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Effectiveness of Cooperative and Mastery Learning Styles on Handball Skills amongst Iraqi School Students

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The aim of this study was to investigate the effectiveness of cooperative and mastery learning styles on basic handball skills amongst secondary school students in Iraq. A total of 85 students participated in this study, which was conducted using a quasi-experimental research design. Particularly, basic handball skill tests were administered before and after a treatment process. The students were divided into three groups and were taught by the same teacher. The first and second experimental groups were taught via cooperative and mastery learning styles, respectively. Meanwhile, the traditional learning style was employed in the control group. Results showed that students under the experimental group scored significantly higher than those in the control group, after eight weeks. This study presents substantial evidence that learning styles can significantly and positively affect the basic handball skills of secondary school students.

Key words: *Cooperative, Handball basic skills, Mastery learning styles, Quasi-experimental, Traditional.*

Introduction

One of the most important academic subjects is physical education, where an individual undergoes skill and physical training. Thus, many countries have included this subject in their respective curricula, which they frequently revise as well. These countries also employ different learning styles to effectively teach physical education in accordance with the established educational systems. Such learning styles assist physical education teachers to effectively teach this subject and train students in different games and skill sets based on their learning capacities and potential (Reza, 2008). Accordingly, various learning styles have been

established. These learning styles aid the selection of proper teaching methods based on the circumstances, nature and learning capacity of students. Thus, these methods facilitate the achievement of educational objectives.

The focus of every educational style is the learner instead of the teacher and aims to develop the former's capabilities, which require considerable attention. A good learning process should enable the development of the learner's abilities for an optimal performance in different sports skills. Such a performance can reflect on the ability to understand skills and movements (Emad, 2006).

Meanwhile, handball is a collective game that features speed, precision and thrill based on a performance regulator (Reza, 2008). This game requires multiple and complex skills, with passing and shooting as the most basic of these skills. Passing, shooting and catching are important factors of ball control in handball. Secondary school students are taught the basic skills and the different offensive and defensive styles of this sport. Evidently, handball is an active sport and performance depends on how players or the team learn and apply the basic skills required. In this context, the success of a team depends on the players' constant training and mastery of basic skills. Thus, a long hour of training is required, particularly in an atmosphere that fosters sincerity and genuine desire to improve (Al-khayat & Al-Hayali, 2001). Passing and shooting are two of the basic skills in handball. Passing is the process of handing the ball from one player to another of the same team either in either a stable position or in motion (Mufti, 2000). The aim of passing is to rapidly and accurately move the ball to the desired location to enable players to shoot the ball towards the goal (Ibrahim, 2004). Therefore, the kinetic performance of passing or scrolling requires nervous and muscular compatibility. Meanwhile, shooting skills will determine the outcome of a match (Hadi, 2010). Thus, shooting is an extremely important skill in handball because such ability can spell the difference between winning or losing. Other basic skills and gameplays are of no use if a team fails to score (Hadi, 2010).

The students' mastery and efficiency in using basic skills are important parameters in their development. Such skills are the core factors that enable students to succeed in a physical education class (Al-khayat & Al-hayali, 2001). Thus, identifying the best learning style for students will decrease the effort and time needed to accelerate the learning process (Reza, 2008). However, teachers do not apply specific learning styles when teaching handball skills in educational institutions. The reason is that they lack knowledge on the effectiveness of such styles (Emad, 2006). Moreover, college teachers never employed any learning style when teaching the basic defensive and offensive skills in handball.

Basic Handball Skills

Passing and shooting are considered important basic handball skills as they are continually needed during the match. Thus, these two skills are part of the curriculum of Intermediate school that was mandated by the Directorate of Curriculum under the Ministry of Education. Passing is considered basic attacking as it is the only skill that allows the ball to be traded between the two players for the purpose of scoring a goal against the opponent. Passing is defined as the process of handing the ball from one player to another of the same team while they are in the state of either stability or movement as the author prescribed (Mufti, 2000). Handling's aim and purpose is to quickly and accurately move the ball to the desired place so that it can then be shot towards the goal (Ibrahim, 2004). The shooting skills will actually determine the outcome of the match as stated by the researcher (Hadi, 2010). Thus, it is considered a very important skill in handball. It can spell the difference between winning and losing. Other basic skills and gameplays are useless if the team fails to score successfully as the researcher prescribed (Ibrahim, 2004). In terms of performance, shooting skill is similar to passing. The difference lies in the aim since the aim of shooting is for the ball to completely get through the goal located on the opponent's side. On the other hand, passing aims to move the ball to a player who belongs on the same team.

Mastery Learning Style

Mastery learning style (MLS) is a form of educational philosophy, which indicates that any student can refine his/her skills under proper learning conditions. Thus, proper learning condition, environment and timely feedback enable students to improve their learning ability (Husam & Sinan, 2010). MLS focuses on providing all learners (or, at least, the vast majority) access to a higher learning level compared with other styles. Thus, MLS enables learners to master the skills through repetition. Hence, we included this learning style in the present study (HUSENAWE, 2006).

Cooperative Learning Style

Cooperative learning style (CLS) refers to a technique, in which the learners' role is activated when they practice with other cooperating members in a team, thereby enabling them to reach an optimal learning level (Husam & Sinan, 2010). However, a few teachers refuse to apply learning styles, including CLS and MLS. CLS encourages better participation in the student-centred curriculum than in the teacher-centred one. In CLS, the teacher likewise facilitates various learning activities that can provide students with a holistic educational learning process (i.e. physical, social and mental). Considerable focus has been provided to active learning processes, such as social interaction, decision-making and cognitive understanding.

Cognitive Elaboration Theory

Cognitive elaboration theory is substantial beneficial in sports, physical and general education. Accordingly, developing teaching strategies based on this theory may facilitate the improvement of physical education and training programs. These strategies enable teachers to improve the behaviour and performance of students. Moreover, developing such teaching strategies can potentially reduce exhaustion caused by overtraining and the training volume imposed by teachers or educational units (Robert, 1990). Furthermore, the present study used cognitive elaboration theory to focus on CLS that can improve students' performance and behaviour, thereby enabling them to acquire new skills by improving the old educational unit. Such intervention is effective for physical education programmes that failed to improve students' cohesion during the lesson. This endeavour likewise enhances the performance of students by teaching them the benefits of achieving a group goal (lesson goal).

Mastery Learning Model

The mastery learning model offers an explanation on the relationship between failure and success (Guskey, 2010). A closed loop exists and starts from the students' internal motivation. Thus, they will identify errors or mistakes upon reaching a high level of achievement. Students exert additional effort into learning and achieving their goals after they experience an increased sense of merit and responsibility after facing difficulties at the start of a lesson. Hence, teachers have to increase the amount of educational units for students who show considerable desire to learn. Thus, a relationship exists between movement (i.e. skill) insertion and the degree of internal interaction in improving achievement or otherwise.

The present study aims to identify the effectiveness of MLS, CLS and TLS in teaching handball skills. This study was conducted to answer the following research questions:

1. Does the use of the MLS, CLS and TLS approach have any significant effect on basic handball skills?

Methodology

Participants

The study involved 90 secondary school students in Iraq. They were equally distributed into 30 of students in MLS, 30 of students CLS and 30 of students in traditional learning style groups.

Research Design

The current study adopted a quasi-experimental design to determine the disparities amongst the two experimental and one control groups (Creswell, 2012). This research focuses on the handball shooting and passing skills of the participants. Moreover, the current study delves into the potential of incorporating fundamental handball skills to physical education classes. The influence of CLS and MLS were tested on experimental groups, particularly the development of their fundamental shooting and passing skills. The disparities prior and subsequent to the treatment process were scrutinised and evaluated. The treatment and control groups were included in the investigation to obtain an accurate result. A quasi-experimental design comprises three major components: control group, experimental group (i.e. various treatments are feasible) and pre- and post-test designs. In this investigation, the experimental groups were subjected to an entire semester (i.e. two months) of physical education sessions, in which the teacher adopted CLS and MLS. For the same period, the control group underwent a traditional learning procedure.

The two treatment groups were exposed to contemporary methods aimed at developing their basic passing and shooting skills in handball. One treatment group was exposed to CLS, whilst the other was exposed to MLS. Meanwhile, the participants in the control group were taught basic handball skills through the traditional learning process. All groups received one lesson per week for a total of eight weeks. The performance of the control group, which serves as a baseline measurement, was evaluated after their exposure to the different learning styles. The current study proposes a design that can assess the effectiveness level of the three learning styles in developing basic handball skills (Creswell, 2012).

Table 1: Procedure of MLS, CLS and TLS

MLS	CLS	TLS
Warm up (10 minutes) includes stretch the body, Jogging and running	Warm up (10 minutes) includes stretch the body, Jogging and running	Warm up (10 minutes) includes stretch the body, Jogging and running
Aerobic exercise (10 minutes) Sweden exercises, flexibility exercises, butterfly exercises, pronation exercises, rotation exercises, modified push-up and modified sit-up.	Aerobic exercise (10 minutes) Sweden exercises, flexibility exercises, butterfly exercises, pronation exercises, rotation exercises, modified push-up and modified sit-up.	Aerobic exercise (10 minutes) Sweden exercises, flexibility exercises, butterfly exercises, pronation exercises, rotation exercises, modified push-up and modified sit-up
Employing the cooperative learning style, the teacher begins the program with a 20-minute explanation on the skill required and a demonstration on its proper execution. Equipped with this information provided through cooperative structures, so teacher will divide them into small groups during the practical part, the students then proceed to perform the basic handball skill to the best of their ability. Meanwhile, the teacher observes their performance and intervenes to make corrections whenever an execution is not up to the mark. As in the cooperative style learning program, the teacher steps in with corrections whenever mistakes are detected	Employing the mastery learning style, the teacher begins the program with a 20-minute explanation on the skill required and a demonstration on its proper execution. Equipped with this information provided through mastery structures, so students will be in one group unlike CLS, the students then proceed to perform the basic handball skill to the best of their ability. Meanwhile, the teacher observes their performance and intervenes to make corrections (feedback) whenever an execution is not up to the mark. As in the mastery style learning program, the teacher steps in with corrections whenever mistakes are detected	Explanation of the skills that wants to be learned by using the traditional learning style to the students (20 minutes).
Mini entertainment game related with basic skills (5	Mini entertainment game related with basic skills (5	Mini entertainment game related with basic skills (5

minutes).	minutes).	minutes).

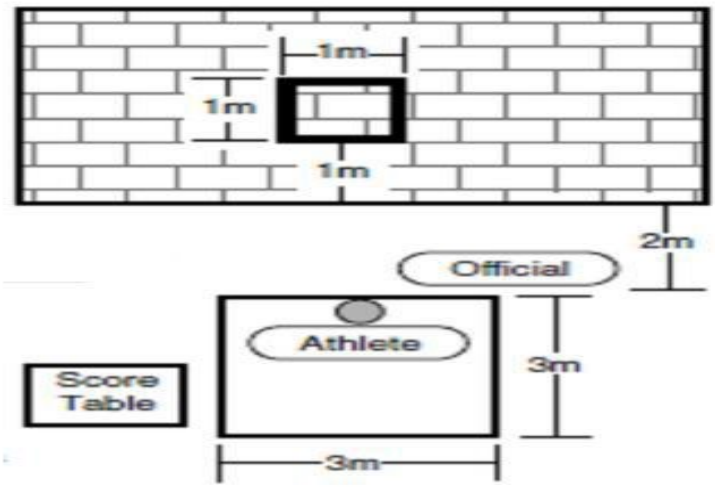
Measurement

Al-Dulaimi (2014) explained that testing aims to assess the subjects' ability to perform specific tasks accurately based on instructions. Thus, the current research employed test-related scientific data to assess the performance of the participants. Meanwhile, the questionnaire was structured to evaluate their basic handball skills. A total of four tests were executed for each of the two skills (i.e. shooting and passing). A team of specialists was also consulted for the selection and appropriate setup of the tests. After the forms were collected, the percentage of each test were determined by dumping the data. The specialists explained that 80 presents of shooting test on goal post divides into 9 targets marked by the experts, whereas 90 presents of the passing test on painted rectangle on the wall at a 2m distance put by the experts.

Passing skill test

The purpose for running this test is to assess the capacity of handball players in the context of their passing ability. Two handballs, a marked wall (as exhibited in Figure 1) and a measuring tape are the instruments utilized for this test. Adhesive tape is used to outline a one-meter square on a wall. This represents the test description. The base of the square is 1 meter from the floor, while a three-meter square is outlined on the floor at a distance of 2.4 meters away from the wall. The test commences with the subject standing within the three-meter square outlined on the floor. At the blowing of a whistle, the subject is required to take aim and direct a pass towards the 1 meter square outlined on the wall. Each subject is permitted a total of five passes. It should be noted that the passes should be executed with the use of one hand in an overhand movement. Also, to be deemed a legitimate pass, it is essential that the thrown ball hits the wall in mid-flight (Geetha, 2007). Three points are given for hitting the wall within the square, two points for hitting any line of the square, and one point for hitting any part of the wall outside the square. The subject is also awarded one point for catching the ball in mid-air, or subsequent to one or more bounces while still positioned within the three-meter square. The total number of points accumulated from the five passes denotes the passing ability of a subject.

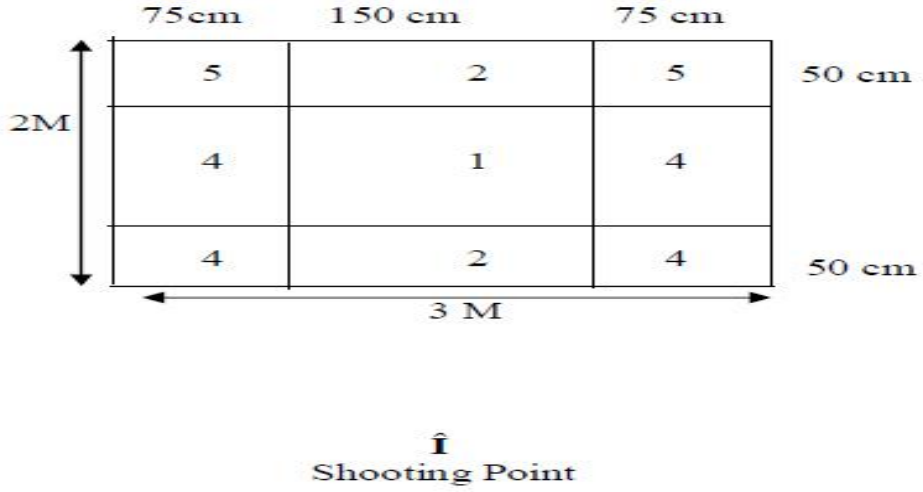
Figure 1. Showing the Passing Test



Shooting Skill Test

This test serves as an evaluation on the capability of handball players in terms of their shooting accuracy. Handballs, a handball court and a score sheet were the instruments employed for this exercise. The test description, which is represented by the face of the handball goal, is illustrated in Figure 2. As can be observed, the face of the goal is partitioned into nine boxes (targets) with the use of ropes. Boxes located at the top and bottom right corners, as well as boxes at the top and bottom left corners measure 75 cm x 50 cm; the top and bottom middle boxes, as well as the left and right middle boxes measure 150 cm x 50 cm; while the remaining box at the centre measures 150 cm x 100 cm (Geetha, 2007). The total score for each subject is derived from ten attempts at the target.

Figure 2. Showing the shooting test



The findings were analysed using two statistical techniques, namely, analysis of covariance (ANCOVA) and multiple comparisons. ANCOVA was employed to analyse and compare the differences amongst the groups in terms of CLS, MLS and TLS on basic handball skills.

Results

Effects of CLS and MLS on Basic Shooting Skills in Handball

ANCOVA was used to identify if the experimental groups have higher scores in basic handball shooting skills than the control group after controlling for their differences.

Table 1: ANCOVA for learning basic handball skills as a function of group, using pre-test scores on learning handball basic skill (shooting) test as a covariate

Source	Df	Mean square	F	Sig.	Partial Eta Squared
Pre-Shooting	1	39.155	7.744	0.007	0.087
Group	2	318.347	62.958	0.000	0.609
Error	81	5.057			
Total	85				

A significant difference was observed amongst the basic handball skills of the experimental and control groups via the learning and traditional styles [F (2.81) = 62.958, $p < 0.05$] and partial eta squared (0.609). The partial eta squared value of 0.609 means that 60.9% of the variance in learning basic handball skills can be attributed to learning styles. The value of eta for basic handball shooting skills test (eta = 0.609) is a substantial effect (Cohen, 1988). Thus, the experimental groups have more opportunities to learn more rapidly than the control group because they could freely communicate and ask questions in the classroom. Moreover, independent discovering and exploring of the learning concepts resulted in mastery of basic handball skills. CLS and MLS groups received high scores ((M = 34.64, SD = 2.02) and (M = 32.43, SD = 2.08), respectively). Such scores were significantly higher than that of TLS group (M = 27.14, SD = 2.81). Meanwhile, multiple comparisons (i.e. post-hoc test, Scheffe) were used to assess if the experimental groups performed better in the post-test than in the pre-test.

Table 2: Multiple comparisons amongst the three groups on basic handball shooting skill

Group	CLS	MLS	TLS
CLS	-	2.21*	7.50*
MLS	-	-	5.29*

The results indicated that CLS group has a significant effect on learning basic handball shooting skill and significantly different ($\underline{d}$ = 7.50) than the TLS group. Meanwhile, MLS group has a significant effect on learning basic handball shooting skills and likewise significantly different ($\underline{d}$ = 5.29) than the traditional learning style (control group). Furthermore, CLS group has a more significant effect ($\underline{d}$ = 2.21) on basic handball shooting skills than MLS.

Effects of CLS and MLS on Basic Handball Passing Skills

ANCOVA was used to identify if the two experimental groups scored higher in learning basic handball skills (passing) than the control group after controlling for the differences.

Table 3: ANCOVA for learning basic handball skills as a function of group, using pre-test scores on learning basic handball skill (passing) test as a covariate

Source	Df	Mean square	F	Sig.	Partial Eta Squared
Pre-Passing	1	13.832	3.940	0.051	0.046
Group	2	443.810	126.423	0.000	0.757
Error	81	3.511			
Total	85				

A significant difference was observed amongst the basic handball skills of the experimental and control groups [F (2.81) = 126.423, $p < 0.05$] and partial eta squared (0.757). The partial eta squared value of 0.757 means that 75.7% of the variance is attributed to learning styles. The value of eta for the passing handball basic skills test (eta = 0.757) is remarkable. The experimental groups exhibited more effect in learning basic handball skills than the control group. Thus, learning styles enable individuals to demonstrate their competence. Students who had sufficient time were more interested in learning styles than others. However, the results may vary for each individual. Multiple comparisons (i.e. post-hoc Test, Scheffe) were used to assess if the experimental groups performed better in the post-test than in the pre-test.

Table 4: Multiple comparisons amongst the three groups on basic handball passing skill

Group	CLS	MLS	TLS
CLS	-	2.93*	7.87*
MLS	-	-	4.94*

Multiple comparisons were conducted to evaluate the effectiveness of CLS and MLS in learning basic handball passing skill. CLS group exhibited a significant effect on learning basic handball passing skills. Moreover, CLS group is significantly different ($\underline{d}$ = 7.87) than the traditional learning style (control group). Meanwhile, the results indicated that MLS group has a significant effect on learning basic handball passing skill ($\underline{d}$ = 2.93). Additionally, the effect of MLS group is significantly higher ($\underline{d}$ = 4.94) than that of the TLS group.

Discussion

The Iraqi secondary school students under the CLS intervention program exhibited a statistically significant improvement in learning basic handball skills (i.e. shooting and passing) in a period of eight weeks. Different learning styles (approaches) are the best predictors of students' academic performance (Diseth & Martisen, 2010). Previous studies have revealed that such learning styles are preferred over traditional styles because the former leads to an improved academic performance. CLS highlights teamwork because it enables students to interact with one another. Furthermore, these results were validated by previous studies. Basher (2012) studied the effects of applying cooperative and competitive learning styles in improving the learning time and performance of school students in terms of their basic soccer skills. Meanwhile, MLS provided the students with a sufficient learning time. This approach was also more beneficial than the traditional learning style in improving the learning experience of students. Similar results were noted in Hafidh (2012), which determined that students under MLS were more sophisticated and better in basic ground tennis skills than those who are not under the program. Moreover, MLS enables students to learn at their own pace. Students do not rely much on themselves under traditional learning styles. Hence, MLS encourages self-reliance by enabling students to take sufficient time to learn any subject or task.

In the process of gathering information and using basic handball learning skills, the students can understand that the different learning styles are continuously evolving with new ideas. Such understanding enables them to realise that they can develop their own learning styles given appropriate justification. Thus, learning basic handball skills will be convenient, thereby leading to an improved understanding of the subject. Meanwhile, students will be passive and quiet in class if they think that the subject is extremely fixed and has no use for

them. That is, they would merely wait for their teachers to impart information. CLS facilitates the enhancement of the self-esteem of students and encourages them to alter their opinions and ideas regarding optimum performance. Moreover, CLS encourages them to seek feedback from their teachers and classmates and discuss with their peers, thereby enhancing their self-confidence.

Additionally, students can gain more knowledge by discussing with their classmates and peers than their teachers. After the students were divided into groups, their collaborative work enabled them to bear all responsibilities through role distribution throughout the conduct of the lesson. Meanwhile, MLS follows the principle of individual differences, thereby decreasing the disparity amongst the students. Accordingly, the teacher has to determine the level of learning of the students and must evaluate if the latter has achieved mastery level. If the students failed to do so, then the teacher must continue to provide the former with substantial learning time and feedback until the students have mastered the necessary skills. Thereafter, the students can move on to a new skill. The educational approach of CLS involves the development of academic and social learning experiences through classroom activities. CLS, which is defined as 'structuring positive independence', is not simply about organising students into groups (Prasetyo, 2012). In this approach, students work as a team in groups to achieve the academic objectives. Although individual learning tends to promote rivalry, CLS encourages students to share their resources and skills. Chiu (2008) explained that this approach facilitates the distribution of information, assessment of proposals and vetting of work amongst students in a group. Additionally, the teacher's role is substituted from a provider of information to a facilitator of the learning process (Syahrir, 2011).

The current study is crucial because it presents substantial evidence that proves the significant and positive impact of learning styles on the educational level of secondary school students. This impact is considerably prominent amongst students under CLS and MLS because they develop better self-confidence, sense of responsibility and motivation than those under traditional learning styles. These results could assist stakeholders draw specific implications and guides teachers and students develop considerable awareness of such effects. The current researcher, who is also an educator, often calls out students for their lack of learning. Various factors, such as their background, lack of motivation, inattentiveness and unsupportive parents, could influence their learning pattern. Furthermore, even educators could be responsible for the students' poor performance. This study presented a clear image of the effects of various learning styles on the performance of students. The results showed that the students improved their performance under CLS and MLS. Hence, teachers must modify their learning techniques, approaches and strategies.

Conclusion

In conclusion, the researcher investigated the manner in which CLS and MLS have influenced the learning of basic handball skills. This study involved 14 secondary students from Iraq. The researcher used different learning styles (e.g. modern learning and traditional learning styles) during the teaching–learning sessions. The experimental group comprised students who were taught using CLS and MLS, whilst the control group consisted of students who were taught using the traditional learning styles. The results suggested that CLS and MLS had a positive effect on the learning of the basic handball skills. Nevertheless, further research should be conducted on a different age group sample with different learning styles.

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