The effect of using the Wheatley model for constructive learning on cognitive achievement and the performance level of some skills of playing with the opposite side of racket in Field Hockey

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Introduction and research problem:

that the modern view of science includes complementarity between the cognitive and behavioral aspects. So attention must be paid to these aspects. It is necessary to care for building the personality of the learner in terms of cognitive, emotional and skillful sides. Thus the learner gains experience to modify his behavior. (7: 11)

and that the usual method doesn't give room for exploration and innovation on the part of the learner. Furthermore, active participation in education leads to a better retention of information and a good understanding. (1:28)

The Wheatley model is an educational tool that builds knowledge and manages practical learning issues. It emphasizes the interaction between concepts and knowledge of skill and between actions and procedural steps.

And that the basic skills in hockey as the attacker when shooting one of the skills of playing the reverse face of the striker on the goal does not expect the defender that, and they are surprising to the defenders and the goalkeeper. (4:182)

The problem of this research is that the researcher has noticed that the college students 'performance has a lot of mistakes, despite the availability of material and human capabilities to some extent. Accordingly, the role of the teacher is to present a problem that attracts the learners. Then he allows them to work until they solve the problem. Based on the foregoing, the researcher realizes the importance of using the Wheatley model for achieving the goals of the educational process in Field hockey. He combined the theoretical content and practical application. Also he considers the capabilities and

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tendencies of learners and their active participation in education.

Research Aim:

The research aims to identify the effect of using the Wheatley model for constructive learning on cognitive achievement and the performance level of some skills of playing with the opposite side of racket in Field hockey.

Research Hypotheses:

1- There are statistically significant differences between the average grades of the pre and post measurements of the experimental group in the performance level of some skills of playing with the opposite side of racket in the research sample in favor of post measurement.

2- There are statistically significant differences between the average grades of the pre and post measurements of the experimental group in the cognitive achievement of the research sample in favor of post measurement.

Research procedures:

Research Methodology:

The researcher used the experimental methodology with the experimental design for every group in the pre and post measurements, due to their suitability for the nature of the research.

Research Community and Sample:

The research community included the second year students at the Faculty of Physical Education - Asyut University for the academic year (2018/2019). The researcher selected the research sample in a random manner. The total amount of the sample reached (60) students, including (40) students for the basic sample, (20) students for the exploratory study.

Data Collection Methods:

First: The Tools and Equipment:

Resta Meter, Medical Scale, Stop Watch, Measuring Tape, Drawer Box, and Hockey Rackets and Balls.

Second: The Used Tests:

- Measuring growth rates (age, height, weight), Advanced IQ Tests, Physical ability tests, Skills tests, Cognitive Achievement Test.

Third: Forms:

- Data registration forms, Cognitive test axes form, Cognitive test vocabulary form

Statistical characterization of the Research Sample:

The researcher found similarities in the light of the following variables: growth rates (age - height - weight), advanced intelligence, physical abilities, skill tests and cognitive achievement test . Table (1) clarifies that.

Table (1)

Arithmetic mean, median, standard deviation, skewness coefficient for growth rates, advanced intelligence test, physical tests, and skill tests for the sample (n = 40)

M	Research Variables		Unit of Measurement	Arithmetic Mean	Median	Standard Deviation	Skewness Coefficient
1	Age		Year / month	٢٠.٠٥	٢٠.٠٠	٠.٥٠	٠.١١
2	Height		Centimeters	١٧٣.١٨	١٧٤.٠٠	١.٨٩	٠.٥٣-
3	Weight		Kg	٦٨.٥٨	٦٩.٥٠	٢.٠٠	٠.٨٠-
4	Advanced Intelligence		Degree	٤١.٨٢	٤٢.٠٠	١.١٧	٠.١٤-
	Physical Tests	Fist strength (right)	Kg	٣٤.٨٥	٣٥.٠٠	٠.٨٣	٠.٨٢-
5		Fist strength (left)	Kg	٢٩.٩٠	٣٠.٠٠	٠.٨٧	٠.٩٤
6		Standing Broad Jump	Meter	١.٨٨	١.٨٩	٠.١٠	٠.٣٦-
7		Running 30 m from High Start	Second	٤.٩٤	٥.٠٤	٠.٣٠	٠.٦٧-
8		Pro Agility Test with Hockey Stick	Second	٩.٩٥	٩.٧٩	٠.٧١	٠.٤٧
9		Standing Forward Bend	CM	٥.٠٣	٥.٠٠	٠.٨٧	٠.٢٨
10	Skill Tests	Test to measure the Strength of pushing the ball	Meter	٣.٥١	٣.٥٠	٠.٣١	٠.٢٧-
11		Test to measure the speed of pushing the ball	Second	١٨.٤٥	١٨.٠٠	٠.٥٠	٠.٢١
12		Test to measure the precision of pushing the ball	Number	١.٣٥	١.٠٠	٠.٤٨	٠.٦٥
13		Test to measure the Strength of hitting the ball	Meter	١٤.٤٦	١٤.٥٠	٠.٢٨	٠.٣٠-
14		Test to measure the speed of hitting the ball	Number	٢.٣٨	٢.٠٠	٠.٤٩	٠.٥٤
15		Test to measure the precision of hitting the ball	Number	١.٣٥	١.٠٠	٠.٤٨	٠.٦٥

Follow Table (1)

Arithmetic mean, median, standard deviation, skewness coefficient for growth rates, advanced intelligence test, physical tests, and skill tests for the sample (n = 40)

M	Research Variables		Unit of Measurement	Arithmetic Mean	Median	Standard Deviation	Skewness Coefficient
16		Test for receiving the ball below with the opposite side of racket from pushing the ball.	Number	٢.٤٥	٢.٠٠	٠.٥٠	٠.٢١
17		Test for receiving the ball below with the opposite side of racket from hitting the ball.	Number	٢.٣٠	٢.٠٠	٠.٤٦	٠.٩١
18	Cognitive test		Degree	٢٠.٩٣	٢.٨٠	٢٠.١٥	٠.٨٣

Table (1) shows similarities among the individuals of the research sample in the selected measurements, The Skewness Coefficient ranged between (± 3). It indicates that the research sample is homogeneous and represents a natural moderate society.

Wheatley Model for Teaching Skills of the Research:

Tasks:

Some introductory questions about the skill have been prepared for the students. These questions lead them to establish effective ways of thinking about the skill. They must be open questions that allow discussion and communication.

Cooperating Groups:

When students work in groups, they have the opportunities to generate new ideas. Working in small groups gives the students cognitive roles and helps them discover the problem together. In this study, the students were divided into five groups. Every group has eight students. Hypotheses were discussed through experimentation and not only theoretical discussion (practical implementation).

Participation:

After that students apply the new concepts and design exercises to implement their suggestion and practice the skill. Every group has the necessary tools to do the lesson and implement the practical side in the light of the attained concepts and knowledge.

Survey Study:

The researcher conducted the survey from Sunday 23/9/2018 to Thursday 4/10/2018, on (20) students from inside the original community and outside the basic research sample. This is to ensure the validity of the research tools and find the scientific processes (honesty and consistency) of the skills. The Wheatley model shows the students' understanding of the skills and the validity of the place.

Pre Measurement:

The pre-measurement was performed on the research group from Sunday 14/10/2018 to Monday 15/10/2018.

Basic Experiment:

The researcher applied the Wheatley model on the research sample from Sunday 21/10/2018 to Thursday 29/10/2018. The unit time is (120) minutes for (6) weeks. The introductory and final parts were taught according to the established curriculum. The researcher taught the research sample.

Post Measurement:

The post measurement was performed on the skill tests from Sunday 2/12/2018 to Monday 3/2/2018.

The Used Statistical Operations:

The researcher performed the scientific operations using the Statistical Package for Social Sciences (SPSS) program, through the following statistical information:

Arithmetic mean, Standard Deviation, Median, Skewness Coefficient, Correlation Coefficient, Test (T) to indicate the differences, The Percentage, The Rate of Improvement.

Presentation and Discussion of the Results:

In the light of the research hypotheses, the researcher presents the attained results:

The Results of the First Hypothesis: There are statistically significant differences between the average grades of the pre and post measurements of the experimental group in the

performance level of some skills of playing with the opposite side of racket in the research sample in favor of post measurement.

Table (2)

Significance of the differences between the pre and post mean averages in the skill variables (n = 40)

Measurement	Unit of Measurement	Pre Measurement		Post Measurement		(T) Value
		Arithmetic mean	Standard Deviation	Arithmetic mean	Standard Deviation	
Test to measure the Strength of pushing the ball with the opposite side of racket	Meter	٣.٥١	٠.٣١	٩.٤٠	٠.٣١	٨.١٥
Test to measure the speed of pushing the ball with the opposite side of racket	Second	١٨.٤٥	٠.٥٠	١٤.٦٣	٠.٨٧	٩.٢٠
Test to measure the precision of pushing the ball with the opposite side of racket	Number	١.٣٥	٠.٤٨	٣.٥٠	٠.٥١	٧.٦٨
Test to measure the Strength of hitting the ball with the opposite side of racket	Meter	١٤.٤٦	٠.٢٨	٢٠.٥٠	٠.٥١	٩.٧٣
Test to measure the speed of hitting the ball with the opposite side of racket	Number	٢.٣٨	٠.٤٩	٥.٤٨	٠.٥١	٨.١٤
Test to measure the precision of hitting the ball with the opposite side of racket	Number	١.٣٥	٠.٤٨	٤.٥٣	٠.٥١	٨.٤٩
Test for receiving the ball below with the opposite side of racket from pushing the ball.	Number	٢.٤٥	٠.٥٠	٧.٤٣	٠.٥٠	٩.٧٢
Test for receiving the ball below with the opposite side of racket from hitting the ball.	Number	٢.٣٠	٠.٤٦	٧.٤٨	٠.٥١	٩.٠٢

The value of (T) at degree (39) and significance level (0.05) = 1.697

As table (2) The presence of statistically significant differences at the level (0.05)Between the pre and post average averages in the skill performance tests of

the skills under consideration in favor of post measurement.

Explanation and Discussion of the First Hypothesis Results:

The skill performance of the experimental group improved after using the Wheatley model which encourages discussion and argument. Thus students participate positively in the educational process and they are able to discover the performance and sequence of the skills. Also they realize the relationship between concepts and principles during answering the teacher's questions.

And that the Wheatley model encourages the learners' mental capabilities and develops their practical skills. The Wheatley model establishes an effective learning environment that allows learners to share their ideas in a small group. Thus it leads to a kind of successful interaction and actual intellectual participation , and sees Mahmoud Abdel Halim Abdel Karim (2006) That the problem is presented to students in the form of a question or phrase that challenges and stimulates students 'thought and interest. (8 : 265)

The role of the teacher in this step is guidance and guidance, as it passes over the working groups and sometimes directs some groups to re-estimate and reflect on what they have reached. (9 : 20)

The researcher points out the positive impact of the Wheatley model. It helps students achieve the goals in a way that suits their capabilities and needs. They become more positive and active with their teacher and colleagues. The Wheatley model allows them to work in groups and develop some exercises to learn and apply the skill. They can employ their efforts and exert more effort without feeling bored. The Wheatley model helps to form a correct perception of all parts of the skill and to remember its parts. This is supported by the studies of "(2011) (3), (2010) (5) and (2002) (10)". The results of these studies confirmed the effectiveness of using the Wheatley model in learning.

The researcher believes that students play a positive role in the educational process which leads to the development of their abilities. Thus the validity

of the first hypothesis is achieved.

The Results of the Second Hypothesis: There are statistically significant differences between the average grades of the pre and post measurements of the experimental group in the cognitive achievement of the research sample in favor of post measurement.

Table (3)

The Statistically Significant differences between the average grades of the pre and post measurements in the cognitive achievement of Field Hockey (N = 40)

Measurement	Unit of Measurement	Pre Measurement		Post Measurement		(T) Value
		Arithmetic mean	Standard Deviation	Arithmetic mean	Standard Deviation	
Cognitive achievement	Degree	22.90	2.61	54.22	3.89	13.24

The value of (T) at degree (39) and significance level (0.05) = 1.697

As table (3) shows, there are statistically significant differences at level (0.05) in the In the cognitive achievement of field hockey, which is greater than the tabular value at level (0.05).

Explanation and Discussion of the Second Hypothesis Results:

Through its findings, the Wheatley model contains many and varied information and knowledge about the history, law, and skill performance of hockey, this resulted in students acquiring the largest amount of information leading to a high rate of retrieval of this information in different situations, where each of the " Mohamed Saad Zaghloul, others"(2001) that the use of educational technology leads to an increase in the impact of the information students have learned and entrenched in their minds, which is reflected in the learning process. (6 ;19)

The researcher attributes the reason for the progress of the experimental group members in the level of cognitive achievement to the use of a model followed by learning skills because it helps in discussion and dialogue, which allows positive participation in the educational process as it makes students able to discover the performance of the skills and their sequence and access to concepts and principles and realize the relationship between

them through answer To the teacher's questions.

The researcher believes that the students 'access to the cognitive requirements of the skill by itself makes the information difficult to forget, and this leads to an increase in cognitive achievement, and this is consistent with the results of the study of" (2011) (3), (2005) (2), (2002) (10), whose results confirmed that the Wheatley model helps to increase cognitive achievement and plays a positive role in the educational process which leads to the development of their thinking abilities, Thus the validity of the second hypothesis is achieved.

Conclusions:

1- Using the Wheatley model showed an improvement in the skill performance level of the experimental group.

2- The Wheatley model had an effect on cognitive achievement and skill performance level in Field hockey, which indicates its effectiveness and impact.

Recommendations:

1- Applying the Wheatley model in learning basic skills of Field hockey on students of the Faculty of Physical Education, Asyut University.

2- Conducting similar studies using the Wheatley model with different age stages and other activities to confirm the effectiveness of the method.

3-Updating the methods of learning in the curriculum of Field hockey because of its importance in improving the level of performance.

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