

# The Influence of Functional Training on Table Tennis Technique

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**Abstract:** This paper mainly discusses the impact of functional training on basic table tennis techniques. This paper takes 60 table tennis major students and 30 table tennis teachers in Suzhou University of Anhui Province as investigation objects. The influence of functional training on blocking, attacking, rubbing and pulling in table tennis is analyzed. The results showed that students and teachers believed that the influence indicators of functional training on attacking are 3.41 and 3.26, which belonged to the moderate influence. The influence indicators on the blocking are 3.43 and 2.94, which belong to the moderate influence. The influence indicators on the rubbing are 2.93 and 2.71, which belong to the moderate influence. The influence indexes of pulling are 3.47 and 3.29, which belong to moderate influence.

**Keyword:** Functional Training, Table Tennis, Technique

## 1. Introduction

Table tennis is a popular sport in China. It is also one of the compulsory courses for college education majors. It is an important subject for college physical education majors to train them to be competent in teaching physical education. In table tennis technology, it is particularly important to master the comprehensive use of basic skills such as blocking, attacking, rubbing and pulling. It plays a key role in actual combat and competition, and is also an important content that coaches strictly require daily training. In daily training and competition, the various technical movement requires good quality as support, especially the coordination, maintain physical stability and sensitivity is particularly important.

## 2. Background of The Study

With the students that we have nowadays their physical quality is weak, as to techniques, the foundation that they learned in their basic training is not solid added to these challenges is their lack of motivation. As such these problems have seriously affected their learning and mastering table tennis technology<sup>[1]</sup>.

With the continuous development of competitive sports, some new scientific training methods and theories have been tested in practice and achieved good results. In 2011, General Administration of of China and American sports organizations carried out all-round cooperation in preparation for the London Olympic Games. Thus functional training theory was officially introduced into China and successively applied in badminton team, swimming team, table tennis team and many other teams. Functional training originally originated in the United States, and was first proposed and applied by two experts, Gray Cook and Lee Burton. At first, functional training was applied in the of injured athletes to improve the speed of sports rehabilitation and return to the sports field<sup>[2]</sup>. After continuous integration and development, this method of helping recovery has been gradually applied to the routine physical training, and has been recognized by the majority of coaches and training is a complex system integrating multiple fields. It mainly combines the human movement on the basis of the characteristics of sports items to design various movements, and integrates multiple joint muscles to form a multi-joint, multi-dimensional and all-round body exercise mode. Compared traditional physical training, functional training is not just focused on a single muscle strength quality and line<sup>[3]</sup>. Functional training pay attention to the human body movement and the unbalanced for the control ability and the ability of rapid transformation of the body, the technical movement, to enhance the nerve to muscle, bones, the training process of complex control system. In addition, in the

process of functional training, there is a system for human symmetry, coordination, stability and flexibility, which is called Functional Movement Screening (FMS)<sup>[4]</sup>. After long-term development, functional motion screening has been recognized and widely used in practice, especially in the detection of physical defects.

Based on the characteristics of table tennis, this study will discuss the influence of functional training on the basic skills of table tennis, such as blocking, attacking, rubbing and pulling<sup>[5]</sup>, of college students and amateur table tennis enthusiasts.

### 3. Research Object

As shown in Table 1, the purpose sampling method will be adopted in this study, and 60 students and 30 teachers will be selected as survey subjects. Among them, 60 students are all the students of table tennis major of Suzhou University of Anhui Province. The 30 teachers include all the table tennis teachers of Suzhou University (9) and all the table tennis teachers of Suzhou Table Tennis Association (21).

*Table 1: List of Respondents.*

Crowd	Number	Male	Woman	Remark
Student	60	48	12	
Teacher	30	26	4	

### 4. Research Design

The study will employ comparative descriptive research design to find out the influence of functional training of table tennis on the skills and knowledge of the students. The assessment of the two groups i.e., teachers and students will be compared and analyzed for similarities and differences.

### 5. Research Methods

#### 5.1 Questionnaire

The questionnaire of "The influence of functional training on table tennis technique" was developed and distributed to the survey subjects through "Questionnaire Star" software. The survey subjects filled in the questionnaire online, and the researchers completed the data collection and inspection online. Data were input into SPSS for statistical analysis.

#### 5.2 Mathematical Statistics

The following statistical treatments will be used in the study at the 0.05 level of significance in analyzing the data to be gathered using the Statistical Package for Social Sciences or SPSS software.

##### 5.2.1 Frequency Count and Percentage

The researcher will use this in his analysis of the athlete respondents' profiles.

##### 5.2.2 Weighted Mean

This is employed to find the level of influence of functional training on the table techniques of table tennis.

##### 5.2.3 Independent Sample T-test

The independent sample t-test will be utilized to test the difference on the assessment of the two respondents on the level of influence of functional training on the table techniques of table tennis.

## 6. Results and Discussion

### 6.1 Level of Influence of Functional Training on Table Tennis Technique

#### 6.1.1 Attacking

Table 2: Statistical table of the influence of attacking.

Respondent	Mean	SD	Interpretation
Students	3.41	0.36	Moderately Influential
Teachers	3.26	0.48	Moderately Influential

Legend: Very Influential 3.51- 4.0

Moderately Influential 2.51- 3.50

Influential 1.51- 2.50

Not Influential 1.0- 1.50

As shown in Table 2, based from the survey results the teacher and student respondents assessed functional training to have a moderate influence on the basic skill table tennis technique attacking, this inference was based from the overall mean rating of 3.41 and 3.26 obtained from students and teachers assessment. Lending credence to this finding is the fact that to them functional training only have a moderate influence in improving arm strength, increasing swing speed when hitting the ball, increasing the battling power while attacking and the number of successful shots.

It can also be noted that “Improving torso stability when attacking the ball” is the only aspect where functional training is very influential for both teachers and student respondents and this is substantiated by the highest mean rating of 3.62 and 3.73 which is obtained from the student and teachers assessment.

Incongruity is also seen from the assessment of the respondents on attacking strategy. On the part of the students, the influence of functional training in improving the stability of the arm movement when attacking the ball and improving the arm strength has a moderate contribution. The teachers on the other hand finds that functional training is very influential, this deduction was based from the obtained mean rating of 3.4 and 3.3 (students) and 3.73 and 3.70 (teachers).

#### 6.1.2 Blocking

Table 3: Statistical table of the influence of blocking.

Respondents	Mean	SD	Interpretation
Students	3.43	0.40	Moderately Influential
Teachers	2.94	0.52	Moderately Influential

Legend: Very Influential 3.51- 4.0

Moderately Influential 2.51- 3.50

Influential 1.51- 2.50

Not Influential 1.0- 1.50

As shown in Table 3, survey revealed that functional training in blocking technique in table tennis is moderately influential. This finding was based from the overall mean ratings of 3.43 and 2.94 obtained from the assessments of students and teachers respectively.

Further supporting the above finding was the assessment of moderately influential from both students and teachers respondents on the following table tennis techniques: increasing arm reach speed, improving the speed of stepping and sliding, number of successful blocking, improving control of the landing spot of the blocking.

Discordance however can be seen from the assessment on the following table tennis techniques: The fixation of the wrist joint is enhanced when pushing and blocking the ball (SW=3.52, TW=3.33). The power of the blocking has been increased (SW=3.42, TW=3.63) these were assessed as moderately influential and very influential by students and teachers respectively.

#### 6.1.3 Rubbing

As shown in Table 4, shown in the table are the results of the respondents assessment on the

influence of functional training in the basic skills of table tennis technique in terms of rubbing.

*Table 4: Statistical table of the influence of rubbing.*

Respondents	Mean	SD	Interpretation
Students	2.93	0.46	Moderately Influential
Teachers	2.71	0.47	Moderately Influential

Legend: Very Influential 3.51- 4.0

Moderately Influential 2.51- 3.50

Influential 1.51- 2.50

Not Influential 1.0- 1.50

Survey revealed that students and teacher respondents assessed the influence of functional training on rubbing skills of table tennis to be moderately influential. This conclusion was based from the overall mean rating of 2.93 from the students and a 2.71.

Mean rating from the teachers serving to validate this finding are the assessment of “Moderately influential” recorded by the respondents on each of the following table tennis skills strategies: “Improved finger control while rubbing”. The number of successful ball has increased, and improved drop control of the ball. Nevertheless there is non- concordance in the assessment in the influence of functional training on “Improving the wrist power when rubbing”. For students they found this to be influential while the teachers only assessed this skill to be moderately influential and this is confirmed by the highest mean rating of 3.55 and 3.47 respectively. In addition there is also an incongruence in the assessment of influence of functional training on “Improving the degree of rotation of the ball”, this obtained the lowest mean rating of 2.07 from the teachers and this is interpreted as less influential. The students on the other hand concurred that functional training on the aforementioned table tennis skill is moderately influential and this assumption was based from the obtained mean rating of 2.85. The foregoing implies that the degree of influence of functional training of the basic skill on rubbing may depend upon the frequency and time of training and agility of table tennis players.

#### **6.1.4 Pulling**

*Table 5: Statistical table of the influence of pulling.*

Respondents	Mean	SD	Interpretation
Students	3.47	0.43	Moderately Influential
Teachers	3.29	0.46	Moderately Influential

Legend: Very Influential 3.51- 4.0

Moderately Influential 2.51- 3.50

Influential 1.51- 2.50

Not Influential 1.0- 1.50

As shown in Table 5, the assessment of the student and teacher respondents on the influence of functional training on pulling as a basic skill of table tennis manifested to be moderately influential. and this is validated by the overall mean rating of 3.47 and 3.29 obtained from the assessments of the students and teachers respectively.

Serving to validate this finding was the response of moderately influential on the following table tennis skills strategies: improving the leg strength, the hitting power on the pull ball and body recovery speed after the pull.

On the other hand the respondents assessed the influence of functional training on following tennis skills strategy to be very influential “Improving body balance when pulling the ball”, this obtained the highest mean rating of 3.77 and 3.67 from teachers and students. In like manner, functional training was also assessed to be very influential for the table tennis strategy skill “Improving waist twist while pulling” supporting this finding is the two legged squat, this is a great functional fitness exercise for building up and coordinating the leg muscles, especially the quadriceps, hamstrings, and calves—the muscles that control the knees and hips.

## 6.2 Difference in the Assessment of the Teacher and Student Respondents on the Level of Influence of Functional Training on Table Tennis Technique

Table 6: Statistical table of teacher and student evaluation differences.

Table Tennis Technique	Respondents	Mean	t	df	sig	Interpretation	Decision
Attacking	Students	3.41	1.54	46.1	0.30	Not Significant	Accept Null
	Teachers	3.26					
Blocking	Students	3.43	4.43	46.6	0.00	Significant	Reject Null
	Teachers	2.94					
Rubbing	Students	2.93	2.09	88	0.04	Significant	Reject Null
	Teachers	2.71					
Pulling	Students	3.47	1.85	88	0.07	Not Significant	Accept Null
	Teachers	3.29					
Overall Difference	Students	3.31	2.71	45.3	0.01	Significant	Reject Null
	Teachers	3.05					

As shown in Table 6, from the results a significant difference was noted on the students and teachers assessment on the influence of training on the table techniques of tennis in terms of blocking and rubbing. This finding was inferred from the obtained sig value equal to 0.0 for blocking while rubbing generated a sig-value of 0.04.

In addition, looking back at the previous. Results in their techniques the difference probably lies in the special training and likewise the strength of the training. This finding is supported by the study of WangWenyuan and WeiZihan (2014) believe that strength training can effectively improve the special strength of college table tennis players, and the promotion of special strength can effectively promote the consistency of the completion of work and the rationality of body strength<sup>[6]</sup>. Moreover, DingTaixia (2015) believes that special physical training can improve the flexibility of joints, including wrist joints, and points out that the degree of external rotation of the wrist in the topspin technique of table tennis push and block directly affects the successful probability of returning the ball<sup>[7]</sup>.

On the contrary a no significant difference was found as regards to the assessment made by respondents on the t test of difference on influence of functional training on the table technique of tennis in terms of attacking and pulling. Serving to confirm this finding was the obtained sig value of 0.30 and 0.07 respectively. As a result the hypothesis of no significant difference was accepted.

On the overall a no significant difference was seen from the assessment of teachers and students on the influence of functional training on the basic skills training of table tennis.

## 7. Conclusion

### 7.1 Level of Influence of Functional Training on the Basic Skills of Table Tennis Technique

#### 7.1.1 Attacking

Based from the survey results the teacher and student respondent assessed functional training to have a moderate influence on the basic skill table tennis technique attacking, this inference was based from the over all mean rating of 3.41 and 3.26 obtained from students and teachers assessment.

#### 7.1.2 Blocking

Survey revealed that functional training in blocking technique in table tennis is moderately influential. This finding was based from the overall mean ratings of 3.43 and 2.94 obtained from the assessments of students and teachers respectively.

#### 7.1.3 Rubbing

Results revealed that students and teacher respondents assessed the influence of functional training on rubbing skills of table tennis to be moderately influential. This conclusion was based from the overall mean rating of 2.93 from the students and a 2.71 mean rating from the teachers.

#### 7.1.4 Pulling

The assessment of the student and teacher respondents on the influence of functional training on pulling as a basic skill of table tennis manifested to be moderately influential, and this is validated by

the overall mean rating of 3.47 and 3.29 obtained from the assessments of the students and teachers respectively.

### ***7.2 Difference in the Assessment of The Teacher and Student Respondents on The Influence of Functional Training on The Basic Skills of Table Tennis Techniques***

A significant difference was noted on the students and teachers assessment on the influence of training on the table tennis techniques in terms of blocking and rubbing. This finding was inferred from the obtained sig value equal to 0.0 for blocking while rubbing generated a sig value of 0.04.

## **8. Recommendations**

(1) Define first your functional fitness goals. Ensure that functional training involves exercises that train endurance, strength power, flexibility, coordination and balance.

(2) Ensure that the functional exercises for table tennis players should involve movements on several planes i.e. eccentric, isometric, and concentric muscle contractions.

(3) Have a professional that will guide you that the functional training is safe.

(4) Match the warm up with your table tennis workout. This will make your muscles in the brain activate and also will cement proper joint alignment<sup>[8]</sup>.

(5) Students must take a comprehensive physical test before starting functional training to assess their basic physical condition.

(6) Develop different functional training contents and objectives for students with different levels.

## **9. Conclusion**

(1) Functional Training may have a moderate influence on the different table tennis technique such as attacking, blocking, rubbing and pulling but the goal of this training is to improve the overall function of the body, boosting muscle strength and endurance and developing muscle and body stability which will be of help to table tennis activities.

(2) In the process of functional training it is necessary to put importance to the significance of movement quality, help establish correct training mode strengthen the effect of exercise through various instruments.

(3) Functional training will be carried out in different ways, so as to make the ability of athletes be improved in a broad spectrum.

(4) Training duration, intensity and frequency are critical variables that need to be taken into account when developing a successful functional training intervention for table tennis players.

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