



# A Model of Technique Training for Passing and Shooting Based on Biomechanics Studies in Futsal for High School/Vocational High School Students

(Development Studies at equivalent high schools in Boyolali)

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**Abstract**— *The present research focus on producing a model of basic technique skills training for passing and shooting futsal based on biomechanics studies for high school/vocational high school students. The research method used is research and development (R&D). The types of data in this research are qualitative and quantitative data. While the data collection techniques using interview instruments and questionnaires. The data analysis technique used in developing the futsal passing and shooting training media model based on biomechanical studies is a percentage descriptive analysis technique.*

*The results showed a significant improvement. The results of the biomechanics-based passing and shooting technique were as follows: the experimental group increased by 33% to 48% and the control group 16% to 43%. Based on the results of calculating the difference in the increase in scores after the final test was carried out, it showed that the difference in scores was greater for the group that was given the treatment of the training model developed by the researcher. From these results, it can be concluded that the use of a passing and shooting technique training model based on biomechanics studies in futsal for high school-vocational high school students is declared effective and feasible to be used as a futsal training medium.*

**Keywords**— *Training Media, Basic Technique Skills of Passing and Shooting, Research Development, Biomechanics.*

## I. INTRODUCTION

Futsal is a team sport that is played by two opposing teams, with five players in each team. The goal of futsal is to put the ball into the opponent's goal as much as possible, and defend the goal itself so as not to concede the ball. Badaru (2017) futsal was first known in Uruguay with the term "five to five". Based on international terminology, the word futsal is a combination of the Spanish "fútbol sala" and the Portuguese "Futebol de salão". So the word when translated means indoor football.

Along with the times, futsal sports games have become more practical because they can be played both

indoors and outdoors. Almost the same as football, futsal is a sport that is identical with the feet as the main skill in the game. In addition, the characteristics of futsal and football are that they both require dominant skill techniques using the feet, both have the position of goalkeeper as a goalkeeper, both use tactics and strategies. Furthermore, both use the ball as the main tool in the game, but the ball in the futsal game is smaller than the size of the ball in the football.

The development of futsal in Indonesia is accelerated. Futsal began to enter Indonesia in 2000. Then futsal began to develop along with the emergence of futsal schools or futsal clubs in Indonesia. Futsal sports in

Indonesia are currently managed professionally; this can be seen from the establishment of the National Futsal Board and the existence of Indonesian futsal leagues. In addition, Indonesia also has a national futsal team that has participated in international futsal competitions. The Indonesian national futsal team won its first title at the 2010 AFF Futsal Championship in Vietnam.

The success of the Indonesian futsal team has motivated the young generation of Indonesia to be able to excel as futsal players. The spirit of the young generation is accompanied and supported by a special futsal competition or championship for students. One of the most popular championships is the Indonesian Student Futsal League. This Competition motivates students to focus on achieving achievements in the futsal sport. To achieve maximum performance in a competition, a team and athletes/players must carry out programmed, systematic, and massive training. The training process also needs to be balanced with science and technology; this is so that the training can run effectively and efficiently.

At the student level, the futsal training process can be followed through extracurricular programs at their respective schools. Extracurricular is a forum for coaching and training that aims to improve the skills of students in order to obtain achievements at the student level, both in academic and non-academic fields (sports and arts). Extracurricular programs in schools also need to be managed professionally. It aims to obtain good results and achievement targets.

There are several factors that need to be considered in achieving a maximum performance. Subarjah (2008) mentions factors that need to be considered in the preparation of achievement coaching programs, including 1) obvious coaching goals, 2) systematic training programs, 3) appropriate training materials and methods and evaluations to measure the success of the coaching process, 4) the characteristics of athletes being fostered include physical and psychological, 5) the ability of the trainer, 6) facilities and infrastructure or facilities, and 7) the condition of the coaching environment.

In addition, physical, technical, and tactical factors also need to be owned by athletes or futsal players. Mastery of technique, need a training process that starts from the most basic level. In the basic training phase, students/players need to master some basic techniques of playing futsal. The basic skills of playing futsal techniques are the key in the game, a team that has players with good futsal individual skills or technical abilities will certainly make the team play better. Lhaksana (2012) futsal technique is not much different from football. The following are some basic techniques in the game of futsal:

(1) basic techniques of passing, basic techniques of holding the ball (control), basic techniques of dribbling, basic techniques of shooting the ball, basic techniques of heading the ball and goal keeper skills. Futsal games rely heavily on the high technical abilities of athletes/players. Individual technical abilities combined collectively will result in a game based on tactics and strategy. The pattern of play in futsal is more or more dominant with short passing techniques, because the size of a short futsal field is very difficult and sprints or long dribbles and passes are rarely done. Besides short passes, ball shooting skills are also very important and dominant in futsal games. Therefore, passing and shooting techniques need to be trained properly.

Mastery of futsal techniques requires a programmed, systematic, and routine training process, based on observations made by the author at SMA N 1 Boyolali. The training process in the extracurricular program has limitations regarding training time. The time schedule for extracurricular training cannot be carried out optimally, this is due to the time given or school policies that are not in accordance with the training needs that should be carried out routinely and systematically. Time constraints can affect the results of the program that has been prepared by the trainer. The training process cannot run optimally, without the assistance of the trainer. Students find it difficult to develop the skills of basic futsal techniques. The trainer is very instrumental in giving instructions, giving examples, and evaluating the techniques being trained. In order for the training program that has been prepared to run well, students need to take part in exercises outside the extracurricular schedule. This can be a solution in improving students' basic technical skills in playing futsal. In addition, to support an effective and efficient training process, extracurricular programs need to have supporting facilities and infrastructure. Because the training infrastructure is not maximized and not yet standardized, it can affect the process of learners in mastering the basic techniques of futsal. Facilities such as training media can be a solution for trainers and athletes to make the training process run effectively and efficiently.

Based on observations at SMA Negeri 1 Boyolali, researchers found the problem that face-to-face limitations greatly affect the process of learners in mastering the basic techniques of futsal. Without face-to-face contact, the trainer/teacher cannot give instructions and give examples of the materials to be trained. In addition, the trainer cannot evaluate the mistakes made by students. To overcome these problems, a practical futsal basic technique training media is needed for creative, effective, and fun activities. Certainly, the media needed is in accordance

with the needs in the field. Based on the needs analysis, the media needed is a model of basic Futsal passing and shooting techniques based on biomechanics studies. Training media is expected to be an alternative to improve student or player achievement and training results.

## II. RESEARCH METHODOLOGY

This research is Research and Development. According to Borg and Gall (1983), "educational research and development (R & D) is a process used to develop and validate educational production". This research focus on producing a model of basic technique skills training for passing and shooting futsal based on biomechanics studies for high school/vocational high school students. The research process was carried out in several stages, namely the preliminary study of potential and problems, the data collection stage, the product design stage, the design validation stage, the design revision stage, the product trial stage, the product revision stage, the usage trial stage, the product revision stage, and mass products.

The types of data in this research are quantitative and qualitative. Quantitative data was obtained from the questionnaire assessment, while qualitative data was obtained from the results of expert interviews and preliminary studies. Sources of data are researchers, futsal coaches, futsal practitioners, media experts, biomechanics experts, and futsal athletes. In addition, the data source comes from the research sample, namely high school and vocational school students in Boyolali, totaling 35 students. Data collection techniques in this research used interview techniques, observation, and a value scale questionnaire. Sugiyono (2015) data collection is the first step that aims to obtain data. The data collection instruments used in this study were interviews and score scale questionnaires. The interviews used an unstructured technique, namely interviews conducted freely. The purpose of the interview was to obtain initial data, information on needs analysis, and information on problems in the field. Meanwhile, quantitative data were obtained from a value scale questionnaire. The value scale questionnaire aims to obtain an expert's assessment of the developed media. The data analysis technique in this study used descriptive qualitative and quantitative descriptive data analysis techniques. The descriptive analysis is used to analyze the data by describing the data that has been collected as it is without intending to make conclusions that apply to the public or generalizations. Descriptive data analysis was used to analyze data derived from interviews and observations. Meanwhile, quantitative descriptive data analysis was obtained from the results of a value scale questionnaire.

## III. RESULT AND DISCUSSION

The results of the preliminary research found that 46% of respondents stated that they needed training media for passing and shooting techniques in futsal, 43% of respondents said they needed mechanics-based training media, 1% of respondents did not need training media, while 10% did not understand the training media. Based on the results of the preliminary study, it can be concluded that athletes and coaches need a model of passing and shooting technique training based on biomechanics studies. Furthermore, researchers develop training media products according to the stages that have been planned. The product of the futsal technique training model for passing and shooting skills based on biomechanical studies developed is packaged in a video. The training model in the form of a video is divided into 3 slides, namely passing techniques, shooting techniques, and mechanics studies. The first slide showed the technique of passing using both the inner leg, the back of the foot, and the outer leg. There are 4 stages in passing techniques. First, it displays the prefix, namely the distance from the square, the angle, body position, view, and others to make it easier for players to make a prefix in passing. Second, the swing technique where the feet, hand swing, body position, view, and angle to make it easier for players to pass. Third, the pedestal technique, which displays the position of the pedestal, body position, angle at the knee, and eyesight when passing to make it easier for players to pass. Fourth, showing impact, this is displaying foot contact, ball impact, body position, angle, and eye view. The second slide showed shooting techniques using the inside of the foot, the instep, and the tip of the foot. There are 4 shooting techniques. First, it displays the prefix, namely the square off distance, angle, body position, view, and others to make it easier for players to make a prefix in shooting the ball towards the goal. Second, the swing technique where the legs, arm swing, body position, view, and angle make it easier for players to shoot. Third, the pedestal technique, which displays the position of the pedestal, body position, angle at the knee, and eye view when shooting to make it easier for players to shoot. Fourth, displaying impact, namely displaying foot contact, ball contact, body position, angle, and eye view. The third slide showed the mechanics of the muscles that contract in passing and shooting movements and it showed the angles in every movement of the passing and shooting technique starting from the start, swing, support and hitting.

## IV. CONCLUSIONS

Based on the results of the rating scale questionnaire from material experts, media, and futsal practitioners, and based

on the results of small-scale, large-scale, and effectiveness tests, the results obtained that the final expert assessment results obtained with a percentage of 76.43% declared feasible. The small group test result obtained is 71%, the large group result is 72.08% so that it can be declared a feasible product, and the product effectiveness test results are declared effective and efficient to be used as a model of futsal passing and shooting technique skills training based on biomechanics studies.

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