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The effect of 12 weeks brain jogging based learning models to improve gross motor skill: object control skill in elementary school

El efecto de 12 semanas de modelos de aprendizaje basados en jogging cerebral para mejorar la habilidad motora gruesa: habilidad de control de objetos en la escuela primaria

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Abstract. The motor skills of children can be used to determine whether or not the child's growth and development is impaired. The aim of the study to know the effect of brain jogging based learning model improving the object control skills of elementary school students. This study was conducted using an experimental method with two groups, namely control and intervention. In comparison to traditional learning models (direct instruction), the brain jogging based learning model. This study's sample consisted of the total number of students in the subject is 60. Classes 4A and 4B have similar characteristics (age, average height/weight, sports learning material, duration, and time of sports learning implementation). Data processing was conducted using SPSS IBM 26. The mean difference in the post-test result between the control and experimental group was based on the significance of the SPSS output ($p<0.05$). Based on the output in the Independent sample t test it is known that the value of two hand striking a stationary is $0.000 < 0.05$; forehand strike of $0.000 < 0.05$; one hand stationary dribble of $0.004 < 0.05$; two hand catch of $0.000 < 0.05$; kick a stationary ball of $0.003 < 0.05$; overhand throw of $0.000 < 0.05$; underhand roll of $0.004 < 0.05$. There is a significant influence statistical analysis on two hand striking stationary, forehand strike, one hand stationary dribble, two hand catch, kick a stationary ball, overhand throw, and underhand roll ability for elementary school with the Brain jogging based learning model can be one solution to improve the performance of object control skill.
Key words: Brain Jogging, Learning Model, Object Control Skill, Gross motor.

Resumen. Las habilidades motoras de los niños se pueden utilizar para determinar si el crecimiento y el desarrollo del niño están afectados o no. El objetivo del estudio es conocer el efecto del modelo de aprendizaje basado en el jogging cerebral que mejora las habilidades de control de objetos de los estudiantes de primaria. Se trata de un estudio cuasi-experimental con un diseño de dos grupos pretest-postest. En comparación con los modelos de aprendizaje tradicionales (instrucción directa), el modelo de aprendizaje basado en jogging cerebral. La muestra de este estudio consistió en el número total de estudiantes en la asignatura es de 60. Las clases 4A y 4B tienen características similares (edad, promedio de estatura/peso, material de aprendizaje deportivo, duración y tiempo de implementación del aprendizaje deportivo). El procesamiento de datos se realizó utilizando SPSS IBM 26. La diferencia media en el resultado posterior a la prueba entre el grupo de control y el experimental se basó en la significación de la salida SPSS ($p<0,05$). Con base en el resultado de la prueba t de muestra independiente, se sabe que el valor de dos manos golpeando una estacionaria es $0.000 < 0.05$; golpe de derecha de $0.000 < 0.05$; regate estacionario con una mano de $0,004 < 0,05$; d captura a dos manos de $0,000 < 0,05$; patear una pelota estacionaria de $0.003 < 0.05$; lanzamiento por encima de la cabeza de $0,000 < 0,05$; giro bajo la mano de $0.04 < 0.05$. Hay un análisis estadístico de influencia significativa en el golpe estacionario con dos manos, el golpe de derecha, el regate estacionario con una mano, la captura con dos manos, patear una pelota estacionaria, lanzar por encima de la cabeza y rodar por debajo de la mano para la escuela primaria con el modelo de aprendizaje basado en Brain jogging puede ser uno solución para mejorar el rendimiento de la habilidad de control de objetos.
Palabras clave: Jogging cerebral, modelo de aprendizaje, habilidad de control de objetos, motricidad gruesa.

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Introduction

Motor science is the study of movement. Motor science is taught to children as early as possible so that they can develop the quality of their movements for as long as possible. The motor skills of children can be used to determine Bones, muscles, and the nervous system are all components of motion. Gross motor skills and basic motor skills are closely related in children (Nugroho et al. 2021).

Children's basic movement abilities are divided into three categories: locomotor, non-locomotor, and manipulative movements (Oñate-navarrete, Batalla-flores, and Páez-herrera 2023). The third movement is a gross motor movement because its characteristics involve the large muscles in the human body. Tools for sports learning are required by students to support physical activity at school in order to improve children's motor skills (Fernandez B, Soto J 2023). According to research findings, elementary schools are unable to prepare the necessary facilities and infrastructure for sports learning (Hendriadi 2021).

Despite the fact that the availability of facilities and infrastructure can facilitate sports learning activities, when measuring elementary students' basic movement abilities, research shows that the manipulative element or object control skill is the lowest element when compared to the two locomotor and non-locomotor elements (Mashudi and Nurrochmah 2022). This occurs because students do not have the opportunity to practice using a tool while playing during sports hours (Arias et al. 2023). Students' ability to control objects will not be maximized automatically. Students can master the control skill object when the sports teacher provides the child with an object to play with(Valle 2010). The introduction of manipulative movements at school will be ineffective if there are no objects, facilities, or infrastructure (Hendriadi 2021).

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The ability to control an object with one's hands or feet is known as object control. The child's ability to align his feet and hands on an object will train his visual perception automatically. As a result of the study's findings, children who struggle to read are weak due to their visual abilities (Sarajar 2021). To help children improve their visual perception, it is crucial for a sports teacher to train the object control skill element in elementary students. Brain jogging is a popular sport in Germany. Lifekinetic is an adaptation of brain jogging. Activity characteristics Brain jogging includes elements of coordination, visual training, and cognitive training. Thus, Brain Jogging is an application of the appropriate learning model used to train elementary students' visual perception.

Object control skills are motor skills that involve using hands or feet to control items or objects (Temple et al. 2016). This skill plays an important role in the development of children because the ability to control objects affects their ability to participate in a variety of physical activities and sports (Adolph and Franchak 2017). However, children's object control abilities have been declining recently (Mera E. Armijos J. Luarte C. 2022). Sedentary lifestyles, excessive use of technology, and changes in traditional playing patterns may be contributing to this decline (Chovanovà and Majherovà 2016). Children's ability to participate in sports, group play, and other physical activities can be hampered by a lack of object control skills (Cook et al. 2019), (Draper et al. 2012).

Object control is thus the ability to control objects with one's hands or feet. The ability of a child to align his feet and hands on an object will automatically train his visual perception (Boyd et al. 2015). According to the research findings, children who have difficulty reading become weak due to their visual abilities(Kaiser et al. 2015). A sports teacher should train elementary school students on object control skills to help them improve their visual perception. In Germany, brain training is a popular sport. Life kinetic is a brain-jogging adaptation. Coordination, visual exercises, and cognitive exercises are some of the characteristics of Jogging brain activities. Thus, Brain Jogging is the use of an appropriate learning model to train elementary students' visual perception. (Kaiser et al. 2015), (Appelbaum and Erickson 2018). Therefore, the objective of this research was to examine the effect of brain running training on improving the object mastery skills of elementary school students in the context of the problem of developing movement object mastery skills.

Brain jogging is an exercise that uses a variety of simple tools to keep children entertained. Brain jogging characteristics include challenging activities that motivate students to complete these challenges. According to (Tafaqur dan Komarudin 2017), brain jogging is a mental exercise model that combines cognitive and multitasking exercises; thus, brain jogging training incorporates coordination, cognition, and visual exercises. Training with varied and challenging brain movements in brain jogging is capable of building new synapses in the brain, resulting in higher performance and information processing speed in our brains, as well as compensating the brain for damage (Kane, 2016).

Furthermore, by studying various forms of movement training and requiring good visual perception, the sensory and motor nerves provide stimulation to the brain, increasing nerve cell cooperation and the formation of branching brain cells (Thomas et al. 2018). New synapses will form as a result of the formation of many neuron cells. Synapses formed as a result of brain jogging exercises will increase the excitability of nerve cells to motor movements, resulting in improved mobility (Jolles and Crone 2012). The study purpose was testing the effect of brain jogging exercises on improving the object control skills of elementary school students against the backdrop of the problem of developing object control skill movement.

Method

Subjects / Participants

This study was conducted using an experimental method with two groups, namely control and intervention. This study's Population consist 60 students, divide two class 4A and 4B. Classes 4A and 4B have similar characteristics (age, average height/weight, sports learning material, duration, and time of sports learning implementation). Two classes have similar characteristics ratio of the number of men and women is also the same proportion 25 boys and 5 girls. Sampling technique using total sampling technique. So, sample consisted of 30 students from grade 4 elementary school, divided into parallel grades A and B. the researcher decides to use class A as an intervention group with a brain jogging-based learning model and class B as a control group with traditional learning models (direct instruction). The brain jogging based learning model previously obtained content validity through Aiken V analysis of 7 expert judgments with an average of V 0.87 indicating high validity. Table 1 shows the results of the content validity of the brain jogging based learning model to make it easier to see.

Table 1.
The Content Validity of The Brain Jogging-based Learning Model

No	Expert Judgments							V	Mean Validity
	I	II	III	IV	V	VI	VII		
Amount	127	126	138	132	123	129	132		
Item	Material Activity							0,85	0,87
	Safe							0,9	
	Convenience							0,87	
	Suitability							0,89	
	Practicality							0,85	
	Goals Appropriate							0,86	

Research Design

Students who receive the brain jogging based learning model treatment twice a week for 45 minutes have an average attendance rate of 90%. Each game/activity name has a goal that is specific to the brain jogging sub-training item. Table 4 lists the games used to treat the intervention groups. The teacher's gave games/activities variety, because

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students are not bored. Each learning meeting is handle by a sport education teacher and accompanied by one class teacher. while the control groups are treated with conventional models namely direct instruction with exploration, elaboration, and confirmation.

Research Instruments and Procedure

The 3rd Ulrich motor development test measures the growth pattern of fundamental motor development skills of children aged 3 to 13 years. The test consists of two object control skill and locomotors skills. The research only use the obect control skills consists of seven sub-tests including two hand striking a stationary, forehand strike, one hand stationary dribble, two hand catch, kick a stationary ball, overhand throw, and underhand roll. An adaptation of the TGMD III dale ulric instrument was used in this study (Aktop et al. 2013). The instrument's validity was previously known to be 0.819, and its reliability was 0.990. As a result, it is stated that the instrument used meets the requirements for valid and reliable use in measuring the gross motor skills of children in Indonesia (Pratiwi 2016).

Statistic Analysis

Data processing was conducted using SPSS IBM 26. The first step involve comparing descriptive data with the size of the entire population and the distribution of variables the mean and standard deviation (SD) were determined. Furthermore, the independent sample t-test analysis was applied to determine the effect of 12 weeks Learning of brain jogging based learningmodel in the intervention group. The basis of decision-making referenced in independent sample t-test: 1) if the value of significance or asymp.sig (2-tailed) < 0.05 then hypotheses are accepted; 2) if the value of significance or asymp.sig (2-tailed) > 0.05 then the hypothesis is rejected. The following is the descriptive result covering several aspects of gross motor skills: object control skill subtest (two hand striking a stationary, forehand strike, one hand stationary dribble, two hand catch, kick a stationary ball, overhand throw, and underhand roll)

Results

The mean difference in the post-test result between the control and intervention group was based on the significance of the SPSS output ($p<0.05$). Based on the output in the Independent sample t test it is known that the value of two hand striking a stationary is $0.039 < 0.05$; forehand strike of $0.009 < 0.05$; one hand stationary dribble of $0.039 < 0.05$; d two hand catch of $0.000 < 0.05$; kick a stationary ball of $0.004 < 0.05$; overhand throw of $0.002 < 0.05$; underhand roll of $0.020 < 0.05$. Therefore, as the basis of the decision-making of the Independent sample t test test can be concluded that the hypothesis is accepted. So it can be said that there are significant differences in the value of control groups and intervention. Because there is a significant difference, the formulation of research problems is answered, namely the influence of 12 week Brain Jogging based learning model (table 5,6).

The coordination system, visual system, and cognitive skills are the three main components of the brain jogging based learning model used for elementary school students. Each element has several sub-training items, as shown in table 2 below.

Table 2. ′
Brain Jogging models

Brain Jogging Model	Training Items	explanation
Coordination System	Movement flow	The integration of a single movement into a continuous movement.
	Movement pattern	Combine partial movements into a single flowing movement.
	Movement change	Changing rapid movement without stopping.
Visual System	Tracking eye movement	Smooth eye movements horizontally, vertically and diagonally
	Field of view	Increase the viewing area and improve spatial perception.
	Focus	Calculate distance and speed accurately
Cognitive Skill	Working Memory	Evaluate and select several options
	Preception	Improved understanding and organizing the information received.
	Recalling Information	Enhances the ability to recall available information in times of difficulty.

Table 3.
TGMD III Object Control Skill Subtest

Gross Motor Skills Object Control Skills Subtest	Explanation
Two hand striking a stationary	Place ball on batting tee at child's waist level. Tell child to hit the ball hard straight ahead. Point toward straight ahead.
Forehand strike	Hand the plastic paddle and ball to child. Tell child to bounce and hit the ball toward the wall
One hand stationary dribble	Tell the child to bounce the ball 4 times without moving their feet using one hand, and thenstop by catching the ball.
Two hand catch	Mark off 2 lines 15 feet (4.6m) apart. The child stands on one line and the tosser stands on the other line. Toss the ball underhand to the child aiming at the child's chest area. Tell the child to catch the ball with 2 hand,
Kick a stationary ball	Mark off 1 line about 20 feet (6.1m) from the wall and a second line 8 feet (2.4m) beyond the first line. Place the ball on the first line closest to the wall. Tell the child to run up and kick the ball hard toward the wall
Overhand Throw	Attach a piece of tape on the floor 20 feet from the wall. Have the Stand behind the tape line facing the wall. Tell the child to throw The ball hard to the wall
Underhand roll	Attach a piece of tape 15 feet (4.6m) from the wall. Have the child stand behind the tape line facing the wall. Tell the child to throw the ball underhand and hit the wall

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Tabel 4.
List of Brain Jogging Based Learning Models Used to Treat the Intervention Group

Week	Training Items	Name of the Game
1-2& 7-8	Movement flow	Bouncing; duration 15'
	Movement patern	Holahoop jump; duration 20'
	Movement change	Knowing your body; duration 15'
3-4& 9-10	Tracking eye movemen	Look at the patern ; duration 15'
	Field of view	Move and spin ; duration 15'
	Movement Flow	Brings a ball ; duration 10'
	Focus	Brings a marbels ; duration 10'
5-6& 11-12	Working Memory	Catch a ball ; duration 15'
	Preception	Throwing and cacthing ; duration 10'
	Recalling Information	Looks behind ; duration 10'

Tabel 5
Descriptive Result of Pre and Post Test

Group	Object Control Skill	Pre-test		Posttest	
		Mean	SD	Mean	SD
Control	Two Hand Striking a Stationary	3.10	0.607	3.30	0.51
	Forehand strike	2.73	0.691	2.80	0.484
	One hand Stationary Dribble	2.83	0.648	3.30	0.507
	Two Hand Catch	2.43	0.626	2.50	0.509
	Kick a Stationary Ball	3.23	0.568	3.57	0.504
	Overhand Throw	2.67	0.547	3.03	0.556
	Underhand Roll	3.43	0.728	3.80	0.610
Experiment	Two Hand Striking a Stationary	3.07	0.944	4.07	0.691
	Forehand strike	2.73	0.740	3.50	0.572
	One hand Stationary Dribble	2.83	0.950	3.67	0.498
	Two Hand Catch	2.77	0.568	2.97	0.183
	Kick a Stationary Ball	3.23	0.898	3.90	0.305
	Overhand Throw	2.80	0.805	3.77	0.430
	Underhand Roll	3.07	0.907	4.33	0.758

Tabel 6.
An Independent Sample t-tes of Post-test control and Experiment Results

Variable	Mean	N	Std. Deviation	Signification
Two Hand Striking a Stationary				
Control	3.30	30	0.651	0.000
Experiment	4.07	30	0.691	
Forehand strike				
Control	2.80	30	0.484	0.000
Experiment	3.50	30	0.572	
One hand Stationary Dribble				
Control	3.30	30	0.507	0.004
Experiment	3.67	30	0.498	
Two Hand Catch				
Control	2.50	30	0.509	0.000
Experiment	2.97	30	0.183	
Kick a Stationary Ball				
Control	4.06	30	0.504	0.003
Experiment	4.08	30	0.305	
Overhand Throw				
Control	3.57	30	0.556	0.000
Experiment	3.90	30	0.430	
Underhand Roll				
Control	3.80	30	0.610	0.004
Experiment	4.33	30	0.758	

Discussion

In response to this decline, several studies [7–10] proposed brain jogging-based learning models as a strategy for improving object control skills in children. Between the ages of 13 and 15, children's and adolescents' brains undergo dramatic changes (Rizkyanto et al. 2022). As a result, this significant brain development during childhood and adolescence should be put to good use so that brain-centered cognitive functions can also improve (Kane, et.al, 2016). Physical activity, sports, and movement are used to maintain brain health and function (Awwaludin, Komarudin, and Muhtar 2018). According to CDC (Centers for Disease Control and Prevention) research, physical activity can affect brain physiology by increasing the growth of blood capillaries, blood flow, oxygenation, production of neurotrophins, growth of nerve cells in the hippocampus (center of learning and memory), neurotransmitter levels, development of nerve connections, density of nerve tissue, and volume of brain tissue (Force 2013).

As a result, this learning model combines structured physical exercise with activities that stimulate the brain, such as cognitive games and problem-solving tasks. Children's basic movement abilities are classified into three types: locomotors, non-locomotors, and manipulative (Asrianti et al. 2020),. These basic movements are known as gross motor movements because they involve the large muscles of the human body (Komaini et al. 2022), (Bezerra-santos et al. 2023).

The brain jogging training is designed to stimulate the brain's working system, resulting in improved cognition/concentration, motivation, intelligence, multitasking, memory and attention, stress resistance, and fitness (physical fitness) (Rosmi 2017). Brain Jogging is a type of exercise that helps with both the need to move and learning activities such as remembering, feeling, seeing, and so on (Rizkyanto et al. 2022). The combination of physical activity, mental training, and visualization training has enormous brain benefits, which will, of course, have a direct effect on cognitive function. According to (Arazi, Dadvand, and Suzuki 2022), brain jogging movements such as multitasking, coordination, and agility movements stimulate cooperation between brain hemispheres and between parts of the brain.

Furthermore, learning various forms of movement training that require high concentration will stimulate the brain, increasing nerve cell cooperation and the formation of brain cell branches (neurons). Beck (2008) in (Akbar, Priambodo, and Jannah 2019). With the formation of many neuron cells, new synapses are formed. The synapses that form will later multiply nerve impulses, which will translate messages from the motor and sensory nervous systems to the human body's limbs (Hermanto, Kandarina, and Latifah 2020).

A synapse is the name given to the connection between the axon of one neuron and the dendrites of the next neuron. It is derived from the Greek word for connection. Synapses are neuronal connections that are also known as switches. This necessitates the development of a mechanism to send neural messages from one neuron's axon to the dendrite or cell body of the next neuron, or from the neuromuscular junction to the muscle (Lestari, Mulyani, and Susanti 2016). The junction contains impulses, which are transmitted through this gap by neurotransmitters, which are special chemical transmitters. Neurotransmitters include acetylcholine, which is found in synapses throughout the body, noradrenaline, which is found in the sympathetic nervous system, as well as dopamine and serotonin, which are found in the brain (Agung, Suyanto, and Aminatun 2020).

Physical activity/exercise produces the hormones serotonin and dopamine (Hermanto et al. 2020). The two hormones are transported from the axon to the dendrite via

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simple diffusion. The fast transmission that occurs at the synapse is caused by the proximity of the distance that must be traversed and the fast diffusion. The synapse is very important functionally because it regulates the flow of impulses through the nervous system. Not all impulses that reach the synapse are transmitted to the next neuron. Synapses determine the human response to a specific stimulus by regulating the passage of impulses through the nervous system, one of which is reflex action. Object control is one of the motion stimuli.

Because this movement has two types of movement skills, receptive and propulsive, object control skills require the ability of the nerves to coordinate with each other. Receiving an object, such as catching, and exerting force or strength on an object, such as hitting, throwing, bouncing, or kicking, are examples of receptive skills (Rahman, Simatupang, and Sinulingga 2021). According to research findings, various basic manipulative movements/object control skills will require coordination between parts of a person's body such as eye-hand coordination (when catching, throwing, and hitting an object), eye-foot coordination (when kicking and herding an object), and these two coordinations are later required when participating in specialized sports activities (football, badminton, basketball, volleyball, and so on) (Rahma and Kastrena 2020). According to (Mashudi and Nurrochmah 2022), the basic movements of object control skills are complex basic movements because a person manipulates objects with all parts of his body. This manipulative/object control skill movement is classified into two types: 1) Preoccupation movement: a combination of reflexes and coordination with the ability to observe and comprehend activities. A baby, for example, holds an object due to the cooperation of flexion, grasping, and inhibitory reflexes. 2) Dexterity movement: the ability of the hands and fingers to do things like arrange dice, draw, and play the ball(Mashudi and Nurrochmah 2022).

A useful way to describe how someone can actually learn a movement skill is that they must go through three stages before they can master a skilled movement (Anton Komaini 2019) (1) The cognitive phase is the first stage in learning movement skills because students are very focused on processing how the movement should be performed at this stage. Often, novice students at this stage are observed to be fully concentrated on what they are doing or completely oblivious to what is going on around them when they are trying to choose what they should do to perform a movement. (2) The second phase in learning movement skills is known as the associative phase. During this stage of the learning process, students can focus more on the dynamics of a skill, mastery of timing, movement skills, and coordination of the skill's parts to produce smooth and smooth movements. (3) The third phase in learning movement skills is known as the automatic phase; during this phase, students do not focus on a skill. Processing has moved to lower brain centers, where students can focus on something else; movement responses do not require students' attention.

The ability of object control skills is supported by the development of 15 different games, with each brain jogging-based learning model game utilizing the tools used to hone students' ability of object control skills. Furthermore, the treatment was administered for a total of 24 face-to-face meetings, or 12 weeks. According to the research findings, elementary school students who had eight face-to-face meetings experienced changes in their movements (Fallah, Nourbakhsh, and Bagherly 2015). Even though students struggled to implement the brain jogging learning model in weeks 1-2, the teacher's role in providing motivation to learn reawakened students' interest in implementing the brain jogging learning model. The effectiveness test employs the TGMD III instrument, with one of the subtest instruments designed specifically to assess children's ability to control objects.

Therefore, brain jogging based learning model contributes greatly to physical education, especially in the gross motor: object control skill of complex aspects.The descriptive results for the control group, pre and post test data, using conventional methods were as follows: two hand striking a stationary ball with pre-test mean (3.10), standard deviation (0.607) meanwhile, post-test mean was (3.30), and standard deviation (0.651). Forehand strike, the pretest mean was (2.73), standard deviation (0.691), post-test mean (2.80), and standard deviation (0.484). Furthermore, the pre-test results for One hand Stationary Dribble a mean of (2.83), standard deviation (0.648), post-test mean (3.30), and standard deviation (0.507). Two Hand Catch showed a pre-test mean of (2.43), standard deviation (0.626), post-test (2.50), and standard deviation (0.509). Regarding, the pre-test mean for Kick a Stationary Ball was (3.23), standard deviation (0.568), post-test (3.57), standard deviation (0.504). Also, Overhand Throw indicated a pre-test mean of (2.67), standard deviation (0.547), post-test mean (3.03) and standard deviation (0.556). while Underhand Roll indicated a pre-test mean of (3.43), standard deviation (0.728), post-test mean (3.80), and standard deviation (0.610).

The descriptive results for the pre and post test data of the intervention/experiment group using the brain jogging based learning model were as follows: two hand striking a stationary ball with a pre-test mean of (3.07), standard deviation (0.944), post-test (4.07), and standard deviation (0.691). Forehand strike indicated a pre-test of (2.73), standard deviation (0.740), post-test (3.50), and standard deviation (0.572). In addition, One hand Stationary Dribble showed a pre-test mean of (2.83), standard deviation (0.950), post-test mean (3.67), with standard deviation (0.498), while Two Hand Catch indicated a pre-test mean of (2.77), standard deviation (0.568), post-test mean (2.97), and standard deviation (0.183). Kick a Stationary Ball showed a pre-test mean of (3.23), standard deviation (0.898), post-test mean (3.90), standard deviation (0.305) while Overhand Throw indicated a pre-test mean of (2.80), standard deviation (0.805), post-test mean (3.77), and

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standard deviation (0.430). Also, underhand roll indicated a pre-test mean of (3.07), standard deviation (0.907), post-test mean (4.33), and standard deviation (0.758).

Therefore, based on these results, the intervention group with brain jogging based learning model obtained a better average score compared to the control group. The independent sample t-test data analysis was conducted to test whether the post-test control and intervention group have a difference in the mean. Based on the IBM SPSS 26 output, there was a significant difference between the two groups in terms of Two Hand Striking a Stationary (0.000), Forehand strike (0.000), One hand Stationary Dribble (0.004), Two Hand Catch (0.000), Kick a Stationary Ball (0.003), Overhand Throw (0.000), and Underhand Roll (0.004). The significance level between both groups were <0.05. Therefore, the measured post-test variables for both control and intervention group were not the same. Also, the difference in the mean value for all variables showed that the intervention group has a higher mean value. Thus the effects of 12 weeks of brain jogging learning model based training for the intervention/experiment group had a better improvement compared to the control group

Conclusion

Based on the results, the intervention group with the Brain Jogging based learning Model on two hand striking stationary, forehand strike, one hand stationary dribble, two hand catch, kick a stationary ball, overhand throw, and underhand roll ability method on show better improvement compared to the control group. Therefore, that sport and physical activity have a positive impact on brain function and health However, it turns out that many factors can affect learning and achievement of physical education learning outcomes, including teacher competence, facilities and infrastructure, and student factors As a result, this learning model combines structured physical exercise with activities that stimulate the brain, such as cognitive games and problem-solving tasks.

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