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Fundamental Movement Skills – A Resource Material for Physical Educators in Kenya

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Abstract

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The purpose of this thesis was to deliver a fundamental, comprehensive, and practical guide of teaching FMS – a Physical Education Resource Book, for physical educators in Kenya. The aim is to develop the fundamental PE in Kenya by supporting physical educators with educational material they are able to use in their work. This thesis is part of a KENFIN EUDURA –project, and delivered with a cooperation with the project group. As Kenya is in the middle of a transition phase, whereas Finland is already ahead of development, both technologically and educationally, the support and developmental tools the project enables to give are essential.

The emphasis on the theory is on PE, PA, motor development, and motor learning to help to understand how important role PE, and learning FMS in a childhood is in general. To understand and finally implement teaching FMS in practice, it is necessary to have the knowledge about motor development, motor learning, motor competence – what they include, and how does it affect on learning FMS. FMS are the very base on any movement in general, and furthermore a base to learn and develop more specific sports – and movements skills.

In this thesis, I want to clarify and explain what is PE, and PA, as they are two different matters, and what they consist of. Closely connected to these two, is a concept called physical literacy, which is also important to know.

The importance of PE is a lifelong journey. In matter to have and maintain active- and healthy lifestyle throughout the whole lifespan, to be physically active should be learnt already in a childhood. PE and PA should support child´s physical- and motor development, and therefore the importance of quality education and research are essential.

Keywords
physical education, physical activity, physical literacy, motor development, motor learning, motor competence, fundamental movement skills

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1 Abstract

This thesis aims to deliver an educational material for primary school physical educators in Kenya, focused on Fundamental Movement Skills (FMS) – the importance of them, and how to teach, and learn them. This thesis is a part of a KENFIN EDURA (Kenya-Finland Education and Research Alliance) – collaboration, which aims to develop Physical Education (PE) to meet its requirements during fast transition phase in Kenya.

The importance of quality PE is not only to support and teach how to be physically active in school age, but it also has a great impact on academic performance, and affects strongly on the physically active- and healthy lifestyle the whole lifespan. Existing and perceived competence of motor skills are closely related to youth´s increasing levels of Physical activity (PA) and decreasing levels of weight issues, and also positively related to the levels of PA in adulthood. (Fu & Burns 2019.)

As PE, has developed during the years, the focus nowadays is more on motor development, motor competence, and FMS which are the base of moving and being physically active in general, and furthermore, all the skill learning in different sports. This is why this thesis emphasizes FMS closely. The basic movement skills encourage the active lifestyle throughout the human´s life, and embracing those skills at young age can be considered as a significant factor, when trying to prevent inactive lifestyle of the modern world. Practicing the basic movement skills have a versatile and positive impact on children´s and youth´s comprehensive wellbeing. (Jaakkola 2016, 19-20.)

In Finland, lots of materials for teachers, to support PE, are available, and teachers are able to stay up to date with their work as physical educators. Generally, in Kenya the situation is different. Some materials are made, and some of them are available for physical educators, but as Kenya is now in the middle of a great transition phase regarding the demands of PE, and physical active- and healthy lifestyle in general, comprehensive guide for teachers is highly needed. To offer quality PE also in Kenya, the focus of the guidance booklet is in FMS – how to teach and learn them the most efficient way. When teaching children, model learning is an efficient way of learning. Some children do not necessarily have previous experience of PA, therefore using creative methods of teaching, diversify the opportunities to comprehend how the human body is able to move many different ways. By creating a safe learning environment for pupils, it enables them to learn and perform without prejudice. (Heikinaro-Johansson & Huovinen 2007, 40.)

2 Physical Education

2.1 The concept of PE

Physical education (PE) has an important role of comprehensive educational process, in which it helps children and adolescents develop in physically active context. (Shimon 2011, 36.) PE should enable every child to experience and see the wide range of opportunities physical activity (PA) has to offer without forcing. (Autio 1995, 25.) In the school curriculum, it is the only subject that itself develops the skills needed in long lasting PA. PE should be taken seriously as the importance of quality teaching increases. (Shimon 2011, 36.)

2.2 The purpose of PE

The purpose of PE can be considered and understood in many different ways depending on personal, cultural and educational perspectives. (Shimon 2011, 36.) In schools, PE has a purpose to have a positive impact on children´s physical-, mental-, and social acting and welfare. (Finnish Agency for Education 2012, 10.) Frequently, PA can be confounded with PE, even though they are two different matters. PE is a learning process which aids to develop the whole person, body and mind, by exploiting physical activities. Shimon (2011, 36) explains the purpose of PE “not only to activate pupils in PA, but to educate them in movement, concepts and PA skills”, which “consists of supporting pupils to obtain confidence of their potential, and empower them to enjoy moving and being active independently and with others.”

PE can be divided into different categories of learning, which helps to understand the purpose of it in general. Bloom (1956) has divided learning into three separate domains; psychomotor-, cognitive- and affective domain, and on occasion affective domain is split into social and affective. (Shimon 2011, 36.)

The unique part of PE is the psychomotor domain, which consists of developing neuromuscular skills and in addition fitness skills – meaning health- and performance-related skills in this context. The psychomotor domain includes different fundamental movement skills (FMS) (i.e. balance, skipping, running etc.), and fitness skills (such as cardiorespiratory endurance). (Shimon 2011, 36.)

The cognitive domain consists of thinking and having the knowledge, in a way that children and adolescents should understand the meaning and importance of PE. This is closely related with a concept of physical literacy. The cognitive domain contains the role

of aiding pupils to develop a comprehension of the activities they are performing. (Shimon 2011, 37.)

Furthermore, the pupils need to learn and develop a positive perspective towards PA. Additionally, affective- and social domains play an important role in the field of PE, as they consist of developing cooperation skills and teaching to work responsibly with others, or independently. Both help to develop self-confidence about being physically active and help pupils to enjoy and appreciate different activities. Furthermore, the social domain consists of important life skills, such as collaboration, fair play and reliability. (Shimon 2011, 37.)

2.3 The importance and benefits of PE

As well as the purpose of PE – also the benefits of PE can be divided into four categories; psychomotor -, cognitive-, affective- and social benefits. There are many psychomotor benefits that pupils learn from PE, such as learning and developing FMS, and a wide repertoire of physical benefits of being physically active. (Shimon 2011, 38-40.)

In PE, pupils develop a strong base of FMS that initiate the base for further particular skills needed in different activities and sports. “Children who establish competent movement skills are more likely to be active adolescents and adults.” (Okely, Booth, and Patterson 2001). Physical benefits achieved by being physically active are comprehensive. (Shimon 2011, 38-39.)

Physical benefits of PE

- Supports weight control
- Lowers blood pressure and improves cholesterol levels → reduction of the risks of cardiovascular diseases
- Reduces the risk of type 2 diabetes
- Reduces the risk of some cancers, including breast and colon cancers
- Strengthens bones and muscles
- Improves mental health and mood, especially with aerobic exercise
- Increases chances of living longer

(Shimon 2011, 38-39.)

2.4 Physical literacy

Physical and Health Education Canada (2016) defines physical literacy as “a journey upon which children and youth, and everyone, develop the knowledge, skills, and attitudes they need to enable them to participate in a wide variety of activities.” Physical literate people

PHE Canada (2016) defines as “those who move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person.” Physical literacy can be defined also as the motivation, physical competence, confidence, knowledge and comprehending the importance, and be responsible for committing in physical activities (PHE Canada, Whitehead, 2016). Physically literate individuals continually develop the motivation, and aptitude towards comprehend, analyze, apply, and communicate dissimilar forms of movement. They are able to demonstrate diversity of movements with confidence, creativity, competence, and strategy throughout large scale of healthy physical activities. These abilities enable individuals to make choices which are healthy and active, and have benefits, and respect towards their whole self, others, and their environment. (PHE Canada, Gardner 2017, 15.) To be physically literate, is one of the cognitive aims and benefits of PE. (Shimon 2011, 40.)

3 The objectives of PE

3.1 International perspective

International Council for Health, Physical Education, Recreation, Sports, and Dance (ICHPER•SD) in collaboration with United Nations Educational, Scientific, and Cultural Organization (UNESCO) has set International Standards for PE, and Sport for School Children. By establishing global standards (table 1) for PE, ICHPER•SD and UNESCO aim to enable quality PE curriculum in schools, and assure that every child and adolescent is physically educated, as it is one of the fundamental human rights set by United Nations (UN). The usage of these standards is to set content, which constitute the foundation for the development and the estimate for all school-based PE curriculums, to enable global communication for describing the common content for PE curriculum, to establish functional definitions for enabling global discussion, research, understanding, and exchanges between and among professionals and leaders worldwide. (ICHPER•SD 2012)

In this context, PE academically consist of human movement, and physical fitness (motor- and health related), and it is predicated on following fields; motor learning, motor development, exercise physiology, sport psychology, sports sociology, biomechanics, kinesiology, and aesthetics. These standards are global and represent what children and adolescents should know and should be able to perform in different phases of their development (based on age or school grade) as a result of the instructional program. (ICHPER•SD 2012.)

Table 1. Global standards for PE and Sport for school children

Standard	Standard consist of
1. Movement competency and proficiency	Demonstrate competency in many movement forms and proficiency in a few movement forms.
2. Knowledge and application of movement concepts	Apply movement concepts and principles to the learning and development of motor skills.
3. Health-enhancing fitness	Achieve and maintain a health-enhancing level of fitness.
4. Physically active lifestyle	Exhibit a physically active lifestyle.
5. Personal and social behavior	Demonstrate responsible personal and social behavior in PA settings.

6. Understanding and respect for individual differences	Demonstrate understanding and respect for differences among people in PA settings.
7. Personal meaning derived from PA	Understand that PA provide opportunities for enjoyment, challenge, self-expression, and social interaction.

(ICHPER•SD 2012)

Standards 1 through 4 are the principal and the most characteristic responsibilities of the PE curriculum, as not any other subject in schools teaches knowledge, skills, and behaviors regarding human movement and physical fitness. Hence, standards 5 through 7 are more generally included also in other school subjects. However, the PA settings are uniquely beneficial to enable pupils to achieve these skills, which makes this learning unique to PE. (ICHPER•SD 2012)

3.2 Finnish perspective

The aim of PE in Finland is to evolve the comprehensive development and growth, and to support health and wellbeing. Comprehensiveness consists that objectives and contents of PE are contributed into three domains of performance; physical-, social-, and psychological domains. The performance in this context is to be understood as physical-, social-, and psychological prerequisites to act and to get through different everyday basic functions and tasks. High performance in this context also strengthens the prerequisites of wellbeing. (Finnish Agency for Education 2016, 1-5.) In general, PE aims to give children the acquirements to obtain knowledge and to process themselves, others, and environment as a space and a matter, through PA. (Zimmer 2002, 121.) The main objectives are obtained through milestones, taking into consideration child´s age and premise. Active, happy, and trying child is a result of successful PE. (Autio 1995, 27.)

Physical performance consists of physical functionality that helps to get through everyday duties that enquire physical effort. It consists of strong control of motor skills, and furthermore the ability to exploit features of those skills, such as endurance, velocity, strength and mobility, in duties where they are enquired. Physical fitness is depending on physical development, and that is why the objectives of PE should be sorted by age groups - or in this case by school grade groups. (EDUFI 2016, 1-5.)

Pupils' social- and psychological wellbeing is closely connected to, what kind of skills supporting their socioemotional life, and relationships they are able to develop, and adopt by themselves and by PE. Social skills are important for developing interaction skills between other people, and help to obtain positive social objectives. Emotional skills are needed to obtain a balanced and expedient emotions for life. Socioemotional skills consist of pupils´ ability to develop values for life and ethical-, and moral ways of thinking. (EDUFI 2016, 1-5.)

Psychological performance in this context is to be understood as matters related to mental health, and –wellbeing, life management, and comprehensive contentment. Psychological wellbeing consists of autonomy, social affiliation and competency, and it is also connected with strong self-confidence, positive self-concept, understanding of reality, and high feeling of security. Furthermore, pupils´ self-esteem, and sensation of temper and resources are also a part of psychological wellbeing. Social support, sense of control, commitment and sensation of being normal and meaningful are all concepts that encourage psychological wellbeing. (EDUFI 2016, 1-5.)

To obtain all the objectives and standards of PE, it is required to take into consideration specific methods and didactics. The offer of PE should follow guidelines of pedagogical activity, such as child-oriented activities, openness, voluntary, experiential, decision-making opportunity, and autonomic functioning. (Zimmer 2002, 122.)

Generally, in Finland children start school at the age of seven years. Two hours of PE weekly in elementary school, is obligatory for pupils. Usually pupils in elementary school have two times 45 minutes PE weekly or one 90 minutes' session per week. Elementary school consists grades 1 to 6, so children are aged 7 to 12 years. In secondary school (grades 7 to 9), PE continues as obligatory subject, and pupils have minimum 2 hours of PE, and usually it is constructed as one 90 minutes' session per week. In general, pupils are separated for PE classes by gender, but many times groups are also combined. After mandatory school grades, 1 to 9 (includes primary-, and secondary school), there is a possibility to continue studies in upper secondary school, or vocational school, where in both, PE remains as an obligatory subject. In upper secondary school, the education includes two compulsory credits (76 hours in total) of PE, but pupils may supplement their PE studies by accomplishing three optional credits (in total), within three years of upper secondary school studies. In vocational school education, there is one compulsory credit of PE (28 hours in total), but pupils may supplement their PE studies with maximum of four optional credits within their three years of studies. (Kalaja 2012, 21.)

3.2.1 Finnish curriculum of PE

Every pupil develops physically and mentally as an individual, but there are some general developmental phases, which are taken account as emphasis, on classifying the objectives of PE for different grades. (EDUFI 2016 1-6.)

The objectives are related to develop pupils´ FMS, competency, and features by practicing different physical abilities. Current Finnish curriculum is more concentrated on physical exercise instead of specific sports. Physical exercise consists of appropriate exercising in different operating environment, such as indoor-, (i.e. using balls, ropes, music, and gymnastics equipment) or outdoor surroundings (i.e. field, forest, and hills), and taking into consideration different seasons. Physical exercise also consists of different activities, such as music, - dance-, nature-, and snow activities, ballgames, and gymnastics, which all develop and practice the objectives of PE. Sports are more concentrated on specific skill training. (EDUFI 2016, 1-7.)

In grades 1 to 2 (pupils aged 7 to 8 years), objectives of PE are to develop and practice sensory motor skills, and FMS, through fun games and activities performed in groups, so that pupils achieve positive experiences of moving, and learn the basics of interacting with others, and - to perform individually. (EDUFI 2016, 6.)

In grades 3 to 6 (pupils aged 9 to 12 years), the objectives concentrate on establishing and diversifying FMS, while specifically developing social skills. Pupils can also be required of participating on operational planning, and responsible action, according to their developmental phase. Wellbeing, independency and participation of the pupils are developed and supported by interactive-, and comprehensive teaching method, which enables the development of physically active lifestyle. (EDUFI 2016, 6)

3.3 Kenyan perspective

The main objectives of PE in Kenya, are generally increasing health, fitness, leisure habits, and the comprehensive wellness of children and youth. In addition, promoting active lifestyle, socialization, teaching moral values and discipline, cherishing and identifying sports talents are also general objectives teaching PE consist of. In each level of education, PE has more specific guidelines, which are conducted by these extensive general objectives. In schools, PE is an obligatory subject, but it is not evaluated. The challenges PE faces these days, are negative attitude towards it, the lack of teachers, equipment, and modern facilities. For further support and encouragement of teaching PE in schools,

continually appropriate strategies should be invented and implemented. (Mwisukha, Rintaugu, Kamenju & Mwangi 2014, 269-272.)

The current educational system in Kenya consists of 8 years of primary school studies, 4 years of secondary school studies, and 4 years of university studies. The curriculum of basic studies in public primary- and secondary schools are compiled by the Kenya Institute of Education (KIE). Although, many private schools follow the British and other international curriculums. PE was framed as an obligatory subject through the Kenyan Presidential Decree of 1840. (Mwisukha et al. 2014, 296-272.)

The current status of PE and sports in Kenya has been achieved and developed by several historical events. The original sports and games of the precolonial period were intertwined enclosed by the African culture, and the ratified PE at that time was introduced by British Colonialists. This established the base for the current PE programs that have been developed over the years. (Mwisukha et al. 2014, 296-272.)

From the traditional point of view, PE is identified as a child´s play in many African societies. Therefore, the attitudes towards the subject are often negative. That may be one of the reasons why the lifestyle among youth in Kenya is inactive. The deficiency and unavailability of facilities and equipment that are crucial to the execution of proper PE in Kenya, worsen the situation as well. In addition, these challenges are expanding even more, as many developing countries, including Kenya, are experiencing an increasing abundance and urbanization, which results in a population suffering from overweight and obesity. The possibilities of PA and PE programs in alleviating overweight and obesity, are affected by the circumstances and setting the children live in. The differences between genders - mostly based on traditions, and settings – mainly based on regions or districts, require a reconceptualized PA- and PE programs, which demands a versatile plan including urban and rural Kenya. (Mwisukha et al. 2014, 296-272.)

3.3.1 Kenyan curriculum of PE

The current curriculum of PE in Kenya, is compiled and developed by the KIE, which is the national center for curriculum research and evolvement. KIE ensures there are proper teaching materials, which support the teaching itself. These materials consist of i.e. teachers´ guides, video programs, brochures, charts, still pictures, and audio programs. The objectives of teaching PE in all the levels, are defined clearly to carry out the teaching-learning process. Generally, PE in Kenya requires more progression and variation of the activities, more standardized and structured criteria for evaluation, especially in primary- and

secondary studies. Therefore, there are no demands for pupils to encourage prime performance in PE classes towards the following class levels. (Mwisukha et al. 2014, 296-272.)

The amount and duration of PE classes are planned and adapted by class levels by the KIE. At primary school studies, pupils have five PE lessons of 30 minutes, and three PE lessons of 35 minutes in a week. At secondary school studies, the time divided to PE ranges, as pupils of levels 1 and 2 have one PE lesson of 40 minutes per week, and pupils of levels 3 and 4 have three PE lessons of 40 minutes per week. (Mwisukha et al. 2014, 296-272.)

In practice, PE is most practical in outdoors where activities such as, ball- and racquet games, track and field, and swimming are realized with and without equipment. The practical parts of PE, such as sports and games dominate the subject in schools, when more academic parts, such as anatomy, motor learning, physiology, and psychology are left for less attention. Therefore, the discussion if PE is even an academic subject exists, and this may have affected to the obvious and constant exclusion of PE in the school curriculum. Furthermore, the amount of PE teacher in all institutional levels is not sufficient. (Mwisukha et al. 2014, 296-272.)

The support materials of the curriculum are important step to implement the curriculum in the classroom level. The KIE has published the latest release of PE textbook, that usually has been published by private firms and independent authors. This is one of the common reasons, why further variable reference materials, that are required for efficient learning and teaching of PE, struggle to be published and to be available for the field. (Mwisukha et al. 2014, 296-272.)

4 Physical activity

4.1 The concept of PA

World Health Organization (2011) defines PA as “any bodily movement produced by contraction of skeletal muscle that substantially increases energy expenditure”. PA can be described as a conduct that appears in multiplicity contexts and forms. (Malina, Bouchard & Bar-Ol 2004, 6.) In addition, PA can be seen as a biocultural behavior: energy is spent in active behaviors that happen in different forms and cultural contexts. (Finnish Agency for Education 2012.) PA consists of different components, such as mechanical, physiological, and behavioral. The biomechanical perspective consists of measuring the PA by force, velocity, acceleration, mechanical power, or mechanical work produced. The physiological perspective as regards to energy expenditure, uses the measurements, such as oxygen uptake, metabolic energy, metabolic power, or the multiple of resting energy expenditure (MET). The behavioral perspective consists of the type of the activity, and the context of the activity (i.e. environment). PA is behavior, which is built by cultural characteristics, and is depending on that context, whereas it has important biological implications. (Malina et al. 2004, 458.)

The intensity, frequency, and duration can be defined as the fundament parts of PA. (Shepard 2003.) The intensity of PA can be described in “a form of absolute energy expenditure, or as a value of maximum, or peak performance”. The frequency of PA can be described as “a number of times given activity has been performed a week”. The duration of PA usually demonstrates the total number of active minutes obtained during a week. (Kalaja 2012, 11.; Shepard 2003.)

PA for children and young adolescents consists of games, play, sports, transportation, chores, recreation, physical education, or organized exercise, in the context of family, school, and community activities. (World Health Organization 2011.).

4.2 Benefits of PA for young people

The effect of PA considering children´s health, is indisputable. (Syväoja, Kantomaa, Laine, Jaakkola, Pyhältö & Tammelin 2012, 9.) PA develops healthy musculoskeletal tissues (i.e. joints, bones and muscles), a healthy cardiovascular system (i.e. lungs and heart) neuromuscular awareness (i.e. coordination) and sustains a healthy body weight. (World Health Organization 2011.) Rapid exercising reduces extra adipose tissue, decreases high blood pressure, strengthens bone tissue, and improves the condition of heart and circulatory

system. Regular amounts of PA improve children´s physical fitness, reduces visceral- and whole body fat, hence affects positively on children´s cardiovascular- and metabolic heatlh. (Syväoja et al. 2012, 9.) Furthermore, physical inactivity has straight connection with obesity and it´s issues, which are connected with decreasing quality of life, limited functional independence and shorter lifespan. (Shimon 2011, 36.)

PA consists also cognitive benefits as it helps to control anxiety and depression. Furthermore, PA develops children´s and young adolescent's social skills by providing possibilities for expressing themselves, developing a self-confidence, social interaction and integration. PA has also positive effect on academic performance and physically active young people tend to embrace other healthy habits more easily. (World Health Organization 2011.)

4.3 Impact of PA on learning and academic performance

PA is an important medium of learning offered by the children´s growth environment. PA enables to learn how to move, to learn about oneself as an active person, and to learn from the PA itself. PA affects positively on children´s academic performance, cognitive functions, such as memory, attention, and information processing- and problem solving skills, and in addition learning itself. The latest studies show a link between PA integrated into classes, the amount of PA and aerobic fitness, and then again school grades and standardized test result in individual subjects. The positive effects of PA in academic performance, have been discovered especially in mathematic subjects. Increasing PA enhanced test results, especially in memory and tasks requiring executive functions. Therefore, the connections between PA and cognitive functions may present to declare the link between PA and academic performance. (Syväoja et al. 2012, 5-11.)

Furthermore, PA occurs to encourage also other points that are important in terms of learning, such as concentration on assignments, classroom behavior, and participation in classwork – and afterwards learning itself. Pupils who are physically active tend to have higher goals for further studies after comprehensive school studies, and furthermore physically active pupils are absent from school rarely compared to inactive pupils. Additionally, PA does not always affect on academic performance directly, but through some other, usually psychosocial factors, such as self-efficacy. (Syväoja et al. 2012, 5-11.)

The connection between learning and PA may be explained by the effect of exercising on the structure and function of the brain. A part of the connection between PA and cognitive

functions, is based on changes in the metabolism of the brain. PA increases the circulation of the brain, improves the oxygen uptake, increases the level of neurotransmitters, and grows the production of neurotrophic. Whereas, a part of the connection between PA and cognitive functions is based on the development of the structure of the brain. Regular amount of PA has been proved to grow the number of capillaries in the brain, and to produce new nerve cells especially to the hippocampus, which is the center of learning and memory. In addition, regular amount of PA increases the capacity of children´s brain area related to memory and executive functions. The studies have shown that endurance training increases the number of nerve cells and the growth of the factors that promote the amount of them in the hippocampus. In addition, the production of new vascular improves by the effect of PA. The electric activity of the cortex improves by being physically active, which has an effect on cognitive functions, especially on concentration. Therefore, according to the researchers increasing levels of activity in the cortex, enhances concentration and cognitive performance. (Syväoja et al. 2012, 20-21.)

4.4 Global recommendations for the PA of young people

Global recommendations of PA for young people according to World Health Organization are:

1. Children and youth aged 5-17 should collect minimum 60 minutes of moderate- to vigorous-intensity physical activity daily.
2. More than 60 minutes of physical activity daily provides further health benefits.
3. Most of the daily PA should be aerobic. Vigorous-intensity activities should be contained, including muscle- and bone strengthening, minimum 3 times a week.

These recommendations are relevant for all healthy children and youth aged 5-17, unless specific medical condition demonstrate otherwise, regardless of gender, ethnic, race, or income level. Any time possible disabled children and youth should meet these recommendations. Nevertheless, they should understand the amounts and types of activities suitable for their specific capabilities by the help of their health care provider. (World Health Organization 2011.)

In case children being inactive, even lower amounts of activity recommended are beneficially better than none activity done at all. In these cases, they should begin with small amounts of physical activity and slowly increase intensity, duration and frequency of PA over time. (World Health Organization 2011.)

The idea of accumulation relates to reaching the aim of 60 minutes daily by performing activities in various shorter periods spread throughout the day and then counting together these periods. (World Health Organization 2011.)

4.5 Recommendations for the PA of school-aged children in Finland

Basic recommendations consist, that all children and youth aged 7-18 should do physical activities one to two hours per day diversely and according to each age group. Continuous periods of sitting over two hours should be avoided. Screen time with entertainment media should be limited to two hours per day. (Lasten ja nuorten liikunnan asiantuntijaryhmä 2008, 6.)

These basic recommendations are based on the opinion of specialists and scientific researches about the effects of PA on health and wellbeing of school-aged children. These recommendations are general for children and youth aged 7-18 years from health enhancing PA point of view, and are suitable for all – for young athletes as well as for schoolchildren with special needs. (Lasten ja nuorten liikunnan asiantuntijaryhmä 2008, 17.)

Daily activity for school-aged children is prerequisite for a healthy growth and development and wellbeing. Inactivity on some days is not grave, but longer periods of inactivity should be avoided. Children aged 7-12 years should move at least two hours per day, but it is recommended to be even more active. As long as the exercising is variable, there is no need to limit the amount of natural activity. Only over similar, or limited exercising, or activities with high vigorous intensity performed too long and often, can be considered as a health risk. It is also important for children to get enough sleep and have time to recover. Children are capable for vigorous intensity interval exercising for short periods, but not for long-termed ones. (Lasten ja nuorten liikunnan asiantuntijaryhmä 2008, 18-19.)

The latest studies show that especially PA performed during school time is important for children´s health. Increased amounts of PA during school time, had a decreasing effect on pupil´s body fat and the risk factors of cardiovascular diseases, and improving effect on aerobic fitness level. In addition, pupils who had more hours of PA during school day, obtained better physical fitness and their BMI didn´t increase as much as the pupils who had less hours of PA in the study. According to the researches, regular amounts of PA should begin in early state to prevent excessive increase of BMI. (Syväoja et al. 2012, 23-22.)

5 Motor development

5.1 Children´s motor development

Gallahue, Ozmun and Goodway (2012, 3.) describe motor development as “continuous change in motor behavior throughout the life cycle, brought about by interaction among the requirements of the movement task, the biology of the individual, and the conditions of the environment.” Motor development can be referred as a process, continuous change, when child learns, and adopts moving skills. During this process child´s neuromuscular system develops and matures, the size of body changes and grows, and the composition of body, and the correlation of body parts changes. (Kalaja & Jaakkola 2015, 195.)

Genes define the sequence of motor development, but the difference between individuals is the time that motor development takes. (Kalaja & Jaakkola 2015, 195.) It is important to understand the individuality of the learner when considering the process of motor development. Each person has their own timetable to acquire movement skills and – abilities, and the development process is only age-related. (Gallahue et al. 2012, 5.) The components affecting on the time motor development takes are biological age, heritage, and individual differences in physical- and psychological development. Furthermore, the experiences that social- and physical environment create, shape individual´s development. (Kalaja & Jaakkola 2015, 195.)

Child´s skills and abilities improve through the development, and it enables them to connect in closer proximity with their growth environment. Furthermore, motor learning improves when child´s interaction with their growth environment develops, due to new opportunities, and stimuluses, the environment provides. The interaction between the heritage and the environment continuously accumulates, when development proceeds. The experiences child has towards moving, and be physically active, depend a lot due to opportunities they meet in their growth environment. (Kalaja & Jaakkola 2015, 195.) Development is a process that is continuous, which begins at fertilization and lasts a lifetime. (Gallahhue et al. 2012, 4.)

First phase of motor development (table 2) starts, when newborn babies start to learn reflexes, which are natural for all. These first reflexes babies learn basically in their first year of life, beginning with the natural ability to move themselves through different sensory stimuluses. The purpose of the first reflexes babies learn (i.e. moro-, suck-, grasp-, breath

holding when diving reflexes) (University of Rochester Medical Center 2019), are for survival – for keeping them in safe and alive for the first months of their lives. (Kalaja & Jaakkola 2015, 196-197.)

Second phase consists of adopting primitive movement skills, meaning of voluntary movements of the body. This phase takes place in the second year of life, when babies begin to learn basics of FMS (i.e walking, running, throwing), but the movements are still quite uncoordinated. (Kalaja & Jaakkola 2015, 196-197.)

Third phase consists of learning FMS, and it takes place from the third year until the seventh year of life. At his phase children learn most of the FMS, and enables them to form a base for further, specific skill learning. This phase consists of more fluent coordination, and more efficient performance. (Kalaja & Jaakkola 2015, 196-197.) The environmental factors have a great influence on this period, and it is the first of two periods, when the environmental factors take an important place on motor development. The exercising should be versatile, and be focused on developing the general characteristics of moving, because at this period children learn easily simple, and comprehensive movements. The exercising should focus particularly on encouraging balance-, mobility-, agility- and velocity training. (Kauranen 2011, 347.)

Fourth phase takes place in the school age (7 to 15 years), and consists of more specific movement – and skill learning, which requires strong control of FMS. (Kalaja & Jaakkola 2015, 196-197.) This phase is also the second of the most important periods, when the environmental factors have a great influence on the motor development. Particularly, the period between 9-12 years is the most important for motor learning, and coordination in human´s life, because children´s physical development is fast, and child tries out new motor performances. The focus of exercises should be unifying and coordinating movements and movement chains together, and controlling different objects, or tools. (Kauranen 2011, 347.)

The fifth and the last phase takes place after the age of 15, and continues through the whole life from there. It consists of exploiting the skills learnt, meaning of using and developing all the learnt skills in different sports, and activities. (Kalaja & Jaakkola 2015, 196-197.)

Table 2. Motor development phases

Motor development phase	Age
Reflex based functioning	0-1 years
Adoption of primitive movement skills	1-2 years
Learning of FMS	2-7 years
Specific movement-, and skill learning	7-15 years
Utilization and development of the skills learnt	> 15 years

(Kalaja & Jaakkola 2015, 197.)

Motor development means preparedness for performing skills, and this development is individual, even though the phases are defined – the phases are directive. Children should be seen as individuals, and offer them activities according to their motor development phase. Nevertheless, some developmental phases go by fast, it is important to remember that motor learning continues the whole lifespan, and adequate quality- and quantitative exercising enables to learn skills, even at a later age. (Kalaja & Jaakkola 2015, 197.)

Motor development and motor learning may convey the positive effects of PA to learning, thus children´s physical growth, and motor – and cognitive development are closely connected together. The studies show, that motor- and cognitive skills develop alongside. The ability to control motor skills has in impact on the development of the brain, as the same mechanisms of the central nervous system are responsible alongside of both motor- and cognitive skill control. Diverse PA supports the entity by promoting the neuromotor development and motor skill learning. Through motor development and PA, child gets to more diverse interaction with their environment. (Syväoja et al. 21.)

5.2 Motor learning

Motor learning is defined as a group of inner processes produced by exercise and experience, which lead relatively permanent changes in motor ability, and skill demanding performance. Throughout motor learning, people adapt themselves into the motor requirements set by the environment, and communicate, and act with the environment. Motor learning can be understood as improved performance in exercise, combined performance, or transferring performance already learnt, into a new environment. Therefore, specifically skill demanding performances, changes in coordinating movements, and cognitive functions, are all motor learning. Changes in motor performance should be relatively permanent to be defined as motor learning. (Kauranen 2011, 291-293.)

Motor learning happens through different motor learning experiences, and exercises, which can be seen as situations, where people by conscious attempts try to pursue higher performance in specific motor functions. In exercises, people accustom, develop, improve, or practice their motor system for some motor function. Motor learning is situational, meaning that new motor skill learnt in one context does not automatically transfer into another context. Learning a new motor skill, first of all it should always be considered where, and in what circumstances that skill is principally needed and used. New motor skills and functions are encoded in the memory by the specificity principle, meaning encoded by relating into a specific context, and in the future, this context performs as the most important factor of bringing that skill, or function back to mind. (Kauranen 2011, 292.)

Children's motor development and -learning is different from adults´. In young age the nervous system develops by different exercises, and functions, which are the base of nerve activity of the central nervous system, and the motor control system. Throughout the motor development, nerve cells are built as the nervous base of the central nervous system, which is the base for motor activity. In later age motor learning happens by rearranging the nerve cells already formed. Motor development, and –learning can be perceived as motor behavior, which in addition of motor learning, consists of various momentary factors such as motivation, and alertness. Motor learning is divided into explicit-, and implicit learning. Over the half of motor learning is implicit learning, which means people learn motor skills principally unconsciously, during the exercise. (Kauranen 2011, 291-292.)

Furthermore, when teaching motor skills, it should be noticed and defined if the learner is adopting skills being taught. The knowledge is based on measuring motor performance characteristics. It is essential for effectual evaluation of motor skill learning to set a performance measure, which is the base for that specific evaluation of learning. (Magill 1993, 15-17.)

5.2.1 Phases of motor learning

Motor learning can be divided into three phases based on a first produced model of human´s motor learning, presented by Paul Fitts and Micheal Posner in 1967. The first one is the initial phase of learning skills, when individual learns to perceive the objectives of the actions, and decides how to achieve them. The main characteristics of this phase are high demands of observation, limited degrees of freedom of joints, extensive variations between performances, fast progress, and benefits from feedback. Decision making has

an important influence on this phase concerning exercising, and performing the task requires the greater part of observation. The second phase of motor learning is the practicing phase, which can also be called as motoric, or associative phase. It means the individual has already resolved most of the cognitive-, and strategic issues, being aware of how to perform the task. The main characteristics of the second phase are movements begin to form engrams (memory traces), lower demands of observation, increasing degrees of freedom of joints, increasing confidence of performance, and slower progress. The cognitive choices, and observations in movements should be transformed into as effective motoric movements as possible, for central nervous system´s development, and reforming – for enabling it to form engrams. This process enables the movements, and performances become more secure, and stable, and begin to focus on more specific details. The third phase is the final phase of learning skills, when movements and sensory responses act mainly independently and automatically, without requiring that much of observation. Automated, and well-coordinated movements, low demands of observation, full degrees of freedom of joints, high confidence of performance, and slow progress, are all the main characteristics of the third phase. This final phase is close to an individual´s maximum performance, but the upper limit of central nervous system´s ability to adapt, in relation to performance, hasn´t been researched yet. (Kauranen 2011, 356-359.)

6 Motor skills

6.1 Motor skill

Schimdt and Wrisbrg (2008, 4.) define motor skill as “a skill for which the primary determinant of success in the quality of the movement that the performer produces.” It is a learnt, voluntary movement action or task of one or more of the body parts with an objective or a specific goal. (Gallahue et al. 2012, 14.) Motor skills are needed in special physical body- and limb movements in order to achieve an objective. (Jaakkola 2010) In the concept of motor skill, the term can be defined at least two different ways. It can be understood as a task (i.e. throwing a ball, or playing card.), when it should be discernible alongside various of dimensions, or on the basis of a range of important characteristics. Furthermore, motor skill can be understood in terms of the expertise a person performs a movement. (Schimdt & Wrisberg 2008, 4.) Motor skills can be seen in different performances executed by athletes, in contents of PE, and in everything considering leisure time PA. The most essential feature of motor skill is, that it is a learnt skill. (Jaakkola 2010)

6.2 Gross motor skills and fine motor skills

When classifying motor skills, the classification is generally divided into two different groups. (Magill 1993, 10.) The classification is based on the accuracy of movements and corresponding size of the musculature needed for their competent performance. (Coker 2018, 7.) Gross motor skills are generally understood as abilities, that require large muscle groups to perform the movements. (Magill 1993, 10.) Fundamental movement skills such as walking, running, throwing and jumping are considered as gross motor skills. (Hulteen, Barnett, Morgan, Robinson, Barton, Wrotniak & Lubans 2018, 303.) These types of movements are usually the result of multi-limb movements, hence they don´t require that much precision. (Coker 2018, 7.) The successful execution of movement is more characteristic to gross motor skill, than the accuracy of it, whereas fluent coordination of movement is relevant element for a competent performance of the skill. (Magill 1993, 10.)

The other group of the classification is fine motor skills, which consists of movements produced by smaller muscle groups (Magill 1993, 10.), yet the skills consist of very precise movements. (Coker 2018, 7.) These types of abilities require mainly eye-hand coordination and high accuracy of the movement to achieve a competent performance of the skill. Grapping and manipulating objects, writing and using thumb and one finger to pick up something are all examples of fine motor skills. (Magill 1993, 10.)

Many skills require both –large muscle group- and small muscle group movements. The combination of both type of movements are needed when performing skills and therefore a continuum is also used in a classification. Skills that require larger musculature to perform are placed closer to the gross end of the continuum and inversely same with skills requiring smaller musculature to perform. (Coker 2018, 7-8.)

Children usually develop the competency of gross motor skills before achieving the control over fine motor skill. When teaching, and preparing the development of motor skills, it should be taken into consideration to teach tasks increasingly from easy to more difficult ones. Skills or skill components should be introduced in an order from gross- to fine motors kills. (Coker 2018, 8.)

6.3 Motor competence

In general, motor competence is defined as an individual´s ability to accomplish motor tasks extensively (Hulteen et al. 2018, 302-303.), a recognition to perform tasks that include a particular motor skill (Fu & Burns 2019.). Motor competence might prevent decreasing level of PA during adolescence, and taking into consideration the participation on PA in present and in future, motor competence is essential. Being physically active in childhood, improves and develops motor competence, yet the progress of motor competence enhances PA also in adolescence and in adulthood. (Hulteen et al. 2018, 302-303.) The development of motor competence in the early childhood is essential for engagement in PA and creating positive observations of motor competence throughout childhood and adolescence. (Gallahue et al. 2012, 189.) Children with higher levels of perceived motor competence, are more likely to indicate and develop physical abilities (i.e gross motor skills and higher participation in PA). Furthermore, studies show that children with lower current and perceived motor competence, have a tendency to have lower autonomous motivation towards sports and global self-esteem. (Fu & Burns 2019.)

The development of gross motor skills begins at young age and perceived motor competence may have an interpretative role. Studies show that there exists a straight relationship between gross motor skills and perceived competence, as acquiring a proficiency motivational climate among primary school pupils, increases their perceived competence for motor skills. Furthermore, existing and perceived competence of motor skills are closely related to youth´s increasing levels of PA and decreasing levels of weight issues, and also positively related to the levels of PA in adulthood. (Fu & Burns 2019.)

Furthermore, recent findings support the relation between motor skill development, school day activity, and perceived competence, as more objective estimation of PA were used in the study. Consequently, perceived competence may have a great impact in a bi-directional gross motor skill and PA procedure, which may enhance youth´s health results that follow into adulthood. (Fu & Burns 2019.)

7 Fundamental movement skills

7.1 The meaning and importance of FMS

The concept of FMS consists of basic skills in movement, which practice both skill- and efficiency abilities. The basic skills learnt and adopted at young age are the base for a long-term impact in life. (Jaakkola 2016, 19-20.) For being a skilled mover, the control of the locomotor movements and basic manipulative skills are required as the foundational knowledge. (Colvin, Markos & Walker 2016, 1.) The basic movement skills encourage the active lifestyle throughout the humans´ life, and embracing those skills at young age can be considered as a significant factor, when trying to prevent inactive lifestyle of the modern world. Practicing the basic movement skills have a versatile and positive impact on children´s and youth´s comprehensive wellbeing. (Jaakkola 2016, 19-20.) FMS offer the base for competent and effectual movement and enable children to explore their environment and obtain knowledge about the world. When children obtain basic motor competence during their early years, their ability to move, to obtain FMS is ensured. (Gallahue et al. 2012, 187.) Learning of FMS in childhood, create a possibility to develop cognitive skills, as motor – and cognitive development are closely connected together. (Syväoja et al. 2012, 21.)

FMS are mainly gross motor skills, and the relationship between gross motor skills and PA is compound and possibly bi-directional, as youth who more likely will participate in PA are competent in gross motor skills, and physically active youth are more likely to achieve competent in gross motor skills. Enhancing gross motor skills, may facilitate youth to achieve sufficient amount of daily PA suggested. (Fu & Burns 2019.)

The development of FMS in childhood are a result of maturation of the nervous systems, development of the physical characteristics, and motor learning. (Laukkanen, Finni, Pesola & Sääkslahti 2013, 48.) Studies show that youth lacking gross motor skills, are more inactive and it may affect negatively on their health in future. (Fu & Burns 2019.) FMS are closely linked with the amount of PA – the better FMS are, the more active children are. Weak control of FMS has a relation with variables of health, such as increased BMI and waist size, worsened health-related fitness levels, and weakened academic performance. (Laukkanen et al. 2013, 48.) From the cultural point of view, the competency achieved in various sports, games, and dances are relevant by the development of FMS. (Gallahue et al. 2012, 187.)

7.2 FMS categories

Clark, Barnes, Holton, Summers and Stratton (in the study of A Kinematic Analysis of Fundamental Movement Skills, 2016.), describe fundamental movement skills (FMS) (table 3) as “the basic building blocks for movement and provide the foundation for specialized and sport-specific movement skills required for participation in a variety of physical activities.” FMS consist of locomotor skills, nonlocomotor stability and manipulative skills.

Table 3. FMS categories

Fundamental Movement Skills		
Locomotor skills	**Nonlocomotor stability**	**Manipulative skills**
- Walking - Running - Hopping - Skipping - Jumping for height/distance - Climbing - Leaping - Sliding - Galloping	- Spinning - Rolling - Swinging - Stopping - Twisting - Bending - Dodging - Landing	- Throwing - Catching - Kicking - Rolling - Bouncing - Striking

(Kalaja & Jaakkola 2015, 196.)

7.2.1 Locomotor skills

Locomotor skills consist of moving a human body from one place to another, both horizontal, and vertical dimensions (i.e. walking, running, jumping, skipping, hopping, sliding, leaping, galloping, and climbing) (Gallahue & Cleland-Donnelly 2007) (Holfelder & Schott 2014) and navigate across space. Locomotor skills allow individuals also to form foundational skills for participation in PA for health, sports, games, dances, and other lifetime activities. Locomotor skills are not culturally determined, as they develop more naturally than i.e. manipulative skills, meaning that they require less formal instruction and feedback. (Gallahue et al. 2012, 223.)

7.2.2 Nonlocomotor stability

The group of nonlocomotor stability in some studies, is named as balance skills, which refers to the same group of FMS, but in this work, I chose to use nonlocomotor stability. Balance in this context is understood both the body remaining in one place, but also moving around its vertical and horizontal axis, and the process for maintaining postural stability. Static balance can be defined as “the ability to maintain a posture, such as balancing in a

sitting, or standing position", and dynamic balance as "the ability to maintain a postural control during other movements, such as reaching for an object or walking across a lawn." (Westcott, Lowes & Richardson 1997) (Kalaja 2012, 13.) Nonlocomotor stability forms the range of FMS, which is the base for locomotor- and manipulative skills, and also later for more specific sport skills. (Gallahue & Ozmun 2002.)

7.2.3 Manipulative skills

In general manipulative skills consist of manipulating or controlling objects (i.e. balls and racquets). Unlike locomotor skills, manipulative skills are more culturally determined, meaning that in order to develop, they need more practicing and feedback to gain proficiency. (Gallahue et al. 2012, 191. 223.) Manipulative skills contain gross motor – and fine motor manipulative skills. Gross motor manipulative skills contain movements that give force to objects, or receive force from objects, such as throwing, catching, trapping, striking, kicking, rolling, bouncing, and punting. Fine motor manipulative skills consist of small object-handling activities that accentuate motor control, precision, and accuracy of movement. (Kalaja 2012, 13.)

7.3 Learning FMS

Generally learning FMS can be characterized by the improvement of an execution and performance, the harmonization of them, the stability, and the ability to perform the learnt skill in different environments. (Jaakkola 2010.) Primary graded pupils are easily motivated in PE, as generally for children that age everything physical is fun. On the other hand, children often get excited of the skills and accomplishments they are able to do, that they don´t learn to perform them correctly. Without proper correction of these fault motor patterns, they may become habits that are challenging to correct later. (Colvin et al. 2016, 7.) Even though childhood is focused on the acquisition of FMS, the importance of high quality of skill is not that significant. The focus should preferably be in developing basic motor competence and effective body mechanics in an extensive variety of movements skills and situations. Various movement patterns that are learnt, used, processed, and modified from childhood and throughout adulthood, are effected by several elements that can impact on skill performance. These elements are grouped into individual, task, and environment demands. (Gallahue et al. 2012, 186.) Usually, the learners' performance is better after the practice, then before it, as person´s performance is more efficient when they have learnt more optimum technique to perform the skill. Furthermore, learning FMS is relatively permanent, meaning that learnt skill can be recalled, and repeated even after long breaks of practice. (Jaakkola 2010.)

Three phases can be recognized in the learning process of FMS; the initial phase (cognitive phase), the practice phase (associative phase), and the final phase (automation phase). All of them describe the learner´s development of performance, the gradual automation, and the attention- and the observation function changes towards the skill acquisition development. Even though skill learning can be divided into three phases, they can rather be considered as a continuum, meaning that the learner does not move from one phase to another at once, but the transition between the phases happens in periods. The first – the initial phase consists of understanding and perceiving the skill as a whole, and creating a vision of it. The first phase requires a lot of thinking and cognitive functions, when observation is bound for practicing. Furthermore, changes in performance are great in the initial phase, and also quite ineffective. Nevertheless, the development is generally fast. In the practice phase, the cognitive challenges have been solved, therefore the learner´s observation and energy can be targeted into finding and trying more effective strategies of performance. Additionally, performing the skills is already quite fluent, reliable, and equable, and the learner is able to recognize the mistakes made, which with practice can be corrected. In the final phase, the skill has become a whole, and it can be performed subliminally without great effort of thinking or trying. Furthermore, the movements are equable, and not so many mistakes are made performing the skills. The learner is able to perform more than one skill simultaneously, and take into consideration of the surroundings, as the skill performing does not acquire so much focus anymore. (Jaakkola 2010.)

Furthermore, when learning new motor skills, the ten general principles and rules of practicing new skills (table 4), such as overload principle, specificity principle, principle of progression, reversibility principle, principle of individualism, principle of variety, principle of active involvement, principle of adaptation, principle of balance between load and rest, and principle of concentration apply. (Kauranen 2011, 371-373.)

Table 4. General principles of practice

(Kauranen 2011, 373.)

The first, overload principle in this context means that practice and it´s intensity should be clearly higher than normal daily activities and functions require, to obtain permanent changes in body and learning processes. In practice the duration, frequency and intensity of the performance can be raised, meaning increasing the number and time of performance when practicing new motor skill. The second, specificity principle consists of targeting the practicing of new skill. Human develops and learns functions that is been practiced. Specific movements activate particular motor units that are connected to each other. The third, principle of progression consists of practicing being continuously progressive process, which requires that the quality, quantity and intensity of practice should meet the level of performance and progress the learner. (Kauranen 2011, 371-373.)

The fourth, reversibility principle means that the changes of adaptation caused by practice are regressive. The fifth, principle of individualism consists of individual planning of practicing, taking into consideration individual´s personal capacities. The sixth, principle of variety considers the versatility of practicing. Same skill can be practiced by many different ways by varying the contents of training. The seventh, principle of active involvement consists of active participation of the learner. New skills are learnt by practicing and participat-

ing actively. The eighth, principle of adaptation means adapting the body into practice. Human body adapts itself quickly, and the same practice doesn´t affect so strongly as in the beginning. The ninth, principle of balance between load and rest considers the regression after practicing. The performance develops at rest, not during the actual training. The tenth, principle of concentration highlights the importance of concentration in practicing. Perfect training response requires perfect presence and concentration to the practicing. (Kauranen 2011, 371-373.)

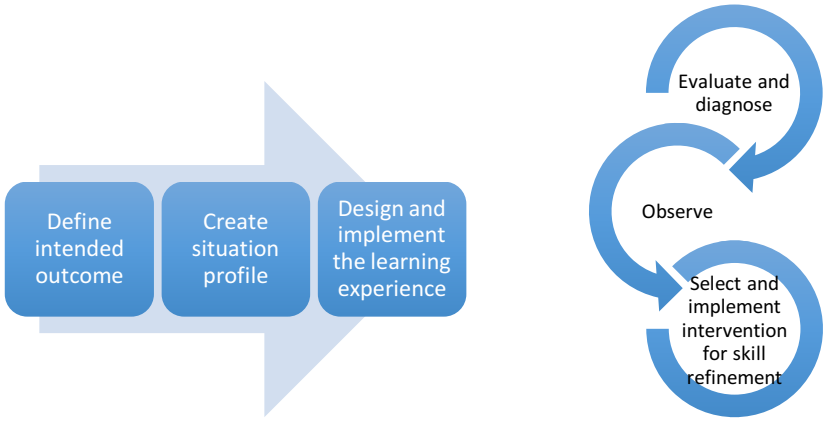
Additionally, learning FMS can be divided into explicit- and implicit learning. Explicit learning consists of goal-oriented learning situation, when the pupil both actively and consciously acquires knowledge from the teacher. Whereas, in implicit learning, the pupil acquires knowledge and learns skills subliminally, during the practice. Studies show that many movement skills are learnt subliminally. (Jaakkola 2010.)

7.4 Teaching FMS

For successful introduction to teach motor skills, is to understand the learning process itself, the current learning situation, and the potential instructional strategies available, which to use. (Coker 2018, 2-3.) Even though motivation and success are important parts of the learning process and the teaching, it requires specific lesson plan to develop and implement high-quality instructions into practice to fulfill the needs of all learners, despite of the skill level. (Colvin et al. 2016, 1.) When teaching children, model learning is an efficient way of learning. Some children do not necessarily have previous experience of PA, therefore using creative methods of teaching, diversify the opportunities to comprehend how the human body is able to move many different ways. By creating a safe learning environment for pupils, it enables them to learn and perform without prejudice. (Heikinaro-Johansson & Huovinen 2007, 40.)

An integrative model for facilitating motor skill learning and performance (table 5) presents the components which should be taken into consideration in the learning process. It is based on situation-based learning approach and begins by defining the outcome intended to learn. (Coker 2018, 2-3.)

Table 5. Integrative model for facilitating motor skill learning and performance



(Coker 2018, 3.)

Furthermore, when considering the understanding and facilitation of motor skill acquisition and performance, the interaction between three elements – the learner, the task, and the environment are primitive and important to take into consideration. (Coker 2018, 2-3.) Defining, adjusting and changing the skills wanted to learn, and the learning environment are the basic factors of skill learning. One of the most important range of responsibilities for teachers is to create learning exercises and environments that support the learning process. The exercises, and environment that meet the level of the learner´s acquired knowledge, support the development of the learner´s motivation, cognitive functions, and the skill itself. (Jaakkola 2010.) Once the current learning situation has been defined, practitioners are able to contemplate and plan how to implement the learning experience. Next phase consists of practitioner entering a periodic process, beginning with the perception of the learner´s performance attempts. By perceptions of process evaluation (performance of the skill) and product evaluation (the outcome of the performance) made, the learner´s progress towards skill achievement is assessed, and critical faults identified and emphasized. The strategies of intervention for skill improvement are then chosen and realized, which consider the learner, the task, and the environment again and its mutual interaction with the other two elements are continuously changing. Performance is onward observed and the success of the intervention assessed. Consequently, chosen strategies of intervention are either continued or adapted as the learner aspires towards the intended outcome. (Coker 2018, 2-3.)

7.4.1 Adjusting the task and the learning environment

The essential questions in skill learning situation is, how much variation the task and the environment should contain. Should one task always be a standard, which is repeated, or is it more effective to variate different tasks after few repetitions? Should the learning environment always be the same, or would it be more effective to variate it as well, i.e. changing equipment, bases, and gradients? Studies show, that when learning skills, especially new ones, it is more effective to variate the learning environments and tasks. However, when trying to improve and develop one specific skill faster, repetition and maintaining the same learning environment works better. In skill learning, especially with skills performed in varied environments naturally, variation and adaptation are the key points. (Jaakkola 2010.) Nonetheless, when teaching children, repeating exercises one after another without any fun or creative components, it is not the most meaningful method to learn. By varying the learning environment will always add more and new interest into learning in practice. The educator should be able to support pupils´ learning process, by taking the practice into different environments, varying bases, equipment, and gradients in order for making the learning interesting, inspiring and constructive. (Sääkslahti 2015, 179.)

Additionally, there are different ways of teaching and practicing FMS, depending on the characteristics of the skill. Overall training is better when teaching a skill that is not complicated, but consists of movement patterns that are closely connected to each other, whereas component training is better way to practice skills that are more complicated, but the movement patterns are not so closely connected. The complexity of the skill and how the patterns of the movement are formed among themselves, help the teachers in the practice to understand better if overall- or component training in that case is more effective way to teach. Generally, the skill is always more complex, when more body parts need to be used, and when more cognitive requirements the skill sets. In this context, complexity is not the same as challenging, since complex skill can be easy to perform and vice versa. The formation of the movement patterns in this context refers to how the necessary movements of a skill are connected to each other. Some skills require more formation or control of movement patterns between different movements than others. (Jaakkola 2010.)

When teaching PE for children, the important elements for the educators are creating and offering inspiring -, and using gradually more challenging learning environments. (Heikinaro-Johansson & Huovinen 2007, 40.) Pupils need to feel joy, excitement, and success and experience positive atmosphere for learning. (Sääkslahti 2015, 179.) Furthermore, it is important to give children enough time for versatile and creative experimenting.

When the teacher subtly guides the activities, the learning environment together with the guidance of the teacher help the child to find the correct movement patterns to perform in different environments. At the same time, common premises for learning are created, and when the activities are planned and implemented, it challenges the physical load of cardiovascular system of the children, and their fitness level improves. (Heikinaro-Johansson & Huovinen 2007, 40.)

8 The KENFIN EDURA project

8.1 Educational collaboration between Kenya and Finland

As this thesis is a part of a larger educational collaboration between Kenya and Finland, it is also essential to explain the main purpose of the project. The KENFIN EDURA (Kenya-Finland Education and Research Alliance) stands for developing higher education and research capacity to direct the PA and nutrition transition in Kenya. The KENFIN EDURA is a three-year project (2017-2020) funded by the Finnish Ministry of Foreign Affairs and coordinated by the Finnish Agency for Education (EDUFI). The project is executed in a collaboration between Kenyatta University; Department of Recreation Management and Exercise Science and; Department of Sport and Leisure Management (Nairobi), Haaga-Helia University of Applied Sciences, and University of Helsinki; Department of Food and Environmental Sciences. (KENFIN EDURA 2017.)

The background for this collaboration is Kenya´s rapidly increasing PA and nutrition transition, as in many other African countries. Now that different technological devices are coming available quickly, these sorts of transitions are leading to a serious public health crisis related to non-communicable diseases. Therefore, as Finland is already ahead of the development, when considering the growing technology, the collaboration between these two countries was funded. (KENFIN EDURA 2017.)

8.2 The purpose of the KENFIN EDURA

The KENFIN EDURA project aims to develop new study programmes, to increase multidisciplinary collaboration within the curriculum, to train teachers and researchers by specific training, exchange visits and several “learning by doing” approaches in the new curriculum, to develop and improve the use of modern, mobile technologies as pedagogical tools in teaching and also practical health promotion. The project aims to build capacity to strengthen the role and relevance of their institutions in societal development, especially in the background of the PA and nutrition transition, and to enhance the research capacity in the field of healthy lifestyle and obesity in Kenya. (KENFIN EDURA 2017.)

The project wants to offer expertise and information with the aim of improving quality of higher education and the research environment, in particular regarding health promotion and healthy lifestyle, and share the best practices with a goal of enhancing systems and capacity to support quality of teaching and research in their institutions. Furthermore, the aim is to strengthen the role of academia (Kenyatta University) in providing expertise and collaboration for practical health promotion in Kenya. The activities consist of partnership

with key ministries (particularly the ministries of health, education, and transportation), local communities and Non-governmental organizations with a mission towards health and consumer rights. (KENFIN EDURA 2017.)

8.3 My personal collaboration within the project

This thesis is based on KENFIN EDURA project, being part of creating support- and research material to develop PE in Kenya. The need was to create a practical atlas – a PE Resource book with pictures to help and support physical educators in their work in Kenya, and as the project group decided to offer this project as a thesis assignment, I got the opportunity to be a part of KENFIN EDURA project by doing my thesis based on their urge.

My role was to create content by finding, and collecting theory based on the subject, whereas my Kenyan partner in project´s role was to create pictures and part of the theory by using the background theory found by me. The emphasis of the atlas is on FMS and it is targeted for primary school pupils. In that age FMS are generally learnt already and is the period for practice them and develop the skills further in PE. The atlas is built by explaining the theory briefly and all different skills are presented as well. Thereafter, different games and activities are presented for practicing those skills creatively, and taking into consideration the age group of the pupils. Altogether, the PE Resource book is a fundamental and practical tool for physical educators in Kenya, which supports the quality education of the pupils in primary schools. As the atlas will be used in Kenya, it was also important for the project group that the activities and games are local, and known among their culture.

How I realized the process can be divided into three phases. The phase was to study the current situation of the PE in Kenya, and how the project group hoped it would be developed by the atlas. I studied and tried to understand what the work itself consists, and how I should build it to deliver the thesis as a whole. The second phase was writing the theory part, which was the main focus of my role with the whole project. I sent few versions of the theory along the process to Kenya, so they could already start with the atlas itself. The third, and final part was supposed to be the implementation part, which consists of implementing the theory into the PE Resource Book, and building a practical comprehensive guide based on the theory part. Due to my and my partner´s different ways of working within the process, the second and the third phase were more mixed, and in the end the current version of the atlas got implemented already in a quite early phase.

9 Discussion

This thesis aimed to deliver a fundamental, and comprehensive guide of teaching FMS, with pictures as a significant component, for physical educators in Kenya. The aim was to develop the fundamental PE in Kenya by supporting physical educators with a practical guide they are able to use in their work. The principal emphasis was on FMS, and how to learn them, particularly in primary school age, and how physical educators could benefit the most out of the outcome of the overall work. The whole atlas is a PE Resource Book which beside of teaching FMS, includes activities for gymnastics, kid´s games and water based skills to meet the requirements of local curriculum.

As a thesis, this was a product development assignment, which aimed to deliver a concrete outcome to be practically used in laboral life. The importance of the work was its topicality, hence Kenyan rapid changes in development need more accurate supplies to changing demands. From a Finnish perspective, the outcomes are not so much of developmental, but also important from another point of view. When Finland is ahead in education in general, and also in PE, I believe there are not so many fundamental materials or studies that focus on all the topics in the same way as this work does as a whole. Therefore, I see this work has also a lot to give to Finnish educators, or people who work in the field of PE.

In general, there are a lot of studies and resources available to support this thesis, and yet it showed and proved the importance of quality PE. It is not only to be learnt in schools, but something that gives lifelong benefits – how to live and maintain healthy, and active lifestyle throughout the whole human lifespan. PE is a unique school subject, as it teaches and offers beneficial values towards social – and active domains, which are matters everyone should embrace in everyday life. I thought it is essential to show and explain why PE and PA are so important; why people need to acquire movement skills from childhood, how it influences on academic performance, and how it has long term effects by influencing on people´s future activity- and health conditions. And my aim was to answer those questions in the text.

As writing this thesis in English, I realized there are less terminology in Finnish language based on the topic of this thesis in a whole. Some of the concepts do not have a Finnish equivalent at all, such as physical literacy, and some concepts are explained in a different way in different studies, i.e. motor competence or FMS, as they do not have an official equivalent in Finnish either, or have multiple meanings. This made parts of the writing process more challenging, but at the same time I found it better and more beneficial to do the

whole work in English, and I personally learnt a lot more about the concepts, because I needed to go through them carefully to be sure it had the right meaning in the right context.

There are a lot of resource materials to be used with the topic as a whole. Many studies have been written, and a lot of new and old theory could be found. I found the very basics the most difficult part to be explained in my text, as many resources I found and used were very specific and did not focus on the basic components that much. Topics as PE in general, and the explanation of FMS categories were surprisingly challenging to be explained, as many resources did not give further fundamental knowledge about them. I wish I could have found more resources to support some of the text I created, especially about the concept of PE, physical literacy, FMS categories, and how to teach FMS in general. On the contrary, some topics as motor competence, motor learning, and skill learning had a lot resource material to support my text, and sometimes those studies were extensive, but deeply thorough.

Academically, I feel I have learnt the most by finding and discovering resources, that are accurate and I have become more critical with reading studies and different materials. I have also understood better how PE is built nowadays based on learning FMS, and how to teach them creatively considering pupils´ motor abilities in different ages. Lots of new studies have been made about how motor competence influences on academic performance, and I have understood why PE should be taught with high quality, as it is the most important school subject when considering healthy-, and active life. Even though in Finland lots of studies have been made, and experts are ahead of the development, I have noticed that many Finnish materials are not as comprehensive terminologically as they are in English language in general.

The project was realized as a cooperation with KENFIN EDURA project, and Kenyan student, who implemented the actual guide based on the text of this work. The cooperation was not always fluent or easy, as I never met the Kenyan project group in person, and additionally cultural differences in working methods challenged it even more. The project group from Kenyan part had more haste to get the actual resource atlas ready, hence my part was mainly to focus on the theoretical part, and my Kenyan companion focused on carrying out the guide with pictures itself, using my theoretical text as a base. Cooperation with a companion and a project group from a distance turn out to be one the most challenging parts of the whole work for me, as the communication did not work as I would have hoped and the most support I got during the project was from my thesis supervisor, and basically not at all from the rest of the project group, nor my work partner. In the end, I

feel like my theory base and the atlas itself are quite separate works from each other, even though the text is principally based on my output in the theoretical part, and was used as a content. At first, the atlas was supposed to be published in October 2019, but since changing the schedule many times, the project group has postponed the publishing for spring 2020.

Theoretically, this thesis focuses a lot on motor development, motor learning, motor competence and FMS themselves – how to learn and teach them. FMS as a concept is the very primary foundation of any movement. Fundamentally, I thought it was essential to explain first the concepts and the purposes of PE and PA to understand why FMS are so important part of them and why they are being taught. The results aim to show the importance of PE, and PA in general, and how great influence learning FMS actually is for children to live a happy, active life. Motor development and –learning take a great part in the text, as it explains when, why, and how different movement skills are learnt, and how they should be considered when teaching them to children.

As the resource material is intended to be a working tool for teachers, I hoped that the importance on how different movement skills should be taught would have been explained carefully, and I hope it comes across also in the atlas, because that is the one those educators are going to use in practice. The resources I found and used are more based on how children learn FMS and sports skills generally, but not so much how teachers could effectively teach those skills to pupils. I hope I would have found even further resources to support that part of my text, because I consider it fundamentally important as a principal for quality education. In the atlas itself, there are actual activities and games presented for practicing each skill, which makes it practical for the teachers. The activities are explained with pictures and simple explanations. To make the Resource Book even more useful, it would be an idea to add and give some examples of adaptations in the activities. Those examples could be added in i.e. below each activity. Most of the activities could be adapted by changing i.e. the equipment, the timing, the amount of people participating, and the environment. Hence the activities would be suitable for all the pupils, and by small changes it would also keep up the interest towards the activities among the pupils. It is also important to take into consideration the sizes of the classes. In some cases, class can consist of ten to twenty pupils, but sometimes there can be classes up to sixty pupils. Therefore, it would also be useful to notice it in comments, and depending on activity add adaptations. Creativity is the key to keep learning interesting for pupils that age, and it is also important to take into consideration that everyone can join PE despite the experience or physical condition.

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Appendices

Appendix 1.

As the PE Resource Book has not been published yet due to schedule changes, I chose to attach here examples how the atlas has been assembled by theory, explanations, activities and pictures. All the activities are under different FMS, and the contents of the atlas are divided by FMS categories. Every FMS is explained and followed by different activities with pictures. I chose to attach some content from every category to give an idea how the actual atlas will look like when it is published. In the end of the Resource Book there are also activities for gymnastics, general kid´s games, and a whole chapter for water based activities and skills, since it is also part of PE curriculum in Kenya.

To start with, I attached also the foreword of Professor Paul Wainaina, which will appear in the atlas, the acknowledgement of the authors, and the introduction of the Resource Book itself. The actual table of contents has not been created yet.

Foreword

I am delighted to give the foreword for this physical education resource book, which will make an important contribution to the teaching, learning and research in physical education and sports in Kenya and the region. It is noted that the Kenya's Competency Based Curriculum (CBC) is very learner-centered, with more focus on the ability of the student to self-learn, be creative, innovative and develop relevant skills required during the performance of any physical activity. The CBC puts all forms of physical activity at the heart of teaching, learning and research in physical education. Physical education will have its rightful place from pre-primary to the completion of secondary education. Pre-primary will focus on developing psycho-motor skills; the lower primary will expose the learners to creative movement activities; in the upper primary the learners will advance to physical and health education. At secondary level, the learners will gradually be introduced to organized sports and basics of movement science. Thus, physical education will truly be at the heart of Kenyan CBC.

Though Physical Education has been compulsory in the Kenyan education system to date, there has been lack of adherence in implementation. The CBC provides every learner with the opportunity to be adequately exposed to and evaluated in physical education. The inclusion of Physical Education in the school curriculum is in line with the United Nations Charter on Physical Education and Sport that was proclaimed by the UNESCO Conference on 21st November 1978 in Paris, France. The conference stated that Physical Education and Sport play a major role in the all-round development of an individual.

The Charter emphasis that" One of the essential conditions for the effective exercise of human rights is that everyone should be free to develop and preserve his or her physical, intellectual and moral powers, and that access to physical education and sport should consequently be assured and guaranteed for every individual (UNESCO, 1980, p.22)."

Children and youth therefore, need opportunities to be physically active in order to grow and be happy. There is sufficient evidence that children and youth who participate actively in physical education and sports have better academic performance on average, better body image, enhances leadership qualities, and an element of team spirit compared to children who do not participate in sports. Participation in physical education and sports also develops the ability to give and take, hence inculcating the spirit of fair play. Most importantly, early appropriate exposure to physical activity inculcates the life-long lifestyle healthy active behaviours. In the long term, this active lifestyle will reduce physical inactivity-related non-communicable diseases (NCDs). Development and availability of teaching and learning resources, such as this book is therefore commendable. To facilitate smooth implementation of the CBC, this book provides a practical reference resource for all stakeholders interested in the teaching and learning of physical education and sports in Kenya and beyond.

It is my hope and expectation that this book will provide an effective learning experience and reference resource for fundamental movement skills as emphasized in the Competency Based Curriculum for children.

Prof. Paul Wainaina

Vice-Chancellor, Kenyatta University

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This resource book has been developed as a result of a collaboration between the members of staff in the Department of Physical Education and Exercise Science of Kenyatta University, Kenya, and the staff at Haaga-Helia University of Applied Sciences, Vierumaki, Finland. It has been developed as part of the capacity-building programme, The Kenya-Finland Education and Research Alliance (KENFIN-EDURA), funded by the Ministry for Foreign Affairs of Finland.

Academic staff and students at both Kenyatta University and the Haaga-Helia University of Applied Sciences, have contributed with valuable insights and comments towards its development. The illustrations photography, design and layout in the book have been undertaken by a team at Kenyatta University.

The authors would like to thank the Department of Physical Education and Exercise Science of Kenyatta University, for the support given during this project. The authors also thank the illustrators and design team for their contribution to-

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INTRODUCTION

This resource book is developed in line with the new Competency Based Curriculum in Kenya. It is an important guide for all professionals in the area of physical education and sports. The book offers a quick and comprehensive guide to all areas of focus in the pre-primary programme of the new Competency based Curriculum in Kenya. The book presents a view of knowledge about physical education learning activities for the elementary school and related pedagogy embracing both traditional and emerging activities of interest to children/learners in the specified categories across the country and the region.

This comprehensive and diverse exploration into physical education activities in pre-primary serves to firmly re-establish the place of physical education as a core discipline in schools and in the life of the learners. The resource book is designed to become an essential academic resource for physical education scholars, teachers, trainers and enthusiasts. It is noted that the learner-centred, Kenya's Competency Based Curriculum (CBC) lays a lot emphasis on the ability of the

learners to self-learn, be creative, innovative and develop relevant skills required during the performance of any physical activity. It also puts all forms of physical activity at the heart of teaching, learning and research in physical education. Consequently, Physical Education will have its rightful place from pre-primary to the completion of secondary education. Pre-primary will focus on developing basic motor skills such as locomotor skills, non-locomotor skills, water safety, swimming and gymnastics. The lower primary will expose the learners to creative movement activities; in the upper primary, the learners will advance to physical and health education. At secondary level, the learners will gradually be introduced to organized sports and basics of movement science. Thus, physical education will truly be at the heart of Kenyan CBC.

This resource book provides teachers and other stakeholder with the necessary information to ensure that learners benefit fully from participating in Physical Education related activities. There is sufficient evidence that children, who participate actively in physical education and sports, have better academic performance on average, better body image, enhances leadership qualities and an element of team spirit, compared to those who do not participate in sports. Participation in physical education and sports also leads to the development of stronger bones, declined risk of obesity, diabetes, hypertension and some types of cancer. It also promotes a better emotional health as well as promote generation of energy needed to growth, play and learning. In addition, participation in physical activities influences the development of attitudes and values such self-believe, self-respect, integrity, commitment, perseverance, courage, respect for diversity, tolerance, open-mindedness, care, compassion as well as fair and positive participation. Most importantly, early appropriate exposure to physical activity inculcates life-long healthy active lifestyle behaviours. Moreover, participation in physical activities, as envisage in the new CBC, will have direct influence on the realisation of the 'National Goals of Education' to:(i) Promote individual development and self-fulfillment; (ii) Provide opportunities for the learner to develop to his/her fullest potential; (iii) Develop the learner's interests, talent and character for positive contribution to the society and (iv) Promote sound moral and religious values.

Education also impacts on the achievement of the core competences namely; Communication and Collaboration, Self-Efficacy, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, and learning to Learn many of which will be addressed by the content of this book. Therefore, to facilitate smooth implementation of the CBC, this resource book provides a practical reference resource for all stakeholders interested in the teaching and learning of physical education and sports in Kenya and beyond.

FUNDAMENTAL MOVEMENT SKILLS

This consists of basic skills in movement, which practice both skill- and efficiency abilities. Fundamental movement skills are mainly gross motor skills. The basic skills learnt and adopted at young age are the base for a long-term impact in life (Jaakkola 2016). To be a skilled mover, the control of the locomotor movements and basic manipulative skills are required as the foundational knowledge (Colvin, Markos & Walker 2016). The basic movement skills encourage the active lifestyle throughout the humans´ life, and embracing those skills at young age can be considered as a significant factor, when trying to prevent inactive lifestyle of the modern world. Practicing basic movement skills has a versatile and positive impact on children´s and youth´s comprehensive wellbeing (Jaakkola 2016). Fundamental movement skills offer the base for competent and effectual movement and enable children to explore their environment and obtain knowledge about their world. When children obtain basic motor competence during their early years, their ability to move, to obtain fundamental movement skills is ensured (Gallahue et al. 2012). Learning these skills in childhood, create a possibility to develop cognitive skills, as motor – and cognitive development are closely connected together (Syväoja et al. 2012).

Fundamental Movement Skills Categories

Fundamental movement skills are "the basic building blocks for movement and provide the foundation for specialized and sport-specific movement skills required for participation in a variety of physical activities." They consist of locomotor skills, non-locomotor stability and manipulative skills.

LOCOMOTOR SKILLS

CRAWLING

This is moving slowly across the floor on hands and knees, most babies crawl before they learn how to walk

Activity: Ladder Crawl

Requirements:

· Carpeted space /grass

· Ladder drill rope

Ladder Walk – Start with a classic! The child should be on hands and feet facing the floor, with the seat up in the air. Ask the child to move around in this position. Engage the child in conversation as he/she walks along. Ask the child to move like a cat, a leopard or any familiar animal.

Fig:2. Ladder Bear Crawl.

WALKING

Walking is a child's first upright movement on both feet. It requires the transfer of body weight from one foot to the other, with one foot always in contact with the ground. As this takes place, a corresponding shift results in the centre of gravity of the body, bringing about the movement.

This skill is used in almost every aspect of daily living. Walking gives the child independence and freedom to move about and explore the environment.

Activity: Ladder Walk

Arrange newspaper strips to form ladder on floor. Have the pupils walk the "ladder" in different ways.

Ways to walk:

- Walk the "ladder" by stepping in the spaces. No stepping on the "rungs" now!
- With each foot on either side of the "ladder", straddle walk to the opposite end
- Role playing while walking. Tip-toe when stepping in the spaces; be a huge elephant when straddle walking

Fig; 5. Ladder Walk.

Activity: Role Play Walk

Fig:6 Role play

Encourage the pupils to role play and walk around in different ways. They can walk:

- On heels like a penguin

- On toes like a dancer

- With feet pointing outwards like a clown

- By marching smartly like a soldier

- With toes in like a pigeon

- With toes out like a duck

Call out a shape or number – square, circle, triangle, number 8 or 6.

Have the pupils walk its outline.

Ask the pupils to count and record the number of steps he/she takes to walk each outline.

Have them compare and share with you the shape or number they found easiest or most difficult to trace.

Instruct the pupils to walk the same shape or number – either holding hands or in opposite directions, giving each other high-fives as they pass each other.

RUNNING

Running is similar to walking except that in running, there is a flight phase when both feet are momentarily off the ground at the same time.

Variations of the running movement include jogging, sprinting, dodging, chasing and fleeing.

Next to walking, running is the most used locomotor movement skill required in the children's daily activities.

Activity: Free Space Running

Note: Specify the boundary of the play area before starting the activity. Use coloured plastic bottles, boxes, or cones to mark the area of play. This will help reduce risks.

Remind the pupils to be aware of their environment, especially when changing directions. This helps avoid collisions.

Have the pupils run around in a free space. When you clap once, they must change direction.

When you clap twice, they must freeze.

Let the leaners explore running in different styles. They can:

- Run, stooped down as low as possible, then gradually come upright.
- Try the reverse (from standing tall to stooping down).
- Lift knees high and clap hands while running.
- Run with arms high in the air, arms behind back, arms stiff at sides, arms swinging at sides, hands on head, hands in pockets.
- Follow the leader, who will run at different speeds (the learners can take turns to be the leader).

Activity: Role Play Running

Requirements:

· Recycled/locally available materials, such as big empty bottles or boxes, to serve as markers.

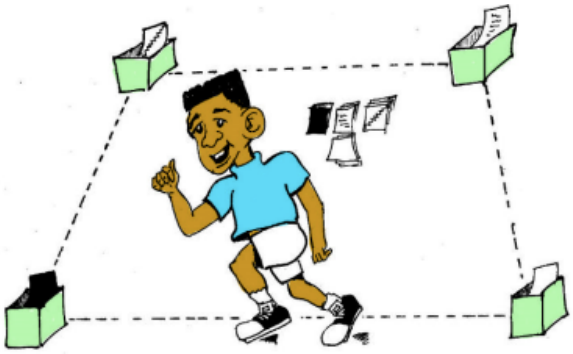

Fig:10. Role play running.

Role play with your pupils. Pretend you are the captain and he is a sailor on a ship.

Mark out the running area with four objects. Each object represents a different part of the ship (bow, stern, starboard and portside).

The sailors/children must act according to the commands given by the captain.

Action Commands:

Bow - Run to object designated as bow (front).

Stern- Run to object designated as stern (back).

Port - Run to object designated as port (left).

Starboard - Run to object designated as starboard (right).

Activity: Jumping Off a Low Stool

Requirements:

· A stable stool

· A stuffed toy

· Bean bags

JUMPING OFF A HEIGHT

Fig:11. Jumping off a height is a great thrill for children.

Jumping skills are challenging for children as they require simultaneous arm, leg and body coordination while controlling the flight phase during which both feet

are off the ground. There are three phases in the jumping: the preparatory or take-off, the flight, and the landing.

All jumping should be in shoes on relatively softer surfaces. When learning to jump off from a height, the child should start by taking off into the air from both feet at the same time and landing on both feet at the same time. This skill could be done by starting from a low height and gradually increasing the height, such as low bench, stool, chair, sofa, stairs and suitable playground equipment.

This is the ideal stage to in-grain landing resilience in children as it becomes a 'reflex' action.

Ensure the child lands with knees slightly bent and straightens them as soon as the feet touch the ground (gives a spring like action in the knees).

Fig: 12. Jumping Off a Low Stool.

Note: Ensure the stool is stable and does not topple easily.

Have the learners stand on a firm stool. Let them practise jumping off a stool.

Hold a stuffed toy/bean bag in front of and above the learner's head.

From a low crouching position on the stool, the pupil must spring forward, swinging and stretching the arms forward to touch the stuffed toy/bean bag.

Encourage the learners to jump and touch the stuffed toy/bean bag several times. Count the number of successful attempts together.

HOPPING

Hopping involves jumping and landing on the same foot, usually in a continuous and rhythmic movement. Hopping is a challenging skill for many children as it

requires balancing on a small base of supporting foot while controlling the body for continuous motion.

To hop efficiently, the non-hopping side of the body has to be the counterbalance when the body is in flight. The performer will also require leg strength to cover distance as required in skills such as hopscotch or as in keeping the body up and down continuously in rope-skipping.

Activity: Alphabet Hopscotch

Requirements:

· Numbered foam mats

· Small objects found at home, such as bean bags, stuffed toys or erasers

· Tape

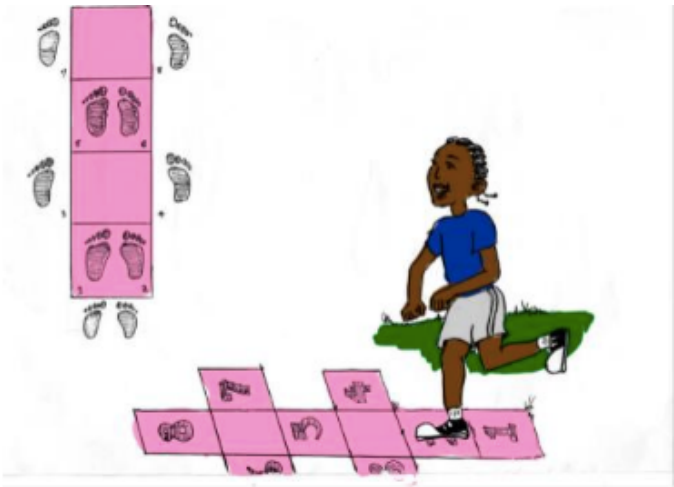

Fig:22. Alphabet Hopscotch.

Construct the hopscotch pattern on the floor with the numbered foam mats and tape. Toss a small object onto one of the mats in the pattern.

The pupil hops the pattern in ascending numbers until he/she reaches the mat with the object. He/she must pick up the object and hop back to start in descending numbers.

Where ever there are two mats next to each other (4 & 5; and 7 & 8), the pupil must land with both feet at the same time but one on each mat. Stick alphabets or words onto each foam mat. Let the pupil toss a small object onto a mat in the pattern. He/she must then call out the alphabet or read out the word on the mat loudly before hopping onto it.

NON-LOCOMOTOR SKILLS

Fig:31. Stretching

STRETCH

Stretching is a fundamental stability skill required in many aspects of daily life, in physical activity and in sports. Stretching while the body is lower to the ground is usually easier than when the body or its parts are further from the ground or in the air.

Different parts of the body can be stretched separately or together at the same time as seen when outstretching on arm and the body to reach for a book on the top shelf. Provide the child with fun-filled engaging activities to explore stretching different parts of the body while in static or dynamic balance.

Activity: Alphabet Forms

Let the pupils work in twos.

Fig:33. Children making X letter patterns.

Fig:34. Children making W letter patterns.

Get them to explore forming capital letters in the alphabet using different parts of their bodies. Begin with letters involving straight lines as in letters 'K', 'L' and 'T'.

Invite some children to show their letters and talk about how they have formed the letters using their bodies.

Challenge children in forming letters involving curved lines such as in letters 'C', 'S' and 'O', and get them to share how they worked together with their partners to form the shapes.

Lastly, encourage children to form letters involving both straight and curved lines as seen in 'P', 'D' and 'G'.

Activity: Back to Back See-Saw

The pupils' partner with someone approximately the same size. Have the learners position themselves back to back with their partners.

The pupils interlock their arms at the elbows. Alternating with each other, bend such that the lift their partner is lifted on to his/her back.

Fig:35. Back-to-back see-saw.

PUSHING

The act of pushing is using force to move something away from you

Activity: Pedal Power

Fig:42. Alternating cycle-push.

Working in twos, pupils sit facing each other. They may lean on their elbows for support. Keeping the knees bent, raise the feet and place the soles of the feet against those of the partner.

Instruct the pupils to:

- Alternating the sides, cycle-push against the partner's feet by straightening and bending the knees.
- Push hard and fast for 20 counts, then slowly for 20 counts
- Do double pushes in each position such that the pupils push, retreat and push twice on one side before changing to do the same on the other side)
- Try combinations of such double push, double push, single, single, single

MANIPULATIVE SKILLS

BOUNCING

Bouncing requires the learner to track the up and down movement of a ball, and pushing/patting/ it down firmly to ensure rebound Bouncing can be done on the spot (stationary), or on the move.

Fig: 57. Bouncing.

Activity: Drop and Catch

Requirements:

A ball

Fig: 58. Drop and catch

Ask the pupil to drop the ball and catch it from a stationary position (Drop-catch).

Gradually introduce repetitive gentle pats on the ball.

Variations:

- While kneeling on one knee
- While kneeling on both knees
- In a wide sitting position
- With each consecutive bounce, alternate between standing and kneeling positions
- While walking in a circle

Advanced skill: while the pupils continue bouncing the ball, the teacher will call out.

Without stopping the bouncing, the pupil looks up to shout out the number of fingers held up by the teacher.

Activity: Hula Hoop Bounce

Requirements:

· A hula hoop or tape

· A ball

Fig:59. Hula Hoop Bounce.

Group the learners into pairs, place a hula hoop between them, or use the tape to form a circle on the floor.

Instruct them to stand two giant steps away from the hula hoop, facing each other.

Let the learners this is a recurring spelling mistake bounce the ball to each other. With each bounce, the ball must hit the floor inside the hula hoop or circle.

Note: Encourage the learners to tap the ball with greater strength. This will help the ball bounce in the centre of the hula hoop, and then out to the catcher.

Make sure the fingers are spread and the ball is pushed with consistent force.

GYMNASTICS

STATIC BALANCE

Static Balance is one of the most fundamental movement skills. It is the body's ability to maintain stability/equilibrium on a small base of support. It is reflected in the body's ability in maintaining a stationary position with control while performing a task. It is critical in sporting activities when catching, bouncing, or executing a two-handed sidearm strike.

To achieve static balance, the body's centre of gravity needs to remain stable within a base of support. A body is more stable when it is supported over a wide base of support with the centre of gravity near to, and/or directly over, the base of support.

A narrow base of support and a centre of gravity far from, and/or outside, the base of support create instability and affects static balance.

Activity: Can you balance …?

Requirement:

· Mats.

Fig:68. Balancing on one foot.

Can you balance …?

- On one body part: on your side, back, front, shoulders, or knees
- As above but with your eyes closed

- While moving your weight from one body part to another part: from one foot, to your tummy, to your back
- On two body parts: on one hand and one knee.
- On three body parts: on one elbow, one foot and one knee.

Fig:69. Balancing on one foot

KIDS GAMES

Game: Hopscotch

Requirement:

· A hopscotch diagram or chalk if necessary;

· an object, for example, a bean bag for a marker

Number of participants: 1+

Activity level: Moderate

Movement skills: Balance on one foot, jumping, hopping

How to play:

Fig:74. Children drawing hopscotch letters.

Fig:75. Hopscotch.

The 1st player throws a marker into box number 1.

The player then hops on one foot to the end of the court, hopping over the square that contains the marker. This same player, once in the last box, turns and hops back again.

He/she must stop at the second box, balance on one foot and pick up the marker from the first box and hop out.

If this player is successful in their first round, he would then proceed to throw the marker inside box 2 and so forth. Leaners should take turns to avoid too much standing around, always starting where they left off, until someone has successfully navigated all the spaces.

A player forfeits a turn and must return to the back of the line whenever any of the following fouls have been committed: (1) failure to throw the marker fully inside the intended box; (2) stepping on a line; (3) hopping into a box that contains the marker; (4) using hands to support oneself while picking up a marker.

The first player to complete the course successfully wins the game.

Game: Kamau Says

Requirement:

· none

Number of participants: at least 6 participants

Activity level: Moderate to high

Movement skills: jumping, hopping, dynamic balance, stationary balance

How to play:

Fig:78. Simon says

Designate one learner to be Kamau, the others are the players. Standing in front of the group, Kamau instructs the players on what they must do. The players must follow only those instructions that begin with the words "Kamau Says." If Kamau instructs, "Kamau says touch your ear," the players touch their ears. But, if Kamau simply instructs, "hop," without starting with "Kamau says," players must not hop. Those that hop are out.