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EFFECTIVENESS OF DEVELOPMENT OF SMASH BALL VOLLEY SKILLS EXERCISE MODEL FOR BEGINNERS OF AGE OF HIGH SCHOOL

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Abstract

The aim of this study is to prove the effectiveness of the volleyball smash skill training model for high school age beginners produced. The research method used in this study is the research and development method of Borg and Gall using 10 stages and the subject of the study is beginner high school age athletes in East Jakarta. Effectiveness test, the significance of the difference test with SPSS 16 paired sample test obtained the accuracy of the experimental group with an average value of 10.63 and the control group with an average value of 3.23 This difference value is the average value of increased test results in group skills. Selection of the average results of the different values of the experimental group and the control group or mean difference = 0.127, t-count = 7.765 df = 60, with p-value = 0.000 <0.05. Significant differences between the experimental and control groups. These results indicate that the treatment given to the experimental group that is the volleyball smash skill training model for high school age beginners has a higher effectiveness and can improve the volleyball smash skill for high school age beginners.

Keywords: *Training model, volleyball smash, Age of High School.*

The school is a place to foster and develop a student's knowledge and talent interests. In a school there is one activity that is usually a place to channel the interests and talents of students, namely an extracurricular activity. Extracurricular activities are additional activities held by schools such as sports and non-sports activities. Extracurricular activities, especially sports, can be a vehicle for building character and fostering individual development. ”Firdaus (2014: 2). Izzulmuttaqin, (2016: 259) states that "The smash technique is the core or the end of an attack that is built by a team to get points and also the most often done to get points". Smashes can be done in various ways with the ability of a player so that they will be given variations of smash exercises that are useful for themselves and the team to get points so they can win the game easily. Volleyball is a sport that is loved and loved because the development of basic technical skills has begun to be seen and in volleyball where they can do it with fun and learn how to play fair play.

This actually has become a very good start in training, when a great will is possessed by someone, the transfer of knowledge carried out can be more effective, but volleyball training can be less effective and unpleasant and even make the child have difficulty doing this due to lack of training models smash but still be effective in achieving the goals designed in each exercise. Based on observations, the results obtained that when doing smash learning, especially when using the drill method for smash blows make the faces of students look sad and disappointed so that when it is their turn to smash, the results of the blows tend not to be maximal. Effective and efficient training methods are driven by the facts or symptoms that arise in training. The training method is a method that aims to improve skills for athletes who are trained. The focus of this study is the effectiveness of developing volleyball smash skills training models for high school age

beginners with problems. Is the volleyball smash skill training model effective for high school age beginners?

Hart (2010: 2) added, "research is a craft requiring judgment and creativity, not merely memorization and application of the rules of science". Research is said to be part of a work that requires judgment and creativity by applying the rules of science, a process to produce objects that can be seen or touched "(Priyanto, 2009: 10). Many forms of research exist, namely, program / policy evaluation research, action research, development research. Research is said to be part of a work that requires judgment and creativity by applying the rules of science, a process to produce objects that can be seen or touched "(Priyanto, 2009: 6). Gall and Borg say the following: "Reasearch and development is an industry based development model in which the findings of reasearch are used to design new products and procedures, which then are systematically field tested, evaluated, and refined until they meet the specified criteria for effectiveness, quality, or similar standards". "Research and development (research and development) is a research method used to produce certain products, and examines the effectiveness of these products" (Fannie, 2014: 101).

Mulyani (2013: 53) states that "Innovation and its possible use are very important determinants". This research will use the Borg and Gall development model where this model has systematic steps that are stronger and more perfect than others. Having two field trials in the form of small and large tests by including experts to validate the product so that the product produced has the effectiveness that has been validated by experts precisely in their fields. Briefly requires 3-5 people as experts for validation, 20 subjects as a small test, 40 subjects as a large test, 16 meetings in the effectiveness test and 16 meetings in the tretatmen stage.

Several development model theories that exist, the researcher will apply the concept or the steps that will be applied in this research is to refer to the concept of the Borg and Gall development model which consists of ten stages including: *1. Reseach and information collecting, 2. Planning, 3. Develop Preliminary of Product, 4. Preliminary Field Testing, 5. Main Product Revision, 6. Main Field Test, 7. Operational Product Revision, 8. Operasional Field, 9. Final Product Revision, 10. Dissemination and implementation.* The concept model of volleyball smash practice training for beginners using the Borg and Gall development design model, this model provides the following steps: Volleyball game is a game played by two teams, each of which has 6 people. Each player has special skills such as hitter, feeder, and libero. The main objective in this game is to hit the ball towards the opponent's field in such a way that the opponent cannot return the ball (Praponik, 2017: 31). Volleyball games have three basic elements, namely service, pass (passing), block and punch (smash) "Edo (2012: 186). In this game requires some basic rules and skills that are not limited by equipment. Firdaus (2014: 364) states that "Volleyball is a team sport. Each squad is on their own playing field and is limited by the net. "Smash is one of the most preferred volleyball techniques in the game. Smash or commonly referred to as spike as a movement that requires coordination of various sub-movements and the movement of hitting the ball is part of a series of movements that are displayed while the limit of the smash of some hard ball hits from the top down. Beutelstahl (2008: 71) success or failure of an attack, largely depends on giving the ball from the toser to the attacker.

Other research explains that volleyball smashes can be used as a reference that this technique is widely used and is important when attacking strategies in volleyball. Another statement about smash with a simple concept as quoted (CA, 12: 124) that, "Spiking is also called hitting or attacking. It is one of the most exciting and challenging parts of the game of volleyball. It requires the hitter timing his / her jump and arm swing with the ball flying through the air. Jump serving is just spiking from the end line but the server to the access set ". Explained in smash included in the pattern of attacks to take points. This technique is supported by jumps then swing arms and timing the ball when floating in the air. Beutelstahl (2008: 24) states that: generally states, the sequence of movements during a smash consists of four stages as follows:

1) The first stage:

The run up phase depends on the type of ball and the fall of the ball. We start to run at approximately a distance of 2.5 to 4 meters from the fall of the ball. The last two steps are the most decisive. When we take of (start jumping), we must pay close attention to the position of the foot. The foot that is going to take-off must be on the ground first, and the other foot follows next to it, so we sometimes need to change our steps before making the last two steps. The direction taken must be arranged in such a way that the player will be behind the ball when taking take-off. In other words, his body was at that time facing the net. The arms that stick out forwards are swung back and up after the first step, then are swung forward so that when the take-of player the two arms are hanging down in front of the player's body. Visually it looks as follows:

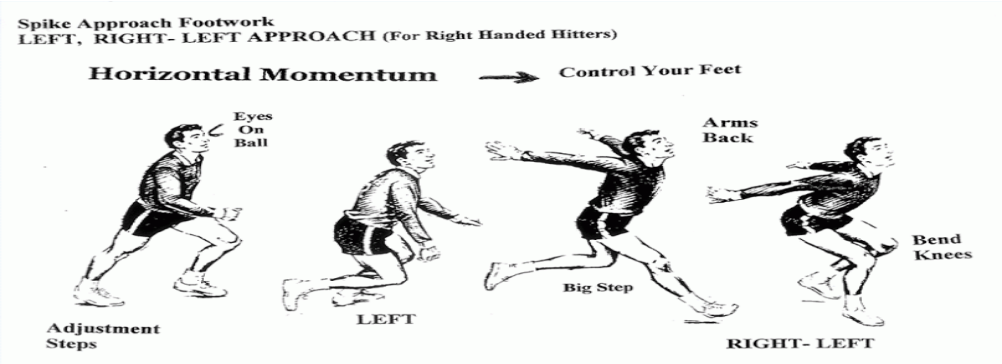

Figure 2.6 Learning to play volleyball (beuthestahl, 2008: 29)

2) Second stage:

The take-of or jumping phase, the movement must proceed smoothly and continuously, without interruption. During take-off, the two protruding hands must be moved upward. At the same time the body must be straightened. The foot used for jumping is what gives the take-of strength, the arm used for hitting, also the side of the body of the part is rotated slightly so that it moves away from the ball. The stem is bent slightly and the batting arm is bent slightly. The other arm is kept at head level. This arm is what regulates the overall balance. Visually it looks as follow:

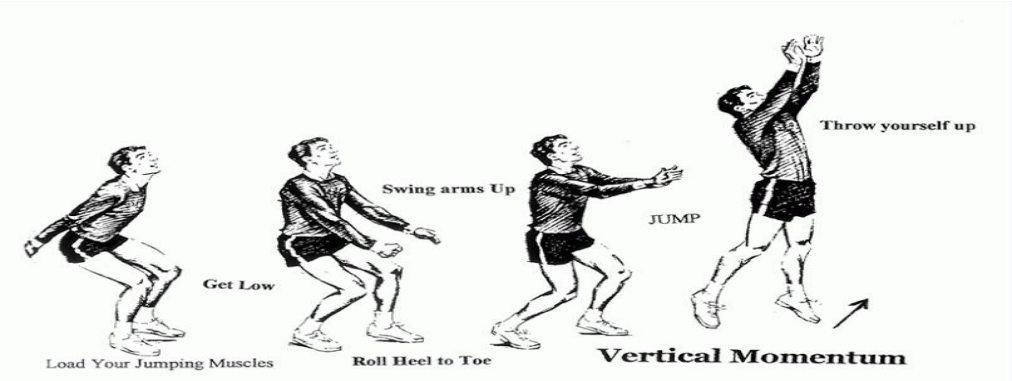

Figure 2.7 Learning to play volleyball (beuthestahl, 2008: 29)

3) Stage three:

Hit phase or hit stage. In accordance with the type of smash. Hands swing from behind the head to the front to hit the ball and the body bouncy like a bow. Visually it looks as follows:

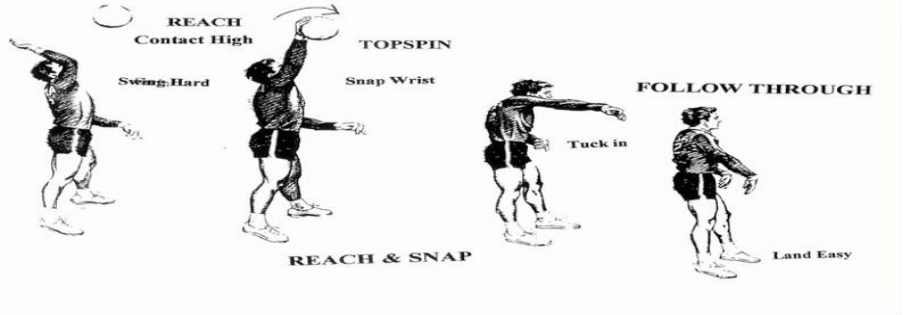

Figure 2.8. Learning to play volleyball (beuthestahl, 2008: 29)

4) Stage four
   Landing phase or landing stage. This landing method is the same for all smash types. After a smash or dump, the landing step starts, when the upper body bends forward. The legs are directed forward to maintain balance. Players land on both feet, knees bent according to the landing requirements.

Praponik (2017: 32) explains, that "the basic training that must be done in smash" (Praponik, 2017, 32) is:

1) Palms open as if to slap, fingers must be tight.
2) Before touching the ball, the elbows are bent while the time to touch the ball must be straight, the elbows must be above the shoulders and palms far behind the body, not on the side.
3) When the palm of the hand touches the ball, position the palm of the hand in front of the body slightly.
4) From the original position to the point of doing a smash, try not to go too far, so that we don't go too much. You should only do 2 or 3 steps. The last step before jumping, must be fast and strong. If we do a smash with the right hand, the first step is done with the left foot and vice versa. Small steps for adjustments, not counting these 2-3 steps.
5) Position the hand when going to jump as far behind the body as possible. This will give a high jump, and swing forward when we jump will put the position of the hand in the best position to hit.
6) Most smashes are done with the body slightly tilted to the left (for those who hit with the right hand) or vice versa. The hand should be parallel to the straight line of our body. The head should not be tilted because the shoulders are also not tilted.
7) The body facing the ball will be hit and the hands swing parallel to the straight line of the body, should not cross at body width. The shape of the body position is adjusted to the hand swing, it will usually be curved due to the severity of the hand swing and preparation for landing after jumping. Visually it looks as follows:

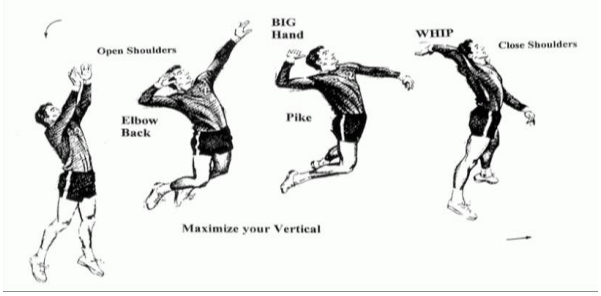

Figure 2.9 Learning to play volleyball (beuthestahl, 2008: 29)

Subarjah, (2010: 326) argues that "Learning of motion skills is a set of internal processes related to training (experience) which results in relatively permanent behavioral changes in the form of skilled motion

behavior". Based on the description of the paragraph above, learning movement skills can be interpreted as a set of internal processes that lead to behavioral change, especially relatively permanent motion behavior. According to Desmita in Sulasmi stated that "Motor skills are body movements or body parts that are intentional, automatic, fast and accurate" (Sulasmi, 2018, 87).

In addition, Suyadi in Febriana (2018: 72) states that "Motor skills are the development of movement through the activity of the coordinated nerve center, nerves and muscles". The Fitt and Posner model in Richard A. Magill in (Haqiyah, 2016: 11) explains that the stages of motion learning are divided into three different stages, namely: "cognitive stage, association stage, and autonomic stage, and this stage is determined by the tendency of participant behavior. students are shown at various points / points during the learning process ".

The cognitive stage is the beginning of the learning phase according to the Fitt and Potsner model. During this stage, students are first introduced to "new motor skills and their main task is to develop an understanding of the requirements of the movement". (Magill, 2011: 26). "Motor performance during this stage is marked by a large number of errors, varying performances that show a lack of consistency from other experiments, and although students may realize that they are doing something wrong, they generally do not know what to do to improve their appearance. "(Coker, 2004: 98). Conclusions from various opinions that have been explained that at this cognitive stage are very important and more attention is needed so that the child or student in making further movements that have branched off does not experience mistakes.

The associative stage or the intermediate stage which is also called the "refinement" stage is that students focus on the performance of skills to be successful and become more consistent from one experiment to the next, and during this stage the variability of appearance decreases and students have the ability to detect and identify some errors that are done". (Coker, 2004: 267). At this stage, the role of "The teacher or trainer is needed in an effort to serve students in a capacity as a motivator to help students reach the potential of students" (Magill, 2011: 267).

Breslin, Hodges, Steenson & Williams (2017: 104) in Kaipa, Robb & Jones (2017: 104) state: "Practice variability involves practicing different variations of a motor skill. A practice situation can either involve an individual practice only one variant of a skill, referred to as the constant practice, or have the individual practice more than one variation in the dimensions of a skill, referred to as a variable practice. " Based on this it can be concluded that the automation stage is the final stage of motion learning which is characterized by the level of mastery of the movement where students are able to do the movements automatically without being affected, even when doing the movements students pay attention to things other than the movements that are done.

Bompa and Haff said "methodically arranged set of ideas, theosies, or speculation". Irianto (2009: 19) states that "training is essentially a systematic process to improve the quality of athletes' performance in the form of fitness, skills and energy capacity, paying attention to educational aspects and using a scientific approach". Tangkudung and Wahyuningtyas (2012: 48) are "Systematic and practicing processes that are carried out repeatedly with increasing numbers of training loads and training intensity". Bompa (2015: 1) defines that "Training is the process of repetitive executing, progressive exercises or work that improves the potential to achieve optimum performances." The results of a continuous training method will be very beneficial for players from an early age to later adulthood. As the following quote states that "the main purpose of training is to improve the athlete's sports skills and level of sports performance, regular exercise can cause the body to adapt to the burden posed by exercise" (Muis, 2016: 78). Inputs and criticisms provided by the coach will increase the motivation of athletes to perform better and the presence of a coach can cause its own motivation for athletes who are facing the match (Saputro, 2014: 4).

"High achievement depends on well-organized program planning and is based on the correct training principles and methodology" (Harsono, 2015: 177). It was concluded that training is a process of activities carried out repeatedly to improve athlete performance by paying attention to the principles of

systematically planned training in achieving achievement. Repeated means that which is done more than once in one training session, so that in training that is difficult will experience ease with the repetition of the movement but also with the principle that there is not just doing it repeatedly. The design of the model will be investigated by researchers in which the volleyball smash variable will be the model to be made, which will be the subject of research, namely high school age students who are in schools in East Jakarta.

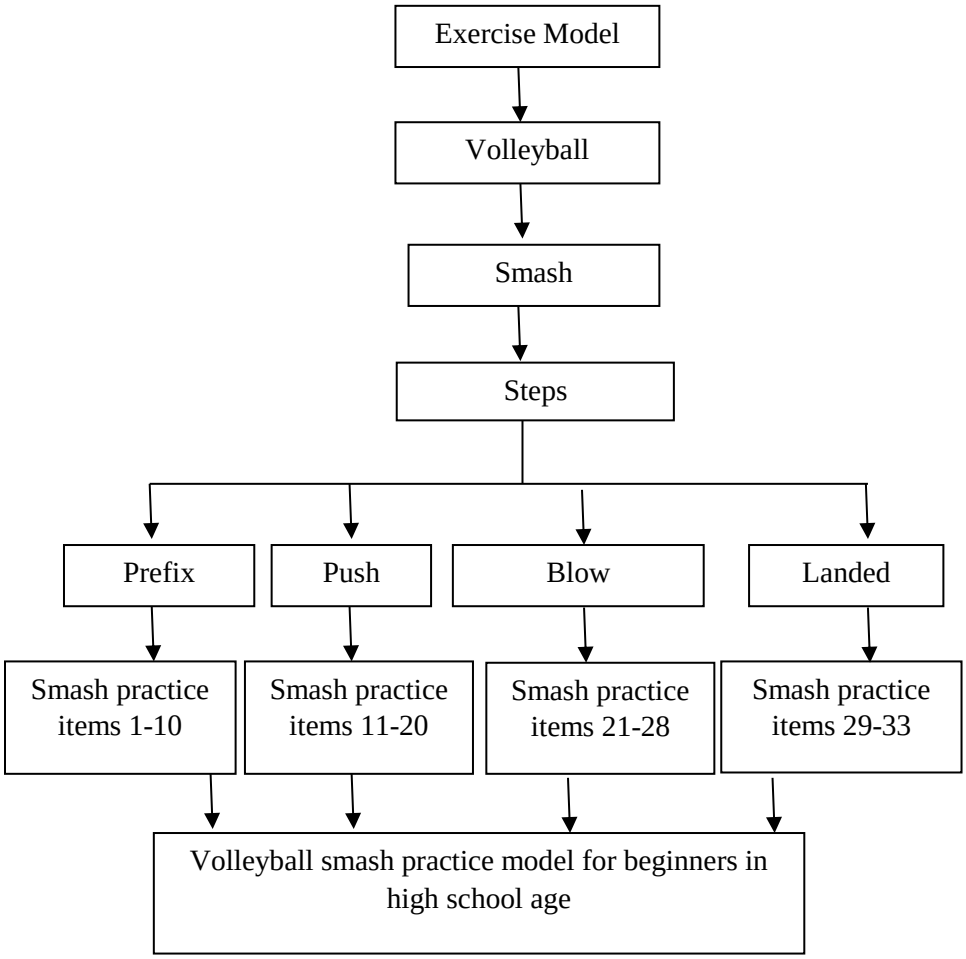

Figure 2.10 Volleyball Smash Skill Training Model Design For Beginners Of High School Age

The volleyball smash skill training model that was made was divided into several types, starting with the prefix phase (10 models), the repulsion phase (10 models), the stroke phase (8 models), the landing phase (5 models) of the four phases having interrelationships between models, This stage aims to provide a training with increasing burden and an increase in the player's smash ability.

METHOD

The approach in this study uses a Mixed method with the research and development method (Research and Development) model of Borg and Gall (2003: 549). The product effectiveness test was made using a pretest-posttest control group design, that is, two groups whose subjects were chosen randomly.

Tabel 3.1 Design Study of the Effectiveness Test Model

Subject	***Pre-Test***	**Treatment**	***Post-Test***
R_1	**O_1**	**P**	**O_2**

R_2	**O_1**	**-**	**O_2**

The steps taken in this trial include: (1) establishing a group of research subjects; (2) implementing the pretest (O1); (3) try a model that has been developed; (4) carrying out post-test (O2); (5) looking for an average score of pretest and posttest and compared between the two; (6) find the difference between the two averages through the statistical method (t-test) to find out whether there is a significant influence or not from the use of the model. Furthermore, t-test data analysis using the help of Statistical Product and Service Solution (SPSS) software programs. Data collection is carried out in the research and development of this model through the following stages:

a. The first evaluation phase is carried out at the design stage of the model form by experts, the initial evaluation is the first assessment from experts to: (1) determine whether the material is in accordance with the training given to students, (2) whether the volleyball smash skill training model is appropriate for students before being tested.
b. The second stage of evaluation is carried out at the small group trial stage. At this stage the evaluation is obtained through the results of the trainer's response to the model that has been created and demonstrated, the trainer's evaluation of the training model that has been carried out is an evaluation of the improvement of the smash skill training model product before the training model is field tested in heterogeneous groups of ability and the greater number of subjects.
c. The final evaluation stage was carried out at the stage of large group and heterogeneous field trials at the level of ability of the volleyball smash technique. The results of the trainer's response to the implementation of the volleyball smash skills training model are the same as the questions in the previous evaluation stage which later as a revision of the improvement in the results of the new product smash skills training model implemented in the beginner high school athlete group.

RESULTS

Table 7 Results of Smash Skills Before Treatment (Pretest) and Results After Treatment (Posttest) in the Experiment Group

No	Responden	Pretest	Posttes	Difference Mark
1	X1	9	25	16
2	X2	9	21	12
3	X3	11	22	11
4	X4	17	22	5
5	X5	12	20	8
6	X6	9	24	15
7	X7	18	24	6
8	X8	13	19	6
9	X9	13	26	13
10	X10	9	23	14
11	X11	9	18	9
12	X12	15	25	10
13	X13	13	25	4
14	X14	15	25	10
15	X15	15	20	5
16	X16	13	17	4

17	X17	9	24	15
18	X18	12	17	5
19	X19	10	24	14
20	X20	18	19	1
21	X21	9	25	16
22	X22	18	25	7
23	X23	9	22	13
24	X24	9	25	16
25	X25	15	19	4
26	X26	3	24	21
27	X27	6	25	19
28	X28	8	19	11
29	X29	6	18	12
30	X30	9	19	10
Total		**341**	**660**	
Average		**11,37**	**22,00**	**10,40**

The table above shows the results of the pre-test and post-test of the athlete experimental group when doing smash skills. Pre-test results showed an average value of 11.37, pre-test was carried out before the implementation of the 31 items of the smash skills training model. after being treated the application of the next training model is carried out post-test data collection with the results of 22.00. Changes in the ability of pre-test and post-test results with an average value of 10.40. Based on these descriptions get the difference in the results of the pre-test and post-test the ability to smash. Thus the smash training model is developed effectively and can improve volleyball smash skills.

Table 8 Results Normality Table Accuracy Data Experiment Group

Test of Normality

	Statistic	Df	Sig.	Statistic	df	Sig.
PRE_EKSPERIMEN	0.198	30	.004	.939	30	.086
POST_EKSPERIMEN	0.152	30	.074	.939	30	.083

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Based on the above table that has been calculated using SPSS results from the Shapiro-Wilk Test obtained normality data in the 0.086 pre-test and in the 0.083 post-test group in which both data are greater than alpha 0.05. Thus it can be concluded that both data come from populations that are normally distributed. Table 9 Results of Paired Sample Test (Pre-Test) and After Treatment (Post-Test) given to the Experiment Group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preetest	11.37	30	3.828	.699
	Postest	22.00	30	3.301	.603

The average value of athletes before given the training model is 11.37 and the value after being treated with the volleyball smash training model is 22.00 which means that there is an increase resulting from the pre-test and post-test so that the speed of the smash ability is increased.

Table 10 Results of Paired Samples Correlation Before Treatment (Pre-test) and Results After Treatment (Post-test) in the Experiment Group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pretest & postest	30	-.044	.819

Based on the values in the table above, the correlation coefficient results obtained before and after being given a treatment that is 0.044 p-value 0.00 <0.05. So the conclusion is that there is a significant relationship.

Table 11 Results of Paired Sample Statistics (Pre-Test) and (Post-Test) in the Experiment Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre_Eksperimen Post_Eksperimen	10.633	5.163	.943	-12.561	-8.706	19.285	29	.000

In a significant test of difference with SPSS 16, the mean = 10,633 shows the difference between the pre-test results and the post-test results, df = 29, tcount = 19.285> ttable 2.042 (from n = 30) and p-value = 0.00 <0.05 which it means that there is a significant difference between before and after the treatment of volleyball smash skill training models for beginners of high school age.

Table 12 Results of Pretest and Posttest Smash Time of Experiment Groups

No	Responden	Pretest	Posttes	Difference Value
1	X1	3.79	2.55	1.24
2	X2	3.95	2.42	1.53
3	X3	3.05	2.48	0.57
4	X4	3.81	2.56	1.25
5	X5	3.97	2.45	1.52
6	X6	3.81	2.45	1.36

7	X7	3.04	2.46	0.58
8	X8	3.83	2.47	1.36
9	X9	3.18	2.49	0.69
10	X10	4	2.5	1.5
11	X11	3.72	2.43	1.29
12	X12	3.84	2.6	1.24
13	X13	3.9	2.5	1.4
14	X14	3.85	2.48	1.37
15	X15	3.19	2.4	0.79
16	X16	3.79	2.72	1.07
17	X17	3.89	2.56	1.33
18	X18	3.87	2.45	1.42
19	X19	3.14	2.45	0.69
20	X20	3.05	2.4	0.65
21	X21	4.07	2.45	1.62
22	X22	3.95	2.42	1.53
23	X23	3.91	2.42	1.49
24	X24	3.02	2.49	0.53
25	X25	3.96	2.47	1.49
26	X26	3.13	2.46	0.67
27	X27	4.01	2.46	1.55
28	X28	4.1	2.54	1.56
29	X29	3.82	2.42	1.4
30	X30	3.1	2.44	0.66
Total		**109.74**	**74.39**	
Average		**3.658**	**2.47967**	**1.17833**

The table above shows the results of the pre-test and post-test of the athlete experimental group when doing smash skills. Pre-test results showed an average value of 3,658 pre-tests were carried out before the implementation of the 31 items of the smash skills training model. after being treated the application of the next training model is carried out post-test data collection with the results of 2.47967 Changes in the ability of the pre-test and post-test results with an average value of 1.17833. Based on these descriptions get the difference in the results of the pre-test and post-test the ability to smash. Thus the smash training model is developed effectively and can improve volleyball smash skills.

Table 13 Results Normality Table Time data for Experiment Groups

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre	.128	30	.200*	.946	30	.399
Post	.160	30	.200*	.953	30	.501

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Based on the above table that has been calculated using SPSS results from the Shapiro-Wilk Test obtained normality data in the pre-test 0.399 and in the post-test group 0.501 in which both data are greater than alpha 0.05. Thus it can be concluded that both data come from populations that are normally

distributed. Table 14 Results of Paired Sample Stastictic (Pre-Test) and After Treatment (Post-Test) given to the Experiment Group.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preetest	3.13	30	.346	.063
	Postest	2.00	30	.000	.000

The average value of athletes before being given a training model is 3.13 and the value after being treated with a volleyball smash practice model is 2.00, which means that there is an increase resulting from the pre-test and post-test so that the speed of the smash volleyball smash time is increased.

Table 15 Results of Paired Samples Correlation Before Treatment (Pre-test) and Results After Treatment (Post-test) in the Experiment Group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pretest & posttest	30	.146	.319

Based on the values in the table above, the correlation coefficient results obtained before and after being given a treatment that is .146 p-value 0.00 <0.05. So the conclusion is that there is a significant relationship.

Table 16 Results of Paired Sample Test (Pre-Test) and (Post-Test) in the Experiment Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PRE_EKSPERIMEN - POST_EKSPERIMEN	1.133	.346	.063	1.004	1.262	17.954	29	.000

In the significant difference test with SPSS 16, the mean = 1,133 shows the difference between the pre-test results and the post-test results, df = 29, t-count = 17,954> ttable 2,042 (from n = 30) and p-value = 0.00 <0.05 which it means that there is a significant difference between before and after the treatment of volleyball smash skill training models for beginners of high school age. Based on these results it can be concluded that the volleyball smash skill training model for Beginners of high school age is effective and can improve the volleyball smash skill for beginners of high school age. The training model applied to the treatment for the experimental group had significant effectiveness.

Table 17 Results of Pretest and Posttest smash skills in the Control Group

No	Responden	Pretest	Posttes	Difference mark
1	X1	9	12	3
2	X2	9	14	5
3	X3	11	12	1
4	X4	15	18	3
5	X5	12	16	4
6	X6	9	16	7
7	X7	15	18	3
8	X8	13	16	3
9	X9	13	15	2
10	X10	9	12	3
11	X11	9	12	3
12	X12	15	16	1
13	X13	13	15	2
14	X14	15	18	3
15	X15	15	16	1
16	X16	10	16	6
17	X17	9	14	5
18	X18	12	13	1
19	X19	10	12	2
20	X20	18	19	1
21	X21	9	12	3
22	X22	18	18	0
23	X23	9	12	3
24	X24	9	12	3
25	X25	15	16	1
26	X26	3	8	5
27	X27	6	10	4
28	X28	8	16	8
29	X29	6	10	4
30	X30	9	16	7
Toatal		**333**	**430**	**97**
Average		**11.10**	**14.33**	**3**

The table above shows the results of the Pre-test showed an average value of 11.10, this group was not treated with the developed training model, at the same time as the experimental group was taking post-test data with the results of 14.33 Changes in the ability of the pre-test and post-test results with average difference value 3

Table 18 Results Normality Table in the Control Group

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk			
	Statistic	Df	Sig.	Statistic	df		Sig.
PRE_KONTROL	.188	30	.009*	.939	30	.	086
POST_KONTROL	.192	30	.006*	.933	30		057

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 19 Results of Paired Sample Stastic Pre-Test and Post-Test in the Control Group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE_KONTROL	11.10	30	3.585	.655
	POST_KONTROL	14.33	30	2.783	.508

Table 20 Results of Paired Samples Correlation Pre-Test and Post-Test in the Control Group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PRE_KONTROL & POST_KONTROL	3		0

Table 21 Results of Paired Samples Statistic Pre-Test and Post-Test in the Control Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PRE_KONTROL - POST_KONTROL	3.233	1.995	.364	3.978	2.489	8.879	29	.000

Based on the above table and the SPSS results, the pre-test and post-test results of beginner volleyball athletes of high school age who conduct smash skills tests with volleyball skills instruments. The average test results of 30 athletes at the time of the pre-test were 11.10 and the average results at the time of the post-test were 14.33 While the results of the correlation coefficient were 0.00 <0.05, there was a significant relationship. In the different test obtained mean = 3,233, t-count = 8,879, df = 29 and p-value = 0.00 <0.05 which means there is a difference.

Table 22 Results of Independent Samples Test (Post-test) Experiment Group and Control Group

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
EKSPERIMEN KONTRL	Equal variances assumed	24.771	.000	7.323	58	.000	7.400	1.010	5.377	9.423
	Equal variances not assumed			7.323	37.468	.000	7.400	1.010	5.353	9.447

Group Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Eksperimen	30	10.63	5.163	.943
Kontrol	30	3.23	1.995	.364

Based on the test results of these differences it can be concluded that the results obtained are based on SPSS 16 statistical counts in the experimental group with an average of 10.63 and a control group with an average of 3.23. well. Selection of the results of the experimental group and the control group or mean difference = 7,400, t-count = 7,323, df = 58, with p-value = 0,000 <0.05, it can be concluded that there are significant differences between the experimental group and the control group. These results indicate that the treatment given to the experimental group that is the volleyball smash skill training model for high school age beginners has a higher effectiveness and can improve the volleyball smash skill for high school age beginners

Table 23 Results of Pretest and Posttest Control Group smash time data

No	Responden	Pretest	Posttes	Difference Value
1	X1	3.89	2.4	1.49
2	X2	4.01	2.44	1.57
3	X3	3.87	2.46	1.41
4	X4	3.02	2.41	0.61
5	X5	3.92	2.42	1.5
6	X6	3.92	2.47	1.45
7	X7	3.98	2.47	1.51
8	X8	3.98	2.44	1.54
9	X9	3.88	2.44	1.44
10	X10	3.09	2.53	0.56

11	X11	3.87	2.47	1.4
12	X12	4.06	2.5	1.56
13	X13	3.95	2.82	1.13
14	X14	3.97	2.55	1.42
15	X15	3.92	2.52	1.4
16	X16	3.88	2.44	1.44
17	X17	3.94	2.48	1.46
18	X18	3.94	2.54	1.4
19	X19	3.92	2.46	1.46
20	X20	3.88	2.6	1.28
21	X21	3.83	2.47	1.36
22	X22	3.18	2.49	0.69
23	X23	4	2.5	1.5
24	X24	3.72	2.43	1.29
25	X25	3.84	2.6	1.24
26	X26	3.9	2.5	1.4
27	X27	3.85	2.48	1.37
28	X28	3.19	2.4	0.79
29	X29	3.79	2.72	1.07
30	X30	3.88	2.44	1.44
Total		**114.07**	**74.89**	
Average		**3.80233**	**2.49633**	**1.306**

The table above shows the results of the Pre-test showed an average value of 3.80233, this group was not treated with the developed training model, at the same time as the experimental group was taking post-test data with the results of 2.49633 Changes in the ability of the pre-test and post-test results with average difference value 1,306

Table 24 Results Table Time normality in the Control Group

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre	.456	30	.103*	.733	30	.240
Post	.146	30	.230*	.119	30	.110

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 25 Results of Paired Sample Stastic Pre-Test and Post-Test in the Control Group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE_KONTROL	3.10	30	.305	.056
	POST_KONTROL	2.00	30	.000	.000

Table 26 Results of Paired Samples Correlation Pre-Test and Post-Test in the Control Group

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PRE_KONTROL & POST_KONTROL	30	.211	.201

Table 27 Results of Paired Samples Statistic Pre-Test and Post-Test in the Control Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PRE_KONTROL - POST_KONTROL	1.100	.365	.056	.986	1.214	19.746	29	.000

The average time test results of 30 athletes at the time of the pre-test was 3.80233 and the average results at the time of the post-test were 2.49633. While the results of the correlation coefficient were 0.00 <0.05, there was a significant relationship. In the different test obtained mean = 1,100, t-count = 19,746, df = 29 and p-value = 0.00 <0.05 which means there is a difference.

Table 4. Results of Independent Samples Test (Post-test) Experiment Group and Control Group

Group Statistics

	waktu	N	Mean	Std. Deviation	Std. Error Mean
Hasl	1	30	1.178	1.820	.327
	2	30	1.306	1.777	.319

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
hasil	Equal variances assumed	.016	.901	7.765	60	.000	0.127	.457	2.634	4.462
	Equal variances not assumed			7.765	59.966	.000	0.127	.457	2.634	4.462

Based on the test results of these differences it can be concluded that the results obtained are based on SPSS 16 statistical calculations in the experimental group with an average of 1,178 and the control group with an average of 1,306 results derived from the assessment of the test in the form of smash time, so a small value is obtained then better. Selection of the results of the experimental group and the control group

or mean difference = 0.127, t-count = 7.765, df = 58, with p-value = 0.000 <0.05, it can be concluded that there are significant differences between the experimental group and the control group. These results indicate that the treatment given to the experimental group that is the volleyball smash skill training model for high school age beginners has a higher effectiveness and can improve the volleyball smash skill for high school age beginners.

DISCUSSION

Based on the above data it can be concluded that the volleyball smash skills training model for beginners of high school age is feasible to use and is effective in improving volleyball smash skills for beginners of high school age. The product produced by the researcher, namely the volleyball smash skill training model for beginners of high school age, has several shortcomings that researchers will describe in order to achieve the resulting attack of this product. Then the input referred to is as follows:

a. The training model must be clearly made using the language, so that the trainer will easily understand it in applying it.
b. The duration of implementation of the exercise model must be paid more attention to in more detail so that the time used is appropriate and efficient.
c. The training equipment is made more attractive so that athletes are more motivated to do the exercises
d. The variation of instructions in training is further redefined, so that there are trainer references in developing instructions in the field.

Volleyball smash skill training models for high school age beginners are made to be a reference or reference for volleyball smash skill training with different variations to help trainers in the field. This training model is based on an analysis of needs in the field. Products that have been evaluated with some existing weaknesses and product revisions to make a good final product, can be conveyed some of the advantages of this product are as follows:

a. The product provides a variety of volleyball smash skills training models
b. Products are made with a variety of rules so that it will provide training experience with a variety of situations.
c. The product provides training that is fun and motivates athletes to engage in motion exercise activities.
d. This training model is useful for improving volleyball smash skills
e. Provide trainer references as training material in the field to support the training material needs.

CONCLUSION

Research that produces volleyball smash practice model training for beginners of high school age. based on research data consisting of needs analysis, product design, expert validation, small group and large group trials, and effectiveness tests so that discussion of research results is obtained, the researcher can draw conclusions that The voli ball smash skill training model for high school age beginners can be developed and applied in practicing volleyball smash skills. The training model developed based on research data obtained effective results for beginner high school age athletes.

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