The Effectiveness of Using Educational Technology-Supported Micro Teaching in the Cognitive and Motor Learning of Shot Putting Skills for Beginners

*Dr/ Shaimaa Mustafa Abdullah Ali

Introduction and problem:
Teaching techniques play a crucial role in the development of the educational process in order to achieve an effective learning and maximize the intended learning outcomes. Conscious application of technology increases the productivity of the educational process, releases the teacher from his daily routine and puts the learners in situations that motivate them to learn and to use their senses and brain. Micro teaching is a modern teaching style commonly used in the field of teaching methods as an alternative for traditional teaching methods. It's widely known that educational technologies are clearly used in micro teaching. Also, video recorder device is used as a way to provide feedbacks in order to achieve better results.

Micro teaching is based on mastery learning strategy and basic educational principles such as immediate reinforcement. This is achieved by providing immediate feedbacks which consolidates and reinforces the acquisition of knowledge and improves the learners' level of performance in all cognitive and applied respects.

The educational program's designer in micro teaching tries to reduce common complications in usual teaching situations by reducing the number of learners to (5) learner. After showing the skill in which the learners participate, the teacher and the learner proceed with watching, analyzing and criticizing the skill. If there was a crucial need to repeat and re-plan the lesson, the teacher puts another plan for the micro lesson, teaches it to a group of learners and records the skill by video recorder. The skill can be repeated as much

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as needed for the development and improvement of the learners' skill.

Shot put is one of the most important field events. Its main goal is to throw the tool as far away as possible without prejudice to the rules of the competition. Putting styles in shot put has developed from glide to spin. The goal of this change was to make maximum use of the competitor's physical forces so that he could be at the highest speed at the moment of releasing the tool (the shot).

By teaching the curriculum of track and field events to the first-year undergraduate students of the Faculty of Physical Education for Girls at Zagazig University, the researcher noticed some problems faced by the teachers of track and field events. These problems consist in the low number of weekly lessons, the high number of students, the lack of capabilities in addition to the adopted command teaching style which depends on explaining and providing the practical model of the skill by teaching and correcting the common mistakes of a few number of students without taking into account the individual differences between the students. Furthermore, this style does not have the ability to attract the students' attention and motivate them to participate actively and effectively in the lesson; which in turn drives them bored due to the long intervals between the students' performance. All this had negative effects on the level of cognitive and motor learning of shot putting skills among the first-year undergraduate students.

The researcher notes that educational technologies can be used in the improvement of cognitive and motor learning of the skill of shot putting as it allows the process of motor learning to be implemented successfully by building the learner's motor imagery. The processes of display and the use of feedbacks can have a positive effect on building and developing the learner's cognitive and motor knowledge. Hence, it's crucial to use micro teaching style in keeping up with the development and promotion of educational strategies. This drove the researcher to conduct this study in order to identify the effectiveness of using
educational technology-supported micro teaching style on the level of motor and cognitive learning of shot putting skills for the first-year undergraduate students of the Faculty of Physical Education at Zagazig University.

**Research goals:**
This research aims at identifying the following points:
1- The effectiveness of using educational technology-supported micro teaching style on the level of motor and cognitive learning of shot putting skills for the first-year undergraduate students of the Faculty of Physical Education at Zagazig University.
2- The effectiveness of using command teaching style on the level of motor and cognitive learning of shot putting skills for the first-year undergraduate students of the Faculty of Physical Education at Zagazig University.
3- Comparing between educational technology-supported micro teaching style and command teaching style in terms of their effect on the level of motor and cognitive learning of shot putting skills.

**Research hypotheses:**
1- There are statistically significant differences between the average pretests and posttests of the experimental group (micro teaching) in terms of the level of motor and cognitive learning of shot putting skills in favor of the posttest.
2- There are statistically significant differences between the average pretests and posttests of the control group (command teaching) in terms of the level of motor and cognitive learning of shot putting skills in favor of the posttest.
3- There are statistically significant differences between the average posttests of the experimental and control groups in terms of the level of motor and cognitive learning of shot putting skills in favor of the posttest.

**Research procedures:**

**Methodology:**
The researcher adopted the empirical method given that it suits the nature of this research, by using the empirical design of two groups; an experimental group and a control group.

**Population and sample:**
By means of the purposive sampling, the researcher chose,
among the first-year undergraduate students of the Faculty of Physical Education – Zagazig University for the first semester of the academic year 2014/2015 who are at the number of (533), a sample of (40) students as a basic research sample from the original population. The sample was divided into two groups; an experimental group and a control group of (20) students each, in addition to (15) students for the exploratory study in order to determine the coefficients (validity – reliability) of the tests under consideration.

**Equivalence between the research's two groups:**
In order for the researcher to attribute the research results to the effectiveness of using educational technology-supported micro teaching, she has assured equivalence between the research's two groups (the experimental group – the control group) and calculated the normal distribution of the subjects of the research sample as shown in tables (1) and (2).

### Table (1)
**Indication of the differences between the experimental and the control groups in terms of growth rates under consideration**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>The experimental group N = 20</th>
<th>The control group N = 20</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>independent</td>
<td>dependent</td>
<td>independent</td>
</tr>
<tr>
<td>Age</td>
<td>Years old</td>
<td>18.35</td>
<td>0.52</td>
<td>18.47</td>
</tr>
<tr>
<td>Height</td>
<td>Cm</td>
<td>163.00</td>
<td>4.81</td>
<td>163.85</td>
</tr>
<tr>
<td>Weight</td>
<td>Kg</td>
<td>70.00</td>
<td>4.44</td>
<td>69.14</td>
</tr>
<tr>
<td>Imagery intelligence</td>
<td>Points</td>
<td>45.50</td>
<td>5.29</td>
<td>46.30</td>
</tr>
</tbody>
</table>

T value is at 0.05 = 2.042 significance level

As table (1) shows, there are no statistically significant differences at level 0.05 between the experimental and the control groups in terms of growth rates (age – height – weight – intelligence), which indicates that both groups of the research are equivalent in terms of these variables.
Table (2)

Indication of the differences between the experimental and the control groups in terms of physical and cognitive variables as well as the level of technical and quantitative performance in shot put

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>The experimental group N = 20</th>
<th>The control group N = 20</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>independent</td>
<td>dependent</td>
<td>independent</td>
</tr>
<tr>
<td>Muscular strength of the arms</td>
<td>M</td>
<td>3.42</td>
<td>0.29</td>
<td>3.50</td>
</tr>
<tr>
<td>Muscular strength of the legs</td>
<td>M</td>
<td>1.30</td>
<td>0.15</td>
<td>1.35</td>
</tr>
<tr>
<td>Agility</td>
<td>T</td>
<td>8.31</td>
<td>0.41</td>
<td>8.15</td>
</tr>
<tr>
<td>Dynamic equilibrium</td>
<td>Points</td>
<td>56.49</td>
<td>4.28</td>
<td>57.23</td>
</tr>
<tr>
<td>Flexibility of the torso and the thigh</td>
<td>Cm</td>
<td>5.50</td>
<td>1.71</td>
<td>5.87</td>
</tr>
<tr>
<td>Level of technical performance in shot put</td>
<td>Points</td>
<td>0.91</td>
<td>0.50</td>
<td>0.95</td>
</tr>
<tr>
<td>Level of quantitative performance in shot put</td>
<td>M</td>
<td>2.63</td>
<td>0.32</td>
<td>2.70</td>
</tr>
<tr>
<td>Cognitive learning of shot putting</td>
<td>Points</td>
<td>3.00</td>
<td>1.21</td>
<td>2.25</td>
</tr>
</tbody>
</table>

T value is at 0.05 = 2.042 significance level

As table (2) shows, there are no statistically significant differences at level 0.05 between the experimental and the control groups in terms of physical and cognitive variables as well as the level of technical and quantitative performance of shot putting, which indicates that both groups of the research are equivalent in terms of these variables.

Data collection tools:
Are divided as follows:
First: equipment and tools used in the research
- Restameter device to measure body height in centimeters.
- Calibrated medical weighting scale to measure body weight in kilograms.
- Digital camera
- Computers and a projection screen
- CDs
- Medicine balls, measuring tape, colored tape, stopwatch
- Certain number of shots for throwing: legal and educational shots as well as a throwing sector.

**Second: Physical tests under consideration:**

In order to determine the physical requirements for shot putting as well as the needed physical tests to measure physical abilities, the researcher designed an expert survey form in order to determine the principal physical requirements for shot putting and methods of measurement. The form was reviewed during a personal interview with experts:

1. Test of pushing the medical ball as far as possible.
2. Long jump test from stability
3. Baru zigzag run test $3 \times 4.75$ m.
4. PASS modified assessment for mechanical equilibrium
5. Twisting the torso test after standing

**Third: Evaluation of the performance of shot putting skills**

The level of performance of shot putting skills was evaluated using the jury method: (4) jury members and a president with not less than (15) years of experience in teaching track and field events. Each one of them gives a mark to the student; afterwards, the president of the jury deletes the higher and the lower marks and counts the final mark depending on the average two middle marks. The skill was evaluated by giving a certain mark out of (10) marks.

**Forth: Measuring the quantitative level of shot putting skill:**

The researcher measured the quantitative level of shot putting skill as per the rules and conditions defined by the International Association of Athletics Federations. The distance thrown was measured from the throwing circle to the place where the shot landed inside the throwing sector without prejudice to the rules.

**Fifth: Imagery intelligence test prepared by/ Ahmed Zaky Saleh (1987)**

**Sixth: Cognitive learning of shot putting test (prepared by the researcher)**

The cognitive learning test in its initial form included (35) diversified phrases containing a lot of information. The phrases in the test were distributed according to the principal axis.

The researcher presented the test in its initial form to a
group of specialists in track and field events in order to be assured of the validity of the model. The researcher conducted a survey to collect the experts' opinions in order to make sure that the phrases in the test were correct and that the proposed questions suit the students' level. The survey showed that the experts agreed 100% on the proposed questions which were at the number of (35) phrases. After deleting some phrases in light of the experts' opinion, they became at the number of (22) phrases; i.e. the cognitive learning test's final applicable form.

**Pretests**

The pretests were conducted on the subjects of the experimental and control groups during the period from 09/10/2014 till 13/10/2014 in terms of cognitive learning as well as technical and quantitative level of performance of shot putting.

**Basic experiment**

The researcher followed the model plan of micro teaching referred to by Mohsen Hommos (1997) which includes three stages: first: teaching, second: feedback sessions, third: re-teaching.

**First: Learning using micro teaching style for the experimental group**

The students watched the illustrative model of the shot putting skill during (8) minutes. Afterwards, they performed some warm-up trainings for (14) minutes. (20) Minutes were dedicated for performing the watched motor tasks, (20) minutes for criticism, (20) other minutes for re-teaching, (3) minutes for the final part and (5) minutes for management tasks and for the preparation of the tools used in the implementation of the research experiment.

The content of the proposed micro teaching-supported educational modules was submitted to (5) experts specialized in teaching methods and track and field events at the Faculties of Physical Education. They agreed (90.00%) on the content of the educational plan and approved it as suitable and applicable to the research sample.

**Second: Learning using command teaching style for the control group**

The teacher performs a practical model of the shot putting skill while providing corresponding verbal explanation for (8) minutes after performing warm-up for (14) minutes. The students start training on the educational steps for (60) minutes and the teacher provides them with remarks and instructions in this aspect in order to correct the technical mistakes immediately.
after their emergence. The final part lasts for (3) minutes in addition to (5) other minutes for management tasks.

**Implementation of the suggested educational modules:**

The suggested educational modules were applied on the subjects of the experimental group for (5) weeks; two educational modules per week. The duration of each daily educational module was (90) minutes, for the period from 15/10/2014 to 18/11/2014.

**Posttests:**

The researcher conducted the posttests for the research's two groups (the experimental group – the control group) during the period from 20/11/2014 till 23/11/2014 in terms of cognitive learning as well as technical and quantitative level of performance of shot putting, following the same orders and conditions of the pretests.

**Presentation and discussion of results:**

**First: presentation of results:**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>Pretest</th>
<th>Posttest</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>independent</td>
<td>dependent</td>
<td>independent</td>
</tr>
<tr>
<td>Level of technical performance of shot</td>
<td>Points</td>
<td>0.91</td>
<td>0.50</td>
<td>8.00</td>
</tr>
<tr>
<td>putting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of quantitative performance of</td>
<td>M</td>
<td>2.63</td>
<td>0.32</td>
<td>7.95</td>
</tr>
<tr>
<td>shot putting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive learning of shot putting</td>
<td>Points</td>
<td>3.00</td>
<td>1.21</td>
<td>26.47</td>
</tr>
</tbody>
</table>

T value is at 0.05 = 2.093 significance level

*Statistically significant at 0.05

As table (3) shows, there are statistically significant differences at level 0.05 between the pretests and posttests.
posttests of the experimental group in terms of cognitive learning as well as level of technical and quantitative performance of shot putting in favor of the posttest.

Table (4)

Indication of the differences between the pretests and posttests of the control group in terms of cognitive learning as well as the level of technical and quantitative performance of shot putting N = 20

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>Pretest</th>
<th>Posttest</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of technical performance of shot putting</td>
<td>Points</td>
<td>0.95</td>
<td>0.53</td>
<td>6.90</td>
</tr>
<tr>
<td>Level of quantitative performance of shot putting</td>
<td>M</td>
<td>2.70</td>
<td>0.41</td>
<td>7.33</td>
</tr>
<tr>
<td>Cognitive learning of shot putting</td>
<td>Points</td>
<td>3.35</td>
<td>1.29</td>
<td>23.00</td>
</tr>
</tbody>
</table>

T value is at 0.05 = 2.093 significance level
*Statistically significant at 0.05

As table (4) shows, there are statistically significant differences at level 0.05 between the pretests and posttests of the control group in terms of cognitive learning as well as level of technical and quantitative performance of shot putting in favor of the posttest.

Table (5)

Indication of the differences between the posttests of the experimental and the control groups in terms of cognitive learning as well as the level of technical and quantitative performance of shot putting

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>The experimental group N = 20</th>
<th>The control group N = 20</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of technical performance of shot putting</td>
<td>Points</td>
<td>8.00</td>
<td>1.02</td>
<td>6.90</td>
</tr>
</tbody>
</table>
Follow Table (5)

Indication of the differences between the posttests of the experimental and the control groups in terms of cognitive learning as well as the level of technical and quantitative performance of shot putting

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unit of measurement</th>
<th>The experimental group N = 20</th>
<th>The control group N = 20</th>
<th>T value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>independent</td>
<td>dependent</td>
<td>independent</td>
</tr>
<tr>
<td>Level of quantitative performance of shot putting</td>
<td>M</td>
<td>7.95</td>
<td>0.44</td>
<td>7.33</td>
</tr>
<tr>
<td>Cognitive learning of shot putting</td>
<td>Points</td>
<td>26.47</td>
<td>2.19</td>
<td>23.00</td>
</tr>
</tbody>
</table>

T value is at 0.05 = 2.042 significance level
*Statistically significant at 0.05

As table (5) shows, there are statistically significant differences at level 0.05 between the posttests of the experimental and the control groups in terms of cognitive learning as well as the level of technical and quantitative performance of shot putting in favor of the experimental group.

Table (6)

Rates of improvement of the posttest in comparison to the pretest of the experimental and control groups in terms of the level of cognitive learning as well as the level of technical and quantitative performance of shot putting

<table>
<thead>
<tr>
<th>Variables</th>
<th>The experimental group N=20</th>
<th>The control group N=20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rates of improvement</td>
<td>Pretest</td>
</tr>
<tr>
<td>Level of technical performance of shot putting</td>
<td>0.91</td>
<td>8.00</td>
</tr>
<tr>
<td>Level of quantitative performance of shot putting</td>
<td>2.63</td>
<td>7.95</td>
</tr>
<tr>
<td>Cognitive learning of shot putting</td>
<td>3.00</td>
<td>26.47</td>
</tr>
</tbody>
</table>
As table (6) the subjects of the experimental group has outdone those of the control group in terms of the rates of improvement of the posttests in comparison to the pretests of the level of cognitive learning as well as the level of technical and quantitative performance of shot putting.

**Second: Discussion of results:**

1. Discussion of the results of the research's first hypothesis

The results of table (3) has indicated that there are statistically significant differences at level 5.00 between the pretests and posttests of the experimental group in terms of the level of cognitive learning as well as the level of technical and quantitative performance of shot putting in favor of the posttest.

The researcher attributes this improvement to the effectiveness of the educational technologies-supported micro teaching style through which a set of typical educational lessons of shot putting skills are provided. The illustrative models of the skill are displayed as a good practical model accompanied by the teacher's verbal explanations of the technical stages and educational steps of shot putting. During implementation, each student's performance is filmed. And during the feedback sessions, each student's performance is displayed so that her teacher and peers could draw her attention to the strengths and weaknesses of her performance. Afterwards, they restart training on the skill under consideration; the matter that contributes to improving the cognitive learning and the level of technical and quantitative performance of shot putting. This result is consistent with Abdullatif Bin Hussein Faraj (2005) who indicates that micro teaching depends on the use of technology to facilitate the educational process given that such techniques attract the learner's attention, bestows vitality on the educational process, increases the learner's interest in learning and helps us to study many accurate variables that cannot be easily followed up.

The researcher has also attributed the improvement of the level of cognitive learning
as well as the level of technical and quantitative performance of shot putting to the micro teaching style which provides feedbacks through certain teaching techniques that allow the student to identify the positive and negative points in her performance. This result is also consistent with Richard & Jensen (1997) who have indicated that micro teaching style has two basic learning elements: active participation by the learner and feedback which is likely to improve and develop the motor performance.

Thus, the validity of the research's first hypothesis has been established

**B- Discussion of the results of the research's second hypothesis:**

As the results in table (4) show, there are statistically significant differences at level 0.05 between the pretests and posttests of the control group in terms of the level of technical and quantitative performance of shot putting in favor of the posttest. The researcher attributes such improvement in the level of cognitive learning as well as the level of technical and quantitative performance of shot putting to the active role played by the teacher in the command teaching style which depends on providing verbal explanations and accurate descriptions of the skill in addition to displaying a practical model of the skill, providing feedbacks and continued assessment during and after the educational model. All this led to the improvement of the cognitive and motor aspects of shot putting. This result is consistent with William Lee Mark (2003) who has noted that the use of the traditional method in the learning of motor skills has a positive effect on the level of motor and cognitive learning due to the presence of the teacher who puts plans for the lesson, implements its content, assesses the learning outcomes and provides the learners with various guidelines and instructions in order to correct their technical mistakes. Thus, the validity of the research's second hypothesis has been established

**C- Discussion of the results of the research's third hypothesis**

As the results in table (5) show, there are statistically significant differences at level 0.05 between the posttests of the experimental and control groups in terms of the level of
cognitive learning as well as the level of technical and quantitative performance of shot putting in favor of the experimental group.

The researcher attributes the superiority of the subjects of the experimental group in comparison with those of the control group in terms of the posttests and rates of improvement of the level of cognitive learning as well as the level of technical and quantitative performance of shot putting to the effectiveness of educational technology-supported micro teaching style which deals with a few number of students giving them the opportunity to take the fullest possible advantage from the educational lessons. Furthermore, this teaching style depends on teaching, providing feedbacks during feedback sessions and, then, re-teaching and correcting the technical mistakes, which in turn contributed to the superiority of the students of the experimental group in comparison to those of the control group in terms of the skill under consideration. This result is consistent with Bonnie (2003) and Donal (2005) who have noted that the use of micro teaching supported by educational technologies such as computers and display devices reinforces and consolidates the taught material and allows the learners to retain the acquired information for a longer time by involving the learner's various senses. Furthermore, it saves the teacher's time and effort in the hall given that displaying visual educational tools suits the teacher who is no more obliged to give long explanations, thus avoids sinking to pure verbalism. Some pedagogical studies note that the use of different educational techniques such as computer software saves up to one-third or half the teaching time in most cases.

Enayat Faraj (1998), Nileson (2004) add that displaying the filmed model through educational technologies and allowing the learners to watch their own performances helped them to learn the skill rapidly with a high level of mastery and to improve their cognitive learning of the learnt skill.
Findings:
1- Effectiveness of educational technologies-supported micro teaching style in the improvement of motor and cognitive learning of shot putting skill.
2- Command teaching style has a positive effect on the level of motor and cognitive learning of shot putting skill.
3- Educational technologies-supported micro teaching style is more effective than command teaching style in improving motor and cognitive learning of shot putting skills.
4- The rates of improvement of the posttest in comparison to the pretest of the experimental group (micro teaching) is better than the control group (command teaching) in terms of the level of motor and cognitive learning of shot putting skill.

Recommendations:
1- The necessity of using educational technologies-supported micro teaching given its effectiveness in the improvement of the level of motor and cognitive learning of shot putting skills for the students of the Faculty of Physical Education for girls, Zagazig University.
2- Organizing training courses for the professors of the Department of Track and Field Events at the Faculty and their assistants in order to show them the latest and most effective teaching styles for the curriculum of track and field.
3- Paying attention to the application of teaching methods that give the learner an active role during the educational process, in line with the pedagogical developments, including micro teaching style.
4- Producing and implementing more educational technologies that are affordable and easy to handled such as (electronic books – educational packages – educational software) in order to help the learner and the teacher in the promotion of the educational process in the curriculum of track and field events.
5- Conducting more scientific studies in the field of teaching styles in order to discover the best teaching styles for the teaching of skills in the curriculum of track and field for the first-year
undergraduate students at the Faculty.

References:
First: Arabic References:

Second: Foreign Resources:
33- Davis, R., (1999): The Effectiveness of Micro Teaching and video tapes in training prospective elementary teachers inspifeteachical, oniouniverity.


38- **William Lee Mark (2003):** An ex post facto on the comparison of levels of achievement and satisfaction in distance education and traditional education in distance education, is this walking with the Lord or dancing with the devil, Volume 64- 08 A of Dissertation Abstracts International.