



RESEARCH ARTICLE

Implementation of Manipulative Basic Movement Learning Model Development for Students aged 5-6 years

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Abstract

This research aims to know application of learning models motion base manipulative of participants educate aged 5-6 years . Loading experimental method pre test and post test as well as skills test results motion base manipulative . Population from study This participant educate 5-6 years old totaling 120 students . Experiment 12 meetings were held . Pretest and posttest were carried out with instrument motion base throwing , catching , dribbling , kicking and bouncing the ball. Based on the results of the data normality test stated that the data was not so that data analysis with using non- parametric statistics . Test results with using Wilcoxon states there is difference between group experiment and control with sig. 0.00 . With thereby can concluded that application of learning models with a motion model base manipulative effective For increase results ability motor rough child 5-6 years old .

Keywords

Learning Models, Basic Manipulative Movements, Early Childhood

INTRODUCTION

There are three stages of movement, namely "Cognitive, Associative and Autonomous." Cognitive stage is the stage where every movement is the result of previous thoughts and experiences. The associative stage is the stage where all movements are coordinated so that they become a complete movement. Meanwhile, autonomous movements are movements that are formed and produced according to external stimuli. According to Fitts and Posner in (Tarreh, 2020). Students in the automatic stage of motor skill learning do not have

to concentrate on movement. These students can focus their energy on other areas, such as offensive and defensive situations in sports, targets in activities such as golf and archery, or the aesthetic feeling of movement in dance (Erazo-Damian, 2018).

Basic movement skills are basic movement patterns that begin to develop at the same time that a child is able to walk independently and move freely through his environment. Fundamental movement skills (FMS) are basic skills used in everyday life, and thus mastery of these skills among children and adolescents is an important

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contributor to future participation in sports and physical activity (McGrane, 2017). Fundamental movement skills are gross motor movements that are the basis for the development of more complex and specialized skills and include skills related to stability (e.g., stopping, turning, pushing), locomotion (e.g., jumping, running), and object control. (e.g., catching, kicking) (Gursel, 2014).

Achieving the advanced stage is greatly influenced by opportunities for practice, encouragement, and instruction in an environment that encourages learning (Goodway, 2019). For normal and special needs children, the fundamental stage is about learning all the basic movement skills. It is about learning to run and jump and leap and catch and throw and kick and it is also about learning to use a prosthetic arm or leg, or to become mobile using a wheelchair or walker. It is about learning all the skills that can be used in sports and physical activities later in life (Tóth-Király, 2020). These basic movement skills help participants engage confidently in a variety of sports (Byl, 2014). Basic movement skills are one of the important things in a person's movement development phase (Pangkey, 2020).

With good basic movement skills, a person can perform various sports skills. Foundational skills, sometimes called basic movement or functional skills, are the skills a child needs to function effectively in the environment (Stanton, 2016). Basic skills are basic human movements that are usually identified by a single verb, such as walking, turning, running, jumping, or stretching. Basic movement skills are “a set of specific skills that involve different parts of the body such as the legs, feet, body, head, arms and hands” (Kezić, 2018). Basic movement skills form the building blocks of everyday activities such as running for the bus, jumping over puddles, and stretching to stop a cup from tipping over (Wang, 2013). The unification method is a method and training to introduce and understand the basic movements of Running ABC which are good, efficient, and harmonious. Unification analysis can describe basic movement errors that are often made during training (Hernawan, 2020). Children's motor repertoires expand rapidly during the second year of life (Eime, 2013).

Basic movement skills support overall development of children, especially their force to and from objects to achieve certain results (Jenkins, 2022). Manipulative skills are a person's

coordination and physical dexterity” (Cresham, 2021). The observable movements can be grouped into three functional categories according to the purpose and the entire phase of motor development: stability movement tasks, locomotor movement tasks, and manipulative movements, or a combination of the three Motor development in young children (Goodway, 2013). In brief, if movement functions as a trigger for the process of motor development, then one way to study this process is through the sequential development of motor skills across the life span. There are three fundamental phases that must be passed, namely the proficient stage, emerging elementary stages, and initial stage. Although children become mature and learn at different rates, almost all children learn their fundamental movement skills in the same order and through the same phases (Pommier, 2020). Stability is the ability to maintain body position against the force of gravity, which can include other circumstances that increase the difficulty of the task (Ozmun, 2012). Maintaining stability is essential for not only most sports-related motor skills, but also many functional skills (Foster, 2019). Nonlocomotor skills are performed without significant movement from one place to another (Aaron, 2022).

Manipulative skills are a person's skills in manipulating objects. “Manipulative skills (also referred to as object control skills) generally involve a combination of at least two movements and are performed in conjunction with other types of movement” Constraints Model for Improving Motor Skills in Children with CHARGE Syndrome (Foster, 2019). Additionally, manipulative skills involve the use of some types of tool, often with the hands but also with the feet or other parts of the body. Manipulative activities develop hand-eye and foot-eye coordination and dexterity (Pangrazi, 2019). By using equipment such as balloons, hoops, magic wands, bean bags, balls, tug-of-war ropes, Lummi sticks, Frisbees, and spoons, students can develop manipulative skills in a variety of situations (Li, 2013). Object control skills require the children to control objects using body parts or using tools (Bucher-Koenen, 2018). Manipulative skills involve moving and controlling objects. The body is used to apply force to an object and to absorb force when receiving or controlling an object. Manipulative skills allow children to give or receive ability to manipulate objects around them to achieve certain goals (Karisman, 2021). Manipulative skills

involve the use of some types of tool, often with the hands but also with the feet or other parts of the body (Stanton NA, 2019).

Quality physical education offers a variety of physical and fitness activities that are developmentally appropriate and enjoyable for students; use meaningful and appropriate teaching practices to provide students with maximum learning experiences; and ensure students to spend 50% of class time in MVPA (Heidorn, 2013). Students are people who have basic potential, namely cognitive, affective and psychomotor, who try to develop their own potential through the learning process in educational pathways, both formal and non-formal education, at certain levels of education and types of education (Suwartini, 2017). Movements can be grouped into three functional categories according to their purpose namely: stabilizing movement tasks, locomotor movement tasks, and manipulative movement tasks, or a combination of the three (Darmawan, 2018). The age period of 2-7 years is a fundamental movement phase (basic movement stage) and in the age period of 7-10 years, 11-13 years, 14 years is the specialized movement phase (special movement stage). The process of forming movements does not occur automatically, but is an accumulation of learning and practice processes, namely by understanding movements and carrying out movements repeatedly accompanied by awareness of whether the movements being carried out are correct or not. Therefore, the growth and development of students can have good basic movement skills with the presence of professional teachers. The potential of students generally consists of three categories, namely cognitive, affective and psychomotor in assessing their learning of movement skills, especially manipulative basic movements which have been programmed through RPPH indicators and visitation assessment instruments in schools.

MATERIALS AND METHODS

Method

Study This use method loading experiments *pre test* and *post test* as well as skills test results Study motion base manipulative.

Participants

Population from study This is all over participant educate 5-6 years old. Treatment given in the form of a learning model motion base

manipulative through development of throwing, catching, bouncing, hitting and kicking models (Asmawati, 2015). With amount sample involving 120 of participant divided education into 2 groups, groups experiments and groups control at AHA Asahan Kindergarten North Sumatra Province, with using 22 existing models worthy used For 5-6 years old.

This research was approved and supervised by the research committee department, Institute for Research and Community Service, Muhammad Arsyad Al Banjari Islamic University of Kalimantan Banjarmasin, Indonesia (Reg No 38/UNISKA-LP2M/II/2024. Participant provided informed consent, with the volunteer form covering research details, risks, benefits, confidentiality, and participant rights. The research strictly adhered to the ethical principles of the Declaration of Helsinki, prioritizing participant's rights and well-being in design, procedures, and confidentiality measures.

Treatment

Treatment held for 12 meetings. steps which is conducted is as following : (1) determine group subject research : (2) carry out *pre-test* , (3) do treatment learning motor rough with a motion model base manipulative , (4) carry out *post-test* (5) look for average score results *pretest* and *posttest* , then compare with group control , (6) difference these two averages through method statistics observation repeat For know is there is significant influence from use of this model in results Study motor rough with a motion model base manipulative .

Instrument Study

Instrument study is sheet consists of observations from motion throwing, catching, kicking, hitting, dribbling, bouncing the ball with grille as following:

Validity instrument with correlation between score item with factor score. The instrument was tested Then results calculation correlation as following.

Table 1. Validity instrument

	Scale Mean if	Critical	
	Item Deleted	limit n 30	Information
Throw	,561 **	0.3494	valid
Catch	,807 **	0.3494	valid
Herding	,561 **	0.3494	valid
Kick	,716 **	0.3494	valid
Reflect	766 **	0.3494	valid

Based on table 1 it is stated instrument declared valid with results correlation with sample 30 with mark critical 0.3494, five sub -instruments own value above mark critical. Likewise with results calculation reliability. The calculation results reliability show a Cronbach's Alpha result of 0.716 was stated reliable.

Table 2a. Instrument reliability

Reliability Statistics	
Cronbach's Alpha	N of Items
,716	5

Table 2b. Advanced reliability instrument

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Throw	56.4333	46,392	,309	,732
Catch	56.5667	38,185	,665	,591
Herding	59.8667	48,464	,366	,707
Kick	57,1000	40,300	,510	,654
Reflect	57.2333	36,392	,552	,635

Table 3. Grid lattice test instrument

Sub Indicator	Stages of Movement
1. Throw "direction lower " 1 leg position 2 body positions 3 positions view	1. Upright leg position Straight , one leg is in front . 2. Bending body position body and leaning toward front . 3. Arm position moment throw swing and hold the ball. 4. Views eye forward toward target .
2. Throws a "strong" direction front 1 leg position 2 body positions 3 positions lengn 4 views	1. Leg position straight Straight , one leg is in front 2. Body position slightly tilted and upright 3. Position one arm straight facing toward front , and Position arm 1 holding a small ball bend with direction 180 and ready swing his arm as well as do throw 4. View and head looked up to on
3. Throw direction bottom " circular "	1. Leg position straight straight both legs opened shoulder width 2. Body position facing to front 3. Position second arm bend and hand holding the ball right in front of the chest 4. Position view toward front see friends who will chosen For throw the ball to her friend
4. Throw goal Alone	1. Leg position straight straight opened wide over the shoulder 2. Bending body position 3. Position second arm toward lower under your feet and ready holding the ball 4. Position view toward lower Ready do throw .
5. Throw while jump " direction on "	1. Position both feet parallel with a slight shoulder bend 60 2. Position second arm A little bend 60 and second hand yeah hold the ball in front of the chest. Position second arm changed on head moment do throw to the top . 3. Body position slightly bent 70 4. View to direction front
6. Throw the ball to " right " basket	1. Position both legs standing straight , left leg is at the front . Core movements Position right sole tiptoe next Both legs are slightly tilted at 90 degrees body direction . 2. Body position towards front with tilt position 90 3. Position hand right hold the ball and be ready swing and hand the left is silent 4. View toward front basket
7. Throwing a Basketball " Left"	1. Position both legs standing straight , right leg is at the front . Both legs are slightly tilted at 90 degrees body direction . Core movements Position left sole tiptoe .

	<ol style="list-style-type: none"> 2. Position hand left hold the ball and be ready swing and hand right, just keep quiet . 3. Body position towards front with tilt position 90 4. View toward front basket
8. Throw “ top ” balloon	<ol style="list-style-type: none"> 1. Position both legs standing straight 2. Straight body position 3. Position second arm hold balloon and is at the top head 4. Position view toward on
9. Catching “2- handed ” Sitting	<ol style="list-style-type: none"> 1. Position both legs folded in a way cross-legged 2. position sitting and upright 3. Position second hand is in front of the chest and holding the ball 4. Position view see toward
10. Catch reflection “ hand right”	<ol style="list-style-type: none"> 1 Position both legs opened wide shoulder -width apart and upright straight . 2 Upright body position straight 3, Position arm right holding the ball, Position hand right Ready is at in front of the chest, Position palm hand right open wide . Next palm hand right open wide Ready catch reflection from lower 4, Outlook toward lower .
11. Catch reflection ' hand left "	<ol style="list-style-type: none"> 1. Position both legs opened wide shoulder -width apart and upright straight. 2. Upright body position straight, 3. Position arm left holding the ball, Position hand left Ready is at in front of the chest, Position palm hand right open width and palm hand left open wide Ready catch reflection from lower 4. View toward lower
12. Catch 2 hands and sit together	<ol style="list-style-type: none"> 1. Position both legs folded in a way cross-legged 2. position sitting and upright 3. Position second hand is in front of the chest with hand empty, Position second tap hand open wide 4, Position view see toward the ball arrives
13. Catch the ball bounced in the middle with second hand	<ol style="list-style-type: none"> 1. Position both legs straight straight and open shoulder width 2. Upright body position straight 3. Position arm and second hand is at the front body. Position palm hand open wide and facing toward on Position palm hand right still open and palm hand is at toward on 4. View see toward the ball arrives
14. Capture reflection togetherness	<ol style="list-style-type: none"> 1, Position both legs bend 80 degrees and open shoulder width 2, Upright body position straight stand 3., Position second hand is in front of the chest and palms hand open wide toward front 4. View see toward the ball arrives
15. Kicking the Gender Ball	<ol style="list-style-type: none"> 1. Right foot position is at behind and left foot position bend 90. right leg swung , sole of the right foot part top and fingers the tip of the foot touches the ball and is ready For kick 2. Body position tilted 90 degrees direction front 3. Position arm left is at toward front and arms right behind the right leg 4. View see the ball in front
16. Kicking Reflection direction wall / walls	<ol style="list-style-type: none"> 1. Position both legs straight and open shoulder width apart , Perkenaan sole of the front foot and toe with the ball 2. Position second arm beside the body 3. Upright body position straight 4. Outlook facing direction of the ball and the wall .
17. Hitting Balloon on	<ol style="list-style-type: none"> 1. Standing leg position straight and one leg in front and 1 behind 2. Standing body position tilted 90 3. Position second hand grasp tool bat directed on head 4. Position view toward on
	<ol style="list-style-type: none"> 1. Standing leg position straight and one leg in front and 1 behind 2. Side body position stand straight and chest out to front

18. Hitting Balloon with hand right	<ol style="list-style-type: none"> 3. Position 1 hand (left) bent hold balloons in front face and Position 1 hand the other (right) is open chest width ready swing 4. View is at toward front holding balloon
19. Hitting like Golf	<ol style="list-style-type: none"> 1. Leg position slightly bend one leg in front 2. Position second arm is at the front stomach hold tool hitter and second arm swing from direction side 3. Body position bent 70 degrees 4. View leads to in front of the ball that will hit
20. Hitting balloon with hand right sitting position	<ol style="list-style-type: none"> 1. Position both legs folded in a way cross-legged 2. position sitting and upright 3. Position hand left holding the ball and hands right is at beside face For preparation hit the ball 4. Position view see toward front
21. Bouncing the ball to middle	<ol style="list-style-type: none"> 1. Position both legs straight Straight , one leg is in front 2. Upright body position straight 3. Position one arm is on the side Ears and Position hand other beside the body and towards lower relax then move the hand to the side ear Ready swung toward back 180 4. View toward front
22. Bouncing the ball while walk	<ol style="list-style-type: none"> 1. Position both legs straight Straight , one leg is in front . 2. Body position tilted to front 3. Position one arm is next to the body as a control for Move and Position hand other holding the ball and bouncing the ball while dribbling the ball with walk . 4. View toward front .

Data Analysis

Test and post test data furthermore analyzed with use SPSS assistance in the form of descriptive statistics, normality tests, and non- parametric statistical tests.

RESULTS

As for the results evaluation from effectiveness of the jumping model motion base manipulative For child 5-6 years old is as following:

Table 4. Test results skills motor rough manipulative

		Pretestexperiment	Posttestexperiment	Pretestcontrol	Posttest Control
N	Valid	60	60	60	60
	Missing	60	60	60	60
Mean		60.18	76.48	61.26	71.10
Median		61.00	75.00	63.00	71.00
Mode		63.00	75.00	63.00	70.00
Std. Deviation		5,016	4.15990	3.66	4.35
Minimum		50.00	70.00	55.00	60.00
Maximum		69.00	87.00	65.00	78.00

This result show that the mean value is good control and experimental groups in the post test section The same The same experience enhancement compared to with pre-test. Pre test scores group experimental 60.18 while post test 76.48 as well as pre test control group 61.25 and post test 71.10. happen the difference is 16.30 each for group experiment and 9.84. Viewed from difference This can in the article group experiment

experience more improvement tall. Viewed from standard deviation group experiment experience repair data tightness, meanwhile control group instead experience allowance, based on matter This beside happen more improvement tall it turns out enhancement This range distance between the data also experienced distance is not Far more strict compared to with control group.

Table 5. Normality test results

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Pretestexperiment	.113	60	,056	,966	60	,096
Posttestexperiment	,156	60	,001	,945	60	,009
Pretestcontrol	,382	60	,000	,734	60	,000
Posttest Control	.134	60	,009	,955	60	.028

a. Lilliefors Significance Correction

Based on the results of the data normality test it turns out only group pre-test experiments were declared normal, the other groups had sig values.

more small of 0.05, so analysis next using non-parametric statistics . As for the results non-parameteric analysis as in table 6.

Table 6. results Wilcoxon analysis

Test Statistics ^a	Score
Mann-Whitney U	714,000
Wilcoxon W	2544,000
Z	-5,719
Asymp . Sig. (2-tailed)	,000

a. Grouping Variable: ex

Based on non- parameteric test results it turns out the calculated sig is $0.000 < 0.05$ so can stated there is difference between results control group and group experiment stated median control group 63 with mean 71 and posttest group experiment media value 61 and average 75.

results. Mastery to a number of Skills like ability For running, playing objects, self control and jumping is very important thing at the age of 1-3 years (Akbar et al., 2021). Very different the incident If child get treatment and environment Study good move.

DISCUSSION

Research purposes This For know results implement learning motion to enhancement manipulative abilities consisting from motion throwing, catching, leading, kicking and bouncing. Research result show exists enhancement Good For group experiment or so control group. Reviewed from achievements group mean value experiment experience more improvement tall compared to with control group. Non- parametric test show that happen difference between group experiment and control with median test. Important point from study This is happen enhancement Skills manipulation being tested from treatment given. However treatment in Movement Education is very important thing. Observation to child 4-5 years old in place custody child shows, apparently inside activities room dominate up to 70%, so matter This cause lack stimulation child For activity physical (S. Iivonen et al., 2016). In better condition positive proof study children involved in sport show enhancement locomotor, manipulator and TGM test

Why mastery Skills motion This become important? There is proof supporting research matter This other evidence shows between movement, language and activity physical own significant relationship in the process of development and learning child 4-5 years old (Vargas-Vitoria et al., 2023). Mastery balancing yourself above bicycle it turns out own strong relationship to locomotor, balance and object control (Kavanagh et al., 2020). Skills motion base give influence to Study rhythmic gymnastics movements, especially the learning phase coordination hand, in phase Study more high on coordination hands, strength and precision motion (Kezić et al., 2018b). There is significant correlation between Skills motion base specifically balance dynamic and static children 5-6 years old to performance academic (de Waal, 2019). Study to child 4-4.5 years old state that ability motion base own connection development ability cognition (Martzog et al., 2019). Children who are overweight have a negative correlation with Skills motion locomotor including ball control, kid daughter more good at movement locomotor compared to son but

child son more Good in possession of the ball (Song et al., 2023) furthermore there is close relationship between Skills motor rudeness and activity physical to metabolism, neuromuscular ability paa child ages 5-8 years (Laukkanen et al., 2014). In children age ability locomotor and motor fine correlated with literacy movement in the environment home and possession vocabulary (Suggate et al., 2017). A very crucial message from results study as example, about mastery balance and movement control, p This will Keep going continues arrived at class One school base (Bellows et al., 2017). Text there is a transfer of learning when the child has control A skills, skills beginning This can made child as initial capital as a process for get new movement.

Mastery Skills motion This Good sons and daughters will experience differences , several study show son only superior in ability throw the ball over head and kicking , while That ability gullap , leap, run , hop, spar long jump, skip and women's slide more superior (Nikolić et al., 2016) Ability locomotor and object control between sons and daughters 4-4.5 years old based on observation for 3 days at school and two days at home , apparently There is significant relationship between age , type gender , and BMI against activity physical (KS Iivonen et al., 2013) . Children aged 3-5 years ability women's vertical jump more superior, next between activity physical and skill motion base No There is close correlation (Duff et al., 2019). Other research shows son 5-7 years old more excel at skills locomotor, meanwhile daughter more excel at skills manipulation (Friskawati, 2023).

Skills motion base experience enhancement along with increase age, conclusion This based on measurement child ages 3-7 years with 1,029 samples (Lin & Yang, 2020). Basic movements correlated with age, type gender, BMI and activity (Chen et al., 2021), based on p This It is recommended that children accept activity motion fun dynamic between 30-60 minutes furthermore stated there is connection between activity levels with mastery calories per hour, ability motor and activity physical, as well ability control object (Ali et al., 2021). At least there is three factors of outside the child who gave it donation to learning and results Study children, environment, family, and education. Environmental factors prove that condition social ecology child it turns out correlated to ability motion base (Zeng et al., 2019). Desire child For move influenced by one among them is environment around child (Nazarpouri et al., 2023),

increasingly child live in the neighborhood active so will increase motivation For move.

From family factors influenced by patterns parenting Parental education, activities carried out by father, transportation to school, sports parents, negative influence is influenced by interaction watching TV and reading book (Cools et al., 2011). Enhancement mastery movement in children aged 2-4 years influenced by chance For do activity physicality and movement good basis with guidance good by the teacher or parents in a way sustainable (Roscoe et al., 2017), engagement child in kindergarten activities physical including patterns foster, environment school, facility playing outside class (Coe, 2020). Proven son more tall score Skills control object compared to daughter, skills motor This related with activity weekend done especially activity with intensity moderate (Foweather et al., 2015), be message from study This are parents need For invite child For do recreation form activity physical give provisions For mastery movement skills and provisions For life active later day.

Furthermore From the education factor it is very giving proof that creation chance for child For do practice, engage and design with quality learning give great guarantee For development motion child. Study motor skills in children No only just about body, muscles and joints, more Far Again matter This about make synergy, balance, symemmetry, and skill Skills during Study form motion (Akbar & Awalludin, 2021). Teaching motor rough 4-5 years old in Longitudinal study in Singapore, in class show involvement lowly students, in fact student more high outside class in Study motor rough (Bautista et al., 2020). Exercise program intervention for 1 year own influence positive to level Skills motor child (Plazibat et al., 2021)

Skills education intervention motion base child 5-6 years old influenced by treatment motion elementary, locomotor and manipulation at school (Boz & Aytar, 2012). In children 4-4.5 years old the more child own allocation high movement will give matter positive to mark motor (Mota et al., 2020), a study student given do it with give fruit and activity motion base for 10 months against 10 parks child child, the result significant lower number obesity and increasing Skills motion (Zask et al., 2012) . Still around child 4-5 years old given treat activity physical it turns out happen enhancement Skills motor rough compared to with test the beginning

and end of the program with average enhancement up to 45.7% (Kordi et al., 2012).

For ensure development Skills motion basics are very important For held Physical education class in the park child child (da Silva et al., 2024) , for effectiveness of the learning process class more small it turns out more effective compared with class big in learning motion base (Cheung & Zhang, 2020) , as example small allocated 5 minutes quality per day and activities activity physically on weekends significant increase competence motor and movement control abilities (Roscoe et al., 2021).

Research and study results review study This show proof that, mastery movement is very important. Ability motion will experience development along with increase age, happens difference achievements mastery between sons and daughters. Furthermore Skills motion Good locomotor nor manipulation (throwing, catching, kicking, bouncing the ball, etc herding) will increase If child given chance For do in environment (family or education). Guarantee educational environment quality move and give child chance For move in a positive setting so that achievements targeted and designed. What a message crucial from results research and studies This is mastery motion child will continues at the next age and level of education. So that attention every level become important thing.

Conclusion

From the results application development learning model motion base manipulative is one of effort help participant educate 5-6 years old to be deep follow learning motor rough can active, creative, effective, encouraging and fun. Learning model motion base manipulative own principles that require teachers to evaluate need Study child 5-6 years old, so child in do learning besides fun and improve multilateral quality of the movement, Experimental results This prove that designed intervention give influence positive to enhancement Skills motion manipulation.

Conflict of Interest

The author declares that this article has no conflict of interest.

Ethics Committee

This research was approved and supervised by the research committee department, Institute for Research and Community Service, Muhammad Arsyad Al Banjari Islamic University of

Kalimantan Banjarmasin, Indonesia (Reg No 38/UNISKA-LP2M/II/2024

Author Contributions

Study Design, AN, PE, JM; Data Collection, JM, SYTJ, BS, IEP; Statistical Analysis, SMHD, DD, SEFN, AM; Data Interpretation, PE, JM, SYTJ; Manuscript Preperation, PE, JM; Literature Search, AN, PE, JM, SYTJ, BS, IEP, SMHD, DD, SEFN, AM. All authors have read and agreed to the published version of the manuscript.

REFERENCE

- Aaron, R. W., & Cogswell, C. A. (2022). The on ramp: Essential entry level experience and skills in student affairs assessment. *New Directions for Student Services* , 2022 (178–179), 29–42. [[Crossref](#)]
- Akbar, Z., & Awalludin. (2021). Functional movement screening as an assessment in early childhood. *Journal of Physical Education and Sport* , 21 , 2432–2439. [[Crossref](#)]
- Akbar, Z., Awalludin, & Tohar, K. (2021). Fundamental movement skills and sensory movement strategies to support online learning in early childhood. *Journal of Physical Education and Sport* , 21 , 2364–2371. [[Crossref](#)]
- Ali, A., McLachlan, C., McLaughlin, T., Mugridge, O., Conlon, C., Mumme, K., & Knightbridge-Eager, T. (2021). Fundamental movement skills and physical activity of 3–4-year-old children within early childhood centers in New Zealand. *Children* , 8 (9). [[Pubmed](#)]
- Asmawati, L. (2015). Development of a Gross Motor Learning Model Through Parental Stimulation and Games with Paired Balls in Early Age Children 4-5 Years. *Journal of Educational and Learning Technology* , 2 (1), 1–13. [[Crossref](#)]
- Bautista, A., Moreno-Núñez, A., Vijayakumar, P., Quek, E., & Bull, R. (2020). Gross motor teaching in preschool education: where, what and how do Singapore educators teach? (Enseñanza de la motricidad gruesa en educación infantil: ¿dónde, qué y cómo enseñan las maestras en Singapur?). *Infancia y Aprendizaje* , 43 (2), 443–482. [[Crossref](#)]
- Bellows, LL, Davies, PL, Courtney, JB, Gavin, WJ, Johnson, SL, & Boles, RE (2017). Motor skill development in low-income, at-risk preschoolers: A community-based longitudinal intervention study. *Journal of Science and Medicine in Sport* , 20 (11), 997–1002. [[Crossref](#)]
- Boz, M., & Aytar, A.G. (2012). the Effects of the Fundamental Movement Education on Preschool Children'S Movement Skills. *Hacettepe Universitesi Egitim Fakultesi Dergisi-Hacettepe University Journal of Education* , 51–59. [[Crossref](#)]
- Bucher-Koenen, T., & Lamla-Dietrich, B. (2018). The Long Shadow of Socialism: Puzzling Evidence on East-West German Differences in Financial Literacy. *Economic Notes* , 47 (2–3), 413–438. [[Crossref](#)]
- Chen, Z., Xu, H., Konishi, D., & Zhu, W. (2021). Relationship Among Preschool Children's Fundamental Motor Skills, Physical Activity, And Physical Fitness: A National

- Study. *Medicine & Science in Sports & Exercise*, 53 (8S), 196–196. [Crossref]
- Cheung, P., & Zhang, L. (2020). Environment for preschool children to learn fundamental motor skills: The role of teaching venue and class size. *Sustainability (Switzerland)*, 12 (22), 1–10. [Crossref]
- Coe, D. P. (2020). Means of Optimizing Physical Activity in the Preschool Environment. In *American Journal of Lifestyle Medicine* (Vol. 14, Issue 1, pp. 16–23). [PubMed]
- Cools, W., de Kristine, M., Samaey, C., & Andries, C. (2011). Fundamental movement skill performance of preschool children in relation to family context. *Journal of Sports Sciences*, 29 (7), 649–660. [PubMed]
- Cresham, E. (2021). Aistear: The Social Context of Play and Language Development. *Reach*, 34 (2), 21–33. [PubMed]
- da Silva, RH, Nobre, GC, Pessoa, MLF, Soares, Í. AA, Bezerra, J., Gaya, AR, Mota, JAPS, Duncan, MJ, & Martins, CML (2024). Physical activity during school-time and fundamental movement skills: a study among preschoolers with and without physical education classes. *Physical Education and Sport Pedagogy*, 29 (3), 302–314. [Crossref]
- Darmawan, A. (2018). Development of interactive multimedia-based manipulative fundamental movement model for primary school students. *International Journal of Physiology, Nutrition and Physical Education*, 3 (1), 526–531. [Crossref]
- de Waal, E. (2019). Fundamental Movement Skills and Academic Performance of 5- to 6-Year-Old Preschoolers. *Early Childhood Education Journal*. [Crossref]
- Duff, C., Issartel, J., O' Brien, W., & Belton, S. (2019). Physical activity and fundamental movement skills of 3- To 5-year-old children in Irish preschool services. *Journal of Motor Learning and Development*, 7 (3), 354–373. [Crossref]
- Eime, R., Young, J., Harvey, J., & Payne, W. (2013). Psychological and social benefits of sport participation: The development of health through sport conceptual model. *Journal of Science and Medicine in Sport*, 16, e79–e80. [Crossref]
- Erazo-Damián, I., Apsley, J.M., Perini, R., Iacchetti, M.F., & Marques, G.D. (2019). Stand-Alone DFIG FOC Sensitivity and Stability under Mismatched Inductances. *IEEE Transactions on Energy Conversion*, 34 (2), 860–869. [Crossref]
- Foster, E.A., Lieberman, L.J., Perreault, M., & Haibach-Beach, P.S. (2019). Constraints Model for Improving Motor Skills in Children with CHARGE Syndrome. *Palaestra*, 33 (2), 39–44.
- Fowweather, L., Knowles, Z., Ridgers, N.D., O'Dwyer, M.V., Foulkes, J.D., & Stratton, G. (2015). Fundamental movement skills in relation to weekday and weekend physical activity in preschool children. *Journal of Science and Medicine in Sport*, 18 (6), 691–696. [PubMed]
- Friskawati, GF (2023). Effects of Structured Games Led by Classroom Teachers on Preschool Students Fundamental Motor Skills. *Journal of Physical Education and Sport*, 8 (2), 140–147. [Crossref]
- Goodway, J.D., Ozmun, J.C., & Gallahue, D.L. (2012). Understanding motor development: Infants, adolescents, adults. In *Jones & Bartlett Learning*.
- Gursel, F. (2014). Inclusive intervention to enhance the fundamental movement skills of children without hearing: A preliminary study. *Perceptual and Motor Skills*, 118 (1), 304–315. [Crossref]
- Heidorn, B. (2013). Exploring Role Modeling in Sport and Physical Education. *Journal of Physical Education, Recreation & Dance*. [Crossref]
- Iivonen, K.S., Sääkslahti, A.K., Mehtälä, A., Villberg, J.J., Tammelin, T.H., Kulmala, J.S., & Poskiparta, M. (2013). Relationship between fundamental motor skills and physical activity in 4-year-old preschool children. *Perceptual and Motor Skills*, 117 (2), 627–646. [PubMed]
- Iivonen, S., Sääkslahti, A.K., Mehtälä, A., Villberg, J.J., Soini, A., & Poskiparta, M. (2016). Directly observed physical activity and fundamental motor skills in four-year-old children in day care. *European Early Childhood Education Research Journal*, 24 (3), 398–413. [Crossref]
- Jenkins, K.P., Mead, L., Baum, D.A., Daniel, K.L., Bucklin, C.J., Leone, E.A., Gibson, J.P., & Naegle, E. (2022). Developing the BETTSI: A tree-thinking diagnostic tool to assess individual elements of representational competence. *Evolution*. [PubMed]
- Kavanagh, J. A., Issartel, J., & Moran, K. (2020). Quantifying cycling as a foundational movement skill in early childhood. *Journal of Science and Medicine in Sport*, 23 (2), 171–175. [PubMed]
- Kezić, A., Miletić, Đ., & Lujan, I. K. (2018a). Motor Learning in Rhythmic Gymnastics: Influence of Fundamental Movement Skills. *Acta Kinesiológica*. [PubMed]
- Kordi, R., Nourian, R., Ghayour, M., Kordi, M., & Younesian, A. (2012). Development and evaluation of a basic physical and sports activity program for preschool children in nursery schools in Iran: An interventional study. *Iranian Journal of Pediatrics*, 22 (3), 357–363. [PubMed]
- Laukkanen, A., Pesola, A., Havu, M., Sääkslahti, A., & Finni, T. (2014). Relationship between habitual physical activity and gross motor skills is multifaceted in 5- to 8-year-old children. *Scandinavian Journal of Medicine and Science in Sports*, 24 (2). [PubMed]
- Li, Y., Liang, B., Gu, Z. M., Zou, X. Y., & Cheng, J. C. (2013). Reflected wavefront manipulation based on ultrathin planar acoustic metasurfaces. *Scientific Reports*, 3. [PubMed]
- Lin, S. J., & Yang, S. C. (2020). The norms of fundamental movement skills for children aged three to seven. *International Journal of Human Movement and Sports Sciences*, 8 (4), 134–141. [Crossref]
- Martzog, P., Stoeger, H., & Suggate, S. (2019). Relationship between Preschool Children's Fine Motor Skills and General Cognitive Abilities. *Journal of Cognition and Development*, 20 (4), 443–465. [PubMed]
- McGrane, B., Belton, S., Powell, D., & Issartel, J. (2017). The relationship between fundamental movement skill proficiency and physical self-confidence among adolescents. *Journal of Sports Sciences*, 35 (17), 1709–1714. [PubMed]

- Mota, J.G., Clark, C.T., Bezerra, T.A., Lemos, L., Reuter, C.P., Mota, J.A.P.S., Duncan, M.J., & Martins, C.M.D.L. (2020). Twenty-four-hour movement behaviors and fundamental movement skills in preschool children: A compositional and isotemporal substitution analysis. *Journal of Sports Sciences*, 38 (18), 2071–2079. [Crossref]
- Nazarpouri, S., Doralp, S., Bahram, A., Sayarifard, A., & Haqqani, S. (2023). The Relationship Between Motivation to Move and the Development of Fundamental Movement Skills Among Urban and Rural Preschool Children in Iran. *Asian Journal of Sports Medicine*, 14 (4). [PubMed]
- Nikolić, I., Mraković, S., & Kunješić, M. (2016). Gender differences of preschool children in fundamental movement skills / Spolne razlike predškolske djece u biotičkim motoričkim znanjima. *Croatian Journal of Education - Hrvatski časopis Za Odogoj i Obrazovanje*, 18. [Crossref]
- Pangrazi, R.P., & Dauer, V.P. (1979). Lesson plans for dynamic physical education for elementary school children. *Human Kinetics*. [PubMed]
- Plazibat, K., Karuc, J., & Vidranski, T. (2021). Effects of different multi-year physical exercise programs on motor skills in preschool children. *Journal of Functional Morphology and Kinesiology*, 6 (3). [Crossref]
- Pommier, E., Neff, K. D., & Tóth-Király, I. (2020). The Development and Validation of the Compassion Scale. *Assessment*, 27 (1), 21–39. [PubMed]
- RBR-8jhbzsz. (2023). Relationship between physical activity, sleep and screen time and health condition of preschoolers in Petrolina – PE city – the movement's cool project. [PubMed]
- Roscoe, C. M. P., Duncan, M. J., & Clark, C. C. T. (2021). The 24-h movement processes in weekdays, weekend days or four-day periods differentially associate with fundamental movement skills. *Children*, 8 (10). [Crossref]
- Roscoe, C. M. P., James, R. S., & Duncan, M. J. (2017). Preschool staff and parents' perceptions of preschool children's physical activity and fundamental movement skills from an area of high deprivation: a qualitative study. *Qualitative Research in Sport, Exercise and Health*, 9 (5), 619–635. [Crossref]
- Song, H., Lau, P.W.C., Wang, J., Shi, L., & Wang, X. (2023). Fundamental movement skills in overweight and normal weight preschool children. *International Journal of Physical Education*, 60 (2), 2–11. [PubMed]
- Stanton, N.A., Plant, K.L., Roberts, A.P., Harvey, C., & Thomas, T.G. (2016). Extending helicopter operations to meet future integrated transportation needs. *Applied Ergonomics*, 53, 364–373. [Crossref]
- Stodden, D.F., Gao, Z., Goodway, J.D., & Langendorfer, S.J. (2014). Dynamic relationships between motor skill competence and health-related fitness in youth. *Pediatric Exercise Science*, 26 (3), 231–241. [Crossref]
- Suggate, S., Stoeger, H., & Pufke, E. (2017). Relationship between playing activities and fine motor development. *Early Child Development and Care*, 187 (8), 1297–1310. [Crossref]
- Suwartini, S. (2017). Character Education and Sustainability Human Resource Development. *Trihayu: Journal of Elementary School Education*, Vol. 4 (1), 220–234. [Crossref]
- Taroreh, B.S., & Wijaya, M.A. (2020). Kinesthetic Based Manipulative Physical Activity Program for 6 Year Old Children. *Penjakora Journal*, 7 (1), 1. [Crossref]
- Tóth-Király, I., Amoura, C., Bóthe, B., Orosz, G., & Rigó, A. (2020). Predictors and outcomes of core and peripheral sport motivation profiles: A person-centered study. *Journal of Sports Sciences*, 38 (8), 897–909. [PubMed]
- Vargas-Vitoria, R., Faúndez-Casanova, C., Cruz-Flores, A., Hernandez-Martinez, J., Jarpa-Preisler, S., Villar-Cavieles, N., et al., (2023). Effects of Combined Movement and Storytelling Intervention on Fundamental Motor Skills, Language Development and Physical Activity Level in Children Aged 3 to 6 Years: Study Protocol for a Randomized Controlled Trial. *Children*, 10 (9). [PubMed]
- Wang, C.H., Chang, C.C., Liang, Y.M., Shih, C.M., Chiu, W.S., Tseng, P., Hung, D.L., Tzeng, O.J.L., Muggleton, N.G., & Juan, C.H. (2013). Open vs. Closed Skill Sports and the Modulation of Inhibitory Control. *PLOS ONE*, 8 (2). [PubMed]
- Zask, A., Adams, J. K., Brooks, L. O., & Hughes, D. F. (2012). Tooty Fruity Veggie: An obesity prevention intervention evaluation in Australian preschools. *Health Promotion Journal of Australia*, 23 (1), 10–15. [Crossref]
- Zeng, N., Johnson, S.L., Boles, R.E., & Bellows, L.L. (2019). Socio-ecological correlates of fundamental movement skills in young children. *Journal of Sport and Health Science*, 8 (2), 122–129. [PubMed]



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