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THE INFLUENCE OF MOTOR DEVELOPMENT IN PRIMARY SCHOOL AGE CHILDREN IN THE LEARNING PROCESS

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Abstract

Motor development plays an important role in the learning process of elementary school aged children. Good motor development can improve learning skills, reduce emotional disturbances, and improve children's social development. One important influence of motor development on the learning process is the child's ability to control their body movements. Children who have good motor development can move their bodies with better coordination, which can improve gross and fine motor skills. However, children with poor motor development may have difficulty participating in physical activities, which can affect their interests and learning skills. Therefore, it is important for teachers and parents to support their children's motor development through physical exercise and activities appropriate to their age and abilities. In conclusion, the influence of motor development on the learning process of elementary school aged children is very important. Children who have good motor development can be more effective in learning and have a higher interest in physical activities. Therefore, educators and parents should focus on developing children's motor skills in an effort to improve their learning skills and help them grow as a whole. This journal article investigates how the motor development of elementary school-aged children influences their learning. The extent to which children's motor development can be influenced by their ability to participate in learning at school is the aim of this research. The research method involves a literature study method which contains observations of elementary school age children and focuses on their motor skills, including hand-eye coordination, fine motor skills, and gross motor skills. The research results show that better motor development can help children learn better. These findings show that children's motor development is very important in basic education and can improve the quality of learning.

Keywords : Motor Development, Children, Learning Process

Introduction

Education of elementary school age children is an important step in creating an educational foundation(Setianingsih, 2018). Education for elementary school age children is very important to build skills and knowledge that will guide them towards a bright future. Primary school children's education must be holistic, integrating cognitive, emotional and social aspects to produce balanced individuals(Nasir, 2015). In situations like this, it cannot be ignored that motor skills, in addition to cognitive aspects, are also very important for children's learning abilities. Motor ability is a person's ability to display broader motor skills and it is clarified that motor ability is a general ability related to the performance of various motor skills or tasks.(Sukadiyanto, 1997). Motor skills include many things that require the use of muscles and body movement, such as writing and drawing, and actively participating in sports. A child's motor ability is a person's capacity related to the implementation and demonstration of a skill that is relatively inherent after childhood(Lutan, 1988). Children's motor development is

very important for their learning abilities in addition to their academic skills. Motor skills are the ability to use muscles and body movements, which are important for daily activities such as writing, reading, and actively participating in classroom activities. Motor abilities are physical skills that include body movements, coordination, and skills needed to perform physical activities well(Danim, 2007). Education for elementary school age children is very important to build academic skills and knowledge that will help them have a bright future. However, other important elements such as children's motor development are often ignored. Motor skills, which include physical movement and muscle coordination, are essential for children's involvement in daily activities such as writing, reading, and studying in class. However, although motor skills are very important for the learning of elementary school-aged children, there is little research that thoroughly examines how these abilities affect their learning. Understanding the relationship between motor development and learning can offer a more holistic and supportive educational approach for children at this important stage of their development.

Research Methodology

In this research, a type of literature study or what is also known as a literature review is used. A literature study is a systematic research approach to identifying, evaluating, and integrating all or most of the relevant research on a particular topic(Fink, 2019). Through literature analysis, researchers can understand how motor development in elementary school-aged children influences the learning process. The literature study methodology aims to understand the conceptual framework that has been used in previous research on the same or related topics, which can help researchers build conceptual frameworks for their research.(Booth, Papaioannou, & Sutton, 2012).

Result & Discussion

Children's Motor Development

Motor ability is an individual's ability to move effectively and efficiently according to the situation and goals(L. Gallahue & Ozmun, 2015). Motor skills have a close relationship with education, especially in the context of physical education and physical skill development. Therefore, children's motor skills need to be developed from an early age. Developing children's motor skills is an important part of their development and growth. Motor skills consist of the ability to move the body as a whole, known as gross motor skills, and the ability to control fine movements, such as picking up or arranging objects, known as fine motor skills. During this process, the nervous system, muscles, and sensory perception work together in very complex ways. Optimizing the development of children's motor skills is important to ensure that they can face the physical and cognitive challenges around them. Good motor skills are essential for learning, interacting with others, and playing. In this case, it is very important to understand children's motor development at every stage of their growth, from babies to teenagers. By understanding children's motor development, parents, educators and health professionals can provide the right encouragement and direction to help their children develop fully.

Gross and Fine Motor Development in Early Childhood

In his book,(Haeruddin & Sutarna, 2020)states that motor development includes fine motor skills and gross motor skills. Fine motor skills are abilities related to physical skills involving small muscles and eye-hand coordination. Meanwhile, gross motor skills are abilities related to physical skills that involve large muscles. Each child will develop different motor skills, but the process of learning and mastering physical activities is generally the same, for example, before being able to ride a bicycle smoothly, a child will fall and get up first. The elementary school phase or age (7-12 years) is characterized by agile motor movements or activities. Therefore, this age is an ideal time to learn skills related to motor skills, both fine and gross, which can be explained as follows:

Table 1. Children's Motor Classification

Fine Motor	Rough motoric
Write	Line of march
Draw or paint	Martial arts (such as pencak silat and karate)
Typing (computer)	Exercise
Similar (like making crafts from clay)	Swim
Sew	Athletics
Make crafts from paper	Playing football, etc.

Source:(Yusuf, Psychology of Child and Adolescent Development, 2012)

Briefly about the achievements in gross motor and fine motor development during early childhood can be described in the table below(Hasanah, 2016):

Table 2. Gross Motor and Fine Motor Development Aged < 3 Months – 12 Months

No.	Scope of Development	Level of Developmental Achievement			
		Age < 3 months	**3– < 6 months**	**6 – < 9 months**	**9 –<12 months**
1.	Rough motoric	1. The reflex grasps objects that touch the palm of the hand 2. Raise your head when you lie face down 3. Prone 4. Roll right and left.	1. Grabs an object in front of him 2. Lie on your stomach with your chest lifted and both hands supporting you 3. Sit with assistance	1. Throwing objects held 2. Crawling in all directions 3. Sit without assistance 4. Stand with help. 5. Clap the hands.	1. Attract affordable objects 2. Walk by holding on 3. Walk a few steps without assistance 4. Make a movement to kick the ball
2.	Fine Motor	1. Playing with fingers and toes 2. Holds objects with five fingers	1. Putting objects in the mouth 2. Transferring toys from one hand to another	1. Holding objects with the thumb and index finger 2. Squeezing	1. Scratching the head 2. Holding small or thin objects (e.g. pieces of fruit or biscuits) 3. Banging or tapping toys.

Source: Minister of National Education Regulation No. 58 of 2009 dated 17 September 2009 concerning Early Childhood Education Standards. P.3.

Table 3. Gross Motor and Fine Motor Development Aged 12 Months – < 4 Years

No.	Scope of Development	Level of Developmental Achievement			
		12 – < 18 months	**18 – < 24 months**	**2 –<3 years**	**3 –<4 years**
1.	Rough motoric	1. Walk alone 2. Climb stairs or higher places by crawling 3. Kick the ball forward 4. Stand on one leg for one second	1. Jump in place 2. Climb stairs or higher places by holding on 3. Walk back a few steps 4. Pulling objects that are not too heavy (small chairs)	1. Walk on tiptoes 2. Jump forward and backward on two feet 3. Throwing and catching the ball 4. Dance to the beat 5. Go up and down stairs or lower places by holding on	1. Running while carrying something light (ball) 2. Go up and down stairs or higher places with alternating feet 3. Climb on a fairly wide board 4. Jump down from a height of approximately 20 cm (below the child's knee height) 5. Imitate simple gymnastic movements such as imitating tree

					movements, rabbits jumping)
2.	Fine Motor	1. Holding stationery 2. Create free scribbles 3. Build a tower with three blocks 4. Holding the glass with two hands 5. Spilling things out of containers and putting them back in	1. Imitate vertical or horizontal lines 2. Put objects into appropriate containers 3. Turning the pages of the book even though it's not perfect 4. Tearing paper	1. Squeeze paper or cloth by moving five fingers 2. Folds paper even if it is not neat/straight 3. Cutting paper without a pattern 4. Finger coordination is good enough to hold flat objects such as toothbrushes and spoons	1. Pouring water, sand, or grain into a container (bowl, bucket) 2. Putting small objects in bottles (sticks, pebbles, seeds) 3. String beads that are not too small with a slightly stiff thread 4. Cut the paper following a straight line pattern

Source: Minister of National Education Regulation No. 58 of 2009 dated 17 September 2009 concerning Early Childhood Education Standards. Pg. 5-7.

Table 4. Gross motor and Fine Motor Development Aged 4 Years - ≤6 Years

No.	Scope of Development	Level of Developmental Achievement	
		Age 4 -<5 years	**Age 5-≤6 years**
1.	Rough motoric	1. Imitate animal movements, trees blowing in the wind, airplanes, etc. 2. Perform hanging movements (hanging) 3. Perform coordinated jumping, jumping and running movements 4. Throwing something in a direction 5. Capturing something precisely 6. Make anticipatory movements 7. Kick something purposefully 8. Utilize play tools outside the classroom.	1. Perform coordinated body movements to train flexibility, balance and agility 2. Coordinating head-hand movements in imitating dance or gymnastics 3. Playing a physical game with rules 4. Skilled in using both right and left hands 5. Carry out personal hygiene activities
2.	*Fine Motor*	*1. Create vertical, horizontal, curved left/right, slanted left/right, and circle lines* *2. Trace the shape* *3. Coordinate eyes and hands to perform complex movements* *4. Carrying out manipulative movements to produce a shape using various media* *5. Express yourself by creating art using various media*	*1. Draw according to his ideas* *2. Imitates shape* *3. Conduct exploration with various media and activities* *4. Use stationery correctly* *5. Cut according to the pattern* *6. Paste the image correctly* *7. Express yourself through*

			detailed drawing movements.

Source: Minister of National Education Regulation No. 58 of 2009 dated 17 September 2009 concerning Early Childhood Education Standards. Pg. 8-9

Table 5. Gross Motor and Fine Motor Development Aged 6 Years - ≤8 Years

No.	Scope of Development	Level of Developmental Achievement
		Age 6-<8 years
1.	Rough motoric	1. Stand on one leg without falling 2. Run straight without falling and zigzag/variably, for example through obstacles 3. Walks straight and varies 4. Jump from a height of 20 cm 5. Throw and catch a small ball from a distance of 5-10 meters 6. Combine walking and running movements 7. Combines walking, running, jumping and throwing movements 8. Roll forward/roll over 9. Can now ride a two-wheeled bicycle 10. Can dance and follow movements in rhythmic gymnastics
2.	Fine Motor	1. Drawing of people with complete body parts 2. Able to eat, drink and dress himself 3. Create or write numbers 4. Make diamond, triangle and quadrilateral shapes 5. Cuts and cuts perfectly 6. Draw according to vision 7. Imitate handwritten sentences

Source: Yuliani Nurani Sujiono, Basic Concepts of Early Childhood Education, Jakarta: PT. Index, 2009. Pp. 161-162.

Principles of Early Childhood Motor Development

Malina and Bouchard explain several principles of motor development in(Fatmawati, 2020)namely as follows:

1) Neurological maturity
   Nervous maturity greatly influences a child's ability to move, because it is the nerves that regulate the child's motor skills. When a child is born, the central nerves have not yet developed and are functioning, namely to monitor the child's motor movements. The nerves reach maturity when the child is approximately 5 years old. Large muscles regulate movements related to gross motor skills, while fine muscles control fine motor movements.
2) Order
   There are two sequences that influence a child's physical motor development, namely, first, "differentiation" which contains the gradual development of undirected gross motor movements. Meanwhile, the second is "integration", which means a child's ability to combine two motor movements. Examples include running and stopping, throwing and catching a ball, going forward and backward. So, by the time a child is 5 years old, the child already has complex motor skills. This means the child's ability to coordinate motor movements in a balanced manner.

3) Motivation
   The activity of children who do not want to stop doing physical activities is a reflection of the child's motoric maturity in a broader scope. Motivation that comes from within the child should be followed by motivation from outside, as well as preparing various facilities needed by the child, especially for physical and motor development.
4) Experience
   A sense of joy and joy is given to children through experiences carried out with exercise and movement education for children, because the development of movement will be the basis for subsequent development.
5) Teacher guidance is very necessary in developing children's motor skills.
   The needs that children need are: Expressions or expressions are done through movement, part of a child's development is through play activities, activities that can be done are in the form of drama and in the form of rhythm, and fine motor skills and gross motor skills must be done with lots of practice.

Stages of Child Development

Santrock: 2007 in(Saripudin, 2016)states that children's development certainly has certain periods, so that the stages of educating children cannot be the same depending on the child's mature age. The development period is divided into five periods, namely:

1. The prenatal period or prenatal period starts from conception to birth, takes about nine months. During this amazing time, a single cell grows into an organism, complete with a brain and the ability to behave.
2. Infancy is a period of development that continues from birth until around 18 to 24 months of age. Infancy is a time of extreme dependence on adults. Many new psychological activities begin with the ability to speak, organize the senses and physical actions, think with symbols and imitate the learning of others.
3. Early childhood is the period that occurs from the end of infancy to around the age of 5 years or six years. This period is also called the pre-school years.
4. Middle and late childhood is a developmental period that begins around the ages of 6 to 11 years, this period is also called the elementary school period.
5. Practice
   Adolescence is a period of transition in development from childhood to early adulthood. Entering this age is around 10 to 12 years old and ends at 18 to 22 years old.

Reasons why it is important to develop motor skills in early childhood

Makhmudah, et al: 2020 in (Mayar & Sriandila, 2021)stated that learning motor skills in children should ideally be done during the "Golden Age". Some of the reasons underlying the importance of developing children's motor skills are:

1. Childhood is easier to receive lessons for motor development, because at this time the child's body is still flexible compared to the body of an adult.
2. Children more easily accept new skills taught.
3. When a child is small, he has more courage than when the child is an adult.
4. Children will really like activities that are done repeatedly, so their muscles will be better trained.
5. Children have a lot of time to learn skills that involve their motor skills, because at this age they have fewer responsibilities than adults.

The development of motor skills is a very important factor for the development of a child's overall personality. Elizabeth Hurlock (1956) notes several reasons(Hurlock, 1998):

1. Through motor skills, children can entertain themselves and feel happy.
2. Through motor skills, children can move from a condition of helplessness in the first months of life, to a condition of freedom and independence.
3. Through motor skills, children can adapt to the school environment (school adjustment). At pre-school age or early elementary school age, children can be trained in writing, drawing, painting and lining up.
4. Through normal motor development, it is possible for children to be able to play and socialize with their peers, whereas abnormal ones will prevent children from being able to socialize with their peers and will even result in them being isolated or becoming fringe children.
5. Physical motor development is very important for the development of a child's self-concept or self-concept/personality.

Factors that Influence Children's Motor Ability

According to(Sujiono, 2016)emphasizes that children's motor skills will develop in line with the maturity of nerves and muscles where various parts and systems in the body are controlled by the brain. At the same time, the brain will continuously process various incoming information, so that children will have a variety of movements and produce behavior that quickly reacts to the various movements they make. Although actually there are other factors, namely genetics, nutrition, parenting patterns of parents who have various cultural backgrounds. Several things can become obstacles, but the stimulation provided will also influence children's achievements differently from each other. According to Heri Rahyubi in (Mayar & Sriandila, 2021)Factors that influence children's motor development, namely:

1. **Development of the nervous system**, which functions as a control tool for a person's motor activity.
2. **Physical condition**, a normal person experiences better motor development compared to someone who has physical disabilities.
3. **Strong motivation**, is a big capital for achieving achievements, which starts with strong motivation in mastering motor skills.
4. **Good environment and facilities,**Very necessary in supporting children's motoric development.
5. **Psychological aspect**, also affects children's motor skills, because a good psychological condition will be able to achieve good motor skills.
6. **Influence of age,**It also affects children's development, because each age has different motor skill characteristics.
7. **Gender,**It affects children's motor skills, for example when playing sports, boys are more skilled and agile than girls.
8. Talent and potential

In his book,(L. Gallahue & Ozmun, 2015)emphasizes that motor development is a continuous and complex process. They consider the importance of genetic factors, environment, and learning opportunities in children's motor development.

Family and School Efforts in the Development of Children's Motor Ability

Efforts that families must make to help children's motor development are:

1. Maintain the health of children's bodies. Healthy, clean living habits and regular exercise will help maintain healthy body growth. However, if you still have the disease, you must try to get well quickly. Because health has a big influence on motor development.
2. Feed with good and nutritious food. Good food is food that contains lots of nutrients, is fresh and healthy, and is not contaminated with dirt or disease. The good and bad of the food a child eats will determine the acceleration of physical growth.
3. Provision of facilities and infrastructure. These facilities and infrastructure factors should not cause developmental disorders in children. The unavailability of educational games at home is a factor that hinders children's motoric development. The facilities and infrastructure that can be provided by families are quite easy and very affordable and even economical. For example, by using used goods or other items that can be used as children's play facilities.
4. Provide rest time for children. To relieve fatigue and gather new energy, rest is very necessary for children. For this reason, it is normal for toddlers to rest at least 13 hours per day. So that children are not stressed, fussy and avoid health problems.

In accordance with the physical or motor development of children who are ready to receive skills lessons, schools need to facilitate the child's functional motor development. In his book,(Yusuf & Sugandhi, Student Development: Basic Courses (MKDP) for Prospective Teacher Students at Educational Personnel Education Institutions (LPTK), 2014)states the school's efforts to facilitate functional motor development, namely as follows:

1) Schools design skills lessons that are beneficial for children's development or life, such as typing, sewing, modeling or other handicrafts.
2) Schools provide gymnastics or sports lessons to students, the types of which are adjusted to the student's age.
3) Schools need to recruit (appoint) teachers who have expertise in fields related to children's motor development.

4) The school provides facilities for the continuity of the implementation of these lessons, such as the necessary equipment and a place or sports field.

The Relationship between Motor Development and Learning and Its Implications in Educational Contexts

The relationship between motor development and learning According to Piaget, motor development plays an important role in children's cognitive development. He states that when children move their bodies and interact with the objects around them, they develop more complex thought patterns and gain new experiences that help them learn more effectively. In addition, motor development directly influences language development and reading ability. The ability to read requires motor skills, especially the coordination between eyes and hands that is needed when reading. Many studies also show that the relationship between motor development and learning can lead to positive consequences in learning. Children who have good motor skills tend to have better cognitive abilities and learn more effectively. This can help them to stay focused and participate in classroom activities that encourage active and participatory learning. Implications in the educational context considering the importance of the relationship between motor development and learning, there are several implications that need to be considered in the educational context. First, during learning, it is important for teachers and educators to provide opportunities for students to move and participate in physical activities. This can help students to strengthen their motor skills, develop their understanding of the world around them, as well as build their cognitive abilities. Second, implementing various types of inclusive learning methods, such as project-based learning models, which include physical and intellectual activities, where students are given the opportunity to gain hands-on experience by solving problems and creating physical products. This can help students influence their learning environment and prepare them to acquire the knowledge and skills needed for their future. Third, provide effectiveness in modeling and guidance, providing guidance, assistance and relevant feedback, to help students develop their self-confidence and motor skills. This is important to encourage students to feel comfortable moving their bodies and not feel intimidated by new or difficult physical activities.

Conclusion

This study shows that motor development is very important for the education of elementary school age children. The results of the literature analysis show that good motor skills have a positive impact on children's academic performance, including their ability to count, write and read. These results are very relevant for building educational methods at the elementary level that are more focused and efficient. It is very important for the role of educators, including teachers and parents, to maximize children's learning potential through understanding and supporting motor development. Schools and parents can work together to create a learning environment that supports and stimulates children's motor development. However, as this study shows, further research is needed to understand additional elements that may influence the relationship between motor development and learning processes. Future, more focused research could provide deeper insight into creating educational methods that are more open and appropriate to the needs of elementary school age children. Overall, the emphasis on how important motor development is in the learning process helps enrich the discussion and practice of elementary education. These findings can be used to build a foundation for improving the quality of education at the primary level and help children maximize their learning potential.

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