a soccer field, where the field affords the appropriate environments for playing soccer (paragraph based on Rutkauskaite et al., 2021a, p. 2).

As educators, we should (Broberg et al., 2013, p. 111):

- provide opportunities for children to develop an attitude of care for places that children love and respect;
- promote a meaningful exchange between child and place through affordance actualization in places;
- offer opportunities for environmental learning and developing environmental competence through direct experience in places;
- allow children to create and control territories and protect these territories from harm;
- provide privacy experiences, nurture childhood secrets; and
- allow children to express themselves freely in a place.

DIGITALIZATION IN PHYSICAL EDUCATION

Note: This section is adapted from Rutkauskaite et al., 2022, p. 1–2

The contemporary world is inseparable from information and communication technologies (ICT). The latter are rapidly invading various areas of human life; e.g., everyday routines, businesses, and even education. ICT in education opens new educational opportunities, integrating diverse topics and abundant and up-to-date information resources, as well as providing a lot of space to express creativity, utilise existing skills, and develop critical thinking (Bilyalova et al., 2019; Kerres, 2022). At the same time, the educational process itself is changing (Kerres, 2022). ICT creates opportunities for changes in teaching and learning methods and teaching content, and is a primary driving force behind education reforms. The introduction of new technology-assisted learning tools, such as mobile devices, smartboards, MOOCs, tablets, laptops, simulations, dynamic visualisation, apps, AI, and virtual laboratories, has altered education in schools and institutions. ICT applications in education started with the use of the desktop PC in 1996~, followed by e-learning in 2003~ using the internet PC, afterwards m-learning in 2005~ using the Notebook and PDA (Personal Digital Assistant), and later upcoming u-learning in 2010 using smartphones. The year 2012 was the start of the era of smart education, with the use of several devices in education (Klichowski et al., 2015). Smart education always involves the application of ICT in a way that makes learning more interesting and easier, and it is a method that allows teachers to develop their students' competencies that are indispensable for effective functioning in the reality of the 21st century (Kim & Kim, 2013; Venkatraman et al., 2022). Smart education is based on the five elements arising from the SMART acronym: (1) self-directed, (2) motivated, (3) adapted, (4) resource-enriched, and (5) technology-embedded (Kim & Oh, 2014). Despite the new opportunities opened by information and communication technologies in education, the integration of ICT into the existing education system is a slow and complex process that requires a complex approach (Suárez-Rodríguez et al., 2018), especially in physical education. At the start of the digital era, ICT was mostly used

only for video analysis, and PE digital technology has mostly been connected to topics such as lack of exercise (Jastrow et al., 2022), but the COVID-19 period forced educators to shift the entire education process online and to additionally use all the existing ICT resources and, even more, to open up completely new possibilities that are the result of new technologies, such as virtual or augmented reality (Jastrow et al., 2022).

In the scientific literature, several main obstacles to the successful integration of ICT into the education system have been distinguished; e.g., a lack of ICT resources in schools, a lack of teachers' confidence in their ICT abilities, a lack of competence in using ICT, and a negative attitude towards ICT (Bingimlas, 2009; Cha et al., 2020). In order to ensure the smooth integration of information and communication technologies into the educational process, it is important to act systematically and to consider all technological-, teacher-, and institutional-level factors and barriers (Lawrence & Tar, 2018). This means that it is necessary to invest in ICT equipment at the national level, to update educational content, to prepare computer-based methodological materials, and to invest in teachers' abilities and knowledge in this area (Buabeng-Andoh, 2017; Gil-Flores et al., 2017). It is worth noting separately that when creating effective educational models of ICT development, it is important to consider not only technological, teacher, and institutional factors but also student-level factors and barriers. The presented Lawrence and Tar model does not include student-level factors, so it should be supplemented by including the latter. In a review article, Fu et al. (2013) note that student motivation, ICT acceptance, ease of use, and usefulness are the main factors that influence the use of ICT among students. Many didactic processes that have been described and implemented in experiments with the use of technological devices did not clearly provide for teachers, explaining how to use such devices with the optimal training necessary to carry out the process (Lohmann et al., 2021; Amhag et al., 2019). Therefore, only insignificant modifications in the way of teaching and learning have occurred, since in many cases, both teachers and students are accustomed to traditional methods of teaching (Guillén-Gámez et al., 2018; Ní Chróinín et al., 2017). Unfortunately, this topic has not been studied much in scientific literature and requires additional attention from researchers (Saruji et al., 2017).

The integration of information and communication technologies into physical education lessons, and especially conducting physical education lessons in a virtual space, has been poorly researched in the global scientific community (Goad et al., 2020; Martínez-Rico et al., 2022). Most of the research on this topic is related to the use of ICT in the process of physical education at school. Pedometers or coordination-testing machines (Koryahin et al., 2019), active video games (Quintas et al., 2020), and phone apps for analysing and illustrating sports activities (Rodríguez-González et al., 2022; Cummiskey, 2011) or dance movements (Li et al., 2018) have been used in physical education lessons. The use of ICT in physical education lessons poses challenges; students may feel uncomfortable being filmed, especially those who do not have a positive attitude towards their body image, and issues of ensuring the protection of individuals' data also arise (Steinberg et al., 2019).

A VARIETY OF TEACHING METHODS IN PHYSICAL EDUCATION

Correctly choosing and applying teaching methods during education should be one of the most important things for both the teacher and the student. Therefore, it is important to understand the advantages and disadvantages of these methods, the possibilities, and the benefits of their selection to be able to apply them to achieve an efficient and effective educational process. If the learning is organised in such a way that the student immerses himself and experiences fun and enjoyment, it is much more likely that the quality of learning will improve.

However, the main problem faced by physical education teachers is that there is a difference between what is intended to be taught in physical education classes and what is being taught. To reduce the gap between intention and action in physical education classes, the goal of physical education is emphasised: to promote lifelong physical activity and nurture the physical, psychological, and social development of school-aged persons. To achieve this goal, it becomes important to strengthen internal motivation for physical activity and foster independence, promoting learning based on personal responsibility and communication skills (Mosston & Ashworth, 2008). The Spectrum covers teaching styles ranging from instructional methods characterised by minimal learner decisions to instructional methods characterised by maximal learner decisions (Goldberger et al., 2012). One of the main ideas of the Spectrum is the desire to gradually move from the teacher-student approach to the decision-making process and personal responsibility (Mosston & Ashworth, 2008). In other words, learners can reproduce (mirror or replicate) and produce (discover or create) movements and knowledge. All activities presented in physical education have components that can be taught using either the reproductive teaching styles (A–E) or the productive teaching styles (F–K) (see Table 1). Therefore, the first five teaching methods presented in the scale include the development of memory, and the rest include the development of students' discoveries and creativity. According to the author, the teaching methods presented on the A-E scale aim to provide students with specific knowledge and skills, and students are expected to reproduce knowledge. From the discovery-led learning approach presented in the scale, both teacher and student move to a discovery process in education. To cross the threshold of creativity, it is necessary to change the behaviour of both the teacher and the student (Mosston & Ashworth, 2008).

A comparison of physical education teaching methods from different classifications is presented in Table 1. It can be noted that the sequence of the listed teaching methods corresponds to Mosston's Teaching Methods Spectrum criterion; i.e., the focus of teaching methods in various stages of lessons gradually changes from *teacher-centred teaching activities* to *student-centred teaching activities*. As a practice, despite the diversity of the teaching methods and the showing understanding of their global teaching method and the advantages and disadvantages of applying culture in a physical way, physical education is still more dominated by *teacher-centred* teaching methods (Morgan et al., 2005). In a study by Hein et al. (2012), involving 176 physical education teachers from five European countries, they reported a more frequent use of reproductive

styles than productive ones. The results of this study confirmed the hypotheses that teachers' autonomous motivation is related to student-centred or productive teaching styles, while non-autonomously motivated teachers adopt more teacher-centred or reproductive teaching styles. In addition, intrinsic and introjected motivation were significantly higher among teachers who more frequently employed productive teaching styles than teachers who used them less frequently. Intrinsically motivated teachers using more productive teaching styles can contribute more to the promotion of physical activity among students.

Table 1. *A Variety of Physical Education Teaching Methods*

<i>Mosston's Spectrum of Teaching Methods</i> (Mosston & Ashworth, 2002; Kulinna & Cothran, 2003)			Teaching Methods According to Himberg et al. (2003)	Classification of Teaching Methods According to Rink (2006)	Threshold of Creativity
Teacher-centred activities	A	Command Teaching Style	Direct Teaching	Interactive Teaching	Reproductive teaching methods
	B	Practice Teaching Style	Teacher Feedback	Station Teaching	
	C	Reciprocal Teaching Style	Partner Feedback	Peer Teaching	
	D	Self-Check Teaching Style	Self-Feedback		
	E	Inclusion Teaching Style			
Student-centred activities				Cooperative Learning	Productive teaching methods
	F	Guided Discovery Teaching Style		Cognitive Strategies	
	G	Convergent Discovery Teaching Style	Convergent Discovery		
	H	Divergent Production Teaching Style	Divergent Discovery		
	I	Learner-Designed Individual Programme Style		Self-Instructional Strategies	
	J	Learner Initiated Teaching Style			
	K	Self-Teaching Style			
				Team Teaching	

How do you choose the most suitable methodology for your lessons from such an abundance of different teaching methods? Teachers should be able to use a full range of teaching methods in different lessons or even in different parts of their lessons. Usually, teachers do not choose a teaching method and then plan learning situations but define the goals and objectives of the lesson and then choose which teaching method will best serve those goals and solve the tasks. Many factors determine which teaching method a physical education teacher should choose; e.g., the content of the teaching, the characteristics of the students, the goals of the lesson, or the teacher's preference for one of the teaching methods. The totality of these factors determines which teaching method the teacher will choose to implement according to the learning situations in his specific lesson.

BEST PRACTICE EXAMPLES COLLECTED FROM DIFFERENT COUNTRIES

In the next section, best practice examples from different Nordic and Baltic countries will be presented, along with active games and activities in the context of education and leisure physical activity. These are examples suitable for outdoor and indoor environments, some of which can integrate different learning subjects and incorporate digital technologies. This is a collection of creative ideas for educators to encourage the development of physical literacy in students in all four subsequent areas:

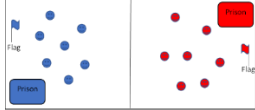
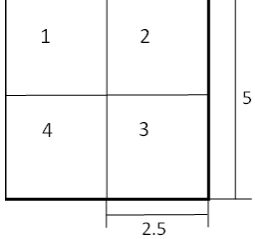
- **knowledge and understanding (cognitive domain);**
- **motivation and confidence (psychological domain);**
- **daily behaviour (physical activity);**
- **physical competence (physical fitness/skills).**

Some Ideas for Good PA Practices

OUTDOORS




ESTONIA

OUTDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4	<i>Capture the Flag</i>	To improve speed and other running skills	At least 10 min or until the game is over	7–10 years old	Markers for playing area Two flags	Divide the playing area into two equal-sized areas Place a flag in each team's area Mark the “prison” area for both teams' territory	Marking the playing area Marking the “prison” areas Placing the flag	The objective is to capture the opponent's flag When tagged by the opponent, the player is sent to “prison” The player can be freed by a member of their own team	Change the way the players can move	
Grades 5–8 & 9–10	<i>Four Squares</i>	To gain object (e.g., ball) control skills	At least 10 min	11–17 years old	Sidewalk chalk Ball	Create a playing area as shown in the visualisation Number the squares from 1 to 4	Marking the 4 squares on the ground	One player in each square, the other players wait outside in a line The objective is to hit the ball with your hand into an opposing player's square after it has bounced only once in his/her square If the ball is missed, the player is out Once out, the player goes back in line and starts at the 1st square The remaining players move up a rank and advance to the next higher number square. To win the game, the player needs to stay in the 4th square as long as he/she can	Rules are the same, but the ball can only be hit using the feet. No hands allowed!	




ICELAND






OUTDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–6	<i>Flag Robbery</i>	The aim of this healthy physical activity is to work as a group in different roles	30–60 min	7–12 years old	2 flags	Play in two groups	Decide the area of the activity and prepare it accordingly	<p>The teams hide their flag in their own area</p> <p>The teams try to find, steal and carry the flags of other teams into their own area</p> <p>Those who get caught shall be put in “jail”</p> <p>Someone can release them</p>	<p>Can be played in a sports hall</p> <p>Same rules but there can also be a “city bombing” at the same time</p> <p>City bombing: teams build their own stronghold; players begin to bomb (throw soft balls) the opposite side</p>	  

LITHUANIA

OUTDOORS/INDOORS

Age Group	Place of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4	Small artificial grass pitch (fenced in football field) Modified fitness track for young kids	High intensity games to improve: Ball skills Coordination and balance Physical fitness	Recess 10–60 min	6–9 years old	Football and balls in all sizes Fitness track	Play in groups or individually on your own terms	No specific preparation required Part of the schoolyard always available during recess and after school	Kids meet their need for exercise by playing in a safe environment	Area for kids to use their imagination and improve their skills and fitness	
Grades 5–8	Basketball court	High intensity games to improve ball skills and coordination	Recess or after school 10–60 min	10–13 years old	Basketball and basketball hoops	Play in groups or individually on your own terms	No specific preparation required Part of the schoolyard always available during recess and after school	Games for dribbling, shooting, and passing	Train basketball skills in dribbling, shooting etc. alone or with a partner	
Grades 9–10	Fitness track	Healthy physical activity to practice building strength and endurance	Recess or after school 10–60 min	14–15 years old	Fitness track	Play in groups or individually on your own terms	No specific preparation required Part of the schoolyard always available during recess and after school	Increase strength, endurance, coordination, and balance	Train courage and boldness	


Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
11–13 years old	<i>Sports Cards</i>	To improve the vocabulary of different types of sports	5 min	All age groups	Cards	Divide all class into 2 groups	Space for moving is required	<p>Some students get pictures, and some students get corresponding words</p> <p>The students have to find the pair of their card/word</p> <p>If the word and the card do not fit together, the student has to change their card</p> <p>When a pair is made, the students have to show it to the teacher</p>	<p>(1) students have to talk</p> <p>(2) students cannot talk</p>	 
Primary classes Grades 5–8	<i>Clock</i>	<p>To familiarise students with the clock</p> <p>To improve understanding of the clock</p>	At least 10–15 min or until the game is over	<p>8–11 years old</p> <p>11–14 years old</p>	<p>Hula hoop, a tape and printed numbers or crayons to draw the clock, a rope for the hour and minute hands of the clock</p>	<p>Divide the kids into 3 groups</p> <p>Kids should work in groups as a team</p> <p>1st student is minute hand, 2nd student is hour hand, and the 3rd student stands in the middle on the rope</p>	Preparing the game area by making the mechanical clock with materials	Students learn to read the mechanical clock by recognising where the minute and hour hands should be placed	Reading different times and exchanging the roles within the group	  

Additional variations and tips:

- Use the clock game to teach and learn cardinal directions.
- The games could take place outdoors and indoors.
- The games could be integrated into different subjects; e.g., math, geography, language, etc. The competitive element of the activity is not appreciated, especially in the beginning.



NORWAY

OUTDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–7	<i>Orienteering</i>	Orienteering involves finding your way along a course, using a map and/or a compass	10–15 min for one round	5–13 years old	Cones or markers, maps and control cards	Students can play individually, in groups of two, or in bigger groups	<p>Prepare score sheets and place markers around the schoolyard</p> <p>Set a starting point where the students can run from and come back to fill out their score sheet</p>	<p>The students run individually to each marker which has a letter that they need to remember and run back to the starting point to write it down on their score sheet</p> <p>Once they have collected all the letters, they need to find a word using most of the letters</p>	<p>Variation can include more persons per group, relays and answering to questions instead of finding letters</p> <p>For more ideas, please follow the link: https://media.yourschoolgames.com/documents/development_schoolgames_secondary_pitchorienteering.pdf </p>	<p>https://www.youtube.com/watch?v=Fo-MG5-frIM</p>  <p><small>shutterstock.com · 1988060525</small></p>

NORWAY

OUTDOORS


Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation																				
Grades 1–7	Map orienteering combined with reading and spelling (Kind of <i>School Nature Trail</i>)	Get to know the map Practice reading and writing	15–30 min	6–8 years old	Maps, paper (answer slips), pencils, assignment items/stations	Alone or in groups of 2–3 students	Create maps, answer slips and assignment items/stations	The teacher places the posts and the map shows every post Students learn about the different map colours and signs	It depends on the area and on the group There is also variation with running or walking to the posts	 <p>ANSWER SLIPS</p> <p>Name: _____</p> <table><tr><td>POST 1</td><td>POST 2</td><td>POST 3</td><td>POST 4</td><td>POST 5</td><td>POST 6</td><td>POST 7</td><td>POST 8</td><td>POST 9</td><td>POST 10</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Solution words: _____</p>	POST 1	POST 2	POST 3	POST 4	POST 5	POST 6	POST 7	POST 8	POST 9	POST 10										
POST 1	POST 2	POST 3	POST 4	POST 5	POST 6	POST 7	POST 8	POST 9	POST 10																					
Grades 1–7	<i>Mirroring</i> <i>Copy Cat</i> <i>Snakes Talking Together</i>	Communicating, movement, and creativity	10–15 min	All school	Use of the landscape/ outdoors	Pairs and groups	With or without music																							

Some Ideas for Good PA Practices

INDOORS





ESTONIA

INDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4	<i>Balloon Volleyball</i>	To gain object (e.g., ball) control skills	At least 10 min	7–10 years old	1 balloon, paper streamers (or string), a volleyball net or a tape on the floor to mark the “net”	Open area is needed Create the “net” with paper streamers (or string) by crossing the playing area	Blow up some balloons	Two teams participate in the activity The aim is to pass the balloon back and forth across the “net” like in volleyball	Change how many times players of each team may hit the ball before crossing the “net”	
Grades 5–8 & 9–10	<i>Do It Yourself Table Tennis Table and Play!</i>	To improve construction skills and table tennis skills	5 hours for constructing the table tennis table	11–17 years old	Rackets and a ping-pong ball	Please see instructions provided in links below: b210.ee/pingpong.pdf https://www.arhitektuurikool.ee/ping-pong.pdf	Please see instructions provided in links below: b210.ee/pingpong.pdf https://www.arhitektuurikool.ee/ping-pong.pdf	Please see instructions provided in links below: b210.ee/pingpong.pdf https://www.arhitektuurikool.ee/ping-pong.pdf	Standard game (1 v 1 or 2 v 2) Running around the table, so many students can play at once	





FINLAND

INDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–3	<i>Find the Synonyms</i>	To learn new synonyms while working in pairs to promote physical activity	15–30 min	7–9 years old	Paper, pencil, pearls, jar, random decision maker, physical activity equipment, dice	Work and play in pairs	Gather the materials	<p>Pupils are divided into pairs with synonym paper sheets</p> <p>They find and write down the correlating synonyms</p> <p>Put the pearl into the jar (collecting the whole group's activity points)</p> <p>Use random spinner to choose the movement</p> <p>Throw the dice to get the number of activity</p>	Variation of the subjects, activities etc.	   

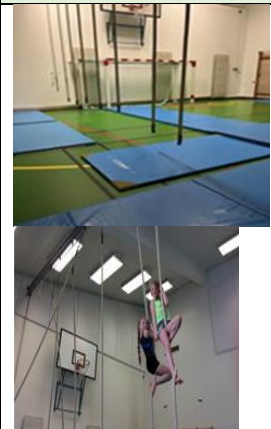

FINLAND

INDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–6	<i>Pizza Delivery</i>	To revise different subjects while working as an individual in a group to promote physical activity	15 min	7–12 years old	Paper sheets	Work and play inside the classroom	Take the paper sheets Write down the subjects	Carry your paper sheet as a pizza box Try to drop someone's "pizza" When the pizza is dropped, write down the name of the subject Continue...	Variation of the subjects Paper sheets can also be picked Pupils throw their papers for 30 s Pupils take one sheet from the floor and write down the name of the subject	   



ICELAND

INDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4	<i>Ropes: In Circuit Training</i>	To train strength and coordination and increase physical fitness	Short workouts Repeated circuit training (30 min)	6–9 years old	Ropes hanging from the ceiling Mattress	Workstations: three stations with different emphasis (4-5 students on each station)	Save Environment Assessment Forms	Set up 3 stations, one of them with rope Teacher located on one station (teaching station)	Hold test Rope swinging from mat to mat	
Grades 5–8 & 9–10	<i>Ropes: In Circuit Training</i>	To train strength and coordination and increase physical fitness	Short workouts repeated Circuit training (30 min)	10–13 years old	Ropes hanging from the ceiling Mattress High jump mattress Obstacle boxes Hula hoop	Workstations: three stations with different emphasis (4-5 students on each station)	Save Environment Assessment Forms Grading Protocols	Set up 3-5 stations, one of them with rope Teacher located on one station (teaching station)	Hold test Rope swinging from mat to mat Climb to your grade level	


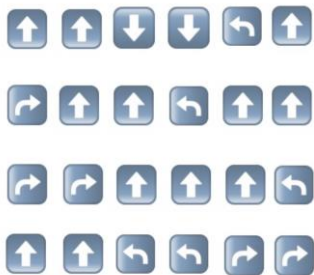
LITHUANIA

INDOORS/OUTDOORS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Any	<i>Sports</i>	To strengthen the knowledge or study words, concepts To learn to concentrate and keep attention	20–30 min	Any	Chairs	Chairs should be organised in a circle	Students sit on chairs, but one chair remains empty One member is standing in the middle of the circle All of the players call their favourite animal	<ol style="list-style-type: none"> 1. One chair remains empty and one member is standing in the middle of the circle 2. Person from the middle tries to take the empty seat 3. The member who is sitting on the left of the empty chair, taps right hand on the empty chair and calls one animal from the circle 4. The member (animal) who is called out has to take the empty chair, but the member standing in the middle also tries to take the chair 5. The person who fails to take the empty seat goes to the middle and waits for next calling 6. The member who has the empty chair on the right now calls an animal from the circle and the activity goes on 7. Activity goes on until all the animals from the circle are called out 8. End of the activity 	<p>Activity has many variations and instead of animal names, different words and concepts can be used</p> <p>Activity can be used when teaching different subjects</p>	 

NORWAY

INDOORS


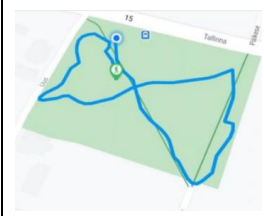
Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–7	<i>Coding With Your Body</i>	To learn the most basic code characters	10–30 min (depends on how long it takes for the students to do the exercise)	5–8 years old	Paper with code characters (arrows)	Make sure there is plenty of space where the students can perform the code moves	<p>Create and print code sheets</p> <p>You can do this everywhere you have space</p> <p>Note: to do this just by showing code characters on a screen is difficult for grades 1–3</p>	<p>The teacher explains the code signs and the students practice with movement, first all together, then two and two/ alone</p>	<p>Low intensity of physical activity</p> <p>The focus here is to learn code characters through body movement</p>	 
Grades 1–7	<i>Shake Breaks</i>	To introduce breaks in a traditional lesson	3–7 min	5–13 years old	Classroom	Everyone gets into groups based on decided characteristics (e.g., born in autumn, boys, girls, people who like bananas)	No preparation is required	<p>The teacher or the first student chooses to walk over and crawl under the desks, around desks and make different movements</p> <p>The others have to copy</p>	<p>This is used often when students are losing their concentration</p>	

Some Ideas for Good PA Practices

BY USING TECHNOLOGIES




ESTONIA

BY USING TECHNOLOGIES

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4 Grades 5–8 Grades 9–10	GPS Art	Promotion of any type and intensity of physical activity	Up to 20 min (regular recess time)	All age groups	A smartphone with a GPS tracking application (e.g., Endomoto, Strava, Figure Running, Trace etc.)	Make sure that the students or a group of students have a smartphone with a GPS tracking app	Plan a shape or figure Plan the route	Start the smartphone application Walk or run through the planned route Make a screenshot, save it Continue with the next shape or figure	Younger students try simple shapes Older students try more complicated shapes	 




LITHUANIA

BY USING TECHNOLOGIES

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4	<i>Who Will Win?</i> <i>The Race for the Gold!</i>	Brain break in classroom Introduce Winter Olympics history and physical activity	10 min	6–9 years old	Computer and screen	The Gold Medal is an interactive game This activity is inspired by the Winter Olympics 2022!	https://youtu.be/H874cuJJA4	Pick a team, do the activity that follows	Winter Olympics Brain Break for Kids!	
Grades 5–8	<i>Winter Olympics 2022</i>	Brain break in classroom Introduce Winter Olympics history and physical activity	10 min	10–13 years old	Computer and screen	Watch a video from the Winter Olympics	https://youtu.be/tsZyRPsFiL4	Do you know what the event is? Do the exercise; underline the name of the event	Know the competition at the Winter Olympics	
Grades 9–10	<i>This or That</i> (Winter Olympics Edition)	Brain break in classroom Introduce Winter Olympics history and physical activity	10 min	14–15 years old	Computer and screen	Pick the sport you want to win a medal in and perform the activity that goes with the answer	https://www.youtube.com/watch?v=V2bC5wlaql0	Perform the activity for the answer you choose	Know the competition at the Winter Olympics	

LITHUANIA

BY USING TECHNOLOGIES

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–4 Grades 5–8 Grades 9–10	<i>Zip Zap Zup</i>	To train concentration	5–10 min	Any age	Cards with different physical activities Cards can be marked by numbers or certain pictures	Play as one group	Use an application to get the cards ready	Repeat <i>zip zap zup</i> until someone makes a mistake Choose a card and do the physical activity drawn on the card	Rules are the same but different words (e.g., irregular verbs, adjectives) or multiplication can be used in the game	  

NORWAY

BY USING TECHNOLOGIES



Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–7	<i>Just Dance</i>	To mimic the dancer on the screen, promote different intensities of physical activity and coordination skills	5 min	5–13 years old	A screen and internet connection	Make sure there is plenty of space where the students can perform dance moves	Set up a screen in the classroom, gym or other area Play the provided video on Youtube	The teacher plays the dance video, and the students follow the dancer's moves	Low, moderate or high intensity of physical activity depending on the song	https://www.youtube.com/watch?v=HptRj9dGwEM
Grades 1–7	<i>Would You Rather?</i>	Brain break activity for students at school or remote learning	5–10 min	5–13 years old	A screen and internet connection	Have the students stand next to or in front of their desks (best if they use an open space in the classroom)	Set up a screen in the classroom, gym or other area Play the video on Youtube	The students choose one of the 2 icons presented each time, and according to their choice, they perform the given activity for 12 s	Can be combined with different topics of discussion, e.g., Halloween, animals, Olympic athletes	https://www.youtube.com/watch?v=O6MKDORsbF8

Some Ideas for Good PA Practices

**WHEN INTEGRATING PA IN DIFFERENT TEACHING
SUBJECTS**

ESTONIA

INTEGRATING MOVEMENT INTO DIFFERENT TEACHING SUBJECTS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1-4	Alphabet Letter Relay Race	To run while learning a foreign language	5-10 min	7-10 years old	Alphabet letter cards/pillows	<p>Divide students into teams</p> <p>Place the teams behind the starting line, and place the alphabet cards face down on the floor at the other end of the classroom</p> <p>The teacher should think of the words in a foreign language, and the teams should be told that they have to put together the words in question from the alphabet cards</p>	The words the teacher uses should be previously taught to students	<p>The team members run and turn over one card at a time</p> <p>If the card has a suitable letter, the student takes the card to his/her team</p> <p>The team that finds all the necessary letters for the given word first, wins the race</p>	Change the way students move during the race (e.g., jumping)	
Grades 4-6	Math Ball	To throw and catch while learning math	5-10 min	10-13 years old	A special inflatable vinyl ball with math problems written on it	Students stand in a circle	Inflate the ball	Students throw the ball to each other and solve the problem found under their left thumb	Have students move around, tossing the ball to each other and answering the questions	



ESTONIA

INTEGRATING MOVEMENT INTO DIFFERENT TEACHING SUBJECTS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 7–9	<i>Translate the Activity</i>	to train various movement skills while learning a foreign language	10–15 min	14–16 years old	Paper strips with different physical/movement activities written on them in a foreign language (e.g., <i>write the numbers from one to ten in the air with your right foot</i>); mobile devices to use translator	<p>Divide students into small teams and hand out a paper strip with the activity</p> <p>Allow the students to use their mobile devices for the translation</p>	Prepare some open space for students to try out the activity written on the paper strip	<p>Students in teams translate their activity from the paper strip using mobile devices</p> <p>The activity is practiced in their own teams</p> <p>Later, the activity is demonstrated to the other teams, who must guess the activity in a foreign language</p>		

NORWAY

INTEGRATING MOVEMENT INTO DIFFERENT TEACHING SUBJECTS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–3	<i>Out in the Nature</i>	<p>The activity takes place in math, Norwegian, and science</p> <p>The students should be able to:</p> <p>Carry out activities in the local area to learn about nature and talk about why this is important</p> <p>Use observations to describe the characteristics of the seasons</p> <p>Recognise and describe some plant and animal species in nearby areas, and sort them into groups</p> <p>Ask questions and talk about experiences in the nature</p>	The activity can be limited in time	6–9 years old	<p>Laminated task sheets (own tasks with pictures for the 1st stage) and whiteboard pens</p> <p>A box for ants and beetles that the teacher provides for a review</p> <p>Bag/box for material that can be taken to the classroom for further review/presentation/posters/writing assignments</p>	It may be a good idea to explain the activity inside the first time and then take it outside	<p>The teacher should prepare laminated task sheets and whiteboard pens for all students, especially if they plan to carry out the activity on a trip</p>	<p>The students are divided into groups of 4–6 students and start from a given meeting point</p> <p>The students run in pairs or in groups to collect what the task asks for and tick off the things they have found</p> <p>Along the way, they get an “approved” signature from an adult</p> <p>When the session is over, the students gather and the class can further reflect on discoveries they have made</p> <p>What are the names of the different trees they found leaves of?</p> <p>What geometric shapes have they found?</p> <p>Have they found something that does not belong in nature?</p>	<p>This activity is suitable both as an introduction to the topic and as revision</p> <p>Inside, students can work with worksheets or write a log</p> <p>If material is brought back, it can be sorted and presented in different ways</p>	<p>Stein</p>  <p>Gress</p>  <p>https://www.askbasen.no/fysiskaktivlaering#aktivitetsbasen/aktivitet/5c51b1e943d280288fb6ed3e/</p>

NORWAY

INTEGRATING MOVEMENT INTO DIFFERENT TEACHING SUBJECTS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 3–4	<i>“To be” Machine</i>	<p>The activity takes place in English</p> <p>The aim is to conjugate the verb to be and be on the move</p>	10–15 min	8–10 years old	Printed, double-sided word cards	<p>Repeat the conjugation of the verb beforehand in the classroom</p> <p>Then the students can take the activity outdoors</p>	The teacher should prepare word cards for each student	<p>The students spread out within a limited area</p> <p>Each student is given a card with a pronoun on one side and the correct conjugation of the verb on the other side</p> <p>Students pair up, squat down, and show one side of the card (the pronouns) to each other</p> <p>Each of the students says the correct conjugation of the verb, and when they have finished, they switch cards, stand up, and find a new partner</p>	Instead of just conjugating the verb, students can make a sentence using a pronoun and a verb	https://www.asmbasen.no/fysiskaktivlaering/#aktivitetsbase/aktivitet/621e2bc970441a00208fc23e/

NORWAY

BEST PRACTICES DURING RECESS

Age Group	Name of Activity	Aim of Activity	Duration	Age	Material	Organisation	Preparation	Procedure	Variation	Visualisation
Grades 1–7	<i>Broken Phone with Movement</i>	To make the students move and enhance their memory skills	Recess time	7–13 years old	None	It is easier to perform outdoors, e.g., in the schoolyard	Divide the class into rows of 5–7 students	<p>The students stand in a row facing the back of each other</p> <p>The last player taps the shoulder of the player in front of them to turn around</p> <p>Then he/she shows three simple movements, e.g., “I stir the soup”, “Take the pot off the heat”, and “Serve the soup in a bowl”</p> <p>The second to last player tries to remember the movements and show them to the next player in the queue until the first player guesses what the movements are</p> <p>The first goes last and the game starts again until everyone has had a chance to show their movements</p>	The students can use more movements in a row, e.g., more than three	https://www.liikumakutsuvkool.ee/liigutustega-rikkis-telefon/
Grades 1–7	<i>Land, Sea, Air</i>	To provide organised physical activity for students during recess	Recess time	7–13 years old	Chalk or tape to draw a line in the schoolyard	It is easier to perform outdoors, e.g., in the schoolyard	A line is marked on the ground by using chalk or tape, and it is agreed which side of the line is the land and which side is the sea	<p>The students line up behind each other</p> <p>One foot is placed on the land, the other in the sea</p> <p>When the game leader shouts “Sea!”, the students jump on the sea side, when he shouts “Land!”, they jump to the land, and when he shouts “Air!”, they jump over the line</p> <p>Whoever confuses the sides or touches the line is out of the game and whoever wins can be the next game leader who calls the three options</p>	The game leaders can choose how fast they want to shout out the three options, so that the jumps can be more intense and frequent	https://www.liikumakutsuvkool.ee/maameri-ohk/

REFERENCES

- Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, 35, 203–220. <https://doi.org/10.1080/21532974.2019.1646169>
- Andersen, H. B. Christiansen, L. B., Pawlowski, C. S., & Schipperijn, J. (2019). What we build makes a difference – Mapping activating schoolyard features after renewal using GIS, GPS and accelerometers. *Landscape and Urban Planning*, 191, 103617. <https://doi.org/10.1016/j.landurbplan.2019.103617>
- Anthamatten, P., Brink, L., Kingston, B., Kutchman, E., Lampe, S., & Nigg, C. (2014). An assessment of schoolyard features and behaviour patterns in children's utilization and physical activity. *Journal of Physical Activity & Health*, 11(3), 564–573. <https://doi.org/10.1123/jpah.2012-0064>
- Baquet, G., Aucouturier, J., Gamelin, F. X., & Berthoin, S. (2018). Longitudinal follow-up of physical activity during school recess: Impact of playground markings. *Frontiers in Public Health*, 6, 283. <https://doi.org/10.3389/fpubh.2018.00283>
- Barnett, L. M., Stodden, D., Cohen, K. E., Smith, J. J., Lubans, D. R., Lenoir, M., Iivonen, S., Miller, A. D., Laukkanen, A., Dudley, D., Lander, N. J., Brown, H., & Morgan, P. J. (2016). Fundamental movement skills: An important focus. *Journal of Teaching in Physical Education*, 35(3), 219–225. <https://doi.org/10.1123/jtpe.2014-0209>
- Barnett, L. M., van Beurden, E., Morgan, P. J., Brooks, L. O., & Beard, J. R. (2009). Childhood motor skill proficiency as a predictor of adolescent physical activity. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 44(3), 252–259. <https://doi.org/10.1016/j.jadohealth.2008.07.004>
- Bates, C. R., Bohnert, A. M., & Gerstein, D. E. (2018). Green schoolyards in low-income urban neighbourhoods: Natural spaces for positive youth development outcomes. *Frontiers in Psychology*, 9, 805. <https://doi.org/10.3389/fpsyg.2018.00805>
- Bell, A. C., & Dymont, J. E. (2006). *Grounds for action: Promoting physical activity through school ground greening in Canada*. Evergreen. <https://www.evergreen.ca/downloads/pdfs/Grounds-For-Action.pdf>
- Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science and Technology Education*, 5(3), 235–245. <https://doi.org/10.12973/ejmste/75275>
- Bilyalova, A. A., Salimova, D. A., Zelenina, & T. I. (2019). Digital transformation in education. In *Proceedings of the International Conference on Integrated Science, Batumi, Georgia, 10–12 May 2019* (pp. 265–276). Springer.
- Brittin, J., Frerichs, L., Sirard, J. R., Wells, N. M., Myers, B. M., Garcia, J., Sorensen, D., Trowbridge, M. J., & Huang, T. (2017). Impacts of active school design on school-time sedentary behavior and physical activity: A pilot natural experiment. *PloS One*, 12(12), e0189236. <https://doi.org/10.1371/journal.pone.0189236>
- Broberg, A., Kyttä, M., & Fagerholm, N. (2013). Child-friendly urban structures: Bullerby revisited. *Journal of Environmental Psychology*, 35, 110–120. <https://doi.org/10.1016/j.jenvp.2013.06.001>
- Broekhuizen, K., Scholten, A., & de Vries, S. I. (2014). The value of (pre)school playgrounds for children's physical activity level: A systematic review. *The International Journal of Behavioral Nutrition and Physical Activity*, 11, 59. <https://doi.org/10.1186/1479-5868-11-59>

- Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development Using Information and Communication Technology*, 8, 136–155.
- Caldwell, H. A. T., Di Cristofaro, N. A., Cairney, J., Bray, S. R., MacDonald, M. J., & Timmons, B. W. (2020). Physical literacy, physical activity, and health indicators in school-age children. *International Journal of Environmental Research and Public Health*, 17(15), 5367. <https://doi.org/10.3390/ijerph17155367>
- Cameron, C. E., Cottone, E. A., Murrah, W. M., & Grissmer, D. W. (2016). How are motor skills linked to children's school performance and academic achievement? *Child Development Perspectives*, 10(2), 93–98. <https://doi.org/10.1111/cdep.12168>
- Carl, J., Schmittwilken, L., & Pöppel, K. (2023). Development and evaluation of a school-based physical literacy intervention for children in Germany: Protocol of the PLACE study. *Frontiers in Sports and Active Living*, 5, 1155363. <https://doi.org/10.3389/fspor.2023.1155363>
- Cha, H., Park, T., & Seo, J. (2020). What should be considered when developing ICT-integrated classroom models for a developing country? *Sustainability*, 12, 2967. <https://doi.org/10.3390/su12072967>
- Chawla, L., Keena, K., Pevec, I., & Stanley, E. (2014). Green schoolyards as havens from stress and resources for resilience in childhood and adolescence. *Health & Place*, 2014, 28, 1–13. <https://doi.org/10.1016/j.healthplace.2014.03.001>
- Cummiskey, M. (2011). There's an app for that smartphone use in health and physical education. *Journal of Physical Education, Recreation & Dance*, 82(8), 24–30. <https://doi.org/10.1080/07303084.2011.10598672>
- Dyment, J. E., Bell, A. C., & Lucas, A. J. (2009). The relationship between school ground design and intensity of physical activity. *Children's Geographies*, 7(3), 261–276. <https://doi.org/10.1080/14733280903024423>
- Dudley, D. A. A (2015). A conceptual model of observed physical literacy. *The Physical Educator*, 72(5), 236–260. <https://doi.org/10.18666/TPE-2015-V72-I5-6020>
- Ghasemian, M., & Dulabi, S. (2020). The association between fine and gross motor skills with cognitive control and academic performance in adolescent students. *International Journal of School Health*, 7(3), 3–30. <https://doi.org/10.30476/intjsh.2020.85766.1059>
- Gibson, J. J. (1986). *The ecological approach to visual perception*. Lawrence Erlbaum Associates.
- Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J. J. (2017). Factors that explain the use of ICT in secondary-education class-rooms: The role of teacher characteristics and school infrastructure. *Computers in Human Behavior*, 68, 441–449. <https://doi.org/10.1016/j.chb.2016.11.057>
- Goad, T., Jones, E., Bulger, S., Daum, D., Hollett, N., & Elliott, E. (2020). Predicting student success in online physical education. *American Journal of Distance Education*, 35(1), 17–32. <https://doi.org/10.1080/08923647.2020.1829254>
- Guillén-Gámez, F. D., Mayorga-Fernández, M. J., & Álvarez-García, F. J. (2018). A study on the actual use of digital competence in the practicum of education degree. *Technology, Knowledge and Learning*, 25, 667–684. <https://doi.org/10.1007/s10758-018-9390-z>
- Guinhouya, B. C., Samouda, H., & de Beaufort, C. (2013). Level of physical activity among children and adolescents in Europe: A review of physical activity assessed objectively by accelerometry. *Public Health*, 127, 301–11. <https://doi.org/10.1016/j.puhe.2013.01.020>
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., Ekelund, U., & Lancet Physical Activity Series Working Group. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *Lancet*, 380, 247–57. [https://doi.org/10.1016/S0140-6736\(12\)60646-1](https://doi.org/10.1016/S0140-6736(12)60646-1)

- Hamer, M., Aggio, D., Knock, G., Kipps, C., Shankar, A., & Smith, L. (2017). Effect of major school playground reconstruction on physical activity and sedentary behaviour: Camden active spaces. *BMC Public Health*, 17, 552. <https://doi.org/10.1186/s12889-017-4483-5>
- Haug, E., Torsheim, T., Sallis, J. F., & Samdal, O. (2010). The characteristics of the outdoor school environment associated with physical activity. *Health education research*, 25(2), 248–256. <https://doi.org/10.1093/her/cyn050>
- Haug, E., Torsheim, T., & Samdal, O. (2008). Physical environmental characteristics and individual interests as correlates of physical activity in Norwegian secondary schools: The health behaviour in school-aged children study. *The International Journal of Behavioral Nutrition and Physical Activity*, 5, 47. <https://doi.org/10.1186/1479-5868-5-47>
- Himberg, C., Hutchinson, G. E., & Rousell, J. M. (2003). *Teaching secondary physical education: Preparing adolescents to be active for life*. Human Kinetics.
- Fjørtoft, I., Kristoffersen, B., & Sageie, J. (2009). Children in schoolyards: Tracking movement patterns and physical activity in schoolyards using global positioning system and heart rate monitoring. *Landscape and Urban Planning*, 93(3–4), 210–217. <https://doi.org/10.1016/j.landurbplan.2009.07.008>
- Fu, J. S. (2013). ICT in education: A critical literature review and its implications. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 9(1), 112–125.
- Jaakkola, T., Hillman, C., Kalaja, S., & Liukkonen, J. (2015). The associations among fundamental movement skills, self-reported physical activity, and academic performance during junior high school in Finland. *Journal of Sports Sciences*, 33(16), 1719–1729. <https://doi.org/10.1080/02640414.2015.1004640>
- Jastrow, F., Greve, S., Thumel, M., Diekhoff, H., & Süßenbach, J. (2022). Digital technology in physical education: A systematic review of research from 2009 to 2020. *German Journal of Exercise and Sport Research*, 52, 504–528. <https://doi.org/10.1007/s12662-022-00848-5>
- Kergel, D., Garsdahl, J., Paulsen, M., & Heidkamp-Kergel, B. (Eds.). (2022). *Bildung in a Digital World: The social construction of future in education*. Routledge.
- Kim, S. Y., & Kim, M. R. (2013). Comparison of perception toward the adoption and intention to use smart education between elementary and secondary school teachers. *The Turkish Online Journal of Educational Technology*, 12, 63–76. <http://www.sciepub.com/reference/138662>
- Kim, B. H., & Oh, S. Y. (2014). A study on the SMART education system based on cloud and N-screen. *Journal of the Korea Academia-Industrial cooperation Society*, 15, 137–143. <https://doi.org/10.5762/KAIS.2014.15.1.137>
- Kyttä, M. (2004). *Children in outdoor contexts: Affordances and independent mobility in the assessment of environmental child friendliness. Dissertation for the degree of Doctor of Philosophy*. Helsinki University of Technology. <http://lib.tkk.fi/Diss/2003/isbn9512268736/isbn9512268736.pdf>
- Klichowski, M., Bonanno, P., Jaskulska, S., Costa, C. S., Lange, M. D., & Klauser, F. R. (2015). Cyber parks as a new context for smart education: Theoretical background, assumptions, and pre-service teachers' rating. *American Journal of Educational Research*, 3, 1–10. <https://doi.org/10.12691/education-3-12A-1>
- Koryahin, V. M., Mukan, N. V., Blavt, O. Z., & Virt, V. V. (2019). Students' coordination skills testing in physical education: ICT application. *Information Technologies and Learning Tools*, 70, 216–226. <https://doi.org/10.33407/itlt.v70i2.2437>
- Kulinna, P. H., & Cothran, D. J. (2003). Physical education teachers' self-reported use and perceptions of various teaching styles. *Learning and Instruction*, 13, 597–609. [https://doi.org/10.1016/S0959-4752\(02\)00044-0](https://doi.org/10.1016/S0959-4752(02)00044-0)

- Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, 55(1), 79–105. <https://doi.org/10.1080/09523987.2018.1439712>
- Li, Z., Zhou, M., & Teo, T. (2018). Mobile technology in dance education: A case study of three Canadian high school dance programs. *Research in Dance Education*, 19, 183–196. <https://doi.org/10.1080/14647893.2017.1370449>
- Lohmann, J., Breithecker, J., Ohl, U., Gieß-Stüber, P., & Brandl-Bredenbeck, H. (2021). Teachers' professional action competence in education for sustainable development: A systematic review from the perspective of physical education. *Sustainability*, 13, 13343. <https://doi.org/10.3390/su132313343>
- Macdonald, K., Milne, N., Orr, R., & Pope, R. (2018). Relationships between motor proficiency and academic performance in mathematics and reading in school-aged children and adolescents: A systematic review. *International Journal of Environmental Research and Public Health*, 15, 1603. <https://doi.org/10.3390/ijerph15081603>
- Martínez-Rico, G., Alberola-Albors, M., Pérez-Campos, C., & González-García, R. J. (2022). Physical education teachers' perceived digital competences: Are they prepared for the challenges of the new digital age? *Sustainability*, 14, 321. <https://doi.org/10.3390/su14010321>
- Morgan, K., Kingston, K., & Sproule, J. (2005). Effects of different teaching styles on the teacher behaviours that influence motivational climate and pupils' motivation in physical education. *European Physical Education Review*, 11(3), 257–285.
- Morton, K. L., Atkin, A. J., Corder, K., Suhrcke, M., & van Sluijs, E. M. (2016). The school environment and adolescent physical activity and sedentary behaviour: A mixed–studies systematic review. *Obesity reviews: An official journal of the International Association for the Study of Obesity*, 17(2), 142–158. <https://doi.org/10.1111/obr.12352>
- Mosston, M., & Ashworth, S. (2002). *Teaching physical education* (5th ed.). Benjamin Cummings.
- Nancy, M., & Jannine, T. (2015). Quality physical education (QPE): Guidelines for policy-makers. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000231101/PDF/231101eng.pdf.multi>
- Ní Chróinín, D., Fletcher, T., & O'Sullivan, M. (2017). Pedagogical principles of learning to teach meaningful physical education. *Physical Education and Sport Pedagogy*, 23, 117–133. <https://doi.org/10.1080/17408989.2017.1342789>
- OECD Future of Education 2030. (2024, May 9). The future of education and skills: Education 2030. [https://www.oecd.org/education/2030/E2030%20Position%20Paper%20\(05.04.2018\).pdf](https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf)
- Pagels, P., Raustorp, A., De Leon, A. P., Mårtensson, F., Kylin, M., & Boldemann, C. (2014). A repeated measurement study investigating the impact of school outdoor environment upon physical activity across ages and seasons in Swedish second, fifth and eighth graders. *BMC Public Health*, 14(1), 803. <https://doi.org/10.1186/1471-2458-14-803>
- Quennerstedt, M., McCuaig, L., & Mårdh, A. (2021). The fantasmatic logics of physical literacy. *Sport, Education and Society*, 26(8), 846–861. <https://doi.org/10.1080/13573322.2020.1791065>
- Quintas, A., Bustamante, J. C., Pradas, F., & Castellar, C. (2020). Psychological effects of gamified didactics with exergames in physical education at primary schools: Results from a natural experiment. *Computers & Education*, 152, 103874. <https://doi.org/10.1016/j.compedu.2020.103874>
- Rink, J. E. (2006). *Teaching physical education for learning*. McGraw-Hill Companies, Inc.
- Robinson, L. E., Stodden, D. F., Barnett, L. M., Lopes, V. P., Logan, S. W., Rodrigues, L. P., & D'Hondt, E. (2015). Motor competence and its effect on positive developmental trajectories of health. *Sports Medicine*, 45, 1273–1284. <https://doi.org/10.1007/s40279-015-0351-6>

- Robinson, D. B., Randall, L., & Barrett, J. (2018). Physical literacy (mis)understandings: What do leading physical education teachers know about physical literacy? *Journal of Teaching in Physical Education*, 37, 288–298.
- Rodríguez-González, P., Hassan, M. A., & Gao, Z. (2022). Effects of family-based interventions using mobile apps on youth's physical activity: A systematic review. *Journal of Clinical Medicine*, 11, 4798. <https://doi.org/10.3390/jcm11164798>
- Rutkauskaitė, R., Gisladdottir, T., Pihu, M., Kjonniksen, L., Lounassalo, I., Huovinen, T., Gruodyte-Raciene, R., Visagurskiene, K., Olafson, O., Kull, M., Rudzinska, I., & Fjørtoft, I. (2021a). Schoolyard affordances for physical activity: A pilot study in 6 Nordic–Baltic countries. *Sustainability*, 13, 11640. <https://doi.org/10.3390/su132111640>
- Rutkauskaitė, R., Gruodytė-Račienė, R., Čikotienė, I., Visagurskienė, K. (Eds.). (2021b). *The recommendations for schoolyard design to increase movement affordances for children*. Lithuanian Sports University. <http://dspace.lsu.lt/handle/123456789/87>
- Rutkauskaitė, R., Koreivaite, M., Karanauskiene, D., & Mieziene, B. (2022). Students' skills and experiences using information and communication technologies in remote physical education lessons. *Sustainability*, 14(23), 15949. <https://doi.org/10.3390/su142315949>
- Saruji, M. A. M., Hassan, N. H., & Drus, S. M. (2017). Impact of ICT and electronic gadgets among young children in education: A conceptual model. In *Proceedings of the 6th International Conference on Computing & Informatics*, Kuala Lumpur, Malaysia, 25–27 April 2017 (pp. 480–486). <http://www.uum.edu.my>
- Steinberg, C., Zühlke, M., Bindel, T., & Jenett, F. (2019). Aesthetic education revised: A contribution to mobile learning in physical education. *German Journal of Exercise and Sport Research*, 50, 92–101. <https://doi.org/10.1007/s12662-019-00627-9>
- Suárez-Rodríguez, J., Almerich, G., Orellana, N., & Díaz-García, I. (2018). A basic model of integration of ICT by teachers: Competence and use. *Educational Technology Research and Development*, 66, 1165–1187.
- Thorèn, K. H., Nordbø, E. C. A., Nordh, H., & Ottesen, I. O. (2019). Uteområder i barnehager og skoler. Hvordan sikre kvalitet i utformingen. http://www.skoleanlegg.utdanningsdirektoratet.no/uploads/Artikler_vedlegg/Uteareal/nmbu-skolerogbarnehager-spreads-web.pdf
- Venkatraman, S., Benli, F., Wei, Y., & Wahr, F. (2022). Smart classroom teaching strategy to enhance higher order thinking skills (HOTS)—An agile approach for education 4.0. *Future Internet*, 14, 255. <https://doi.org/10.3390/fi14090255>
- Ward, K. (2018). What's in a dream? Natural elements, risk and loose parts in children's dream playspace drawings. *Australasian Journal of Early Childhood*, 43(1), 34–42. <https://doi.org/10.23965/AJEC.43.1.04>
- Whitehead, M. (Ed.). (2019). *Physical literacy across the world*. Routledge.
- World Health Organization. (2018). *Global action plan on physical activity 2018–2030: More active people for a healthier world*. <https://iris.who.int/bitstream/handle/10665/272722/9789241514187-eng.pdf>
- World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behaviour: Web annex: Evidence profiles*. <https://iris.who.int/handle/10665/336657>

MANUAL OF IDEAS FOR GOOD PRACTICES IN PHYSICAL EDUCATION

Editors: Renata Rutkauskaitė, Rita Gruodytė-Račienė, Irena Čikotienė, Kristina Visagurskienė

Language editor Ieva Bliavienė

Layout designer Kristina Visagurskienė

The cover illustrations were created and edited by Renata Rutkauskaitė using Microsoft Copilot, Adobe Photoshop, and Topaz Photo AI

2024-06-05

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