Effect of Using Closed Loop Theory on Performance Level of Some Basic Skills of Table Tennis Juniors

M.T. Abu Maaty and J.N. Adib

Games Department, Faculty of Physical Education, Menoufia University, Egypt

Abstract: This study aims to design a training program of table tennis juniors under 15 years by using closed loop, open loop and merging between them to know its effect on the performance level of some basic skills studied in the research and to know the differences between the effects of using the three systems on the performance level of some basic skills studied in the research, besides to designing two equipments of training on the studied skills according to the closed and open loops. The two researchers used the experimental method, they also chose the research sample deliberately of table tennis juniors under 15 years from the Egyptian Hunting Club of sport season 2010/2011, their number is 15 female players, they were divided into 3 experimental groups each one of 5 female players. The first group works by using closed loop, the second uses open loop and the third by using both closed and open loop. The most important results pointed out that using closed and open loops and merging both of them had a positive effect on the performance level. Also using the closed loop had the most positive effect in improving the performance level of both skills of the forehand and backhand service with the side spin. While using open loop was more effective in improving the performance level of The Forehand Straight Loop, also merging between both closed and open loop was more effective in improving the performance level of the backhand straight loop skill.

Key words: Technical %Closed Loop %Table Tennis

INTRODUCTION

Skill preparation is considered one of the necessary needs that must exist in players of high efficient level; it is worthy to mention that the success to achieve matches aim depends always on the perfection of many skills which is considered the means of executing defensive and offensive plans. Hereafter, the most important thing the coach (the trainer) aims to achieve is to train the player to make him able to perform good and accurate skills in the match under competition pressure according to match conditions and the variable forms of these conditions during the match [1].

After the two researchers read specialized scientific references in Table Tennis field and after they surveyed previous studies and researches, they noticed-according to their knowledge-that no researcher talked about using closed loop theory in improving the basic skills performance level of table tennis juniors under 15 years in the Egyptian environment, which motivated them to make this research in order to know the effect of using closed loop when performing in stable environment and using open loop when performing in changing environment and merging between both of them on the performance level of some basic skills of table tennis juniors under 15 years and also comparing between them to which one of them is more efficient in improving skills performance level studied in the research.

The Research Objectives: This research aims to:

C Design a training program of table tennis juniors under 15 years by using closed and open loop and merging between them and to know its effect on:

C The performance level of some skills studied in this research by using closed loop.
C The performance level of some skills studied in this research by using open loop.
C The performance level of some skills studied in this research by merging closed and open loop.
C The differences between the effects of using the 3 systems on the performance level studied in the research.
C Design 2 equipments of skill training studied in the research according to open and closed loop.

MATERIALS AND METHODS

The Research Methodology: An experimental method was used by designing three experimental groups by using an after and before measurement of each group and two following measurements.

The Research Sample: The research sample was chosen deliberately of table tennis juniors under 15 years in Hunting Club sport season 2010/2011, their number is 15 female players and they were divided into three experimental groups each one of 5 players, where the first group works by using closed loop, the second used open loop and the third used both closed and open loop.

Methods and Tools of Data Collecting

References and Studies Associated to the Research: References and studies associated to the topic of this research were viewed in order to make use of them in supporting current research results.

Personal Interviews: Personal interviews were made with a group of five experiments; three of them are experiments in table tennis field and two experiments in the field of tests and measurements.

The Suggested Training Program:

Table 1: The Training Program of the three research groups

<table>
<thead>
<tr>
<th>Basic skills of the research</th>
<th>Number of weeks</th>
<th>Number of training units per week</th>
<th>Total number of training units during application period</th>
<th>Number of sets in the training unit</th>
<th>Number of repeats in 1 set</th>
<th>Number of repeats in the training unit</th>
<th>Total number of repeats during the application period</th>
<th>The break period between sets in the training unit</th>
<th>The total number of breaks between sets in the training unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Forehand Service with the side spin</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>5</td>
<td>12</td>
<td>60</td>
<td>240</td>
<td>720</td>
<td>(30) sec.</td>
</tr>
<tr>
<td>The Backhand Service with the side spin</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>5</td>
<td>12</td>
<td>60</td>
<td>240</td>
<td>720</td>
<td>(30) sec.</td>
</tr>
<tr>
<td>The Forehand Straight Loop</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>10</td>
<td>60</td>
<td>240</td>
<td>720</td>
<td>(2) min.</td>
</tr>
<tr>
<td>The Backhand Straight Loop</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>10</td>
<td>60</td>
<td>240</td>
<td>720</td>
<td>(2) min.</td>
</tr>
</tbody>
</table>

Table 2: Time distribution of the suggested training program by using closed and open loop and merging between them

<table>
<thead>
<tr>
<th>No.</th>
<th>Explanation</th>
<th>Time Distribution of Training Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Weeks number</td>
<td>12 weeks</td>
</tr>
<tr>
<td>2</td>
<td>Number of Training Units per Week</td>
<td>48 Training Units</td>
</tr>
<tr>
<td>3</td>
<td>Total Number of Training Units in Training Program</td>
<td>85 min. concerning both skills of Forehand and Backhand Service. 65 min. concerning Forehand and Backhand Straight Loop. 340 min. (85 min. x 4 training units) concerning both skills of Forehand and Backhand Service. 260 min. (65 min. x 4 training units) concerning both skills of forehand and backhand straight loop.</td>
</tr>
<tr>
<td>4</td>
<td>Time of using closed and open loop and merging between them in one training unit</td>
<td>2040 min. (340 min. x 6 weeks) concerning both skills of forehand and backhand service. 1560 min. (260 min. x 6 weeks) concerning both skills of forehand and backhand straight loop.</td>
</tr>
</tbody>
</table>
RESULTS AND DISCUSSION

Table 3 points out that there are statistic differences between after measurements of the 3 research groups of basic skills studied in the research.

Table 3 shows the supremacy of the closed loop group performance level over the performance level of open loop group and merge group in both forehand and backhand service with the side spin, the two researchers point out that the reason due to the work nature inside the closed loop group where the female player (12) repeats the skill of forehand and backhand service of each area of the 5 table areas successively and in an organized way, the total repeats (60) in one training unit; meaning that she continually repeats the skill performance of a stable place on the table, moreover, she has previous knowledge of the ball direction which makes her take her decision before the performance, which means that the environment where the players of this group perform is stable with no changes or outside effects that hinder the performance during practice. This suits the nature of Service Skill Performance as a closed movement skill performed in a stable environment which means that the conditions never change during skill performance which result in no change of performance each time the skill is repeated, it also matches the service performance way in Table Tennis sport as the rival player (the receiver) is stable in her place and does not move during service performance while the sender player is the one who decide when the service begins and to where it is directed in the competitor playground. Also the ball is stable on her hand and she is the one who raise it choosing how powerful she wants to perform the service, by that she is the only controller of service performance without any intervention from the rival player which positively affected the improving of their performance of both skills of forehand and backhand service with the side spin to the best level possible.

This agrees with what Gentile[2] referred to in 1972 that "the training on the closed skills requires that the player repeats its performance in a closed way as the surrounding environment where it is performed is stable. This result also agrees with the results of Abdel Maged [3] which pointed out that training by using the closed loop way was more effective than training by using open loop way on shooting accuracy when stable in basketball.

Table 3 also shows the supremacy of open loop skill performance group over both closed loop group and merge group in The forehand straight loop, the two researchers indicate that this is due to work nature inside open loop group where the player (20) repeats the forehand straight loop to each of the 3 table areas randomly and in a disorganized way of total (60) repeats in one training unit. This means that the environment where the players of this group perform is changing as it is not known to the player, this suits the performance of the forehand straight loop as an open skill performed in a changing environment which means that the conditions changes during the skill performance which requires that the player does some adjustments in performance in each time the skill is repeated to match the situation requirements. It also suits her performance way in table tennis matches as the player does not previously know where the ball will fall on her half of the table in order to perform this skill as the rival player is the one who controls ball direction and the place where the player will direct the ball is changing as she must direct the ball to a far place away from the rival reach. This is due to her movement and changing places continually during playing, also the timing of hitting the ball is variant in this skill, this is due to the changing in ball speed and how powerful its spin from the rival player. It also matches with the performance method in the evaluating test, consequently, when performing the test the progress of open loop group is bigger than this of closed loop group and merge group in performing that skill.
This agrees with what Gentile [2] referred to, that the training operation on open skills requires the training from the beginning in changing environment considering the place. This result also agrees with the results of Abdel Magid [3] which indicates that training by open loop method had a better effect than that of closed loop concerning shooting accuracy when jumping in basketball.

Table 3 also shows the supremacy of merge group performance level over both closed and open loop groups in the backhand straight loop, the two researchers return this to merge group performance nature as it performed two training units by using closed loop system followed by two training units by using open loop system during the execution of the experiment. From their point of view the performance of the backhand straight loop skill-as difficult skill in performance to the research sample as it is performed by using the back of the racket-in a closed environment, then open the practice environment to reach that which resembles competition conditions or playing situations which means the merge between open and closed environment in training which helped this group players to make use of all the immediate and postponed feedback by knowing the performance and the result which had a great effect in correcting their faults of performance then reaching the right much accurate performance beside the ability to perform it under changing environmental conditions. This suits performance nature in table tennis sport which is performed in an open and variable environment concerning the place where the ball falls, its speed, the kind of its spin and how powerful it is and the rival place on the table. It also suits performance nature in evaluation test; hence when performing the test, the merge group performance level of the backhand straight loop skill was better than the performance of both open and closed loop groups.

This agrees with what Rink [4] referred to, that open skills must be learnt under the simplest conditions first; which means to close the environment where the skill is performed at first, also these skills must not be performed in a closed environment for a long time. This also agrees with what Adams [5] referred in his theory that learning the movements that are performed in an open environment requires to closing it at first in order to form a powerful comprehended effect to each of them.

This result also agrees with the results of Abdel Moneim [6] which resulted in a statistic progress of the merge group over the both open and closed group in accurate performance of defensive skills in duel sport.

**CONCLUSION**

C Using open loop, closed loop and merging between both of them positively affects level improvement.
C Using closed loop was more effective on improving the performance level of both the forehand and backhand service with the side spin skill.
C Using open loop was more effective on performance improvement of forehand straight loop skill.
C Using the merge between closed and open loop was more effective on performance improvement of backhand straight loop skill.

**Recommendation:**

C To use closed loop when training on closed skills of front and back faces of the racket in table tennis sport.
C To use open loop when training on easy performed open skills by using front and back faces of the racket in table tennis sport.
C To use the merge between open and closed loop when training on difficult open skills by using front and back faces of the racket in table tennis sport.
C To use the two equipments suggested in the research in training on table tennis sport skills in accordance with the skills nature as an open and closed skills.

**REFERENCES**