# The Effect of Solo Drill, Pairs Drill, and Mixed Drill Method on the Smash *Kedeng* (Scissors)

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# Abstract

This study aims to test the differences in the effect of the three drilling methods; Solo drill, Pairs drill, and Mixed drill, towards smash *Kedeng* skills (scissors) in sepak takraw (foot-volleyball) games and to find out which method is most recommended. By taking 60 samples divided into 3 groups, each consisting of 20 students, we conducted a post-test only design experiment to see the effect of the three drilling methods on smash *Kedeng* skills. Analysis of variance (ANAVA) with the Tukey test became a data analysis technique with a significance level of  $\alpha = .05$  to determine the difference in the effect of the three drilling methods on smash *Kedeng* skills. The results revealed that there are differences in the effect of the Solo drill method and the Pairs drill method on smash *Kedeng* skills and this condition was the same as the difference in effect between the Pairs drill method and Mixed drill method on smash *Kedeng* skills. The Tuckey test results showed that among the three drilling methods, the Solo drill and Mixed drill method were the most recommended. The implications of the different influences between the three variables and the two recommended methods are also discussed.

Keywords: sepak takraw, smash Kedeng, smash scissors, solo drill, pairs drill, mixed drill

# Introduction

Achieving optimal achievement in the field of sports is a dream for every athlete and this is' thirst for them to develop sports skills that remain as strong (Farrow et al., 2018), can 'make a different contribution to participation broader education and additional contributions (Bailey, 2017) such as 'executive function, mathematical achievement, and cognitive development' (Becker et al., 2018). However, to achieve this, planning is needed through a complete and sustainable guidance system, from government, trainers or instructors, teachers or lecturers, and even parents as research showed by Weltevreden et al., (2018) that parents prefer to have a role than coaches in supporting sports achievements such as roles in autonomy support, responsiveness, behavioral control, and psychological control.

The development of sepak takraw sports, specifically in South Sulawesi, based on observations has not fully followed a systematic guidance path. This is because the stages of formation of sepak takraw sports have not yet led to the stages of publicizing but are only done incidentally and this condition certainly affects the increase in playing skills of sepak takraw athletes. To overcome this, it seems we need to consider suggestions from the results of research conducted by Schulenkorf & Siefken, (2019) about 'sports models for health as a flexible conceptual tool that builds the relationship between sports management, health promotion, socio-cultural development, policy, and sustainability 'so that the formation of sepak takraw sports can occur in a mass and sustainable manner.

To play good sepak takraw then a player must have the basic ability to play adequate sepak takraw. The ability in question is kicking using parts of the foot, playing the ball with the head, with the chest, with the thighs, with the shoulders, and with the soles of the feet. One skill that really captivates the audience is the smash skill that uses the foot and header as a ball hitter and this is not found in other sports. Shan et al., (2015) state that 'smash is one of the most useful and powerful skills, further, 'smash is the most powerful punch of all '(Salim et al., 2010). Here, not only rely on the strength of the legs and head, but also the skills in providing accurate and precise smashes to defeat the opposing team.

In the academic realm, in addition to systematic guidance, the facilities and infrastructure and the supporting environment also influence sepak takraw's achievement because 'academic and athletic are two important and dominant social contexts that shape and develop student-athlete motivation, achievement, and behavior' (Yukhymenko-Lescroart, 2018). No less important factors are physical or kinematic conditions (McKay et al., 2019; Sabiston et al., 2019), mental readiness (Moran et al., 2019; Wylleman, 2019), technical preparation and mastery of strategies (Collins & Barcelona, 2018; Russell, 2017; Schulenkorf, 2017), and the role of technology (Kim & Ko, 2019; Kos et al., 2018; Sujae et al., 2008). However, the readiness of all aspects is in fact not owned by all players. There are players who only master technical skills, some only have physical readiness, some only have mental readiness, and some only have tactics and strategy. In fact, to achieve optimal performance must master the four aspects.

Smash skills include mastery skill categories in sepak takraw and smash success is determined by giving the trainer suitable training methods, ownership of high motivation, and ankle coordination systems or those related to motor skills. The attack in sepak takraw games can be done using the legs or head. Smash is an attempt by a player to attack an opponent's area because 'smash is a high-speed swing movement' (Koike & Hashiguchi, 2014). Good smash will make it difficult for opponents to return the ball. For this reason, the smash movement needs to be trained because it covers the overall body movements and position, therefore 'positioning is a fundamental influential aspect of smash quality (Li et al., 2017). 'Good smash will be successful if the ball from the bait player is successfully done well' (Hanif & Syam, 2015).

For beginners, a good initial exercise is training the ball with the feet because of the initial difficulty in doing a smash, which is placing the foot with the ball in the right time or at the same time. Here, qualified techniques are required, both in learning and in practice so that accurate movements in smashes can be achieved. Engineering is a basic element for players to be able to play sepak takraw well. Without technical ability, a player will not be able to play sepak takraw. The ability in question is the ability to use parts of the foot, holding the ball with the head, thighs, chest, shoulders, and soles of the feet. However, a technique is said to be good when viewed in terms of anatomy, physiology, mechanics, biomechanics, and the mental requirements are met properly, can be applied in practice and contribute to maximum achievement. Therefore, parents and trainers need to consider athletic identity closure, which refers to the stage of discovery of identity where an athlete actually has an identity but has not been able to explore other options or ideas regarding his identity including commitment to his role as an athlete without any alternative exploration of work or ideological (Brewer & Petitpas, 2017).

One of the smash skills in the sepak takraw game is the smash Kedeng (scissors). Smash Kedeng is done by turning your back on the net, using the back of the foot. A smash Kedeng can use the soles of the feet, the resulting ball is not hard, this movement is usually used to chatter opponents in front of the net. The technique of implementing a smash Kedeng in the sepak takraw game when the body has made a repulsion with the legs resting explosively, as soon as possible the fulcrum feet pick up the ball, then do a smash Kedeng with the back of the foot. When landing after a smash, the legs are lowered down and landed with two legs. To improve smash Kedeng skills, of course, serious and ongoing training is needed through both Solo drills, Pair drills, and Mixed drills. To improve students' skills in conducting smash Kedeng and so that these skills can be consistent, we conduct research with the aim of revealing the use of good and appropriate training methods. In addition, information about what makes the individual motivated to move is also very necessary to find out how much the desire and encouragement of students to make efforts in achieving the goal of training Kedeng smash skills in the sepak takraw game.

Regarding the right method to improve smash Kedeng skills, we conducted experiments to see the difference in influence between the three methods and which methods could be recommended to improve smash Kedeng skills.

#### Literature review

Smash ability is one of the basic techniques of sepak takraw and has a very important role in the game, because the success of a team or team is determined by the ability of each individual to do 'effective smash which is considered a very important means to get points to win the game' (Davidson & Gustavson, 1953). For beginners, practicing ball impingement with the feet during the smash is the initial difficulty in doing a smash, which is placing the foot with the ball in the right time or at the same time. By that, it is necessary to have a basic ball training with legs consisting of the knee kick, the inside kick, the outside kick, and the header' (Sanitate et al., 1998).

One type of smash that is usually done in the sepak takraw game is a smash Kedeng (scissors). This type of smash is done by backing the net and kicking the ball with the back of the foot. The smash Kedeng technique in the sepak takraw game starts when the body has made repulsion with the legs resting explosively, as soon as possible the fulcrum feet pick up the ball, then do a smash Kedeng with the back of the foot. When landing after a smash, the legs are lowered down and landed on two legs. The more towards the complex implementation techniques, the more factors that need to be considered in the process of learning smash skills in sepak takraw. Knowledge of the Kedeng smash is very necessary to support the training carried out, both in its application and in the mistakes in applying the Kedeng smash technique. The stages of application are:

- 1. Stand back to the net, lift the leg to be used kicking towards the falling ball, so that the ball will be in front with the foot position between 11 or 1 o'clock (depending on which foot you will use).
- 2. The foot is swung forward quickly so as to provide upward momentum.
- 3. When the foot is in the maximum height of the jump, the swinging foot will be used to kick, the body is leaning slightly backward to get more leverage and power to kick, but not too backward because the body can lose balance.
- 4. The feet used for kicking must be swung up in three rapid stages:
  - a. First the knees are bent, so that the upper leg reaches the maximum height first.

- b. Followed by the lower leg as fast and hard as possible to move up and back (knee down).
- c. Then it is followed by a kick using the back of the foot or toe over the same shoulder with the kicker's feet towards the opponent.
- 5. To get maximum energy, after kicking the ball, there must be a continued movement, not only continuing the leg backward, but also slightly swinging the legs and body sideways.

In addition to the application techniques, it is also necessary to know some of the mistakes that often occur in doing a smash Kedeng.

- 1. Timing (accuracy) between balls with jumps. Sometimes players jump ahead of the ball, so when they are ready to kick, the ball has not reached the range or the ball has dropped first.
- 2. The placement of the ball is not above the left shoulder or right shoulder while the player does not have good flexibility in the legs, as a result the ball smashes about the head itself.
- 3. The player is late landing the left foot especially when doing a right-footed smash so that the player falls down.

Smash skills include the skill mastery category in sepak takraw games. A good smash makes it difficult for your opponent to return the ball. For this reason, the smash movement needs to be trained through the selection and application of appropriate training methods. In choosing and setting the training method depends on: a) general purpose, b) certain tasks, c) the specificity of a sport, and d) the physical and mental maturity of the athlete and the level of his ability. To achieve these skills, ideal methods are needed for each type of smash skill. In addition to providing a variety of methods, the trainer can also understand which method is ideal for each individual or group of exercises. Drill method is a variation of practice in sepak takraw which is often carried out by individuals and groups for the development of techniques in accordance with the objectives to be achieved. The drilling method that is often used is the Solo drill method, the Pairs drill method, and the Mixed drill method.

Every athlete has different potentials and abilities so that in determining the training load must be adjusted to the abilities of each individual. The drill solo method is an individual exercise without the help of others and aids in doing exercises to improve the skills of the athlete's kicking itself. The principle refers to how the player is free in determining the direction or position and technique when playing the ball without being bound by the rules of the game as well as to sharpen known techniques because this is done in the framework of his own training. The following figure 1 shows the Solo drill method.



Figure 1. Solo drill Adapted from *wikihow.com* 

Solo drill (by holding and playing the ball yourself) can be done in the following ways.

- 1) Each player is given a ball
- 2) The ball is raised and kicked with the inner leg (soccer sila) straight up above the head, then ball dismash.
- 3) Like practice 2, the ball is kicked high upwards one time then dismash.
- 4) The ball is kicked as much as possible according to the desired height, then smashed.

In addition to the Solo drill method, the Pairs drill method can also be done to sharpen the techniques of sepak takraw games, which is a form of exercise that is very good and tends to the activity and cooperation of two individuals. Pair training is ball mastery movements in pairs with friends and/or partners as a tool. Pairs drill aims to make it easier to feed the ball to friends but the ball remains within reach. The application can be done in the following ways and can be seen in Figure 2.

- 1) Players line up and face a distance of 3-4 meters and each pair holds one.
- 2) Row A (1,2,3,4, and 5) bounces the ball to row B (1,2,3,4, and 5), row B doing smash Kedeng into the opposite court
- 3) After five smash exercises, the change of the ball giver and the packer is done.
- 4) Like practice 2, the ball is controlled once by a smasher before being given to the ball thrower. The ball is kicked as high as the head by the thrower to be fed to the smasher in the smash.



Figure 2. Pairs drill Adapted from *wikihow.com* 

Both the Solo drill and the Pairs drill method are both drilling methods that are widely used by sepak takraw athletes in their training sessions. In essence, there is no best method because each action certainly has a different method and strategy even for a certain time. Therefore, athletes and coaches should know their abilities and skills so that they can determine which training method is ideal for certain playing techniques in certain situations and conditions. Mixed drill method actually combines the two previous methods, namely Solo drill and Pairs drill method. Mixed drill method is a whole movement technique (part and whole method) and is a method of drilling that is carried out in stages.



Figure 3. Mixed drill Adapted from *wikihow.com* 

In practice, this Mixed drill method follows the sequence starting from preview; provide a complete picture of the motion skills to be trained, Experiments; players try to do the motion process, Review; reveal the problems found during the experiment, train the parts/units; part by part exercise motion patterns, Synthesis; do overall motion skills training, and Stabilization; strengthen ability by practicing motion skills repeatedly. This Mixed drill method can stimulate players to immediately have the ability to smash hard and precisely.

The three methods in the substance aim to improve exercise skills, specifically smash Kedeng skills. However, the thing that always needs to be understood is that there is no best method and strategy but only the best method and strategy for the situation and conditions for the time when the method and strategy are applied. The ideal method and strategy are methods and strategies that significantly have a positive influence on what is to be achieved. Therefore, Münchow & Bannert (2018) suggest that 'encouraging positive influence should encourage learning outcomes regardless of the individual characteristics of students'. Even in sports, every method or application used in each match for each type of sport is, of course, different 'because of the specific nature of match-related features for different sports, the results in various studies in the application generally cannot be compared directly, generally only in the form of predictions and relative' (Bunker & Thabtah, 2019; Leung & Joseph, 2014).

#### Methodology

This research was conducted at the Faculty of Sport Sciences, Makassar State University, South Sulawesi Province with 18 meetings for 6 weeks. The post-test only design experiment design was applied to see the differences in the effect of the three drilling methods; Solo drill (A1), Pairs drill (A2), and Mixed drill (A3), towards smash Kedeng skills. The population of this study was all male students of the PKJR study program, which numbered 110 people and had not yet programed sepak takraw subject. 60 samples were taken randomly and divided into three groups, each consisting of 20 people. Data was collected through posttest on smash Kedeng skills carried out on the three groups. Furthermore, the first treatment group was given the Solo drill method, the second treatment group was given the Pairs drill method, and the third treatment group was given the Mixed drill method.

After the treatment was carried out for 6 weeks where each group was given treatment for a week as many as 6

meetings, then posttest was given to see the difference in application between the three methods by carrying out the smash Kedeng skill test. The post-test results data were then analyzed using analysis of variance (ANAVA) to test the hypotheses that were built. However, before doing ANAVA, we first conducted a data normality test using Lilliefors test. After doing a variance analysis to see main and simple effects, further tests were carried out using the Tuckey test to determine which groups had better Kedeng smash skills with a significance level of  $\alpha = .05$ . The hypothesis built in this study refers to the initial assumption that there are significant differences in A1 - A2, A1 - A3, and A2 - A3 on the smash Kedeng skills in the FIK UNM students.

## **Findings and Discussion**

It can be seen that the results of the smash Kedeng skill test based on the application of the three methods have their own uniqueness when viewed from the existing Mean scores. The results of the smash Kedeng skill test by applying the Solo drill method have a Mean score of 10.40 and the Mixed drill method has a Mean score of 11.35, while the Pairs drill method has a Mean score of 7.45. This also shows that the two training methods are mentioned first; Solo drill and Pairs drill, are two training methods that have a significant influence on smash Kedeng skills. Meanwhile, between the two drilling methods, the highest average value of the smash Kedeng skill test was caused by the influence of the Pairs drill method. The following table 1 shows a description of the results of the smash Kedeng skill test.

Table 1. Description of the Smash Kedeng Skill Post-t	est Results	
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Group	Ν	Range	Min.	Max.	Sum.	Mean	Std. Deviation
A1	20	8	6	14	208	10.40	2.162
A2	20	6	5	11	149	7.45	1.701
A3	20	8	6	14	227	11.35	2.207

Based on the experimental design in this study, the results of the smash Kedeng skill test in the sepak takraw game with three training methods need to be described separately.

#### **1.** Smash Kedeng skills for solo drill group (A<sub>1</sub>)

From the post-test data of smash Kedeng skills, the Solo drill method group, from 20 samples obtained a minimum value of 6 and a maximum value of 14 with a value range of 8. The mean value is 10.40 with a standard deviation value of 2.162 and a total value of 208 and frequency distribution as shown in Table 2 below.

Tuble 2. Trequency Distribution of Shush Redelig Skills Using the Bolo Dim Method								
Class Interval		Lower Bound	Higher Bound	Absolut Freq.	Relative Freq.			
6	-	7	5.5	7.5	2	10.0%		
8	-	9	7.5	9.5	4	20.0%		
10	-	11	9.5	11.5	8	40.0%		
12	-	13	11.5	13.5	4	20.0%		
14	-	15	13.5	15.5	2	10.0%		
			Total	20	100%			

Table 2. Frequency Distribution of Smash Kedeng Skills Using the Solo Drill Method

Berdasarkan Tabel 2 di atas, diketahui ada 2 orang (10,0%) mendapat keterampilan *smash* Kedeng dengan nilai di bawah rata-rata dan 2 orang (10,0%) memiliki nilai di atas rata-rata. Berikut ini disajikan data skor keterampilan *smash* Kedeng dalam permainan sepak takraw dari kelompok metode Solo drill dalam bentuk histogram.



Figure 4. Histogram of Smash Kedeng Skill Score Using Solo Drill Method

#### 2. Smash Kedeng skills using Pairs drill method group (A2)

From the smash Kedeng skills data for the Pairs drill method group, from 20 samples obtained a minimum value of 5 and a maximum value of 11 with a value range of 6. The mean value is 7.5 with a standard deviation value of 1.701 and a total value of 149 and frequency distribution shown in table 3 below.

Clas	Class Interval		Lower Bound	Absolut Freq.	Relative Freq.	
5	-	6	4.5	6.5	7	35.0%
7	-	8	6.5	8.5	7	35.0%
9	-	10	8.5	10.5	5	25.0%
11	-	12	10.5	12.5	1	5.0%
13	-	14	12.5	14.5	0	0.0%
			20	100%		

Table 3. Frequency Distribution of Smash Kedeng Skills Using the Pairs Drill Method

Based on Table 3 above, it is known that there were 7 people (35.0%) who scored the smash Kedeng skill below the average and 1 person (5.0%) above the average. The following is presented the smash Kedeng skill score data from the Pairs drill method group in the form of a histogram.



Figure 5. Histogram of Smash Kedeng Skills Scores Using the Pairs Drill Method

## 3. Smash Kedeng skills using the Mixed drill method group (A3)

Data from 20 samples for smash Kedeng skills using Mixed drill method obtained a minimum value of 38 and a maximum value of 56 with a range of values of 18. The average value of 44.60 has a standard deviation value of 5.862 and a total value of 892 and a frequency distribution like table 5 below.

Class Interval		Lower Higher Bound Bound		Absolut Freq.	Relative Freq.	
6	-	7	5.5	7.5	2	10.0%
8	-	9	7.5	9.5	3	15.0%
10	-	11	9.5	11.5	7	35.0%
12	-	13	11.5	13.5	5	25.0%
14	-	15	13.5	15.5	3	15.0%
			20	100%		

Tab	le 4. Freq	uency	<sup>v</sup> Distribution	of Smash	Kedeng	Skills	Using	the	Mixed	Drill	Method

Based on table 4 above, it is known that there were 2 people (10.0%) who scored the smash Kedeng skill below the average and 3 people (15.0%) above the average. The following is presented the smash Kedeng skill score data from the Pairs drill method group in the form of a histogram.



Figure 6. Histogram of Smash Kedeng Skill Score Using Mixed Drill Method

# 4. Hypothesis testing

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To find out the difference in smash Kedeng skills in the sepak takraw game between the Solo drill method group, the Pairs drill method group, and the Mixed drill method group in the FIK UNM students, the statistical hypotheses are proposed as follows:.

 $\begin{array}{l} H_0:\, \mu A_1 \leq \mu A_2 \\ H_1:\, \mu A_1 > \mu A_2 \\ H_0:\, \mu A_1 \leq \mu A_3 \\ H_1:\, \mu A_1 > \mu A_3 \\ H_0:\, \mu A_2 \leq \mu A_3 \\ H_1:\, \mu A_2 > \mu A_3 \end{array}$ 

Hypothesis testing is done by using the Tukey Test (Q) analysis at a significant level of 95% or  $\alpha$  .05. It is intended to find out the differences in students' smash Kedeng skills in the sepak takraw game between A1 - A2, A1 - A3, and A2 - A3. The results of the Tukey Test can be seen in table 6 below.

Table 5. Results of the Tukey-Test analysis								
Composed group Occurry Otable Std Error Sig95% Confidence Interval								
Compared group	Qcount	Qtable	Stu. Error	Sig.	Lower Bound	Upper Bound		
$A_1$ and $A_2$	$2.950^{*}$	2.95	.635	.000	.94	4.96		
$A_1$ and $A_3$	950	2.95	.635	.856	-2.96	1.06		
$A_2$ and $A_3$	-3.900*	2.95	.635	.000	-5.91	-1.89		

Based on table 5 above, it can be seen that the data from the Tukey Test (Q) analysis on the differences in Kedeng smash skills between the Solo drill method group and the Pairs drill method group at the FIK UNM students, obtained differences in values namely  $Q_{count}$  of 2.950 and  $Q_{table}$  of 2.95 while a significant level is obtained at a value of .000. Thus, it can be concluded that there is a significant difference (p) because a significant level is smaller than  $\alpha = .05$  (.000 < .05). If seen in the Sig. table column (p), there is a value of .000, in other words, the probability is far below  $\alpha = .05$  so that a decision can be taken that  $H_0$  is rejected and  $H_1$  is accepted. So, it can be concluded that there are differences in the smash Kedeng skills in the sepak takraw game between the Solo drill method group and the Pairs drill method group at the FIK UNM students. In table 5, it can also be seen the statement of the results of the same hypothesis test on the application of the Pairs drill method and Mixed drill method where the  $Q_{count}$  value is -3,900 and  $Q_{table}$  is 2.95 with a significant level of value of .000 < .05. That is, H0 is rejected and H1 is accepted. On the results of the hypothesis test between the Solo drill and Mixed drill methods show that there is no difference where the  $Q_{count}$  is -.950 and  $Q_{table}$  is 2.95 with a significant level obtained value of 0.856 > .05. That is, H0 is accepted and H1 is rejected. If the results of the second hypothesis test state that there is no difference in influence between the Solo drill method and the Mixed drill methods are considered to have the same effect on smash Kedeng skills.

From the results of the Tuckey test also, it can be said that students who practice smash Kedeng in the sepak takraw game using the Solo drill method get a high or more skilled score compared to those using the Pairs drill method. It is understandable that the Solo drill method can improve athlete's self-regulated learning in that it needs to be studied and practiced by athletes for effective use (Altfeld et al., 2017). On the other hand, the Pairs drill method requires the role of both athletes when training in pairs. That is, Solo drill is a training method that really relies on self-regulation while Pairs drill is still intervened by training partners, not coaches as in a team of more than two members. If it is linked between academic and sports, McCardle, (2015) shows that 'involves all regulatory phases in both contexts that show the application of self-learning models for sports training and suggest using the same process to succeed in both contexts'.

As for the results of the analysis of research data to test and prove the first hypothesis, it was found that the average value of smash Kedeng skills in the Solo drill methods group as a whole is X A1 =10.40 with a standard deviation of 2.162 and an average value of smash Kedeng skills obtained using the Pairs drill method is equal to X A2= 7.45 with a standard deviation of 1.701. Therefore, overall it can be said that the smash Kedeng skill using the Solo drill method is higher than the Pairs drill method. To test and prove the third hypothesis, it was found that the average value of the smash Kedeng skills in the group of Pairs drill method is equal to X A2= 7.45 with a standard deviation of 2.207. From these results, it can be seen that overall, smash Kedeng skills using the Mixed drill method are higher than the Pairs drill method. It is understandable that because Mixed drill methods involve self-training models and pairs so that athletes are more skilled at smashing both individually and in pairs. This is certainly different when athletes apply training in pairs where the exercises tend to get paired intervention. While the Pairs drill method seems difficult to improve skills individually because it tends to depend on the practice pair. Therefore, John Wooden in Serby (2010) once said that the best thing we can do for people we love is not to do what they can do for themselves.

Both of these overall results also support the results of the second hypothesis test which states that there is no difference in effect between the Solo drill method (A1) and the Mixed drill method (A3) on the smash Kedeng skills, so that both methods can be recommended to improve the students' smash Kedeng skills in sepak takraw. However, it should be understood that whatever form of training method is applied,

the main goal of this is not to measure the participation of athletes with academic achievement and professional contracts (Smucny et al., 2015). As a result, according to Smucny, et al. that a culture has been created where the definition of success in sports is defined not by laying the foundation for a healthy lifestyle, but rather on achieving elite status' or to distinguish between skilled and non-expert athletes (Baker & Young, 2014). However, drilling with any model should always be considered by the coaches because each athlete, both individually and in a team, has the capacity to mediate the skills needed through drilling, including the coache himself. 'Training enhances learning and sports managers' individual performance' (Millar & Stevens, 2012) and coaches can even 'help young athletes develop life skills in the areas of leadership, autonomy, intrinsic motivation, and decision making' (Watson et al., 2011).

#### Conclusions

There are differences in the effect of the Solo drill and Pairs drill methods on the smash Kedeng skills in the sepak takraw game of FIK UNM students and the same thing happens to the difference in effect between the Pairs drill and Mixed drill methods on the smash Kedeng skills. On the other hand, there is no difference in effect between the Solo drill and Mixed drill methods on the smash Kedeng skills in the sepak takraw game of the FIK UNM students. From the three training methods, we recommend using the Solo drill method and Mixed drill method to improve smash Kedeng skills in the sepak takraw game.

To improve the quality of the results of the smash Kedeng skills in the sepak takraw game, efforts are needed to improve the quality of drilling methods with a regular and programmed exercise program. In general, the Solo drill and Mixed drill method have shown its superiority as a drilling method in improving smash Kedeng skills in the sepak takraw game compared to the Pairs drill method. Therefore, we suggest lecturers, teachers, trainers, researchers, and students utilize the results of this study in order to improve the smash Kedeng skills.

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## **Conflicts of interest**

No conflict of interest reported by the authors.

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