VOLLEYBALL SMASH SKILL LEARNING MODEL FOR STUDENTS

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ABSTRACT
This study was to develop a Volleyball Smash Skill Learning Model for College Students. The target in this study is students in Banten Province. The research method used is the research and development of the Borg and Gall model. The data collection technique used is in the form of expert validation results and effectiveness tests through experiments with paired t-test statistical data analysis. The results of research and development of the Volleyball Smash Skill Learning Model for Students show that the Volleyball Smash Skill Learning Model is worthy of Students. Based on the results of the effectiveness test, it shows that the Volleyball Smash Skill Learning Model For College Students is effective. This is shown by the results of the T-Test and N-Gain Score on volleyball smash skills which show a significant improvement. Therefore, Volleyball Smash Skill Learning Model For College Students is effective to improve volleyball smash skills.
Keywords: *Learning, Volleyball, Smash, College Student*

1 INTRODUCTION

The basic techniques in volleyball consist of service, bottom passing, top passing, block and smash. "The basic techniques of volleyball games are, serve, passing, smash, and block. The serve is divided into two, namely, the lower serve and the upper serve, passing is also divided into two, namely the bottom pass and the upper pass." (Nur, S., Manurizal, L., &; Putra, 2022). Basic techniques in volleyball games have a very important role, this is because it is to maintain the quality of the game and develop player achievements. Mastery of basic volleyball techniques is one of the elements that determine the victory or defeat of a team in a match in addition to elements of physical, tactical and mental conditions. The most important technique in the game of volleyball is smash, a movement that every volleyball player must master. So smash in a volleyball game is a form of a series of movements made by a player with the aim of crossing the ball towards the opponent while turning off the opponent's game and getting points. The smash technique is the most difficult technique in volleyball because it requires good physical condition and maximum coordination of motion. Smashes require strong power and precise timing. Getting it all is not easy and it takes repeated learning to perfect the smash technique. The smash technique is the core or end of an attack that a team builds to get points and is also the most often done to get points.

The smash learning model is a learning used by lecturers or teachers to provide different material to students or also to students to avoid boredom and boredom in learning. Every lecturer / teacher in preparing a learning program must think about variations in the provision of learning menus. Because the learning model is very important to maintain the interest and activeness of students or students in following the process of learning activities. The stages for smashing are as follows: Start, Repulsion, Ball Blow, Landing Attitude, Judging from the understanding Smash can be defined as a way to play the ball effectively and efficiently to get optimal results, but still stick to the rules of the game that have been applied.

So smash in a volleyball game is a form of a series of movements made by a player with the aim of crossing the ball towards the opponent while turning off the opponent's game and getting numbers and an attack technique that is done by hitting the ball and aims to place the ball into the opposing team's area without being blocked or returned by the opponent, So that it kills the opponent and of course adds value or points from the team. Previous research on volleyball in universities, so far has been mostly done to analyze the influence of learning, basic techniques for playing volleyball without looking at the series of initial attitude movements, implementation attitudes and final attitudes,

physiological aspects, strenght and conditioning, tests and measurements and biomechanics related to playing strategies. Such as research conducted by (Nur, S., Manurizal, L., & Putra, 2022) on the Contribution of Arm Muscle Explosive Power and Hand Eye Coordination to the Accuracy of Volleyball Smashes of Sports Coaching Education Students of Universitas Riau. Research conducted by (Sumarna, D., &; Muhani, 2022) discusses the Effect of Drill Training on the Accuracy of Volleyball Smashes. Research conducted by (Hadiana, Aris, 2020) Media Development of Volleyball Smash Tools for FIK Students of Medan State University in 2019. Research conducted by (Endang Pratiwi, Hegen Dadang Prayoga, 2019, entitled Analysis of reaction speed in UNSIKA volleyball athletes. Previous research shows that there has been no comprehensive research on physical education learning in universities on volleyball material related to the volleyball smash learning model for students.

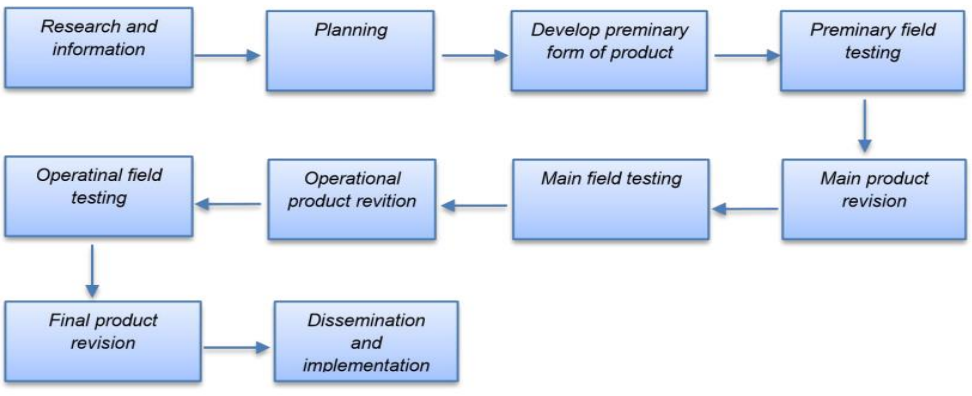
1. RESEARCH OBJECTIVES

This research and development in general is to produce new products that will later be applied in learning activities to make it easier for lecturers to provide volleyball smash learning materials to students and make it easier for lecturers to achieve the expected volleyball smash learning results. Research and Development of volleyball smash learning models for students specifically has several objectives including: Getting in-depth information about the learning process of smash skills in students in college, Improving the learning process and learning outcomes of volleyball smash skills in students in college, Developing volleyball smash skill learning models, Creating a safe learning atmosphere, Comfortable and fun when learning smash skills with learning models., Provide information to students to be more active in following the learning process. The ultimate goal of this development research is to produce products in the form of books and applications that contain learning models of volleyball smash skills for students, so that they can complement the existing learning assistance, namely so that learning in students can:

1. METHODOLOGY

This research is a development research, which is developing a model of learning volleyball smash skills, both individually and in groups. Planning and preparation are factors that determine the success of a development. The preparation and development are made as well as possible with the hope that they can be complete and clear guidelines and guidelines. The characteristics of the volleyball smash skill learning model that will be created or applied are the volleyball smash skill learning model is adjusted to the characteristics of students, this learning model is designed to vary so that the learning process becomes more interesting and the process of learning volleyball smash skills makes it easier for students to digest the material. The main target of this research is to develop a volleyball smash skill learning model that can help students make it easier to absorb volleyball smash skills learning material.

Research on the development of this volleyball service model uses a research and development model (Research and Development) from Borg and Gall which consists of ten steps in research, namely among others (Borg &; Gall, 2004.



The target of this study is to make a learning model of volleyball smash skills, therefore planning and preparation are needed in order to provide clear instructions and guidance in the implementation of research later in learning, planning and preparing learning models are factors that determine the

success of a program. Therefore, the development of a smash learning model with a learning model that will be compiled and developed in the form of modifications to several learning models consisting of 24 learning model items. The objects in this study are students from 3 campuses in Banten Province, namely; Prima Gaha University campus, Jalan Trip, Jamaksari No. 1A, Kaligandu, Serang District, Serang City, Banten 42111. 2). Sultan Ageng Tirta Yasa University Campus (UNTIRTA), Jalan Ciwaru Raya Cipare, Serang District, Serang City, Banten 42117. 3) STKIP Setia Budhi Rangkasbitung Campus, Jalan Budi Utomo No. 22 L, Muara Ciujung Education Complex, Rangkasbitung District Team, Lebak Regency, Banten.

The smash technique has a high level of difficulty so that technical skills and mastery depend on age, physical ability and duration of learning. The learning models developed aim to improve smash skills in students so as to minimize technical errors and increase accuracy when doing smashes

Volleyball *Smash* Test Results *Pretest* and *Posttest*

Testee	Experimental Group		Testee	Control Group	
	Pretest	Posttest		Pretest	Posttest
1	89	95	1	88	91
2	87	95	2	87	90
3	86	95	3	86	88
4	86	95	4	87	89
5	87	95	5	84	86
6	85	93	6	85	91
7	85	91	7	87	90
8	86	92	8	86	89
9	88	92	9	87	88
10	90	95	10	90	92
11	87	93	11	84	90
12	85	92	12	88	90
13	85	93	13	85	90
14	86	95	14	88	89
15	87	92	15	87	88
16	87	91	16	86	88
17	85	93	17	84	89
18	88	95	18	88	90
19	90	95	19	84	88
20	88	95	20	85	86
21	89	95	21	89	91
22	85	92	22	84	86
24	86	93	24	88	89
24	88	93	24	85	86
25	91	95	25	86	89
26	87	90	26	87	88
27	87	91	27	88	89
28	88	92	28	86	90
29	87	92	29	85	87

30	87	93	30	86	88
31	90	95	31	88	89
32	87	92	32	87	90
33	89	95	33	86	91
34	85	93	34	86	89
35	91	95	35	84	90
36	86	91	36	85	87
37	85	92	37	84	87
38	87	93	38	86	92
39	86	92	39	85	88
40	87	93	40	83	90
41	89	95	41	83	89
42	83	88	42	87	88
43	89	95	43	88	91
44	88	92	44	89	93
45	88	95	45	86	87
Σ	727	991	**Σ**	682	811
X	**16,15**	**22.02**	**X**	**15.15**	**18.02**
SD	**1,78**	**1.57**	**SD**	**1.69**	**1.68**

In the table above can be seen the average pretest *and* posttest *values*. The average posttest score is greater than the average posttest score. This shows that the average volleyball smash ability increases after using the learning model. After the researcher knew the average pretest *and posttest* results, next, *to determine the effectiveness of* the volleyball smash ability increased after using the learning model, the N-Gain percent test and T test were carried out using the independent sample t test. The results of the N-Gain Percent test are obtained as follows:

N-Gain Percent Test Results

No	Class	N-Gain Percent	Interpretasi
1	Ekperimen	69,59	Cukup Efektif
2	Kontrol	28,57	Tidak Efektif

Based on *the N-gain Percent results, it shows that the average N-gain percent score for the experimental class (* Volleyball smash learning model) is 69.59% included in the "Quite effective" category. With a minimum N-gain percent value of 33.33% and a maximum N-gain percent of 90%. While for the average N-gain percent for the control class was 28.57% included in the "Ineffective" category. With a minimum N-gain percent value of 9.09% and a maximum N-gain percent value of 60%. So with that it can be concluded that the use of the volleyball *smash learning model is* effective to improve the results of volleyball *smashes*. While the results of *volleyball smashes* without using a learning model are not effective. Based on the results of this effectiveness, according to Nieveen's opinion quoted by (Trianto, 2007), that the model is said to be good if it meets the criteria, namely one of logical theoretical rational validity. Likewise, the same opinion according to (Widdiharto, 2004) states that a good learning model, one of which is to have logical theoretical rational characteristics and learning goals to be achieved. From the test results above show that it has a significant improvement after being given to learn volleyball smash skills, so that it can be used and applied to .

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
N-Gain Persen	Eksperimen	.130	45	.055	.943	45	.029
	Kontrol	.120	45	.104	.936	45	.015

Based on the table above shows that the experimental class's N-Gain percent significant values are 0.055 > 0.05 and 0.104 > 0.05 control class then the hypothesis is accepted. This indicates that N-Gain volleyball smash capabilities are experimental grade and control is normally distributed.

Next, researchers conducted an average difference test. This test uses an independent sample t test with a significant level of 0.05. The test results of the average difference in N-Gain of volleyball smash ability are as follows:

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
NGain_Persen	Equal variances assumed	.565	.454	-12.541	88	.000	-41.01920	3.27076	-47.51915	-34.51926
	Equal variances not assumed			-12.541	87.544	.000	-41.01920	3.27076	-47.51962	-34.51879

Based on the table above, it is known that the value, Sig (2-tailed) is 0.000 < 0.05. obtained tcalculate score = 12.541 with df = 88. obtained ttabel = 1.98729, then the increase in the volleyball *smash skill ability of the* experimental group is higher than the increase in the smash ability of the volleyball of the control group. Thus it can be concluded that the use of the volleyball smash learning model is *effective for improving the results of volleyball* smash *skills* for college students.

3.3 DATA ANALYSIS TECHNIQUES

The data analysis technique in this study used descriptive quantitative data analysis techniques. The method of calculating data analysis is to find the relative frequency of the percentage, with the formula (Sugiyono, 2011) as follows:

$$P=F/N\times100\%$$

P = Percentage sought

F = Frequency

N = Number of Respondents

2 RESULTS AND DISCCUSION

Based on the test results, it can be concluded that the volleyball smash skill learning model is feasible to use and Effective in improving abilities. However, the products produced by researchers certainly have advantages and disadvantages. Therefore, to achieve the perfect product, the researcher will give some suggestions:

1. Lecturers need to provide control and master the material well in the learning process. Lecturers must have excellent supervision skills in learning techniques. The sport of volleyball uses movements that allow injury to . So if anyone abuses this method, an injury occurs. Therefore, it is important to carry out intensive supervision from lecturers (Musa et al., 2017)

Lecturers must master the teaching material and have the latest references. Lecturer knowledge is positively related to the process of teaching and learning activities (Sunaryo, &; Yusuf, 2016). The importance of improving the quality of education and the quality of educational services that can educate and teach while producing and quality graduates (Muhlison, 2014). Lecturers need to increase knowledge to enrich the material they want to deliver and not make them experience boredom. Increasing interest is very important in the learning process (Budiarti &; Muhammad, 2013).

2. The learning model must be arranged based on the level of difficulty to facilitate lecturers in providing material, lecturers must study the level of difficulty of the learning model before teaching. The level of difficulty can be analyzed by trying to study the model related to the ability to be taught. The learning process must be carried out with clear stages. The process is better to do in a row. That is starting from an easy process then a more difficult learning process. This is done to easily understand every volleyball *smash movement* . A volleyball smash style-based learning model was created by researchers to help improve volleyball smash style results . So, this model was created certainly for the need to convince them that studying this material is more fun. Therefore, this model is expected to be a reference for teachers, trainers and also for the students themselves.

1. STUDY LIMITATIONS

After some research, this product has some disadvantages that need to be changed, but there are some advantages of this product. That is; Able to improve basic movements and skills. Based on the results of the experiment, such models can be used and can improve smash results much better. The lecturers are expected to teach various fundamental movement skills, techniques, and strategies for games and sports, internalization values (sportsmanship, honesty, cooperation), and healthy living habits. Its implementation is not through conventional teaching in the classroom which is a theoretical study but involves physical, mental, intellectual, emotional, and social elements (Hartati, 2012). According to research conducted by (Ariawan &; Hartono, 2014; Bhayangkara, 2018; Djawa, 2017) that Games increase interest in performing basic movements. This model can be done in several Game approach models.

The model contains elements of games and competitions, and most like it. Learning while playing competitions is very important to increase interest in learning. According to research conducted by (Aria wan &; Hartono, 2014; Bhayangkara, 2018; Djawa, 2017), interest is strongly influenced by the pleasant atmosphere in the Game. Lecturers must have good creativity to attract attention in sports. In addition to using the Game, increased competitive activity also needs to be done. Competitive activities can be carried out by competitions. A competitive atmosphere can increase enthusiasm to show their abilities. pay more attention to competition to perform the techniques taught by the teacher, In addition, it can stimulate psychomotor, cognitive, and affective.

With this model applied, it can quickly move actively. Active movement can improve students' psychomotor movements, making students happier to move than still. Lecturers are expected to provide places and facilities for students to develop cognitive, affective, and psychomotor abilities through fun play activities for students. Thus, stimulation for the overall growth and development of students can be achieved appropriately. Through a variety of fun physical activities, students get a positive impact, especially on their growth and development can feel comfortable and safe in the teaching and learning process.

Safety and comfort in the learning process are very important to do. A high sense of security in learning can increase interest in education. There is insecurity faced for fear of injury. So the method of using the Game provides a sense of security for you. In addition, comfort in learning can also be realized along with the knowledge of security they experience. A sense of security and comfort supports a learning process that is more conducive to . It is expected that a sense of security and comfort can be connected with increased competence. Based on research conducted by wisdom (2015) If physiological needs and the need for security have been met, then there is a need for love, affection, and belonging. So that it will develop student skills that can appreciate lessons and support the success of learning *volleyball* smash.

Students can be more active and enthusiastic, so they don't get bored.

By applying the model, students tend to prefer learning while playing so that students can master the movements better. According to (Fauziah, 2013), physical factors come from during teaching and learning activities. experiencing fatigue or fatigue experienced by the body due to the activities they do. Causes the appearance of learning saturation , including lazy learning, neglect of tasks, decreased concentration so that some of them pay less attention to lessons. With the application of this model, it is expected that it will not experience saturation due to slowness. Lecturers must adjust the age capacity of each student.

This model can help lecturers in delivering skills material. With this model, lecturers find it more helpful in the learning process. This model is easy to do and implement with Game elements.

As a reference and new knowledge, especially for physical education and sports in schools. This model can provide more benefits in the field of physical education and sports because it has an element of movement that is useful and fun.

REFERNCES

[1] Adiyoso, W. (2022). Kajian Hoax dalam Pandemi Covid-19 di Indonesia. *Bappenas Working Papers*, *5*(3), 356–366. https://doi.org/10.47266/bwp.v5i3.177

[2] Al Ningsih, Y. R. (2021). Manfaat Permainan Tradisional Bola Bekel terhadap Perkembangan Anak Usia Dini. *Jurnal Penelitian Dan Pengembangan Pendidikan Anak Usia Dini*, *8*(1), 69–76.

[3] Algiffari, M. (2015). Perancangan Motion Graphic (Bumper In) dan Video Dokumenter Permainan Tradisional Jawa Barat. *Jurnal Sketsa*, *2*(1), 49–61.

[4] Ali, M., Humaid, H., & Samsudin, S. (2019a). Model Pembelajaran Lompat Jauh Gaya Jongkok Berbasis Permainan Pada Siswa SMP. *Journal Physical Education, Health and Recreation*, *3*(2), 1–9. https://doi.org/10.24114/PJKR.V3I2.11530

[5] Ali, M., Humaid, H., & Samsudin, S. (2019b). Model Pembelajaran Lompat Jauh Gaya Jongkok Berbasis Permainan Pada Siswa SMP. *Journal Physical Education, Health and Recreation*, *3*(2). https://doi.org/10.24114/PJKR.V3I2.11530

[6] Alpen, J., Dlis, F., Hernawan, Widiastuti, Apriani, L., Kurniawan, E., & Sofyan, D. (2022). Trends in scientific publication of traditional game learning models in physical education and sports in Indonesia: A bibliometric analysis. *Journal Sport Area*, *7*(2), 214–226. https://doi.org/10.25299/sportarea.2022.vol7(2).9072

[7] Andriani, T. (2012). Permainan Tradisional Dalam Membentuk Karakter Anak Usia Dini. *Sosial Budaya*, *9*(1), 121–136. https://doi.org/http://dx.doi.org/10.24014/sb.v9i1.376

[8] Anggita, G. M. (2019). Eksistensi Permainan Tradisional sebagai Warisan Budaya Bangsa. *JOSSAE : Journal of Sport Science and Education*, *3*(2), 55. https://doi.org/10.26740/jossae.v3n2.p55-59

[9] Arifah, H. L., & Dinata, V. C. (2014). Pengaruh Permainan Lompat Terhadap Hasil Belajar Lompat Jauh Gaya Jongkok Dalam Pembelajaran Pendidikan Jasmani , Olahraga Dan Kesehatan (Studi pada Siswa Kelas V SDN Kabuh I Jombang). *Jurnal Pendidikan Olahraga Dan Kesehatan*, *02*(03), 680–684.

[10] Arifin, L. T., & Haris, I. N. (2018). Pengaruh Penerapan Permainan Tradisional Terhadap Kebugaran Jasmani Siswa Kelas VIII SMPN 1 Ciasem Kabupaten Subang (Studi eksperimen Pada Siswa Kelas VIII SMPN 1 Ciasem). *Jurnal Biomekanika*, *4*(1), 1–7. http://ejournal.unsub.ac.id/index.php/FKIP/article/view/222

[11] Azizah, M. I. (2016). Efektivitas Pembelajaran Menggunakan Permainan Tradisional Terhadap Motivasi dan Hasil Belajar Materi Gaya di Kelas IV MIN Ngronggot Nganjuk. *Dinamika Penelitian: Media Komunikasi Penelitian Sosial Keagamaan*, *16*(2), 279–308.

[12] Bile, R. L., Tapo, Y. B. O., & Desi, A. K. (2021). Pengembangan Model Latihan Kebugaran Jasmani Berbasis Permainan Tradisional Sebagai Aktivitas Belajar Siswa Dalam Pembelajaran PJOK. *Jurnal Penjakora*, *8*(1), 71. https://doi.org/10.23887/penjakora.v8i1.30752

[13] Branch, R. M. (2009). *Instructional Design: The ADDIE Approach*. springer.

[14] Byrne, M. K., Miellet, S., McGlinn, A., Fish, J., Meedya, S., Reynolds, N., & Van Oijen, A. M. (2019). The drivers of antibiotic use and misuse: The development and investigation of a theory driven community measure. *BMC Public Health*, *19*(1), 1–11. https://doi.org/10.1186/s12889-

019-7796-8

[15] Damayani, N. A., Saepudin, E., Budiono, A., & Rachmawati, T. S. (2019). Preservation of traditional game values as educational tourism assets in Sindangkerta District, Indonesia. *Journal of Environmental Management and Tourism*, *10*(4), 735–745. https://doi.org/10.14505/jemt.v10.4(36).04

[16] Defliyanto, D., Asmawi, M., Pelana, R., & Yarmani, Y. (2020). Development of Learning Model for Squat-style Long-jump Basic Technique Based on Biomechanics with a Game. *PENDIPA Journal of Science Education*, *4*(1), 31–39. https://doi.org/10.33369/pendipa.4.1.31-39

[17] Deys, L., Wilson, P. V., & Meedya, D. S. (2021). What are women's experiences of immediate skin-to-skin contact at cesarean section birth? An integrative literature review. *Midwifery*, *101*. https://doi.org/10.1016/j.midw.2021.103063

[18] Dick, W., Carey, L., & Carey, J. O. (2009). *The systematic design of instruction*. Merrill Prentice-Hall.

[19] Djawa, B. (2017). Penerapan Permainan Terhadap Hasil Belajar Lompat Jauh Gaya Jongkok (Studi Pada Siswa Kelas VII SMP Negeri 1 Ngadirojo, Pacitan). *Jurnal Pendidikan Olahraga Dan Kesehatan*, *5*(3), 445–450.

[20] Eliasa, E. I. (2014). Increasing values of teamwork and responsibility of the students through games: Integrating education character in lectures. *Procedia-Social and Behavioral Sciences*, 196-203.

[21] Emzir. (2012). *Metodologi Penelitian Kualitatif Analisis data*. Raja Grafindo.

[22] Euis Kurniati. (2016). *Permainan Tradisional dan Perannya Dalam Mengembangkan Keterampilan Sosial Anak*. Prenada Media Group.

[23] Fournier, L. S. (2022). The Inventory of Traditional Games in France: Cultural Heritage, Sportification, and the Revitalization of Local Practices. *International Journal of Sport and Society*, *13*(2), 23–33. https://doi.org/10.18848/2152-7857/CGP/V13I02/23-33

[24] Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational Research: An Introduction, 8th Edition*. Pearson.

[25] Gipit Charles, M. A., Abdullah, M. R., Musa, R. M., Kosni, N. A., & Maliki, A. B. H. M. (2017). The effectiveness of traditional games intervention program in the improvement of form one school-age children's motor skills related performance components. *Journal of Physical Education and Sport*, *17*, 925–930. https://doi.org/10.7752/jpes.2017.s3141

[26] Gustafson, K. L., & Branch, R. M. (2002). *Survey of instructional development models fourth edition*. Syracuse University.

[27] Hadi, S., Imron, A., Wiyono, B. B., Gunawan, I., Abbas, A., & Perdana, D. B. (2023). Design and Testing of Teacher Professional Development Models Focusing on the Optimization of Teachers' Teaching Ability in the Era of Asean Economic Communities and New Normal. *Proceedings of the International Conference on Information Technology and Education (ICITE 2021)*, *609*(Icite), 46–54. https://doi.org/10.2991/assehr.k.211210.042

[28] Hanief, Y. N., & Sugito, S. (2015). Membentuk Gerak Dasar Pada Siswa Sekolah Dasar Melalui Permainan Tradisional. *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, *1*(1), 60. https://doi.org/10.29407/js_unpgri.v1i1.575

[29] Hernawan, H., Sukarya, Y., & Solahuddin, S. (2019). Locomotor basic motion learning model based on traditional game for basic school students. In *Journal of Physics: Conference Series* (Vol. 1318, Issue 1). https://doi.org/10.1088/1742-6596/1318/1/012047

[30] Hidayat, E. W., Aldya, A. P., & Miranti, P. T. A. (2019). Game Adu Muncang Berbasis Android. *Innovation in Research of Informatics (INNOVATICS)*, *1*(1), 13–20. https://doi.org/10.37058/innovatics.v1i1.682

[31] Indriyani, D., Muslihin, H. Y., & Mulyadi, S. (2021). Manfaat Permainan Tradisional Engklek dalam Aspek Motorik Kasar Anak. *Jurnal Pendidikan Anak Usia Dini Undiksha*, *9*(3), 349. https://doi.org/10.23887/paud.v9i3.34164

[32] Khasanah, I., Prasetyo, A., & Rakhmawati, E. (2011). Permainan Tradisional Sebagai Media Stimulasi Aspek Perkembangan Anak Usia Din. *PAUDIA: Jurnal Penelitian Dalam Bidang*

Pendidikan Anak Usia Dini, *1*(1), 91–105.

[33] Lamonge, L. G., Najoan, X. N. B., Sugiarso, B. A., Informatika, T., Sam, U., Tradisional, P., Pendahuluan, I., & Game, A. (2017). Rancang Bangun Aplikasi Game Augmented Reality Permainan Tradisional Sulawesi Utara Dodorobe. *Jurnal Teknik Informatika*, *12*(1). https://doi.org/10.35793/jti.12.1.2017.17787

[34] Lorraine R. Gay, Mills, G. E., & Peter W. Airasian. (2009). *Educational Research: Competencies for Analysis and Applications*. Merrill Prentice-Hall.

[35] Maksum, H. (2017). *Pengembangan Model Pembelajaran Gerak Dasar Lompat Jauh Dengan Permainan*. *6*(1), 42–53.

[36] Marzoan, H. (2017). Permainan Tradisional sebagai Kegiatan Ekstrakurikuler untuk Meningkatkan Kompetensi Sosial Siswa. *Journal An-Nafs: Kajian Penelitian Psikologi*, *2*(1), 83–110. https://doi.org/10.33367/psi.v2i1.346

[37] Meza Torres, E. I., Cerne, B., Ulke, A. G., & Morbelli, M. A. (2015). Distribution of Ophioglossum reticulatum L. in South America. A case of long-distance jump dispersal? *International Journal of Biometeorology*, *59*(2), 137–150. https://doi.org/10.1007/s00484-014-0830-8

[38] Muchlisin, B. (2009). *Fun Games For Kids*. Power Books.

[39] Mulyadiprana, A., & Ganda, N. (2017). Permainan Tradisional Kaulinan Barudak Untuk Mengembangkan Kemampuan Mengelola Emosi Diri Sendiri Anak Usia Dini. *Jurnal PAUD AGAPEDIA: Jurnal Ilmiah Pendidikan Anak Usia Dini*, *1*(2).

[40] Mulyani, N. (2016). *Super asyik permainan tradisional anak Indonesia*. DIVA Press.

[41] Mutiah, D. (2010). *Psikologi Bermain Anak Usia Dini*. Kencana Pramedia Group.

[42] Nasution, M. K. M. (2005). Konsep Penelitian dalam Teknologi Informasi. *Journal of Computer Science*, *1*(1), 33–40.

[43] Pontjopoetro, S. (2008). *Permainan Anak Tradisional dan Aktivitas Ritmik*. universitas terbuka.

[44] Prasetyo, K. (2016). Penerapan Pendekatan Bermain Untuk Meningkatkan Hasil Belajar Lompat Jauh Gaya Jongkok Pada Siswa Kelas 5 Sekolah Dasar. *Scholaria : Jurnal Pendidikan Dan Kebudayaan*, *6*(3). https://doi.org/10.24246/j.scholaria.2016.v6.i3.p196-205

[45] Prastiwi, & Wisnu. (2011). Pengaruh permainan tradisional pada kecerdasan emosi anak. *In Prosiding Seminar Nasional*.

[46] Putra, E. P., Syafrial, S., Sufino, S., & Defliyanto, D. (2018). Pengaruh Permainan Tradisional Engklek Terhadap Power Otot Tungkai Siswi Di Smp Negeri 10 Kota Bengkulu Tahun 2017/2018. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, *2*(2), 138–144.

[47] Putra, N. (2012). *Research & development penelitian dan pengembangan: Suatu pengantar*. Rajawali Pers.

[48] Repiyasa, I. W., Tangkudung, J. A. P., Hernawan, & Paramitha, S. T. (2019). Physical condition-based practice models of traditional games for children disabled elementary school age. *Journal of Physics: Conference Series*, *1402*(2). https://doi.org/10.1088/1742-6596/1402/2/022031

[49] Richey, R. C., & Klein, J. D. (2007). *Design and Development Research: Methods, Strategies, and Issues 1st Edition*. Lawrence Erlbaum Associates.

[50] Rinanto. (2014). Pengembangan Model Pembelajaran Lompat Jauh Gaya Jongkok Dengan Pendekatan Permainan Halring Pada Siswa Sekolah Dasar. *Active - Journal of Physical Education, Sport, Health and Recreation*, *3*(12). https://doi.org/10.15294/active.v3i12.4368

[51] Saad, S. (2022). the Courtyard in Cairene Traditional Houses; a Territorial Dispute, Game of Spaces Geometry and Light. *Journal of Islamic Architecture*, *7*(2), 198–209. https://doi.org/10.18860/jia.v7i2.15427

[52] Samsiah. (2018). Early Childhood Education Journal of Indonesia. *Early Childhood Education Journal of Indonesia*, *1*(2), 1–8. https://journal.unnes.ac.id/sju/index.php/eceji/article/view/32411

[53] Santrock, J. W. (2007). *Perkembangan Anak*. erlangga.

[54] Sari, F. P., Nikmah, S., Kuswanto, H., & Wardani, R. (2019). Developing Physics Comic Media a Local Wisdom: Sulamanda (Engklek) Traditional Game Chapter of Impulse and Momentum. In *Journal of Physics: Conference Series* (Vol. 1397, Issue 1). https://doi.org/10.1088/1742-

6596/1397/1/012013

[55] Setyosari, P. (2016). Metode Penelitian Pendidikan & Pengembangan. In *Metode Penelitian Pendidikan & Pengembangan*.

[56] Shi, H. Y., Dong, Z. J., Sun, G. J., & Shan, W. G. (2014). Evolutionary game analysis on quality supervision of traditional Chinese medicine production. *Chinese Journal of New Drugs*, *23*(24). https://api.elsevier.com/content/abstract/scopus_id/84920749183

[57] Siregar, N., & Lestari, W. (2018). Peranan permainan tradisional dalam mengembangkan kemampuan matematika anak usia sekolah dasar. *Jurnal Mercumatika : Jurnal Penelitian Matematika Dan Pendidikan Matematika*, *2*(2), 1. https://doi.org/10.26486/jm.v2i1.427

[58] Slussareff, M., & Šisler, V. (2020). Higher sustainability of mental models acquired from a digital game in comparison with a live action role--playing game and a traditional lecture. *Masaryk University Journal of Law and Technology*, *14*(1), 29–52. https://doi.org/10.5817/MUJLT2020-1-2

[59] Soboleva, E. V., Suvorova, T. N., Chuprakov, D. V., & Khlobystova, I. Y. (2023). Formation of "Teamwork Skills" in Future Teachers when Creating Didactic Games with Traditional and Digital Components. *European Journal of Contemporary Education*, *12*(1), 188–203. https://doi.org/10.13187/ejced.2023.1.188

[60] Sugiyono. (2016). Metode penelitian kuantitatif, kualitatif,dan R&D. In *Alfabeta, cv*.

[61] Suharnoko, F., & Firmansyah, G. (2018). Pengembangan Model Pembelajaran Melompat Melalui Permainan Lompat Cermin untuk Siswa Sekolah Dasar. *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, *4*(2), 145. https://doi.org/10.29407/js_unpgri.v4i2.12169

[62] Sukmadinata, N. S., & Alexon. (2010). Pengembangan Model Pembelajaran Terpadu Berbasis Budaya Untuk Meningkatkan Apresiasi Siswa Terhadap Budaya Lokal. *Jurnal Cakrawala Pendidikan*, *2*(2). https://doi.org/10.21831/cp.v2i2.339

[63] Sumarsono, A. (2017). Implementasi Model Pembelajaran Atletik Melalui Permainan Berbasis Alam. *Magistra*, *4*, 70–83. http://ejournal.unmus.ac.id/index.php/magistra

[64] suparman, atwi. (2014). *Desain instruksional modern*. erlangga.

[65] Supeni, S., Ersta, L., Handini, O., & Yusuf. (2020). Moral values of the javanese traditional game songs to strengthen character education at elementary schools in Surakarta. *International Journal of Innovation, Creativity and Change*, *12*(11), 57–70. https://api.elsevier.com/content/abstract/scopus_id/85084423372

[66] surjono. (2013). *Pemanfaatan Permainan Tradisional dalam Pembentukan Karakter Anak*. Balai Pelestarian Nilai Budaya.

[67] Suroso, M. B. (2015). Permainan Lompat Kanguru Untuk Meningkatkan Hasil Belajar Lompat Jauh Gaya Jongkok. *Active - Journal of Physical Education, Sport, Health and Recreation*, *4*(9), 2089–2093. https://doi.org/10.15294/active.v4i9.7409

[68] Susanti, N., & S, Harningtyas. (2010). Penggunaan Permainan Tradisional Engklek Dalam Peningkatan Konsentrasi Pada Anak Tunagrahita Di Sekolah Luar Biasa C Autis Kedungkandang Kota Malang. *Conference on Research & Community Services*, 150–153.

[69] Tangkudung, J. (2016). *Macam-macam Metodologi Penelitian. Uraian dan Contohnya*. Lensa Media Pustaka Indonesia.

[70] Tangkudung, J., & Wahyuningtyas. (2012). *Kepelatihan Olahraga*. Cerdas jaya.

[71] Tarigan, V. S. br, Napitupulu, J., & Jamaluddin. (2020). *Aplikasi pengenalan permainan tradisional*. *3*, 1–4.

[72] Tim Play Plus-Nindya Kusuma Dewi. (2016). *Ensiklopedia Permainan Tradisional Anak Indonesia*. erlangga.

[73] Wang, B., Zong, B., Wang, H., & Han, B. (2021). Analysis of Digital Long Jump Take-off Wearable Sensor Monitoring System. *Journal of Sensors*, *2021*. https://doi.org/10.1155/2021/4857624

[74] Wang, Y., & Zhang, R. (2019). Bi-level Game Model for Interaction between Arctic and Traditional Routes. *Journal of Navigation*, *72*(2), 269–289. https://doi.org/10.1017/S0373463318000759

[75] Yien, J. M., Hung, C. M., Hwang, G. J., & Lin, Y. C. (2011). A game-based learning approach to

improving students' learning achievements in a nutrition course. *Turkish Online Journal of Educational Technology*, *10*(2), 1–10.

[76] Zarkasih Putro, K. (2016). APLIKASIA: Jurnal Aplikasi Ilmu-ilmu Agama Mengembangkan Kreativitas Anak Melalui Bermain. *Ejournal.Uin-Suka.Ac.Id*, *16*(1), 19–27. http://ejournal.uin-suka.ac.id/pusat/aplikasia/article/view/1170

[77] Zolkifly, I. A., & Zakaria, N. F. J. (2020). Interactive virtual museum for Malaysian traditional games. *International Journal of Engineering Trends and Technology*, *1*, 114–118. https://doi.org/10.14445/22315381/CATI2P218