

# The Effect of Zig-Zag Dribbling and Triangle Dribbling on Futsal Skills for U13 Athlete Using Video

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**Abstract** One of the reasons in conducting this study is that the game of futsal demands a lot of mastery of ball management skills. One of the basic techniques that must be mastered is dribbling. This study aimed to get the effect of video on zig-zag dribbling and triangle dribbling mastery for futsal game. Dribbling has the main role in futsal skills. While the approach of study used is experimentally by factorial group design 2x2 categories. The participants of the study are athletes aged 13 from futsal club at Bengkulu. There are 22 athletes for experiment class and control class. They are taken from 6 Futsal clubs in Bengkulu. Data validity used internal and external controls. The data analysis technique used two-way ANOVA analysis and if an interaction occurs, it is followed by a Dunnett t-test. The results of the study concluded that there was a different mastery of the dribbling zig-zag and triangle techniques through the video practice process that was applied using zoom or YouTube. This result concluded that video call using zoom is better than YouTube and offline meeting. The average score of dribbling training used the zig zag dribbling was 85 and those who trained using triangle dribbling were 72.85. Creativity in designing the video provides athletes with different concepts of mastery of futsal dribbling techniques.

**Keywords** Futsal, Triangle Dribbling, Video, U13 Athletes, Zig Zag Dribbling

## 1. Introduction

Football and futsal games are now very familiar all over the world and these two sports have their own charm. These also have similarities in terms of the techniques used even though there are differences in the rules of the game. However, the game of futsal demands a lot of mastery of ball management skills. One of the basic techniques that must be mastered is dribbling. Mastery of this dribbling technique must of course go through a continuous training process so that it reaches the stage of motion automation. Dribbling is the ability that every player has in controlling the ball before it is given to his friends to create opportunities to score goals [1].

Athletes must practice dribbling regularly to achieve the ability to control the ball. But, it is difficult to train in Covid-19 pandemic condition. Thus, futsal coaches have to use technological devices in providing futsal training effectively and can improve the futsal abilities of athletes at clubs. However, the use of technological devices is not an

easy task for coaches even though people are familiar with various uses of technology in their daily lives. Also, the coach has to design technical and tactical action models in the video for the game is real [2].

The results of observations are from March to April 2020, it was concluded that the futsal skills of athletes at the futsal club did not give a significant increase when training activities were using dribbling training videos made by the coach. Athletes at the club feel bored and are not enthusiastic about training during the lockdown condition. Their psychological condition during the pandemic made it difficult for them to understand every movement taught by the coach. It means that player mental has the main role in the futsal game [3][4]. While the interviews conducted using the WhatsApp application, it was concluded that the students expected training activities can do interactively even though they used technological devices and it is not facing to face.

Previous research has been done to know the dribbling training in futsal or football. [1] found that successful dribbling can be done using passing and shooting distances, such as small-side game [1][5][6]. Therefore, routine training can be done regularly to increase the professional level of playing futsal. The level of training can be complemented by aerobic and anaerobic [7][8], because every futsal player requires great intermittent endurance, leg strength, speed, and agility that matches the rhythm of playing futsal [9][10][11]. Thus, the ability to play football can also be determined through an agility test [12]. [13] show that the reliability and usability of the 30-15 Intermittent Fitness Test (30-15IFT) for professional male and female futsal players help them determine their strength level. It means that health is very important to support the futsal player game [14]. Besides, futsal has also become the right way to develop soccer skills [15]. These studies concluded that professional futsal player has a good dribbling ability, agility and endurance [16].

While currently, the study focuses on implementing zig-zag dribbling and triangle dribbling in futsal game using video for U13 athlete. Dribbling has the main role in the futsal game. Zig zag dribbling and shuttle dribbling exercise improved the player speed in futsal game [17]. [18] concluded that dribbling requires dexterity and good ankle coordination. It is the basic technique of a sport, especially in soccer [19], because the Ankle affects the outcome of the kick [20]. [21] showed the zig-zag method is more effective in dribbling exercise [22]. It can be trained using Dogging Run and Shuttle Run exercises [23]. While in soccer, there is ergonomics model for exercise [24], drill method [25], playing a game like as conventional or modern [26], or Speed Agillity and Quickness (SAQ) training program [27] dribbling need this physical condition.

This research could contribute to the concept of developing innovative futsal training for athletes aged 13 years. Also, the use of interactive videos can provide findings on new ways to practice dribbling during

pandemic Covid-19 or another virus. However, the concept of study expected is also oriented towards the application of video for online and offline futsal dribbling exercises. Hence, the purposes of the study are to get differences to effect between zig-zag dribbling and triangle dribbling for U13 athlete at Futsal Club Bengkulu. Also, it is to know the effectiveness of the video in dribbling training.

## 2. Materials and Methods

### 2.1. Research Design

The research used quantitative approach through quasi-experiment design. It used factorial design 2x2 categories. This study has two independent variables that provide two possible main effects. The first effect is independent variable 1 that is dribbling type and the second effect is independent variable 2 that is a video model. An interaction occurs when the effect of one independent variable at the levels of the other independent variable [28]. The following is research design.

**Table 1.** Research Treatment by 2x2 Factorial Level Design

Video (B)	Dribbling Types (A)	
	Zig Zag Dribbling (A <sub>1</sub> )	Triangle Dribbling (A <sub>2</sub> )
<i>Video Call by Zoom</i> (B <sub>1</sub> )	A <sub>1</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>1</sub>
<i>YouTube and Offline Meeting</i> (B <sub>2</sub> )	A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>2</sub>

The study is conducted at Futsal Club in Bengkulu, Indonesia. There are six futsal clubs which start from May until November 2020.

### 2.2. Research Sample

The participants are U13 athletes and consisted of 44 athletes. Process of sample technique is multistage cluster random sampling. The sample is divided into classes. There are experiment and control classes and each class is divided into 2 groups which received the dribbling training using different video models. The experiment class has 22 U13 athletes and the control class has 22 U13 athletes.

### 2.3. Measures

Data are collected using observation, interview, and test. The observation and interview are used in a preliminary study to get the dribbling problem. The test is used to measure the athlete's dribbling ability, either zig-zag dribbling or triangle dribbling. Test is done before and after treatment. While the dribbling test is measured using the standard test set by the Indonesian Futsal Federation. The score taken from the implementation of this dribbling test is the time that is taken by the player from the whistle signal at the start line to the finish line.

This is the dribbling model test design which can be seen in Figure 1:

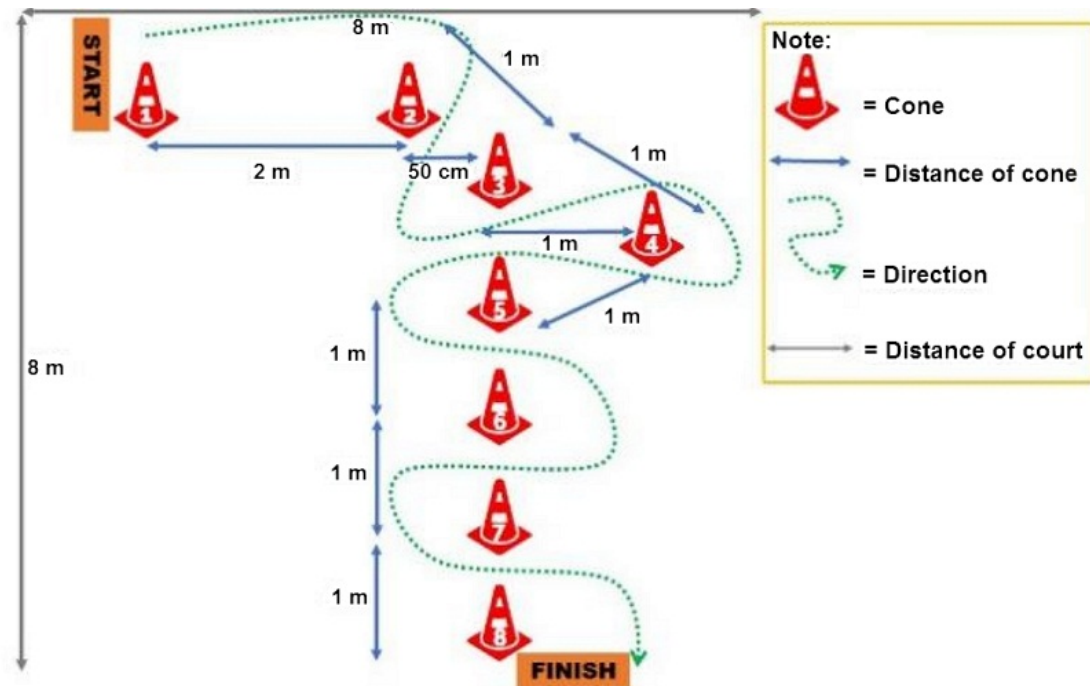


Figure 1. The model of dribbling test design

The process of the test has some steps from figure 1, namely;

- a The player is ready to stand behind the starting line with the ball in control of his feet.
- b When there is a whistle signal, the player dribbles from cone 1 to cone 2 (required to use the sole or sole), then the player turns and goes to cone 3, then heads to cone 4 (turns do cone 4 using the left foot) and turns towards cone 8 until you reach the finish line.
- c The player must dribble in the direction of the arrow if the player does not match the direction of the arrow, the player must correct it by continuing to use his feet and during that time the stopwatch continues.
- d During the dribbling test, the player must use both feet, at least one of the player's feet has touched the ball once.
  - 1) Dribbling movements that are declared failed using criteria;
  - 2) Players dribble with only one foot. Players dribble the ball that is not in the direction of the arrow
  - 3) Players use limbs other than legs when performing the dribbling test.

## 2.4. Data Analysis

The process of validity research design has two ways, namely internal validity control and external validity control. Some steps in internal validity are a) experimental mortality; b) maturation; c) testing; d) instrument; e) the influence of statistical regression; f) location; and g) the influence of interaction with selection. While external validity is population control and ecological.

To analyze of data used 2 ways variance analysis technique with the significance level  $\alpha = 0.05$  and  $\alpha = 0.01$ . If the result of process analysis got the interaction, it continued to analyze using Dunnet t-test[29]. While the normality data test used lilliefors and homogeneity data test used the Bartlett using level confidence  $\alpha = 0.05$  Lilliefors

## 3. Result

Data displayed use descriptive statistic and the result of hypothesis analysis. The following is the recapitulation of descriptive statistics.

**Table 2.** Recapitulation of the Dribbling Score in Futsal Game

B\A	(A <sub>1</sub> )	(A <sub>2</sub> )	Total
<i>B<sub>1</sub></i>	$\Sigma Y_{11} = 925$	$\Sigma Y_{21} = 890$	$\Sigma Y_{B1} = 1815$
	$n_{11} = 11$	$n_{21} = 11$	$n_{B1} = 22$
	$\bar{Y}_{11} = 87,36$	$\bar{Y}_{21} = 83$	$\bar{Y}_{B1} = 170,36$
	$\Sigma \bar{Y}_{11} = 82180$	$\Sigma \bar{Y}_{21} = 74476$	$\Sigma \bar{Y}_{B1} = 156656$
	$S_{11}^2 = 12,45$	$S_{21}^2 = 50,2$	$S_{B1}^2 = 62,47$
	$S_{11} = 3,50$	$S_{21} = 6,15$	$S_{B1} = 9,65$
<i>B<sub>2</sub>B<sub>1</sub></i>	$\Sigma Y_{12} = 700$	$\Sigma Y_{22} = 844$	$\Sigma Y_{B2} = 1815$
	$n_{12} = 11$	$n_{22} = 11$	$n_{B2} = 22$
	$\bar{Y}_{12} = 68$	$\bar{Y}_{22} = 75,73$	$\bar{Y}_{B2} = 143,73$
	$\Sigma \bar{Y}_{12}^2 = 46077$	$\Sigma \bar{Y}_{22}^2 = 65030$	$\Sigma \bar{Y}_{B2}^2 = 112007$
	$S_{12}^2 = 22,15$	$S_{22}^2 = 26,25$	$S_{B2}^2 = 48,37$
	$S_{12} = 4,72$	$S_{22} = 5,50$	$S_{B2} = 10,22$
<i>Total</i>	$\Sigma Y_{A1} = 1625$	$\Sigma Y_{A2} = 1734$	$\Sigma Y_{BT} = 3413$
	$n_{A1} = 22$	$n_{A2} = 22$	$n_T = 44$
	$\bar{Y}_{A1} = 68$	$\bar{Y}_{A2} = 158,73$	
	$\Sigma \bar{Y}_{A1}^2 = 46077$	$\Sigma \bar{Y}_{A2}^2 = 139506$	
	$S_{A1}^2 = 34,60$	$S_{A2}^2 = 76,45$	
	$S_{A1} = 8,22$	$S_{A2} = 11,65$	

Table 2 concluded that video call using zoom is better than YouTube and offline meeting. The result average score of dribbling training used the zig zag dribbling was 85 and those who trained using triangle dribbling were 72.85. While the result of the hypothesis test is;

- 1)  $F_{\text{count}}(R) > F_t(0.05) = 8.7 > 4.085$ , so  $H_0$  is rejected, there are significant differences between row. There are differences for athlete dribbling skills in futsal games for those who are trained using zig zag dribbling and triangle dribbling.
- 2)  $F_{\text{count}}(C) > F_t(0.05) = 185.7 > 4.085$ , so  $H_0$  is rejected, there are significant differences between columns. There are differences for athlete dribbling skills in futsal games for those who used video call by zoom and YouTube.
- 3)  $F_{\text{count}}(i) > F_t(0.05) = 92.6 > 4.085$ , so  $H_0$  is rejected, there is an interaction between column and row factors. There is an influence of interaction between zig zag dribbling and triangle dribbling with video facilities.
- 4) The influence of independent variables on the dependent variable is large. The influence of dribbling types, video media, and interaction is explained below

It means that there is the interaction between dribbling types with video implementation in futsal games that can explain 67%. Because there are differences in analysis, it is continued to determine the level of further differences,

which used One-way ANOVA analysis. Data determine four treatments which have been tested by One-way ANOVA procedure.

a Effect of dribbling types

$$\hat{W}^2 = \frac{db(F_0(A)-1)}{b(F_0(A)-1)+N}$$

$$\hat{W}^2 = \frac{1(8.7-1)}{1(8.7-1)+44}$$

$$\hat{W}^2 = 0.15$$

It means that the dribbling types can explain 15% of the variation in futsal skills.

b Video Influence

$$\hat{W}^2 = \frac{db(F_0(B)-1)}{b(F_0(B)-1)+N}$$

$$\hat{W}^2 = \frac{1(185.7-1)}{1(185.7-1)+44}$$

$$\hat{W}^2 = 0.808$$

It means that the video innovation can explain 80.8% of the variation in futsal skills.

c Effect of interaction between types of dribbling and video

$$\hat{W}^2 = \frac{db(F_0(A)-1)}{b(F_0(A)-1)+N}$$

$$\hat{W}^2 = \frac{1(92.6-1)}{1(92.6-1)+44}$$

$$\hat{W}^2 = 0.671$$

$$JK(A_x) = JK(AB) + JK(A) + JK(B)$$

$$JK(A_x) = 658.76 + 18.7 + 1920.7$$

$$JK(A_x) = 2707.53$$

$$db(A_x) = n_{ax} - 1$$

$$db(A_x) = 4 - 1$$

$$db(A_x) = 3$$

$$RJK(A_x) = \frac{JK(A_x)}{(n_{ax}-1)}$$

$$RJK(A_x) = \frac{2707.53}{(3)}$$

$$RJK(A_x) = 902.51$$

$$RJK(D_x) = RJK(D) = 8.8; db(D) = 40$$

$$F_0 = \frac{RJK(A_x)}{RJK(D_x)}$$

$$F_0 = \frac{902.51}{40}$$

$$F_0 = 22.56$$

From the results of 2-way ANOVA analysis, it showed:  
 $JK(AB) = 658.76$

$$JK(A) = 128.07$$

$$JK(B) = 1920.7$$

$$RJK(D) = 7.8$$

Comparing with  $F_{(0.05;3;40)} = 2.84$

So  $F_0 > F_{tab}$ . Ho is rejected. It concluded that the average score for four treatment groups (cells). The result of Dunnett  $t_{test}$  with  $t_{tab} = \alpha; d(D) = t(0.05; 40) = 2.021$

a The difference in groups  $A_1B_1$  and  $A_2B_1$ :

Hypothesis:

$$H0: \mu A_1B_1 \leq \mu A_2B_1$$

$$H1: \mu A_1B_1 \geq \mu A_2B_1$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[X_{11}-X_{21}]}{\sqrt{RJK(D)\left(\frac{1}{n_{11}}+\frac{1}{n_{21}}\right)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[87.36-83]}{\sqrt{7.8(0.09+0.09)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{43.36}{1.185}$$

$$t_0(a_1b_1 \times a_2b_1) = 3.679$$

$t_0 = 3.679 > t_{tab} = 2.021$ , it means that Ho is rejected, so zig zag dribbling training in futsal game is higher than triangle dribbling that used video call by zoom.

b The difference in groups  $A_1B_2$  and  $A_2B_2$ :

Hypothesis

$$H0: \mu A_1B_1 \geq \mu A_2B_2$$

$$H1: \mu A_1B_1 \leq \mu A_2B_2$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[X_{12}-X_{22}]}{\sqrt{RJK(D)\left(\frac{1}{n_{12}}+\frac{1}{n_{22}}\right)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[68-75.73]}{\sqrt{7.8(0.09+0.09)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{-7.73}{1.185}$$

$$t_0(a_1b_1 \times a_2b_1) = -6.52$$

$t_0 = -6.52 > t_{tab} = 2.021$ , it means that Ho is rejected, so zig zag dribbling training in futsal game is lower than triangle dribbling that used YouTube.

c The difference in groups  $A_1B_1$  and  $A_1B_2$ :

Hypothesis

$$H0: \mu A_1B_1 \leq \mu A_1B_2$$

$$H1: \mu A_1B_1 \geq \mu A_1B_2$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[X_{11}-X_{12}]}{\sqrt{RJK(D)\left(\frac{1}{n_{11}}+\frac{1}{n_{21}}\right)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[87.36-68]}{\sqrt{7.8(0.09+0.09)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{19.36}{1.185}$$

$$t_0(a_1b_1 \times a_2b_1) = 16.34$$

$t_0 = 16.34 > t_{tab} = 2.021$ , it means that Ho is rejected, so the application of video call by zoom is higher than YouTube that is trained using zig-zag dribbling in futsal game.

d The difference in groups  $A_2B_1$  and  $A_2B_2$ :

Hypothesis

$$H0: \mu A_2B_1 \geq \mu A_2B_2$$

$$H1: \mu A_2B_1 < \mu A_2B_2$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[X_{21}-X_{22}]}{\sqrt{RJK(D)\left(\frac{1}{n_{11}}+\frac{1}{n_{21}}\right)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{[83-75.73]}{\sqrt{7.8(0.09+0.09)}}$$

$$t_0(a_1b_1 \times a_2b_1) = \frac{7.27}{1.185}$$

$$t_0(a_1b_1 \times a_2b_1) = 6.13$$

$t_0 = 6.13 > t_{tab} = 2.021$ , it means that Ho is rejected, so the application of video call by zoom is lower than YouTube that is trained using triangle dribbling in a futsal game.

## 4. Discussion

The finding explained that the dribbling exercise through video has been designed and studied together using zoom provides a more effective learning concept. Athletes can ask about various difficulties faced in practicing zig-zag dribbling or triangle dribbling. However,

the process of training activities can be done by athletes on the home page or in the field of the housing complex that does not cause crowds. Crowd activities are prohibited during the training process so that the Covid-19 virus does not spread more. Meanwhile, videos uploaded on YouTube also provide excellent efficiency in dribbling mastery in futsal. Although using YouTube gives different results in mastering dribbling.

In this context, the result of dribbling training process using a zig-zag and triangle pattern showed a lot of progresses in athlete's dribbling skills. Training activities during a pandemic are also more effective and efficient using video calls done by zooming for each exercise. The treatment that has been given to each group showed 67% good interaction of the dribbling training model with video.

The new findings from this study indicate that as much as 80% of the development of video variations has a considerable influence on the mastery of futsal dribbling skills. Zoom meetings use videos that have been made previously and played live so that the trainer can explain in detail each leg movement. Besides, students can repeat watching videos via YouTube as well. But video can also be used in offline training. It concluded that this study offered the training model both online, offline, or combination of online and offline [30]. It is proof that technology helps the learning process easier today. Technology is a new challenge today for futsal coaches.

Technology has had a major influence on all lines of human life, from business, social activities to education [31]. Interactive learning, multimedia interactions, creative learning and global learning using project and critical thinking are some of the modern changes in education.[32].

In sports training activities, technology has also been used as a concept of smart sports. This concept fulfils the needs of sports harmony both in schools, clubs and communities. The combination of technology in sports is a new concept, new model, or a new way of developing sports in China [33] [34]. It is a new trend in sport [35]. Sports and technology today cannot be separated because technology provides convenience and information on sports performance and can prevent injuries to athletes when exercising [36]. It creates an innovation training sport [37].

This study has a uniquely different experience for an athlete's enthusiasm when they watched the video using the traditional game. The use of various learning resources such as the internet, television, cell phones or mass media has created a positive sports learning environment [38]. Furthermore, technology can be prepared as the top model in sports training [39][40].

## 5. Conclusions

The interaction between the dribbling model and the video has provided different perceptions for the coaches. Current technological developments have made learning

activities easier and more attractive to athletes. The results of the data analysis, it shows that the zig-zag dribbling exercise is easier to master through training activities carried out using the zoom, while the dribbling triangle exercise is easier to master by watching videos on YouTube that are done repeatedly. However, other findings show that when athletes get treated alternately using zoom, their understanding of triangle dribbling is very good. Athletes can also show live training results learned from YouTube videos. This means that mastery of a dribbling technique depends on the level of difficulty of dribbling type exercise. Also, the psychological factors of athletes and the variety of various learning resources during the Covid-19 pandemic influence the level of enthusiasm for learning. These findings are a different concept for coaches in designing futsal training activities.

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