



## Development of the *Chop Instrument* in Table Tennis

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### Abstract

*The purpose of this research is to make a chop meter for table tennis. This research method is research and development or Research and Development (R&D). The population and sample in this study were 20 PTM Pasir Pengaraian table tennis athletes. The research was carried out on February 13, 2023, by giving a questionnaire to 2 media experts and two material experts. The first test of Chop on March 5, 2023, and the second on March 7, 2023, tests the instrument's reliability. The Criteria Test uses the results of the jury's assessment in the form of an assessment matrix to be carried out on March 6, 2023, to find the validity of the test. This study involved the first and second test samples of 20 Pasir Pengaraian PTM athletes, using data collection methods with questionnaires and tests. The study results were obtained from material experts 87.70% and 94% (very appropriate) and media experts 91% and 89.80% (decent)—validity 0.91 and reliability 0.87, indicating validity and reliability based on the Kirkendall category.*

**Keywords:** *Development, Instruments, Chop technique, Table Tennis*

### INTRODUCTION

Sport is a physical activity that can make a person physically and mentally healthy, ultimately forming a quality human being. Table tennis is a very fast ball game, so to practice and compete in it, we should know what the sport of table tennis has and the factors that determine its success. Sports are one of the movement activities that humans always do, such as walking, running, jumping, and throwing (Almanar et al., 2018). The current development of sports in Indonesia is very rapid. Moreover, the Ministry of Youth and Sports has developed a method to prepare advanced sports in Indonesia, namely, making a grand design for national sports, which has been drawn up directly by the Minister of Youth and Sports. This grand design was created with the short-term goal of preparing Indonesia for the 2032 Olympics.



Indonesia is a candidate to host the Olympics; the Ministry of Youth and Sports conveyed this on March 24, 2021. In addition, sport is a periodic necessity in life. (Khairi, Zainur, Hidayat, & Aulia, 2022) . A person can achieve achievements and improve physical and spiritual fitness with sport. Sports itself consists of various sports, including team and individual sports. One of the sports that are popular with the public is table tennis or "ping pong."

Table tennis is a net sport that is quite popular (Annisa et al., 2022). Table tennis is a sport that has no age limits. Table tennis or "ping pong" is a sports game that uses bats as a tool in which two people play for singles and two pairs for doubles players, both men's, women's, and mixed doubles, which is played on a table as a field which is bordered by a net. (Andriani & Widodo, 2019) . Besides table tennis, it can be played for recreational purposes and achievement (Paksi, 2016).

Table tennis is an achievement sport that is very popular with the public and is often competed in at various events, both at regional, national, and international levels. Table tennis is a sport that increases the level of concentration, reaction speed, and coordination of arm and body muscles. When making a movement or playing table tennis, always coordinate between the arm muscles and the eyes, which need to be seen. The ball came quickly, and we had to return it quickly. Table tennis also provides many other benefits: good physical, mental, and social growth. Complexity in playing requires mental and tactical readiness. A good table tennis player understands and can perform table tennis techniques himself (Suryapranata et al., 2020).

The training process for learning technical skills in table tennis is, of course, through observation and repeated study by using examples of table tennis games that have reached the highest level in matches. (Yulianto, 2015) . A good training program will give us a successful and effective training process (Apriyanto & S, 2022). In table tennis, various aspects and techniques are needed so that a match can be won in order to achieve better performance in the future. Training the basic technique must be mastered because it is a player's first capital/athlete to develop or improve talent in the sport he is engaged in (Julianena & Abdul, 2018). In table tennis, four basic techniques must be mastered by players so that performance can be maximized: *stroke*, *grip*, *stance*, and *footwork*. Among these techniques are *stroke techniques* such as *serve*, *smash*, *drive*, *flick*, *block*, and *chop*. The hitting technique is one of the basic techniques in table tennis,

in addition to other basic techniques that must be mastered by table tennis players ( Budiman, 2017). Table tennis is a game that has many variations of strokes (Ewan Irawan, 2019). One of the dominant techniques used in table tennis is *chopping*.

*Chop* is a technique of hitting the ball with a movement, such as chopping a tree with an ax, also known as a chopping movement (Irawan et al., 2021). *Chop forehand* is a defensive technique or style of play, which is true if the player or athlete likes typical defense, but it is very important to be able to do the chop forehand. (Kurniawan Farid, Safari Indra, 2015) . *Backhand Chop* is a technique that positions the bet open or the front side tilts upwards (Yulianto, 2015).

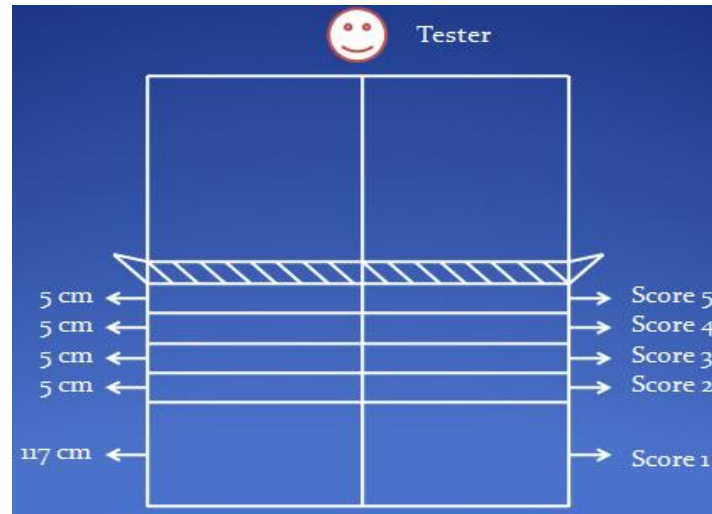
Currently, there are very few measuring instruments for table tennis, and only a few researchers are researching table tennis instruments in particular. As a former table tennis athlete and academic, a researcher was moved to create a measuring tool for table tennis, namely table tennis chop ability. This table tennis chop is a measuring tool to help table tennis people and other researchers conduct better research. When the researcher observed and interviewed the PTM Pasir Pengaraian coach, the problems when the players competed in chopping could have been more efficient and effective. The coach did not have a chop measuring tool that was used to see the extent of each athlete's chopping ability. With the chop measuring tool in table tennis, coaches and players can understand how necessary it is for table tennis athletes. With good chop ability, it will be difficult for opponents to attack and get points in table tennis matches. Therefore, it is necessary to make a chop instrument in table tennis. Apart from that, the formulation of the problem in this research is (1) whether this test instrument is correct (valid), (2) whether this test instrument remains (reliable).

## METHOD

This research uses the Research and Development (R&D) method. Research and development methods are used to produce certain products and test their effectiveness (Purnama, 2016).

There were 20 PTM Pasir Pengaraian athletes, consisting of 20 men, and the sample for this *retest test* was 20 men, which was carried out for the *chopping test*: scratch and *chop test* end. The initial test was carried out on March 5, 20 23, and the last test was carried out on March 7, 20, 23. The technique for determining the trial sample in this

research is to use the saturated sample method.



**Figure 1 . Table Tennis Chop Instrument Design**

#### *Chop Test* (forehand/backhand) Table Tennis

Objective: To measure the *chopping ability* of table tennis players

Equipment: Table tennis table, net, bet, 15 balls, chalk, stationery.

Score Size:

1. For a score of 5, the box size from the edge of the net is 5 cm.
2. For a score of 4, the box size from the edge of the score line 5 is 5 cm
3. For a score of 3, the box size from the edge of line 4 is 5 cm
4. For score 2, the box size from the edge of line 3 is 5 cm
5. For a score of 1, the box size is from the edge of line 2, namely to the back edge of the table tennis court.

Implementation:

1. The testee stands behind the table
2. When the whistle sounds, the feeder gives the ball to the testee.
3. The testee carries out this test with 15 *chop strokes* (15 balls) directed at the number marked with chalk.
4. When we have finished doing 15 *chop strokes*, calculate the score obtained.
5. The test is carried out in just one repetition (15 strokes)
6. When the ball does not go in/out/into the net, it does not get a point/score.

Assessment: Calculate the score obtained by the testee when he has completed 15 *chop strokes*

The data collection method used in this research consisted of questionnaires and measurement tests. Questionnaires were given to experts in the field and media experts to validate whether the table tennis *chop test instrument* was appropriate in terms of content. Meanwhile, the test was carried out to collect data to determine the validity and reliability of the table tennis test instrument. Test reliability can be obtained by correlating the first test's results with the second. Apart from that, determining the instrument's validity can be done by correlating the results of the first test with the results of the criterion test. The criteria test referred to here is a test that evaluates the jury's field assessment using a matrix.

The data analysis technique in this research uses the *product moment correlation formula* (Effendi et al., 2018).

$$r_{xy} = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{\{n \sum x^2 - (\sum x)^2\}\{n \sum y^2 - (\sum y)^2\}}}$$

Formula  $\frac{SH}{SK}$

Information:

SH: Score Count

SK: Criterion Score

## RESULTS

### 1. Expert Validation

The validation results from the first material expert show that the chop instrument in table tennis obtained a score of 87.70% of the maximum score, so it can be concluded that the instrument is feasible. "Meanwhile, the validation results from the second material expert show that the chop instrument in table tennis obtained a score of 94% of the maximum score, so it can be concluded that the instrument is very feasible."

In the first specialist media approval stage, the percentage obtained is 91% of the highest score. It can be said that according to this media expert, table tennis boxing equipment, in terms of content approval, gets the "Strongly Approved" category. At the time of approval of the first specialist media, the percentage obtained was 89.80%, the highest score. It can be said that according to this media expert, table tennis equipment, in terms of content support, reaches the "Good" category.

## 2. Chop Instrument Validity and Reliability

This test was carried out in this study by collecting the first test and the criterion test. According to the received data, the support of the received device is 0.91. Therefore, the rotation of table tennis equipment is declared effective based on the number of Kirkendall moments, which shows 0.91, which is "very high." The reliability of the test was tested in this study by comparing the results of the first test with the results of the second test. Based on the results of the data above, the reliability of this test is 0.87. Therefore, table tennis test kits can be trusted based on Kirkendall's number of 0.87, which means "High" Chop Test Norms in Table Tennis.

**Table 1 . Table Tennis Chop Test Norms**

Mark	Category
≥ 36	Very good
31 - 35	Good
26 - 30	Currently
21 - 25	Not enough
≤ 20	Very less

## DISCUSSION

In the beginning, the development of the chop instrument in table tennis was designed and produced to measure the chop ability of table tennis athletes. The development process through research and development procedures. Through specific planning, production, and evaluation. This instrument was compiled by various parties who supported the development of this chop instrument in table tennis. This early instrument received many suggestions from coaches, material, and media experts. After experts have validated this instrument, retests are carried out to determine the reliability and validity of this test, especially by correlating the results of the first test with the results of the criterion test.

A collaborative process between property experts and media experts generates data that can be used as content for tennis applications, even though empirical validity is the ability obtained from the first reduction and criterion tests. The characteristics of "Development of Chop Instruments in Table Tennis Sports" in terms of content verification are included in the "Very Eligible" section. Trainers and athletes feel happy and excited by

table tennis's chop tool, which can be widely used as a measuring tool for assessing chop strokes in table tennis. There are advantages to this product, including the need for equipment that is easily accessible, and weaknesses of this product include the wide area of use of this equipment, not using technology (sensors), and marking. With these weaknesses, we aim to attract attention and continue development efforts to achieve better product results.

The type of shot is the action adopted by a player when hitting the ball, which is divided into six types, namely, *topspin*, *flip*, *chop*, *chopping short*, *block*, etc. (Zhang et al., 2010; Malagoli Lanzoni et al., 2013, 2014; Wang J., 2019) in (Wang et al., 2022). *The chop* is a control shot with a downward spin, resulting in a long put. A short *chop* is like a chop with a downward spin, but the placement is short (Wang, 2019).

Analysis of stroke types (or defense) is more difficult for players with stroke types (also called defense) to achieve better results in table tennis than players. Some players who play chop stand out in their usual activities. Among the world's players in the *chopping* style are Joo Se-Hyuk from South Korea, Ma Te and Wang Yang from China. Relevant research shows that players chop *players* have two main features, one of which is that attacking has become an important technique for *chop* players to win points (Zhang et al., 2018). So-called *chop-blockers* standing slightly closer to the table and not using long-range backhand strokes are categorized as defensive in this study (Gunter Straub, 2014).

## CONCLUSION

The research "Development of Chop Instruments in Table Tennis" results are classified as effective and reliable as a measuring instrument for chop tests in table tennis. It can be noticed from the learning results with the test of 0.91 and test reliability of 0.87, as well as the chop and table tennis tools being effective and reliable based on the Kirkendall number. Although in terms of content validity, the first subject obtained a score of 87.70 and the second subject 94%, this shows that as a subject, this test instrument is " Very Eligible. "Among media experts, the first 91% and experts the second media 89.90%; this shows that in terms of content, according to media experts, the test tool is " Very L worth it."



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