The impact of the use of mastery learning on the level of learning some basic skills in volleyball

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Introduction

Mastery learning is one of the most recommended strategies in the field of education. This is simply because it aims at helping students acquire successfully learning experiences (65:13).

According to El Far (2000), mastery learning depends on providing students with the distinguished learning that helps them master what they study according to their individuality and pace.

This is applicable for learning skills of volleyball sports where the more learners master the skills necessary for keeping the ball in air, the more enjoyable and interesting the game is. Of these necessary skills are serving, under-head passing and overhead passing.

Despite this importance, the researcher has noticed that students at Faculty of Physical Education, Om El Qura University, lack necessary skills expected from them regarding how to play volleyball. This lack could be attributed to the traditional learning methods followed. By this method, the instructor delivers the instructions as he/she decide regardless the actual situation found in the court. The students, in turn, drill the skills until they learn them. This method, however, does not enable students to master the skills required. Furthermore, it does not consider individual differences. All these reasons have stimulated the researcher to undertake this study.

Aim

The main aim of this study is to examine the effect of using "mastery learning" strategy on learning some principle skills related to volleyball game.

Hypotheses

In light of the literature review, the study hypotheses can be as follows:

There are statistically significant differences between the mean scores of the experimental groups on the pre- and post- measurements in favor of the post measurement.

There are statistically significant differences between the mean scores of the control groups on the pre- and post-measurements in favor of the post measurement.

There are statistically significant differences between the mean scores of the control and experimental groups on the post- measurements in favor of the experimental group.

Terminology

The main term used in this study is "mastery learning". Mastery learning is defined as the method that manipulates the already-used syllabuses and contributes to them distinguished teaching methods and feedbacks that result in mastery learning of most, if not all, students (9: 316).

Methods

Design

An experimental design was used in this study where two groups were manipulated (a control versus an experimental group).

Sample

The sample assigned was a group of second-year students (n=60). The students were assigned into two groups: a control (n=30) and an experimental (n=30). In addition, 20 participants/players were also assigned to two groups: distinguished (n=10 professional players from El Wihda Team) and undistinguished (n=10 second-year students). The distinguished and undistinguished groups were used as benchmarks. The following table shows the sample of the study.

Table (1)
Description of the Sample

Variables		Measurement Unit	Main	Median	SD	
Growth	age	year	٢١.٥٤	٢١.٠٠	١.٠١٧	٠.١٧٨
	height	cm	١٧٧.٢١	١٧٧.٥٠	٤.٨٤٨	٠.١٤٢-
	weight	kg	٧٢.١٠	٧١.٥٠	٩.٥٠٢	٠.٠٩٣
Physical	Leg power	cm	١.٨٥	١.٨٥	٠.٢١٥	٠.٠٠٢-
	Speed	seconds	٣.٥٩	٣.٥٩	٠.٢٠٩	٠.١١٥-
	Agility	score	١٨.٤٤	١٨.٠	٢.٦١٩	٠.٣٨٥
	Muscle endurance	score	٢٠.٨١	٢٠.٥	٢.٤٢٧	٠.٤٩٩
	Flexibility	cm	١٥.٣٥	١٥.٠	٣.٠٩٨	٠.١٧٣
Skills under Investigation	Serve	score	٢٢.٣١٤	٢٣.٠٠٠	٤.٥٧٣	٠.٤١٤-
	Under head Pass	score	٧.١٥٧	٧.٠٠٠	١.٧٩٩	٠.٥٧٣
	Overhead Pass	score	٩.٤٠٠	٩.٠٠٠	٢.١١٦	٠.٤٦٥

Instrumentation

Related studies

Related studies were reviewed to collect related information.

Equipment

- Rest-meter
- A wall
- Computers
- CDs
- Tape measure
- A volleyball court
- Scaled box
- stopwatch

tape

- 10 volleyballs

Checklists

Some checklists were developed to collect data

Interviews

Some interviews were conducted with a volleyball expert.

Tests

Eight tests were administered to the sample of the study. They included the serve test, the overhead pass test and the underhead pass test.

Pilot Study

A pilot study of the instruments was conducted as part of the validation process of the study. The 10 participants of the undistinguished group were recruited in this phase.

Validation

The tests were administered to the distinguished and undistinguished samples and the validity of the tests was achieved. Test reliability was achieved by using a test-retest method. The reliability coefficients of the tests used were 0.8-0.9 which meant that the tests were highly reliable and suitable for the study.

Program Content

- Explanation. The researcher explained the ideal techniques to master the selected volleyball skills to the experimental group.
- Computers. A series of videos was displayed to the experimental group showing sample models of the selected volleyball skills.
- Handouts. A series of pictures were shown to the experimental group showing sample models of the selected volleyball skills.
- Modeling. The researcher, accompanied by a colleague, applied some techniques to show the skills needed to be mastered by students. Students who mastered the skills were also

used as models for their colleagues.

- Time Allotted. The program consisted of 10 units and took 10 weeks to complete (see Appendices 6 and 7).

Procedures

- Pre-test. Pretest administrations to the control and experimental groups were done on February 2 and 3, 2015.
- Actual Administration. The proposed mastery-based program and the traditional one were administered to the experimental and control groups respectively. The proposed mastery-based program started on February 23, 2015 and ended on May 4, 2015 while the traditional program started on February 24, 2015 and ended on May 5, 2015.
- Post-test. Posttest administrations to the control and experimental groups were done on May 6 and 5, 2015, respectively.

Findings

Statistical Tests

To answer the study questions and verify its hypotheses descriptive statistics tests were used; namely means, medians, standard deviations, t-test, correlation coefficients and improvement percentages.

Results & Discussion

Hypothesis 1. There are statistically significant differences between the mean scores of the experimental groups on the pre- and post-measurements in favor of the post measurement.

As shown in the following table, it can be concluded that Hypothesis 1 is accepted.

Table (2)

Mean scores of the experimental groups on the pre- and post-measurements

Tests	Measurement Unit	Pre-test		Post-test		M	T Value	Improvement (%)
		M	SD	M	SD			
Long jump test	m	١.٨٧	0.22	٢.١٥	٠.٢٥	٠.٢٨	❖٤.٤٦	١٥.٠٠
18 m. sprint	seconds	٣.٦٢	0.19	٣.١٦	٠.١٧	٠.٤٦	٩.٥٣٣	١٢.٨٣
Sit up test	number	١٨.٩٦	2.78	٢٢.٢٦	٢.٨٤	٣.٣٠	❖٤.٤٦	١٧.٤٠

Follow Table (2)
Mean scores of the experimental groups on the pre- and post-measurements

Tests	Measurement Unit	Pre-test		Post-test		M	T Value	Improvement (%)
		M	SD	M	SD			
Agility test	number	٢٠.٥٣	2.37	٢٤.٠٠	٢.٨١	٣.٤٦	٥.٠٦٨	١٦.٨٨
Forward flexion trunk test	cm	١٥.٢٣	3.23	١٩.٧٦	٤.٠٩	٤.٥٣	٤.٦٨١	٢٩.٧٦
Over hand serve test	score	٢٢.٤٦	4.58	٣٣.٨٦	٦.٢٦	١١.٤٠	❖٧.٩١	٥٠.٧٤
Over hand pass test	score	٩.٣٦	1.67	٢٥.٨٣	٢.١٣	١٦.٤٦	٣٢.٧١	١٧٥.٨٠
under hand pass test	score	٦.٨٦	1.85	٢٢.٤٣	٢.٥٠	١٥.٥٦	٢٦.٩٣	٢٢٦.٧٠

Notes. *Significant at 0.05 = (٢.٠٤٨)

This result can be attributed to the teaching method used that enables students to master the skills needed to play volleyball. The mastery-teaching method used also motivated students to learn better. This finding is in line with the results of El Mowafy (2003), Joseph and Nancy (1999), and Mohamed (2006) who found that using mastery-teaching methods positively affected their student's physical skills needed for sports.

Hypothesis 2. There are statistically significant differences between the mean scores of the control groups on the pre- and post-measurements in favor of the post measurement.

As can be seen in the following table, it can be concluded that Hypothesis 2 is also accepted.

Table (3)
Mean scores of the control groups on the pre- and post-measurements

Tests	Measurement Unit	Pre-test		Post-test		M	T Value	Improvement (%)
		M	SD	M	SD			
Long jump test	m.	١.٨٢	٠.٢٠	1.94	٠.٢٢	٠.١١٩	❖٢.١٠	٦.٥٣
18 m. sprint	Sec.	٣.٥٥	٠.٢١	3.33	٠.٢٠	٠.٢٢٣	❖٤.٠٩	٦.٢٧
Sit up test	Nu.	١٨.٥٣	٢.٥٤	20.03	٢.٩٨	١.٥٠٠	❖٢.٠٥	٨.٠٩
Agility test	Nu.	٢٠.٨٠	٢.٣٨	22.43	٢.٧٨	١.٦٣٣	❖٢.٣٩	٧.٨٥

Follow Table (3)
Mean scores of the control groups on the pre- and post-measurements

Tests	Measurement Unit	Pre-test		Post-test		M	T Value	Improvement (%)
		M	SD	M	SD			
Forward flexion trunk test	cm	١٥.٦٦	٢.٩١	17.36	٣.٢٦	١.٧٠٠	❖٢.٠٩	١٠.٨٥
Over hand serve test	Sco.	٢٢.٣٠	٤.٨٢	26.83	٥.٦٥	٤.٥٣٣	❖٣.٢٨	٢٠.٣٣
Over hand pass test	Sco.	٩.٤٠	٢.٦٤	20.00	٣.١٤	١٠.٦٠	❖١٣.٨٩	١١٢.٧٧
under hand pass test	Sco.	٧.٢٠	١.٨٠	15.43	٢.١٧٦	٨.٢٣٣	❖١٥.٦٧	١١٤.٣٥

Notes. *Significant at 0.05= (٢.٠٤٨) =

One possible reason justifying this result is the use of traditional teaching method which depends on drilling that connects direct observation of students to the ideal performance of the instructor. This is what Abdel-Kerim (1994) showed in her study where she explained the role of traditional teaching methods in teaching students the physical skills needed for some sports. This result is also consistent with those of El-Mowafy (2003), Joseph and Nancy (1999) and Mohamed who highlighted the positive impact of directly verbal instructions on mastering physical skills.

1.1. Hypothesis 3. There are statistically significant differences between the mean scores of the control and experimental groups on the post- measurements in favor of the experimental group.

As displayed in the following table, it can be concluded that Hypothesis 3 is accepted.

Table (4)
Mean scores of the control and experimental groups on the post-measurements

Tests	Measurement Unit	Exp. Group		Control Group		M	T Value
		M	SD	M	SD		
Long jump test	m	٢.١٥٢	٠.٢٥	١.٩٤	٠.٢٢	٠.٢٠	❖٣.٢٥١
18 m. sprint	seconds	٣.١٦٠	٠.١٧	٣.٣٣	٠.٢٠	٠.١٧	❖٣.٥٢٢
Sit up test	number	٢٢.٢٦	٢.٨٤	٢٠.٠٣	٢.٩٨	٢.٢٣	❖٢.٩١٧
Agility test	number	٢٤.٠٠	٢.٨١	٢٢.٤٣	٢.٧٨	١.٥٦	❖٢.١٢٩
Forward flexion trunk test	cm	١٩.٧٦	٤.٠٩١	١٧.٣٦	٣.٢٦	٢.٤٠	❖٢.٤٦٩
Over hand serve test	score	٣٣.٨٦	٦.٢٦	٢٦.٨٣	٥.٦٥	٧.٠٣	❖٤.٤٩٠
Over hand pass test	score	٢٥.٨٣	٢.١٣	٢٠.٠٠	٣.١٤	٥.٨٣	❖٨.٢٧٣
under hand pass test	score	٢٢.٤٣	٢.٥٠	١٥.٤٣	٢.١٧	٧.٠٠	❖١١.٣٧١

Notes. *Significant at 0.05 = (٢.٠٠٠)

A possible justification can be the use of the mastery-based teaching method that focused on the improvement of students' skills. The skills designated were improved because the program used focused on individual differences and their pace learning as well. In addition, using visuals and models also helped improve students' skills. This result is in consistency with those of El-Mowafy (2003), Joseph and Nancy (1999) and Mohamed who claimed that the use of mastery-based teaching positively affected performance levels of students.

2. Conclusions & Recommendations

In light of the study results, it can be concluded that:

1. using the mastery-based teaching method positively affects students' learning of the necessary skills for volleyball game (the experimental group).
2. using the traditional teaching method positively affects students' learning of the necessary skills for volleyball game (the control group).
3. the mastery-based teaching method has a better impact on students' learning of the necessary skills for volleyball game more than the traditional teaching method does.

In so doing, it can be recommended that:

1. Mastery-based teaching methods be used at the Physical Education Department of Om El-Qura University.
2. the impact of mastery-based teaching methods on other practical courses in the Physical Education Department be further studied and examined.
3. Workshops for teachers on mastery-based teaching methods and their cognitive and affective impact be conducted.
4. Workshops on recently student-centered teaching methods be conducted.

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