Long Jump Learning Model for Junior High School Students Based on Games

Despita Antoni[1*], Wahyuningtyas Puspitorini[2], Susilo Susilo[3], Widiastuti Widiastuti[4], Yusmawati Yusmawati[5], Hernawan Hernawan[6], Samsudin Samsudin[7], Arsil Arsil [8].

[1]*Doctoral Student of Postgraduate Program, Universitas Negeri Jakarta, Indonesia Email: despitaantoni_9904919011@mhs.unj.ac.id*

[2,3,4,5,6,7]*Universitas Negeri Jakarta, Indonesia*

[8]*Universitas Negeri Padang, Indonesia*

Abstracts: The goal of this study was to evaluate how well junior high school students learned the long jump through a game-based learning methodology. The goal is to make games more enjoyable so that students would be inspired to participate in learning about long jumps. Eighty students participated in this study at SMP Negeri 2 Kota Solok in West Sumatra. 40 individuals made up the experimental group and 40 individuals made up the control group. Research and development (R n D) is the research methodology employed. Indicators of the position of the feet, knees, body, hips, hands, and perspectives were examined as they relate to the long jump's fundamental movement. The value utilized for data processing is the three assessment teams' average rating, with 3 repetitions of the test. The statistical analysis applied in this study was carried out using an effectiveness test through the N-gain percent test with the help of the IBM SPSS Statistics Version 29.0.0.0 (241) 2023 program. The results showed that there was an effectiveness of the game-based long jump learning model for students at SMP Negeri 2 Kota Solok which is marked by the calculation results of the average N-Gain percent value of the experimental group is 79.82 with the effective category. Furthermore, the average value of N-Gain percent for the control group is 42.53 in the less effective category. Thus it can be concluded that there is a significant difference between the experimental group and the control group. The conclusion of the game-based long jump learning model can effectively improve the long jump basic motion in junior high school students. This can be seen from the learning model provided, which is game-based as a variation of learning movements. In addition, the variations in the games used in learning are appropriate and match the indicators of long jump basic motion assessment.

Keywords: Learning Model, Long Jump, Games, Middle School Students.

1. INTRODUCTION

The Ministry of Education and Culture, the Ministry of Tourism and Creative Economy, and the Ministry of Youth and Sports are responsible for carrying out the Republic of Indonesian government's implementation of SKN Law Number 3 of 2005's Article 4 on the National Sports System. National education at the Ministry of Education and Culture aims to help students reach their full potential as people who respect and revere God Almighty, have exemplary moral character, are healthy, knowledgeable, and capable of being creative and independent as well as citizens of a democratic and accountable state (UU SPN No. 20, 2003). Education that is empowered has the potential to promote human rights, dignity, and sustainability (UNESCO, 2015; UNESCO, 2018; Purba et al., 2023). One approach to preparing students is through education. to face increasingly complex problems (Octavianus, Cahyanto Adhie, 2020). Indonesian students can compete with developed countries through education (Munifah, et al, 2019). Education 4.0 is a new paradigm in the context of education that focuses on innovation and maximizes the use of information, the internet, and technology (Candradewi, 2018).

Furthermore, the National Sports Grand Design Draft (DBON) in Presidential Regulation (Perpres) Number 86 of 2021 and Regulation of the Minister of Youth and Sports of the Republic of Indonesia Number 2 of 2023 concerning the Long-Term Athlete Development Pattern or Long-Term Athlete Development, abbreviated as LTAD, is a pattern of coaching athletes carried out in a planned, systematic, integrated, tiered and sustainable manner with the support of sports science and technology in order to improve national sports achievements in the medium and long term 2021-2045. The Minister of Youth and Sports emphasized that so far sports development had not been well designed. Therefore, with the birth of DBON, it is hoped that sports achievements in Indonesia can be well created, one of which is through the long jump starting from junior high school students (SMP).

Jumping is a basic movement skill in various sports that requires complex motor coordination of the upper and lower limbs to obtain good performance and is an important indicator of physical fitness (Huiyu Zhou et al., 2020; Chao-Fu Chen, Hui Ju- Wu, 2022). Furthermore, the long jump is one of the most important sports in track and field competition and is involved in several competition events such as the decathlon, pentathlon, pentathlon and was featured in the ancient Olympics as part of the pentathlon (El-Ashker et al., 2019; Christos Papadopoulos et al., 2011). The long jump is an athletic competition (track and field) in which athletes combine approach speed, last step, planting feet, takeoff, while in the air, and landing (Hussain et al., 2011). Children's performance in each phase of the long jump must be considered. One of the key factors affecting a jumper's performance is an experienced expert in the long jump who is able to provide advice and input to long jumpers (Kamnardsiri et al., 2021). The content of the instructions given by the teacher, and power can have a significant impact on student performance (Becker, Kevin A, Smith, Peter J.K, 2015). Maximum strength is strongly related to jumping ability and shows a correlation with increased running speed (Koch, Alexander J, et al. 2003; Margaritopoulos, S., et al. 2015; Christos Ioannides., et al. 2020; Pedro Pinheiro Paes., et al. 2022) . Strength is very important, especially in sports that require speed and explosive power (Alesi et al., 2014; Padulo et al., 2014) and require well-developed upper and lower leg muscle strength (Tabben et al., 2013). Speed is greatly influenced by hereditary characteristics and annual changes in athlete performance (Thomas Haugen1., et al 2019). The long jump remains in general use as a test of explosive leg strength, a general standardized test used by teachers, coaches, teams and sports organizations to evaluate the potential and performance of students or athletes as well as a test of lower body strength and power (Masaki Wakai, Nicholas P. Linthorne, 2005; Wu, Will F. W., et al., 2012; Marija Lorger et al., 2012).

The Basic Competency (KD) for PJOK subjects at the junior high school level is understanding the specific long jump variations in various simple games. It is stated that playing has been and continues to be a recommended way of learning and is a tool for children to explore their world, from the unknown to the known, and from what they cannot do to what they can do (Zielinski, 2019). According to the teacher, students improve technical execution due to exercise assignments for skill development and technical meaning obtained when contextualized in games (Morales-belando et al., 2018). The game element in an activity will make the atmosphere fun (Chen, 2013). Play is a spontaneous and active process in which thoughts, feelings and actions can develop (McMahon, 2010). Education must be planned based on student competence (Erikson & Erikson, 2020). To prevent problems in their adulthood such as lack of motivation to study physical education, do physical activity and participate in sports (Chiorean et al., 2019; Mukherjee et al., 2017). Competency development from an early age is important to do to improve health from an early age and in the future so that children's movement skills are good (Fehmi et al., 2014). The most important aspect of a teenager's life is sports (Santrock, 2003). Furthermore, the child's movement cannot be limited by one basic motion component. This is an active start in the early childhood development phase (Dickinson, 2014). Thus, basic movement learning has a vital role. In this case students learn motion to provide support for their growth and development (Coskun & Sahin, 2014).

From some of the opinions above, it can be stated that being skilled in the long jump does not mean that students are required to master the long jump, but rather prioritizes the process of developing students' movements from time to time by paying attention to the phases of movement and physical conditions such as strength and speed. In carrying out their activities, students are brought in a happy atmosphere, so they can explore and discover new things indirectly.

Based on initial observations of junior high school students, it is known that the students' long jump movements are still far from the expected assessment indicators. This is presumably the low understanding of students about how the movements that must be made when doing the long jump movement. Besides that, many students like other sports that are more fun like football, the lack of renewal of the learning model provided by the teacher so that it looks monotonous and less interesting. Even though it is known that all of this is inseparable from the learning process provided by the teacher for students to accept/do. Learning is a process of student interaction with educators, a process to help students learn well and it is important to consider when assessing the influence of human activity (UU SPN No. 20 of 2003; Rahyubi, 2012; Papaj et al., 2018).

Based on the data and observations that have been made above, a problem solving is needed to improve the

quality of the learning process through the development of learning models. The development of the learning model is carried out in the form of an innovative game-based long jump learning model that is interesting, more fun, easier so that students are motivated to take part in and do learning. Referring to these problems, the authors feel the need to conduct a study on learning models to improve the ability of game-based long jump movements in junior high school students. The update in this study is in the game model designed and adapted to the characteristics of junior high school students. Based on this, a research title was raised, namely a game-based long jump learning model for junior high school (SMP) students.

2. METHOD

The long jump learning model is adapted to the characteristics of students at the junior high school education unit level. The form of play in junior high school students is more emphasized with competitive nature without overly prioritizing winning (Balyi et al., 2013). Through sports, youth can learn life skills and values that enhance their development and ability to succeed in the future (Forneris, Camiré, & Trudel, 2012). Adolescence is a period that represents a period of physical, psychosocial and cognitive development (Trapp, Giles-Corti, Christian, & Timperio, 2013).

2.1. Research Design

The research design used was research and development (R n D) using research and development steps from Borg and Gall which consisted of 10 steps (Borg & Gall, 1983; Prasetya et al., 2023). The scheme of the research stages is shown in the following figure:

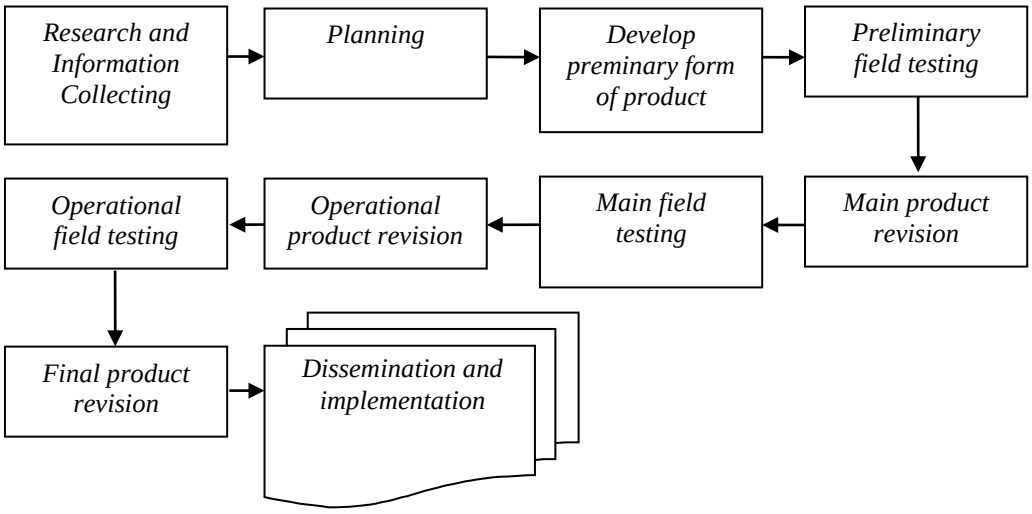

Figure 1. Schematic of the Research Stages of the Borg & Gall Model

2.2. Research Subjects

The research subjects were students of SMP Negeri 2 Kota Solok, West Sumatra, with a sample of the Proportional Random Sampling system. The number of samples is 80 people. 40 people in the experimental group and 40 people in the control group.

2.3. Instruments

The instrument used is to look at the assessment indicators on the long jump material which has been validated by athletic learning experts. Furthermore, the validity is equivalent to the proud moment, it is known that the validity score is 0.847. When compared with r table with n = 30 at level α = 0.05, the r table value is 0.361. Thus r count > r table and it can be stated that the instrument used is valid and in the reliability test it is known that the Cronbach

Alpha value is 0.882 > 0.07 it can be stated that the instrument is Reliable. The assessment instruments can be seen in Table 1 below:

Table 1. Long jump assessment instrument for junior high school students

No.	Assessment Indicators	Assessment Sub Indicators	Description	Mark			
				4	3	2	1
1	Initial fhase	Leg position	1. Stand at a distance of 20-25 meters from the pedestal.				
			2. While running, land on the soles of your feet. The ankle and supporting leg are straight when resisting.				
			3. Running faster and faster until the repulsion board				
		Knee position	1. The knee when the supporting leg is straight while the knee of the other leg is bent (bent ±90O or less).				
		Body Position	2. The attitude of the body leans naturally.				
		Hip Position	3. Hips drop slightly in the last step before the pedestal.				
		Hand/Arm Position	4. Relax hands with swings from back to front alternately with slightly bent elbows.				
		View Position	5. Look towards the jumping pool with the head and back position in one line (not crouching).				
2	Rejection Phase	Leg Position	6. Using one of the strongest support legs.				
			7. The straight support leg starts from the heel, the sole of the foot is continued to the tip of the foot while the swing leg (back leg) is bent ±90O or less.				
		Knee Position	8. The knee on the supporting leg is slightly bent (up to ±150) while the knee of the other leg is bent (bent) ±90O or less				
		Body Position	9. The body is slightly lowered backwards with the body weight on the fulcrum.				
			10. The body goes forward and up with a repulsion angle of 45o				
		Hip Position	11. Hips go back up when the pedestal is already on the pedestal.				
		Hand/Arm Position	15. One hand back together with both arms swinging up.				
		View Position	16. Forward view with head slightly tilted (chin lifted).				
3	Air Fase	Leg Position	17. Both legs are almost tightly behind the body in a slightly bent position then				
			18. When landing, straighten your legs forward				
		Knee Position	19. Both knees while in the air rather tight and bent				
		Body Position	20. Body bouncy backwards				
		Hip Position	21. Hips are pushed forward				
		Hand/Arm Position	22. Both arms straight up beside the ears and when it will land both arms are straightened in front				
		View Position	23. View towards the tub jump (not ducking)				

No.	Assessment Indicators	Assessment Sub Indicators	Description	Mark			
				4	3	2	1
4	Landing phase	Leg Position	24. Both legs are brought forward straight and land on both heels first followed by rolling and both knees bent (bent)				
			25. Both knees when landing bent (bent)				
		Knee Position	26. Body weight forward and fall sideways or forward with bent.				
		Body Position	27. Hips are pushed forward				
		Hip Position	28. Both hands forward				
		Hand/Arm Position	29. View towards the sandbox with your head down				
		Harmony	30. The final attitude or Follow through, the suitability of motion (not rigid) landing on 2 feet simultaneously and balanced				
Total *Score*							

Movements were analyzed using a Likers scale with 4 alternative answers.

Score 4 = always, if you always do according to the movement.

Score 3 = often, if you often do the movement according to the movement and sometimes don't do it.

Score 2 = sometimes, if sometimes do and often do not.

Score 1 = never, if never do

3. RESEARCH PROCEDURES

The first time the students did the long jump movement was assessed by the assessment team according to the instrument test. Furthermore, they were grouped based on the average score obtained from the 3 assessment teams. This first data collection was carried out to obtain pre-test data. Furthermore, the treatment was carried out by providing 39 learning models for 12 meetings. The games are: Butterfly Perch Game, Gathering Shuttlecock Competition, Running ABC 2 with Agile and Flip, Running ABC 3 with Agile and Cardboard Posts, Running ABC 4 with Agile Posts, Cones and Cardboard, Running ABC 5 with Pos M, Running ABC 6 with Rubber, Coordinate Running on Slats, Competition Instruction Running, Stinging, Running Competition Jumping, Partnering, Increased Cone Jumping, Competition Frog Jumping, Pair Frog Jumping, Frog Chase Jumping, Single Wheel Train, Multilevel Tire Jumping , Puzzle Jump, Multilevel Goal Jump, Multilevel Box Jump, Pair Jump Rope, Pair Catch Ball Throw, 5 Ball Catch and so on, Split Ball Relay, Recumbent Move Ball Relay, Moving Water by Walking Using Hands and Feet, Train Passing Tunnels, Sky Ball Relay, Jumping Over Friend in Squat Position, Walking with One Foot Pair, Airplane Moving Ball, Putting Ball in Bucket, Running Over Multilevel Rope, Combination 1 Jump, Combination 2 Jump with Box, Combination 3 Jump with Ball, Combination 4 Jump with Agile, Box and Ball and Game Combination 5 Jump with Cardboard and Board Support. After all the games were given for 12 meetings, it was continued with a post test with the same instrument during the pre test.

4. DATA ANALYSIS

Data description and analysis requirements test in this study were processed using descriptive statistics and effectiveness test through N-gain Percent. The division of the N-gain category in the form of % (percent) refers to the category of interpretation (Hake, 1999) as shown in table 2 below:

Table 2. Category Interpretation of Effectiveness N-gain percent

Mark N-gain	Interpretation
< 40	Ineffective
40-55	Less effective
56-75	Effective enough
> 76	Effective

Before the effectiveness test was carried out, the N-gain Percent normalist test and the N-gain Percent Homogeneity Test were first carried out through the help of the IBM SPSS Statistics Version 29.0.0.0 (241) 2023 program.

5. RESEARCH RESULT

The results of the pretest and posttest in each group can be seen in table 3 below:

Table 3. Data Recapitulation of Pre-Test and Post-Test Results of the Long Jump Assessment

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
Experimental Group Long Jump Pre Test Value	40	57	67	61.93	2.96
Experimental Group Long Jump Post Test Values	40	99	113	105.73	4.06
Control Group Long Jump Pre Test Value	40	58	68	62.00	2.49
Post Test Long Jump Value of the Control Group	40	75	92	82.58	4.56
Valid N (listwise)	40				

Table 3 data above can be used as a reference for researchers to test the effectiveness of the designed learning model. The following is a summary of the results of the tests of Normality which were carried out using the N-gain_Persen test.

Table 4. Summary of the N-gain_Persen Test of Normality Test Results

Tests of Normality							
	Kelas	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
N-gain_Persen	Eksperimen	.177	40	.300*	.958	40	.238
	Kontrol	.227	40	.202	.943	40	.194
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

Based on table 4 above, it is known that the significance value (Sig.) in the Shapiro Wilk test for the N-gain_Percent value in the experimental class is 0.238 and the control class is 0.194. Because the Sig values of the two classes are greater than 0.05, it can be said that the data used in this study are normally distributed. Furthermore, the homogeneity test results can be seen in the following table:

Table 5. Summary of N-gain_Persen Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
N-gain_Persen	Based on Mean	.188	1	78	.867
	Based on Median	.265	1	78	.786
	Based on Median and with adjusted df	.265	1	77.985	.786
	Based on trimmed mean	.197	1	78	.857

Based on the calculation, it is known that the significance value Based on Mean > 0.05 is 0.867 > 0.05. Thus it can be stated that the variance of the data is homogeneous.

Based on tables 4 and 5 above, it can be concluded that all requirements are met. Furthermore, the difference in the effectiveness of the two groups through N-gain_Persen is seen in the Mean N-gain_Persen statistic group table below:

Table 6. Summary of Mean N-gain_Percent Calculation Results

	Kelompok	N	Mean	Std. Deviation	Std. Error Mean
N-gain_Persen	Eksperimen	40	79.824	5.911	.935
	Kontrol	40	42.533	5.484	.867

Based on table 6 above, it is known that the average value of N-Gain_Persen for the Experiment group is 79.824 or if it is rounded up to 80%, it can be concluded that the experimental group is effective for increasing the basic long jump motion in junior high school students. Furthermore, it is known that the average value of N-gain_Persen for the control group is 42.553 or if it is rounded up to 43%. So it can be concluded that the control group was less effective at increasing the long jump basic motion in junior high school students.

Thus, statistically descriptive, it can be said that there is a difference in the effectiveness of the experimental group and the control group in increasing the long jump motion. Next to find out whether the difference in the effectiveness of the two groups is significant (significant) or not, it is done by interpreting the Independent Samples Test as shown in the following table:

Table 7. Summary of Independent Samples Test Calculation Results

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	Df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						One-Sided p	Two-Sided p			Lower	Upper
Ngain_Persen	Equal variances assumed	.188	.867	31.393	78	<,001	<,001	40.022	1.275	37.484	42.560
	Equal variances not assumed			31.393	77.564	<,001	<,001	40.022	1.275	37.484	42.560

Based on table 7 above, it is known that the significance value (Sig) in Levene's Test for Equality of Variances is 0.867 > 0.05, it can be concluded that the variance of the N-Gain data (%) for the experimental group and the

control group is equally homogeneous. Thus, the independent sample t-test for the percent N-Gain shown in the Equal variances assumed column above is known to be the Sig. (Two-Sided p/2-tailed) is (<.001) <0.005, so it can be concluded that there is a significant (real) difference in effectiveness between the experimental group and the control group to increase long jump motion in junior high school students.

6. DISCUSSION

Students combine approach speed, last step, planting feet, takeoff, while in the air, and landing in the track and field event known as the long jump (Hussain et al., 2011). The approach run, take-off phase, flying phase, and landing phase are the four phases that make up the long jump's biomechanics (Kamnardsiri et al., 2021). Similar to short jumps, long jumps have four stages: prefix/stance, repulsion/pedestal, body attitude in the air, and landing attitude (Muhajir, 2017). In addition, the long jump involves four different types of specific motion: (1) specific prefix motion; (2) specific repulsion movement; (3) specific motion while in the air; and (4) specific landing motion (Roji & Yulianti, 2017). Likewise the stages in the long jump, namely; (1) prefix, (2) departure, (3) hovering, and (4) landing (Mark, Guthrie, 2008).

The findings of this study are the effectiveness of the game-based long jump learning model for junior high school students. Based on the findings of the research results, it turns out that the game-based long jump learning model provides significant effectiveness in increasing the long jump movement in junior high school students. This can be seen from the test results, it turns out that the average N-gain Percent of the experimental group is 79.82 greater than the average N-gain Percent of the control group is 42.53. Based on the results of this study, it can be stated that the game-based long jump learning model is effective in increasing long jump movements. (Two-Sided p/2-tailed) is (<.001) <0.005, thus it can be concluded that there is a significant (real) difference in effectiveness between the experimental group and the control group.

As described in the previous section, student performance in each phase of the long jump must be considered. One of the key factors affecting a jumper's performance is an experienced expert in long jump who is able to provide advice and input to long jumpers (Kamnardsiri et al., 2021). Furthermore, the learning model is defined as a series of movements arranged in such a way as to increase the long jump movement. This is because students' abilities cannot be achieved without learning. With the existence of a learning model that is in accordance with the form of movement, students can perform more perfectly when doing an assessment. Thus the given game-based learning model provides a significant level of effectiveness in increasing the long jump movement in junior high school students.

CONCLUSIONS

It may be inferred from the data analysis and discussion that have been given above that the game-based long jump learning model is successful in improving the long jump movement in junior high school students. This is demonstrated by students' interest, enjoyment, and drive to participate in previously uninteresting and monotonous game-based learning activities. Teachers will find the offered game-based learning model very helpful in comprehending the idea of learning motion in long jump sports techniques. When doing a long leap, the position of the feet, knees, body, hips, hands, and perspectives are all important considerations.

Based on the foregoing conclusions, the author is able to make the following recommendations:

1) For teachers it is recommended to provide a learning model in accordance with the actual form of movement;

2) It is suggested that students to implement a learning model that leads to the long jump movement;

3) The school should pay more attention to the learning program plans provided;

4) For future researchers, if they continue this research, they should look at other variables in order to obtain more complete information on long jump performance. And because the research sample is limited, it is suggested to increase the sample.

Many Thanks

We appreciate Junior High School 2 Kota Solok's willingness to participate in this study.

REFERENCES

[1] Alesi, M., Bianco, A., Padulo, J., Vella, F. P., Petrucci, M., Paoli, A., Palma, A., & Pepi, A. (2014). Motor and cognitive development: the role of karate. Ligaments and Tendons Journal, 4(2), 114–120.

[2] Balyi, Istvan, Way, Richard. Higgs Colin. (2013). Long Term Athlete Development. Human Kinetics. Becker, Kevin A, Smith, Peter J.K,. (2015). Attentional Focus Effects in Standing Long Jump Performance. Journal of Strength and Conditioning Research 29(7):p 1780-1783, July 2015. https://doi.org/10.1519/JSC.0000000000000825.

[3] Borg, W. R., & Gall, M. D. (1983). Educational Research: An Introduction 4th. Longman Inc. Candradewi Wahyu Anggraeni. (2018). Promoting Education 4.0 in English for Survival Class. Journal of English Language, Literature, and Teaching. https://doi.org/10.31002/metathesis.v2i1.676.

[4] Chao-Fu Chen, Hui Ju-Wu. (2022). The Effect of an 8-Week Rope Skipping Intervention on Standing Long Jump Performance. Int. J. Environ. Res. Public Health. 19(14), 8472; https://doi.org/10.3390/ijerph19148472.

[5] Chen, A. (2013). Effects of exergaming and the physical education curriculum. In Journal of Sport and Health Science.https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=Effects+of+exergaming+and+the+physical+education+curriculum&btnG= 129-130. https://doi.org/10.1016/j.jshs.2013.03.001.

[6] Chiorean, A., Savoy, C., Schmidt, L. A., Morrison, K., Saigal, S., & Van Lieshout, R. J. (2019). Childhood Motor Coordination and Adult Affective Experience Among Extremely Low Birth Weight Survivors. Perceptual and Motor Skills, 126(4), 656–674. https://doi.org/10.1177/0031512519846769.

[7] Christos Papadopoulos et.all. (2011). Standing long jump and handheld halters; is jumping performance improved. Journal of Human Sport and Exercise - 2011, Vol. 6, No. 2. 436-443. http://dx.doi.org/10.4100/jhse.2011.62.24

[8] Christos Ioannides., Andreas Apostolidis., Marios Hadjicharalambous., Nikolaos Zaras (2020). Effect of a 6- week plyometric training on power, muscle strength, and rate of force development in young competitive karate athletes. Journal of Physical Education and Sport ® (JPES), Vol.20 (4), Art 236 pp. 1740 - 1746, online ISSN: 2247 - 806X. https://doi.10.7752/jpes.2020.04236.

[9] Coskun, A., & Sahin, G. (2014). Two different strength training and untrained period effects in children. Journal of Physical Education and Sport, 14(1), 42–46. https://doi.org/10.7752/jpes.2014.01007.

[10] Dickinson, R. K. (2014). A Review of “Conditions of Children’s Talent Development in Sport.” Journal of Sport Psychology in Action, 5(2), 132–134. https://doi.org/10.1080/21520704.2014.927043.

[11] El-Ashker, S., Hassan, A., Taiar, R., & Tilp, M. (2019). Long jump training emphasizing plyometric exercises is more effective than traditional long jump training: A randomized controlled trial. Journal of Human Sport and Exercise. 2019, 14(1): 215-224. https://doi:10.14198/jhse.2019.141.18.

[12] Erikson, Martin G. & Erikson, Malgorzata. (2020). Learning outcomes and critical thinking – good intentions in conflict: ISSN: 0307-5079 (Print) 1470-174X (Online) Journal homepage: 2293-2303 https://doi.org/10.1080/03075079.2018. 1486813.

[13] Fehmi, Ç., Mahmut, G., Kürşad, S., Ihsan, S., & Erdi, K. (2014). Analysis and examination of the relationship between leisure motivation and academic motivation of students of schools of physical education and sports. Journal of Physical Education and Sport, 14(1), 127–133. https://doi.org/10.7752/jpes.2014.01020.

[14] Forneris, T., Camiré, M., & Trudel, P. (2012). The development of life skills and values in high school sport: Is there a gap between stakeholder’s expectations and perceived experiences? International Journal of Sport and Exercise Psychology, 10(1), 9–23. https://doi.org/10.1080/1612197X.2012.645128.

[15] Hake, R.R. (1999). Analyzing Change/ Gain Score. AREA-D American Education Research Association’s Devision. D, Measurement and Research Methodolog.

[16] Hanif, A., Herman, H., Mudinillah, A., and Rahmi, P. W. L. (2023). Development of the QUIZIZZ Platform as an Interactive Quiz-Based Learning Media for Arabic Language Lessons at Madrasah IBTIDAIYAH. International Journal of Membrane Science and Technology, 2023, Vol. 10, No. 2, pp. 372-384. https://doi.org/10.15379/ijmst.v10i2.1207

[17] Huiyu Zhou et.all (2020). How to Improve the Standing Long Jump Performance. Applied Bionics and Biomechanics. 1-5. https://doi.org/10.1155/2020/8829036.

[18] Hussain, I., Khan, A., Mohammad, A., Bari, M. A., & Ahmad, A. (2011). A comperison of selected kinemetical parameters between male and female intervarsity long jumpers. Journal of Physical Education and Sport.

[19] Kamnardsiri, et al. 2021. A Knowledge-Based Smart Trainer System for Transferring Knowledge From Coaches to Long Jump Students. 6, 609114 http://doi.10.3389/feduc.2021.609114.

[20] Koch, alexander j. et.al. Effect of Warm-Up on the Standing Broad Jump in Trained and Untrained Men and Women. Journal of Strength and Conditioning Research 17(4):p 710-714, November 2003.

[21] Mark, Guthrie. (2008). Sukses Melatih Atletik. Canada. Human Kinetic. Margaritopoulos, S., Theodorou, A., Methenitis, S., Zaras, N., Donti, O., Tsolakis, C, (2015). The effect of plyometric exercises on repeated strength and power performance in elite karate athletes. Journal of Physical Education and Sport, Art 47, pp. 310 - 318. online ISSN: 2247 - 806X. http://doi.10.7752/jpes.2015.02047.

[22] Marija, Lorger et.al, (2012). The effects of motor learning on results of standing long jump performed by female students. Univesity of Zagreb Faculty of Education Svetošimunska cesta 25, 10000 Zagreb, Croatia. Sport Science 5 1: 27-31.

[23] Masaki Wakai, Nicholas P. Linthorne. (2005). Optimum take-off angle in the standing long jump. Human Movement Science. Volume 24, Issue 1, February 2005, Pages 81-96. https://doi.org/10.1016/j.humov.2004.12.001.

[24] McMahon, L. (2010). The development of play. In The handbook of play therapy. 1-26 https://doi.org/10.4324/9780203359310.

[25] Morales-Belando, A Calderón (2018) Improvement in game performance and adherence after an aligned TGfU floorball unit in physical education. Physical Education and Sport Pedagogy 23 (6), 657-671. https://doi.org/10.1080/17408989.2018.1530747.

[26] Muhajir. 2017. Pendidikan Jasmani, Olahraga dan Kesehatan. Jakarta: Erlangga. Mukherjee, S., Ting Jamie, L. C., & Fong, L. H. (2017). Fundamental Motor Skill Proficiency of 6- to 9-Year- Old Singaporean Children. Perceptual and Motor Skills, 124(3), 584–600. https://doi.org/10.1177/0031512517703005.

[27] Munifah, dkk. (2019). Management System of Education: Conceptual Similarity (Integration) between Japanese Learning System and Islamic Learning System in Indonesia. Tadris: Jurnal Keguruan dan Ilmu Tarbiyah, 4 (2). pp. 159-170. ISSN 2579-7964. https://doi.org/10.24042/tadris.v4i2.4893.

[28] Nataša arsović, et.all. (2019). Influence of physical and sports activity on mental health. : Physical Education and Sport. 559-568. https://doi.org/10.22190/FUPES190413050A.

[29] Octavianus, Cahyanto Adhie. (2020). The effectiveness of problem-Based learning Approach in the teaching of hang style long jump. Vol 13 No 2 (2020): Jurnal Ilmiah Bina Edukasi. 24-30. https://doi.org/10.33557/jedukasi.v13i2.1152.

[30] Padulo, J., Chaabene, H., & Ruscello, B. (2014). The effects of one-week training camp on motor skills in Karate kids. https://www.researchgate.net/publication/259285398.

[31] Papaj, D. R., Snell-Rood, E. C., & Davis, J. M. (2018). Learning. In Encyclopedia of Ecology. 1-653. https://doi.org/10.1016/B978-0-444-63768-0.00020-2.

[32] Pedro Pinheiro Paes., Gustavo Augusto Fernandes Correia., Vinicius De Oliveira Damasceno., Eduardo Victor Ramalho Lucena., Iana Guimarães Alexandre., Laís Ramos Da Silva., Wlaldemir Roberto Dos Santos., Carlos Gilberto De Freitas Júnior. (2022). Effect of plyometric training on sprint and change of direction speed in young basketball athletes. Journal of Physical Education and Sport ® (JPES), Vol. 22 (issue 2), Art 39, pp. 305 - 310, online ISSN: 2247 - 806X. https://doi.10.7752/jpes.2022.02039.

[33] Peraturan Presiden (Perpres) Nomor 86 Tahun 2021.

[34] Peraturan Menteri Pemuda dan Olahraga Republik Indonesia Nomor 2 Tahun 2023.

[35] Prasetya, H.B., Batubara, J., Herman, H., Christianto, W.N. (2023). To Fulfil Promises is To Die: A Study of Gatotkaca Falls in Javanese Shadow Puppet Canon. Information Sciences Letters. 12(6), pp. 2343–2355. doi:10.18576/isl/120611

[36] Purba, A., Herman, Tukiyo, Purba, R., Fatmawati, E., and Saputra, N. (2023). The effect of the online learning process and independent learning process on improving students' achievement. Journal of Namibian Studies, 33, pp. 978–990. DOI https://doi.org/10.59670/jns.v33i.547

[37] Rahyubi, Heri (2012). Teori-teori Belajar dan Aplikasi Pembelajaran Motorik. Bandung: Referenc.

[38] Roji & Yulianti, Eva. (2017). Pendidikan Jasmani, Olahraga, dan kesehatan Kelas VIII. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia.

[39] Santrock, John W. (2003). Adolescence Perkembangan Remaja (Edisi Ke enam). Jakarta: PT. Erlangga.

[40] Tabben, M., Sioud, R., Haddad, M., Franchini, E., Chaouachi, A., Coquart, J., Chaabane, H., Chamari, K., & Tourny-Chollet, C. (2013). Physiological and perceived exertion responses during International Karate Kumite Competition. Asian Journal of Sports Medicine, 4(4), 263–271. http://asjsm.tums.ac.ir.

[41] Thomas Haugen1., Stephen Seiler., Øyvind Sandbakk., Espen Tønnessen1. (2019). The Training and Development of Elite Sprint Performance: an Integration of Scientific and Best Practice Literature. Sports Medicine – Open; 5:44 https://doi.org/10.1186/s40798-019-0221-0.

[42] Trapp, G., Giles-Corti, B., Christian, H., & Timperio, A. (2013). Note. This article will be published in a forthcoming issue of the Pediatric Exercise Science. The article appears here in its accepted, peer-reviewed form,. Retrieved from http://scholar.google.com/scholar?hl.

[43] Undang-Undang Sistem Pendidikan Nasional. (2003). Jakarta.

[44] Undang-Undang Sistem Keolahragaan Nasional. (2005). Jakarta.

[45] UNESCO. (2015). Unesco and Sustainable Development. Sustainable Development. http://unesdoc.unesco.org/images/0013/001393/139369e.pdf

[46] UNESCO. (2018). Avances en la educación para el desarrollo sostenible y la educación para la ciudadanía mundial. París, Francia: Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Recuperado de: https://unesdoc.unesco.org/ark:/48223/pf0000266176_spa.locale=es.

[47] Wu, Will F. W., et al., . (2012). Effect of Attentional Focus Strategies on Peak Force and Performance in the Standing Long Jump. Journal of Strength and Conditioning Research 26(5):p 1226-1231, May 2012. https://doi.org/10.1519/JSC.0b013e318231ab61.

[48] Zielinski, D. (2019). Can playing games help students master concepts from general psychology classes? International Journal of Game-Based Learning. 9 (2) page 18. https://doi.org/10.4018/IJGBL.2019040104.

DOI: https://doi.org/10.15379/ijmst.v10i2.1512