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The effectiveness of the six thinking hats strategy in testing the cognitive achievement of handball basic skills

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ABSTRACT

The present study aimed to use and implement the six hats strategy to know its impact on the cognitive achievement of students in the field of physical education and on the development of their basic handball skills. The present study was conducted on second stage students of the College of Physical Education and Sports Sciences of the University of Kirkuk (Iraq) in the academic year 2020-2021. The students were grouped in tree classes: Class A, Class B and Class C. A total of 60 students were recruited as the sample participants of the study using simple random sampling method. Out of 60 students, 20 participants were selected for the pilot experiment. A total of 40 participants were randomly allocated into two groups, experimental group and control group, with n=20 in each group. Based on the findings of the present study, the researcher concluded that the use of the six hats strategy has a significant effect on the cognitive achievement of the basic skills of handball, which helps in the effective learning of handball basic skills and improves performance in competitive games.

KEYWORDS

Six thinking hats strategy; cognitive achievement; handball.

1. INTRODUCTION

In the era of science and technology, a rapid and tremendous development has been observed in the all the domains of human life, including the educational sector in terms of modernization in the teaching methods with the scientific foundations and new learning strategies for the students. There is significant drift of the educationalists towards the use of the development of learning methods, and the best use of educational techniques (Abdulhadi & Abdulhamza, 2022; Gutiérrez et al., 2022; López et al., 2022). The old traditional methods adopted by the trainers do not induce appropriate learning among students. This prompted the specialized scientists to come up with many modern educational strategies, including the six hats strategy in the learning process. It may help the learners

to acquire a set of skills, knowledge, attitudes, principles and values. In addition to this, these modern strategies enabled them to solve their problems related to the various domains of the life independently, giving the learner an important role to actively participate in the educational activities. The six hats strategy improves thought process among students. In addition to this, it also creates a healthy and fun oriented atmosphere among the students by exchanging the roles between hats. These hats are virtual hats that make an individual think in a particular way and then immediately move from it to another method, which maintains the interest of the students throughout the learning process and also keeps them motivated to learn new strategies (De Bono, 2002).

Many educational studies have been conducted in the field of teaching motor skills and cognitive achievement in order to overcome the stereotypical traditional methods of education and transform the traditional environment in which the student is passive and receptive into an environment, characterized by cooperation and discussion among students One of the modern roles of the teacher is to be creative in terms of supplying modern and renewable knowledge (El-Sherbiny & Fawzi, 2010).

Among the pool of games, handball is one of the fun oriented games. This game is subject to international laws and has fixed, agreed-upon various rules and regulations under concerned organization and authorities. It requires stadiums with fixed standards, and the continuous and mutual competition attracts both sexes to practice this sport and to participate in various competitive games at national and international level (Darwish, 2002).

There is strong need to drift attention to the various stages of learning along with the methods of teaching. Hence, the present study was aimed to use and implement the six hats strategy to know its impact on the cognitive achievement of those students in the field of physical education and on the development of basic handball skills among the players.

Learning methods play an important role in the whole educational process. Learning is attained by healthy and positive interaction between the teacher and the student. The educational system relies on the methods adopted by the teacher to transfer the pool of knowledge to their students. Hence great learning is induced by the effective and modern teaching methods. By extensive review of the existing literature, observation in the current educational process and the experience in the field of handball game, the research team noticed that many teachers follow the traditional method of learning, which has no scientific basis. The teachers implement one strategy for all without taking into account the individual characteristics and differences between learners, the

ratios of work to rest in proportion to the learners' abilities and their age group. Hence the researcher identified the problem regarding the strong need to implement new methods of teaching strategies for the students in order to induce better learning among students. Therefore, the researcher focused on the six hats strategy, which gives the student a role in thinking and criticism, as well as renewed activity and how to perform.

The primary aim of the study was to identify the effect of the six hats strategy on the cognitive achievement of the students and to find out the effect of this six hats strategy on basic handball skills among the students.

2. METHODS

2.1. Participants

The present study was conducted on second stage students of the College of Physical Education and Sports Sciences, of the University of Kirkuk, in the academic year 2020-2021. The students were grouped in tree classes: Class A, Class B and Class C. A total of 140 students belonged to the second stage in the College of Physical Education and Sports Sciences, University of Kirkuk. Out of 140, a total of 60 students were recruited as the sample participants of the study using simple random sampling method. Out of 60 students, a total of 20 participants were selected for the pilot experiment. A total of 40 participants were randomly allocated into two groups, experimental group and control group, with n=20 in each group.

2.2. Instruments

Cognitive achievement tests are among the group of common assessment tools in the handball game. Cognitive achievement tests were intended to measure the mental abilities of the students which included, the knowledge regarding the game on and off the field. The knowledge of the students was tested based on the academic content of the subjects included in their curriculum in the educational organization. These tests aimed to measure the mark that the student has obtained from the contents of one of the academic subjects, and it is based mainly on determining the student's cognitive level, according to each student's grade (Muhammad, 2004).

The researcher relied on the cognitive achievement tests developed by Khaleda & Zain (2013) for preparing the phrases in the questionnaires of the cognitive achievement test. A total of 51 phrases were included in the questionnaire. These phrases were experimented on the students who

belonged to the Iraqi environment. The researchers obtained the opinion of all the experts specialized in their respective field. Followed by which, a final agreement was made that it matched the levels of the sample members.

In the present study, the researcher developed a set of tests with the aim to measure the basic skills, i.e. the ball dribbling, the ball shooting from stability. Followed by which, extensive review of the pre-existing literature was done by the researcher to develop a set of tests to measure the skills previously identified in a questionnaire form. The questionnaire was provided to a panel of experts, specialized in the field of handball with the aim to obtain their opinion regarding the appropriateness of these tests to measure basic skills (Rahman, 2007; Duaa Al-Dardiri, 2003; Muhammad Sobhi, 2002; Rahman Darwish, 2002).

Regarding validity, which refers to how well an instrument measures what it is intended to measure (Daoud, 1990), in the present study, the researcher established the face validity, and content validity of the questionnaire.

Face validity refers to the extent to which a test appears to measure what it is intended to measure. In the present study, the researcher relied on face validity. In this field, Ebel indicated that the best way to ascertain the validity of a tool is based on the number of specialists to decide the extent to which the phrases cover the aspects of the trait to be measured (Ebel, & Frisbie, 1972). In the present study, the researcher asked a group of experts, to express their opinions regarding the validity of the test items and their relevance to the content of the material, the behavioural purposes of the lessons, and to test the clarity of the questions (Samara & Aziz, 1989).

The content validity aims to know the extent to which the test or scale represents the aspects of the trait, or ability to be measured (Farre, 1970). Tests are considered valid if they indicate an acceptable degree to the test's representation of the content of the study material or the extent to which the phrase is related to the content of the objective it measures. In the present study, the researcher verified the validity of the content of the exercises, by preparing a table of specifications to ensure that the phrases included the content of the study material and the behavioural purposes, because the validity of the content depends on the extent to which the test represents the content of the course well in its phrases and is representative of the teaching objectives (Farre, 1970).

Reliability is defined as the degree to which the research method produces stable and consistent results. Reliability is a necessary indicator of the test (Allam, 2000). There are many ways to extract reliability, and the best method in objective achievement tests is the use of graphical

methods. The researcher used the Couder-Richardson equation 20 (K20), as it deals with tests with an answer (0-1) (Al-Nabhan, 2004).

2.3. Pilot study

In the present study, the questionnaire was distributed by the research team on the random basis to avoid the respondent's influence on the pattern of each area of the questionnaire. Followed by this, the questionnaire was distributed among the sample of 20 students of the second stage in the Faculty of Physical Education and Sports Sciences in the month of April 2021. The pilot experiment was conducted to ensure that the language of the questionnaire was easy to understand, to verify the understanding and efficiency of the assistant work team in conducting measurements and tests and recording the results, to know the difficulties that the researcher may encounter during the course of the study and providing appropriate solutions to them.

In the present study, pre-tests were conducted on the research participants of the experimental group and control group in the month of January 2021. Regarding the experiment and the content of the curriculum unit plan, the scientific material regarding six hats strategy was formulated by the concerned teacher. The appropriate information was delivered to the students in an organized manner. The content was prepared in an easy, coherent and sequential language. A healthy educational atmosphere was provided to the students. The exercise training was given in the form of educational units that consisted of broad and comprehensive educational content. After successful accomplishment of the educational units prepared by the researcher, post-tests were conducted on the research group participants in the month of March 2021, taking into account the same conditions of the pre-test.

2.4. Statistical analysis

In the present study, the statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) version 23. The statistical tests used were arithmetic mean, standard deviation and t test.

3. RESULTS

Table 1 describes the mean and standard deviation scores of pre and post measurements of the basic skills in the experimental group. Student t test was applied to find out the difference between pre-post measurement scores. A significant difference was found with $p<0.05$, in favor of the post measurement, where the calculated t value varied between 2.522 and 24.547.

Table 1. Pre and post-test in the experimental group

Skill	Pre		Post		xf	xf	T value	Indication
	Mean	SD	Mean	SD				
Dribbling	837.5	503.0	038.5	013.0	0.457	0.503	8.434	Sig.
Shooting	88.4	43.1	355.8	82.1	6.045	1.000	24.547	Sig.
Cognitive achievement	50.34	2.68	275.42	885.5	18.067	4.875	2.522	Sig.

Table 2 describes the mean and standard deviation scores of pre and post measurements of the basic skills in the control group. Student t test was applied to find out the difference between pre-post measurement scores. A significant difference was found with $p<0.05$, in favor of the post measurement, where the calculated t value varied between 2.812 and 21.954.

Table 2. Pre and post-test in the control group

Skill	Pre		Post		xf	xf	T value	Indication
	Mean	SD	Mean	SD				
Dribbling	837.5	503.0	038.5	013.0	0.457	0.503	7.542	Sig.
Shooting	88.4	43.1	355.8	82.1	6.045	1.000	21.954	Sig.
Cognitive achievement	45.30	1.99	148.34	444.3	15.121	3.922	2.812	Sig.

Table 3 describes the mean and standard deviation scores of post measurements of the basic skills between the experimental group and the control group. Student t test was applied to find out the difference between post measurement scores of both the groups. A significant difference was found with $p<0.05$, in favor of the post measurement of the experimental group, where the calculated t value varied between 5.52 and 7.22.

Table 3. Pre and post-test in the experimental and control groups

Skill	Experimental		Control		T value	Indication
	Mean	SD	Mean	SD		
Dribbling	22.6	63.0	87.4	25.0	6.52	Sig.
Shooting	82.7	57.1	26.6	0.58	5.52	Sig.
Cognitive achievement	22.72	21.4	50.62	57.2	7.22	Sig.

4. DISCUSSION

In the present study, significant differences were found between experimental group and control group, in favor of post-tests, indicating a positive impact of the six hats strategy on the cognitive achievement of the basic skills of handball, which helped in effective learning of basic

handball skills and raising the performance in the competitive games, as shown in the table 1, table 2 and table 3. The researcher attributed this difference to the appropriateness of the exercises which contributed to achieve educational goals. In addition to this, the six hats strategy also gave the students an opportunity to choose a different way of thinking. It helped the students in transforming their ideas into a more systematic way that ensures the students to achieve their educational goals, and simultaneously creates an atmosphere of fun and competition during the presentation of ideas (Iman, 2020). The researcher believed that the students' self-interest to develop cognitive achievement and learn basic skills in handball according to the six hats strategy has also increased the learning motivation among them.

In conclusion, according to the findings of the present study, the author concluded that the use of the six hats strategy has a significant effect on the cognitive achievement of the basic skills of handball, which helps in the effective learning of basic handball skills and improves performance in competitive games.

According to the set of conclusions adopted and formulated by the author from the results obtained in this experiment, some recommendations were made by the author. It is recommendable to adopt the six hats strategy for inducing cognitive achievement in the basic skills of handball. The author also recommends to conduct similar studies in different sports, such as volleyball, football, basketball, etc.

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AUTHOR CONTRIBUTIONS

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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