# Effectiveness Of BMP-Based Tools in Improving Beginner's Basic Spin Technique Skills

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**Abstract.** Students play table tennis less actively due to limited equipment. This research aims to test the effectiveness of BMP (Basic Movement Pattern) based tools in improving the basic spin technique skills of beginner students using experimental methods. Sample of 60 students. The research was carried out in May-August 2022 at Medan State University. Data is collected through tests and analyzed using a percentage formula. The research results showed that the experimental group in the initial phase obtained 93.8%, the implementation phase 90.2% and the advanced phase 87.8%. Meanwhile, the control group obtained 85% in the initial stage, 79.2% in the implementation stage and 80.8% in the advanced stage. Based on this data, students who learn table tennis using BMP-based tools have better skills compared to the group of students who learn using conventional tools. So this BMP-based tool can be an inspiration for educators who want to teach table tennis.

**Keywords:** Table Tennis, Tools, Spin.

## 1 Introduction

Table tennis is one of the most popular sports in Indonesia, evidenced by the prevalence of table tennis courts in many households (Siregar et al., 2022). Many workers also spend their free time playing table tennis. In junior high and high school, this sport is a mandatory component of the physical education curriculum. At the college level, especially in Physical Education study programs, table tennis is also a required subject for students (Istianah et al., 2023). Playing table tennis brings joy and satisfaction to players, largely due to the engaging elements of the game. The hand movements involved in hitting the ball in various directions, challenging the opponent to return the shot, and scoring points contribute to the pleasure of the game. The different techniques used to hit the ball, when executed successfully, provide a sense of accomplishment and enjoyment. However, to fully experience these sensations, players need to have a certain level of skill (JIANGZHOU et al., 2020). Novice players with mediocre skills may not experience the same level of joy and satisfaction. Therefore, players should continually hone their skills to fully enjoy the game and utilize all available techniques.

Despite the importance of skill development, beginner players often struggle with mastering the basic techniques of table tennis. In 2023, a survey was conducted on the tools used by educators to teach table tennis and train students' technical skills. The findings revealed that the equipment used by lecturers is still lacking. To master the five basic

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techniques—serving, driving, spinning, and smashing—the tools used are minimal. Observations at three universities (Universitas Negeri Medan, Sekolah Tinggi Olahraga Kesehatan Medan, and Universitas Pembinaan Masyarakat Indonesia) showed that table tennis instruction typically involves just a table, paddle, ball, and net. Lecturers often rely on the floor and walls to improve ball control and adaptation. However, specialized tools to enhance these basic skills are not being utilized (Siregar et al., 2023). This inadequacy underscores the need for developing specialized training tools for table tennis. Learning aids are crucial for educators to effectively present material in the classroom (Susantyo et al., 2023). Every teaching subject should include appropriate tools, as they facilitate learning (Kurniasih, 2021). In table tennis, specific tools can help students master various basic techniques more efficiently. When developing such tools, several factors need to be considered, including the tool's purpose, functional specifications, safety, social and psychological impact, and its efficiency and effectiveness (Muhammad Ramli, 2021).

As table tennis is a compulsory subject for students, it should be taught through an optimized learning process that maximizes all learning components. Students, as future physical education teachers, must gain proficiency in both practical and theoretical aspects of each subject. This ensures they can effectively transfer their knowledge to their future students. Therefore, it is the responsibility of lecturers to ensure their students develop the necessary expertise. Failing to do so can negatively impact the quality of graduates, who may struggle to apply their knowledge effectively in their teaching careers. Table tennis is one of the most popular sports in Indonesia, evident from its widespread development and growing interest. The sport has seen significant growth, as reflected in the establishment of parent organizations in every city and district across Indonesia, and the proliferation of training centers both in and out of schools. The sport's popularity is further demonstrated by the numerous events held at various levels, from village to provincial, and its inclusion in the PON Indonesia activities since 1958. Table tennis attracts a diverse range of enthusiasts in Indonesia, including parents, teenagers, and children. It serves both as a competitive sport and an educational activity, being a mandatory part of the curriculum from elementary school through college (Samsuddin Siregar, 2020).

People learn table tennis for different reasons: those aiming for competitive success follow a structured training program, while those learning for educational purposes adhere to a formal teaching curriculum. For those playing recreationally, self-taught methods and trial and error are common (Siregar & Hasibuan, 2023). Regardless of the approach, proper training equipment is essential to mastering table tennis. Becoming proficient in the sport requires dedicated practice and the use of appropriate training tools. Tools are designed to facilitate goal achievement and are developed based on specific needs and objectives. In learning the basic techniques of table tennis, such as serving, driving, spinning, chopping, and smashing, specialized tools are indispensable to overcome learning challenges. By definition, a tool is an aid that functions to simplify the learning process. The tools developed in this study aim to enhance table tennis skills, particularly in placing/directing the ball and executing spin shots. These aids are crafted from readily available materials, such as flexible wire, thick plywood, and modified balls. The development of these tools is based on an analysis of the motion characteristics of basic table tennis techniques and the needs of the students. The motion characteristics encompass a series of interrelated movements, and performing these movements correctly is essential for skill acquisition.

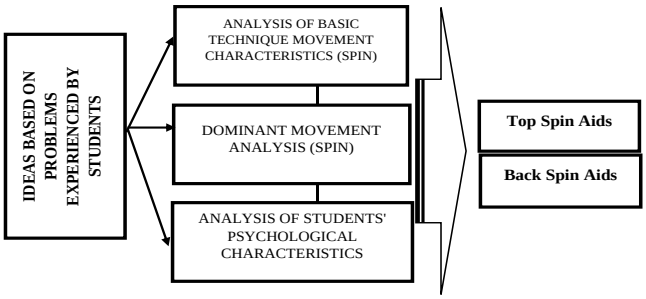


**Fig 1**. Basic Development of Table Tennis Aids

The characteristics of learners, including their movement abilities and psychological aspects, are fundamental in the development of this tool. Generally, students prefer engaging and enjoyable learning experiences, so the design and application of this tool have been carefully crafted to maximize enjoyment. Additionally, the safety of using this tool is a crucial consideration. The materials and designs are safe for learners to use, whether individually or in groups. The developed tool consists of seven components: concept, learning objectives, material to be learned, syntax or steps of use in learning, teacher activities, and student activities.

## 2 Method

An experimental method was employed to evaluate the effect of these tools on spin technique skills and to determine if they are more effective than training without tools. The research was conducted at the Sports Hall of Universitas Negeri Medan, North Sumatra Province, Indonesia, from June to August 2022. The sample included 60 students from the Pendidikan Jasmani Study Program, who were enrolled in a table tennis course. The students were divided into two groups: 30 in the experimental group and 30 in the control group. The research design is illustrated in the following table.

Table 1. Experimental Research Design

| **Pre-test** | **Treatment** | **Post test** |
|---|---|---|
| O1 | X | O2 |
| O3 | X | O4 |

Data sources for this study included pre-test and post-test scores for both groups, obtained through a performance test of basic table tennis spin technique skills. Both groups started with an initial test, followed by group-specific treatments, and concluded with a final test. The test results from both groups were analyzed using a t-test analysis technique, with the Mendeley analytical application.

## 3 Results and Discussion

This research involved an experimental test to gather data and information on the effectiveness of spinning ball aids, long ball bouncing, and short ball bouncing in improving table tennis spin shot skills. As outlined in the introduction, these tools are the product of a developmental

research process that included three stages of testing: expert judgment tests, small-scale field tests, and large-scale field tests. This article presents the results of the effectiveness tests for these learning aids.

As detailed in chapter three, the effectiveness test employed an experimental method with two groups: an experimental group and a control group. Each group consisted of 30 students with similar characteristics, including age and initial skill level (pre-test results). The experimental group learned table tennis spin shot techniques using spinning ball aids, long ball bounces, and short ball bounces. In contrast, the control group used conventional tools, such as walls and floors, for the same techniques. Both groups participated in five sessions of learning activities, each lasting 200 minutes. After completing the sessions, an assessment was conducted using performance tests to evaluate the spin movement's accuracy across three phases: preparation, implementation, and follow-through. The assessment focused on these phases based on an established rubric. Based on the results of the data analysis of the basic technical skills of table tennis spin shots, the data analysis results can be seen in the following table.

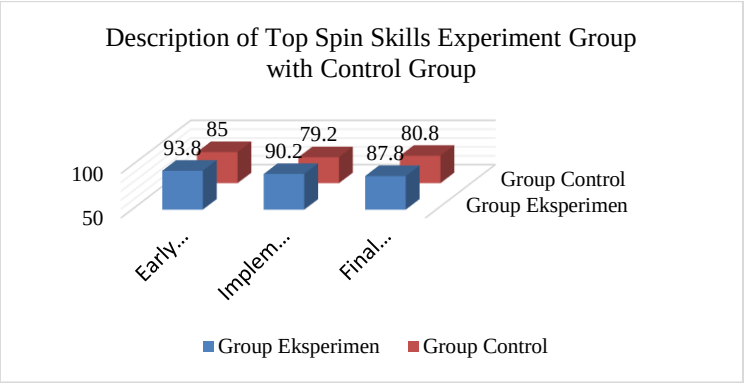


**Fig 2**. Graph of Data Analysis Results of Table Tennis Spin Basic Technique Skills of Experimental Group and Control Group

The results of the data analysis, as shown in the table, indicate the basic table tennis spin technique skills of both groups after the learning treatments. In the skill assessment, the experimental group scored an average of 93.8 in the preparation phase, 90.2 in the implementation phase, and 87.8 in the follow-through phase. Meanwhile, the control group scored 85 in the preparation phase, 79.2 in the implementation phase, and 80.8 in the follow-through phase. These results demonstrate that students who learned the basic techniques of table tennis spin using the specialized aids showed better skill development than those who used conventional tools.

The basic cause of the experimental group is better than the control group, because the learning aids used by the experimental group are functionally, namely the size of the tool, the design of the tool, the size of the frame and the appearance of the tool suitable for learning purposes, and the elements in the tool are adjusted to the characteristics of students. The spinning ball developed in this study is a tool that can help students in practicing wrist flexibility when moving, in the spin shot technique wrist flexibility is needed, because the amount of ball rotation will make a bounce effect that is difficult for the opponent to return. And wrist flexibility is one of the supporting elements to create a fast ball rotation. In addition, the repeated use of spinning balls can also help novice players to train the accuracy of the bet's contact with the ball. Often novice players fail to hit the ball with the right placement on the bed, so they cannot produce a strong spin. Then bounce ball long and bounce ball short are

tools that can help train the automation of hand movements, based on the results of the shot to the bounce, the reflection will make novice players take the right position automatically. And this level of automation is an asset for players to improve their skills to the advanced level.

Ideally, the tool must be in accordance with the characteristics of its users, if this is not fulfilled or is not in accordance with the characteristics of students, it is feared that it will have a negative impact on students (Asep Deni Gustiana, 2005). It is explained that learning tools that are not in accordance with students can cause boredom for students, learning objectives are not achieved, damage the physical aspects of students. Then spinning ball, bounce board ball, and bounce ball short can facilitate educators in carrying out the table tennis learning process. Then this tool is safe to use if it meets the rules of use, and the tool will be dangerous if students do not obey the rules. For effective tool storage both when it will be used and after use, and the tool provides benefits. Furthermore, the spinning ball, bounce board ball, and bounce ball short tools are feasible in terms of content and use of tools that are easy for students to understand so that they do not cause misconceptions. Then according to the purpose of this tool developed in accordance with the physical education curriculum. Tool development basically must have a purpose, and can help facilitate learning for students and also facilitate teaching for educators, provide more real experiences for students, attract the attention of students or in other words learning does not cause boredom, all senses of students can be activated, can evoke the world of theory with reality (Smaldino, Sharon, Lowter, Deborah, Russel, 2011). Another opinion on the function of learning tools as a whole is to facilitate, clarify, and as tools and materials to assist teachers in the teaching and learning process so that students easily understand the content of learning materials and foster a sense of enthusiasm for learning for students (Muhammad Ramli, 2021). Based on the description of the results and discussion of the research above, it can be concluded that spinning ball, bounce board ball, and bounce ball short according to the analysis are effectively used as table tennis learning tools to train basic spin techniques for beginner players.

## 4 Conclusion

Based on the analysis and discussion of the results of this study, it can be concluded that the spinning ball, bouncing board ball short and bouncing board ball long are effectively used as a tool to improve the skill of hitting basic table tennis spin techniques. Based on these results, the researcher suggests that teachers of health sports physical education lecturers can consider the results of this study to determine the tools to teach spin techniques.

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