

## The Effect of Using Programmed Concept Mapping on Breast Stroke Learning of Physical Education Faculty's Students.

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### Abstract

*The Research Aims to design the programmed concept mapping displayed on the computer in order to recognize its effect on Learning Breast stroke to the 3rd year students of Physical Education Faculty in Sadat city and To build a knowledge test to the 3rd year students to measure the knowledge acquisition of Breast stroke , The researcher used the experimental method of two groups; an experimental and control groups as it suits the nature of the research , the sample contents of (22) students , The researcher applied the oral intelligence test which Gaber Abdel Hamid & Mahmoud Ahmed Omar (2007) [5] prepared and which proven its honesty and persistence to measure the description it was prepared for, and the statistical treatment was performed , the results ; The Programmed concept mapping positively affects the learning of Breast stroke and the knowledge acquisitions level of the experiment group's students , The traditional technique (the oral explanation & the practical example performance) positively affects the learning of Breast stroke and the knowledge acquisitions level of the control group's students , The programmed concept mapping was more effective and positive than the traditional technique on the learning of Breast stroke and knowledge acquisitions level which indicates its effectiveness , Knowledge test prepared by the researcher has high honesty and persistence interactions and is appropriate for measuring the knowledge acquisitions level of the 3rd year students of Breast stroke that included (technical analysis of Breast stroke – common mistakes – law.)*

**Key Word :** concept mapping - Breast stroke – learning ..

### Introduction:

Concept mapping is considered one of the modern techniques of learning, as it keeps the student active and enables him to form a knowledge basis that is easy to understand. It also helps to quickly review the school material in a focused way which in turn assists the learner to perform tests in a better way; it also helps to develop the scholastic acquirements, besides developing the knowledge conceptions related to the hierarchy order or the related links among them. Concept mapping is one of the most effective teaching methods that keep the learner in a continuous thinking state and improves the positive attitude of the learners. [6]

Depending on the researcher's experience in teaching swimming in the faculty, he noticed that there are many students who can't perform breast stroke in the correct way during the learning process. The researcher thinks that the inability to learn may be the outcome of the lack of diverse teaching methods and the continuous use of the followed technique in which the teacher explains the skill orally then performs the example without any students' participation in the educational process. This method does not take into consideration the individual differences among students, also some of them may not follow the explanation or face a difficulty in understanding the correct method of skill performance and some of them can't see the example in the right way and consequently

their motivation to learn the skill decreases which may affect their ability to perform Breast stroke.

Regarding the fact that breast stroke is one of the basic swimming methods scheduled for the 3<sup>rd</sup> year students and that it differs in its difficulty from the other swimming methods. So it needs a period of training in order to reach the correct performance, then to raise its level. Therefore, the researcher adopted teaching Breast stroke using the programmed concept mapping which is considered a new method of teaching in the field of physical education. Because programmed concept mapping helps in clarifying all the concepts related to Breast stroke in order to achieve the targets aimed in the educational process in a better way. This urged the researcher to make the current study in order to recognize "the effect of using programmed concept mapping on learning Breast stroke to the students of Physical Education Faculty".

### The Research Aims :

This research aims to design the programmed concept mapping displayed on the computer in order to recognize its effect on:

1. Learning Breast stroke to the 3<sup>rd</sup> year students of Physical Education Faculty in Sadat city.
2. To build a knowledge test to the 3<sup>rd</sup> year students to measure the knowledge acquisition of Breast stroke.

### The Research Theses:

1. There are statistically significant differences between the two before & after measurements averages of the experimental group (using the programmed concept mapping) in the level in learning Breast stroke and the knowledge acquisition in favor of the after measurement.
2. There are statistically significant differences between the two before & after measurements averages of the control group (using the followed technique) in the level in learning Breast stroke and the knowledge acquisition in favor of the after measurement.

#### Research Procedures:

#### Research Method:

The researcher used the experimental method of two groups; an experimental and control groups as it suits the nature of the research.

#### Research society & sample:

The researcher society and sample were chosen from the 3<sup>rd</sup> year students of Physical Education Faculty – Sadat University, registered in the university year 2013/2014, the first semester, their number was (29) students of the researcher. They were divided into a basic research sample of (22) students as (11) students for the experimental group using the method of (programmed concept mapping), the control group (11) students using (the followed technique), and (7) students for the pilot study. The researcher performed the conformity on the total research sample (the basic & the pilot).

Table (1) shows that.

Table (1)  
The conformity of total research sample in the variables (studied in the research) N= 29

No.	variables	Measure unit	means	Standards deviation	medium	Coefficient of torsion
1	Age	Year	20.59	0.50	21.00	-2.46
2	Height	Cm	176.48	1.02	176.00	1.41
3	Weight	Kg	74.58	1.21	75.00	-1.04
4	Intelligence	Degree	65.10	0.77	65.00	0.39
5	The vertical jump test of Sergeant	Cm	41.90	0.77	42.00	-0.39
6	Flexibility of foot sole joint	Cm	10.90	0.82	11.00	-0.36
7	Flexibility of foot back joint	Cm	12.28	0.70	12.00	1.20
8	Diagonal lying from standing	No.	15.03	0.78	15.00	0.12
9	Right fist strength	Kg	28.03	0.78	28.00	0.11
10	Lift fist strength	Kg	25.83	0.76	26.00	0.67
11	Arms' movements	degree	0.14	0.35	0.00	1.20
12	Legs' strikes	degree	0.21	0.41	0.00	1.54
13	Conformity between arms & legs	degree	1.66	0.77	1.00	2.57
14	Breathing	degree	1.28	0.45	1.00	1.87
15	Performance level of Breast stroke	degree	1.14	0.35	0.00	1.20
16	Knowledge acquisition	degree	1.93	0.53	2.00	-0.40

Table (1) shows that the coefficient of torsion for the variables studied in the research is between  $\pm 3$  which indicates the mildness of total research samples in all variables studied in the research.

Table (2)  
The significant differences between the before measurements verages of the variables studied  
in the research of the two experimental & control groups N1= N2= 11

No.	variables	Measure unit	Experimental group		Control group		Differences average	“t” value
			M	Sd.	M	Sd.		
1	Age	Year	20.73	0.47	20.55	0.52	0.18	0.85
2	Height	Cm	176.64	1.03	176.36	1.03	0.28	0.61
3	Weight	Kg	74.27	1.68	74.73	0.79	0.46	0.78
4	Intelligence	Degree	65.00	0.89	65.36	0.67	0.36	0.98
5	The vertical jump test of Sergeant	Cm	41.64	0.67	42.09	0.83	0.45	1.33
6	Flexibility of foot sole joint	Cm	10.82	0.75	11.00	0.89	0.18	0.49
7	Flexibility of foot back joint	Cm	12.00	0.63	12.36	0.81	0.36	1.10
8	Diagonal lying from standing	No.	15.09	0.83	15.00	0.77	0.09	0.25
9	Right fist strength	Kg	28.09	0.83	27.82	0.75	0.27	0.76
10	Lift fist strength	Kg	25.73	0.79	25.82	0.75	0.09	0.26
11	Arms' movements	degree	0.18	0.40	0.09	0.30	0.09	0.57
12	Legs' strikes	degree	0.27	0.47	0.18	0.40	0.09	0.46
13	Conformity between arms & legs	degree	1.64	0.91	1.73	0.79	0.09	0.24
14	Breathing	degree	1.18	0.40	1.36	0.50	0.18	0.89
15	Performance level of Breast stroke g	degree	0.18	0.40	0.09	0.30	0.09	0.57
16	Knowledge acquisition	degree	1.82	0.40	2.00	0.45	0.18	0.94

P value at level 0.05 = 2.080

Table (2) shows the lack of statistically significant differences between the before measurements of the variables studied in the research of the two groups; the experimental and the control groups, which indicates the equivalence of the two groups studied in the research.

#### Means of data gathering:

- A restameter to measure height (cm)
- A medical scale to measure weight (kg).
- A stopwatch to know time (second).
- A ribbon to measure length (cm).
- A computer and display screen.

#### • Intelligence test:

The researcher applied the oral intelligence test which Gaber Abdel Hamid & Mahmoud Ahmed Omar (2007) [5] prepared and which proven its honesty and persistence to measure the description it was prepared for, and the statistical treatment was performed.

#### • Physical Test:

#### • Skill Performance Level:

Performance level of research sample was evaluated by a triple committee of swimming professors.

#### Test of Knowledge Acquisition:

This test is designed by the researcher; in its preparation the researcher followed the next steps:

#### 1- Deciding the aim from the test: this test aims to:

- Make the student recognize the performance method of Breast stroke .
- Make the student remember the common mistakes.
- Make the student recognize the legal aspects of Breast stroke .

#### 2- Preparing the 4 axes of the test:

The researcher identified the scientific material which the test included in the main 4 axes which are: swimming history, technical analysis of Breast stroke , common mistakes, and the legal aspects of Breast stroke .

The material which the test covered was displayed on (9) experts in the field of swimming and teaching methods enclose (2). Determining the kind of questions:

The questions of true or false, multiple choice, and multiple choice using the image questions.

#### 3- Determining & forming the phrases:

The researcher formed the test questions and they were put in the form within the group of test phrases which reached (17) phrases.

1- Preparing the primary form of the test: the test primary form included (17) phrases.

Table (6)

Distributing the knowledge test phrases on the different axes and the questions' kind in its primary form

Axis/questions' kind	True or false	Multiple choice	Image questions	Total
Technical analysis of Breast stroke	5	-	2	7
Common mistakes	2	3	1	6
law	4	-	-	4
Total	11	3	3	17

### 6-Test instructions:

The researcher took into consideration the instructions to be written in proper and correct language without protraction, and the recording method of the correct answer.

7-The validity of primary form of the test:

The primary form of the test was displayed after its preparation on a group of (5) experts. Thus, the test in its final form included (15) phrases, enclose (5).

8-Test correction:

One degree for each correct answer and a zero for each wrong answer.

9-Analysis of test phrases:

The application of the same test is performed on the pilot sample to define the difficulty of the phrases and to recognize its suitability, and the calculation of easiness and difficulty coefficients.

### The suggested educational program using the programmed concept mapping:

The researcher put the educational program of Breast stroke scheduled for the 3<sup>rd</sup> year students, and in light of the scheduled curriculum. The researcher put the program on the following bases & steps:

#### The aims of the educational program:

This program aims to teach Breast stroke scheduled to the 3<sup>rd</sup> year students of the Physical Education Faculty in Sadat University, through designing an educational program using the programmed concept mapping and to recognize the program's effect on learning Breast stroke and the knowledge aspects of swimming.

#### Program Bases:

- That the program content be suitable for its aims taking into consideration the individual differences among students.

- Taking into consideration the gradation principle from easy to difficult.

- That program contents challenge students' abilities allowing raising their motivation in order to achieve the educational outcome.

- That the program enjoys the diverse in displaying the educational material.

#### The content of programmed concept mapping:

The content of the educational program of the 3<sup>rd</sup> year students was organized to make the program include educational maps programmed for Breast stroke scheduled for the 3<sup>rd</sup> year students so as to contain the following:

- Display of the theoretical concepts related to the skill and its uses.

- An example of the skill performance (educational film).

- Sequenced images (in sequence) of the skill performance stages.

- Trainings to develop the skill.

- True or false questions on each skill.

#### • Preparing program contents:

- The educational map was provided with the educational films of the best performance of Breast stroke .

- The educational video was put into the computer by a video card, and then the program windows media player was used to display the video on the computer.

- The sequenced images were put by dividing the educational video into several animated shots by using movie maker program, and then these animated shots were transferred into still shots by using "Paint Brush" program. After that, the researcher chose the suitable shots in order

to display them as still images or to be displayed in sequence.

- The illustrations were input in the computer by using the “scanner”, and then these illustrations were processed by using “Paint Brush”.

- Some sound effects were used such as (clapping), (glass breaking) to accompany the true or false answers (immediate reinforcement). Then the sound files were processed by using “sound forge 4.0” program.

- “PowerPoint 2007” was used and the CD was produced which contains the programmed educational maps of Breast stroke for the 3 year students.

**The time plan of the program:**

The researcher prepared the educational program to include (6) weeks as two educational units per week; which means that the program includes (12) educational units and the time of the educational unit is (90) minutes divided to:

(10) Minutes warm-up.

(25) Minutes the part concerning the programmed concept mapping (watching the concept mapping of Breast stroke and also the educational video on the computer).

(45) Minutes: the practical application of what is watched and to return to the computer screen whenever needed so the computer exists in the same place of the skill practical application all of this under the teacher’s supervision).

(5) Minutes: calm trainings to make the body return to its normal state.

(5) Minutes: to get out of the swimming pool.

**The assistants:**

The researcher implemented the program by himself along with (2) assistants who were chosen from the teaching staff members in the same department.

**The pilot study:**

The researcher performed the pilot study on a random sample from inside the research society and outside the research basic sample of (7) students in the period from 3/10/2013 to 10/10/2013 in order to find out the scientific interactions (honesty – persistence) of the tests used in the research.

**The Pretest:**

The before measurements were performed on the two groups of the research (the experimental – the control) to recognize the knowledge acquisition and the skill performance level (Breast stroke ) on 20/10/2013.

**The Basic Experiment:**

The researcher applied the educational program using the concept mapping on the experimental group (enclose 6), and (the followed technique) of the control group in the period from 20/10/2013 to 3/12/2013.

**The Post test:**

After finishing the implementation of the basic experiment, the researcher performed the after measurements on 3/12/2013 on the two groups of the research (the experimental – the control) to recognize the knowledge acquisition and the skill performance level (Breast stroke ).

**The Statistical Treatments:**

- 1- means      2- standard deviation      3- meduim
- 4- Coefficient correlation      5- t test      6- Alfa coefficient .

**Results:**

Table (11)

The significance of differences between the two before & after measurements averages of the experimental group students in the level of skill performance & the knowledge acquisition (studied in the research) N= 11

variables	Before measurement		After measurement		Differences between 2 averages	t
	M	S±	M	S±		
Arms’ movements	0.18	0.40	8.55	0.52	8.37	*40.34
Legs’ strikes	0.27	0.47	8.45	0.52	8.18	*36.90
Conformity between arms and legs	1.64	0.91	8.64	0.67	8.64	*19.59
Breathing	1.18	0.40	8.73	0.65	8.55	*31.28
Performance level of Breast stroke	0.18	0.40	9.09	0.54	9.09	*41.93
Knowledge acquisition	1.82	0.40	14.09	0.70	12.27	*48.13

P value at level 0.05 = 1.812

Table (11) shows that there are statistically significant differences between the two before & after measurements averages of the experimental group students in the level of skill performance (Breast stroke ) and the knowledge acquisition in favor of the after measurement average.

Table (12)

The significance of differences between the two before & after measurements averages of the control group students in the level of skill performance & the knowledge acquisition (studied in the research) N= 11

variables	Before measurement		After measurement		Differences between 2 averages	t
	M	S±	M	S±		
Arms' movements	0.09	0.30	5.82	0.75	5.73	*22.43
Legs' strikes	0.18	0.40	5.64	0.67	5.46	*22.13
Conformity between arms and legs	1.73	0.79	5.73	0.79	5.64	*11.32
Breathing	1.36	0.50	5.91	0.83	5.91	*14.85
Performance level of Breast stroke	0.09	0.30	6.55	0.52	6.46	*34.03
Knowledge acquisition	2.00	0.45	10.09	0.70	8.09	*30.74

P value at level 0.05 = 2.145

Table (12) shows that there are statistically significant differences between the two before & after measurements averages of the control group students in the level of skill performance (Breast stroke ) and the knowledge acquisition in favor of the after measurement average.

Table (13)

The significance of differences between the two after measurements averages between the two experimental & control groups in the level of skill performance & the knowledge acquisition (studied in the research) N1= N2 = 11

variables	Experimental group		Control group		Differences between 2 averages	t
	M	S±	M	S±		
Arms' movements	8.55	0.52	5.82	0.75	2.73	*9.46
Legs' strikes	8.45	0.52	5.64	0.67	2.81	*10.48
Conformity between arms and legs	8.64	0.67	5.73	0.79	2.91	*8.88
Breathing	8.73	0.65	5.91	0.83	2.82	*8.46
Performance level of Breast stroke	9.09	0.54	6.55	0.52	2.54	*10.71
Knowledge acquisition	14.09	0.70	10.09	0.70	4.00	*12.78

P value at level 0.05 = 1.720

Table (13) shows that there are statistically significant differences between the two after measurements of the experimental & control groups in the level of skill performance and the knowledge acquisition (studied in the research) and in favor of the experimental group.

### Discussion :

Through discussing table (11) results, it is clear that there are there are statistically significant differences between the two before & after measurements averages of the experimental group students in the level of skill performance (Breast stroke ) and the knowledge acquisition in favor of the after measurement average. The researcher attributes this result to using programmed

concept mapping in displaying the skilled scheduled for the students in the scholastic curriculum; as this kind of swimming is characterized by a degree of difficulty and accordance. Consequently, concept mapping resulted in removing these difficulties which students faced during their learning of the skills. Programmed concept mapping proved its great success in overcoming the learning difficulty, in addition to its ability to attract the students' attention through the way of skill display, the comfortable backgrounds for the eye, the movements, and the animations which programmed mapping included. Moreover, the continuous computer display of the skill video and it does not stop until it is order to do so. All of this helps to follow the movement path and make the female students understand the correct technical

performance of the skills which they learn. Consequently, the students became able to perform Breast stroke in a correct technical way, a high performance level and a splendid control of the body which had a great effect on the students' self-confidence and increased their feeling of understanding and comprehending of all the concepts related to the skill.

The researcher sees that there are statistically significant differences between the before & after measurements averages of the experimental group students and attributes this to the fact that the learning method using the programmed concept mapping which was applied on the experimental group students sees the learners as interactive persons, and its aim is to achieve their growth and maturity and to make them get the information without being boredom. Thus, their role will be interactive, positive and active in the educational process which increases their motivation to learning. Also students' use of computers and getting the information by themselves, make it hard to forget these information and easy to remember and retrieve it when it is needed. The programmed maps also made the student challenge himself and his colleagues in his ability to absorb all the information presented to him. All of this led to the development in the knowledge acquisition level of the experimental group students and the occurrence of the differences between the before & after measurements in favor of the after measurement.

Josef Nagi (2003) too assures this, quoting from Hussein Eltobgey (1978) that there is an important factor that must exist in the educational process which is the student's positive interaction with each educational situation he faces. As the student has a positive role in gaining the knowledge that differs from the positive role which is normally followed in the traditional learning technique.

Sead (2000) [20], Lamiaa Mohamed Ibrahim (2007)[11], Mostafa Mohamed Nasreldin (2208) [15], Ahmed Zaki Othman (2009) [1]and Emad Ahmed Abu Shabana (2010) [8].

The previous display shows that the first thesis is completely achieved.

The discussion of table (12) results shows that there are statistically significant differences between the two before & after measurements averages of the control group students in the skill performance level (Breast stroke ) and the knowledge acquisition in favor of the after measurement. The researcher attributes these differences to the practical practice from the control group students of Breast stroke , and their knowledge of the performance content which helped to form a clear image of understanding the performance knowhow. In the end, this

led to the effective performance which occurred these differences between the before & after measurements in favor of the after measurement. In this regard, Affaf Abdel Karim (1990) indicates that the basis of the traditional method is the direct relation between the teacher's direction and the learner's response, as the order from the teacher precedes each movement from the learner and each movement is performed according to the example which the teacher presents. Thus, the teacher makes all the decisions about the place, movement positions, the start, the timing, and the end of the period designated to learning and rest [9]. Hoda Darwish (1994) also sees that the degree of learner's skill performance depends on the teacher's ability to the good explanation of the skill performance regarding the correct position of all body parts during the learning process. [16]

The researcher attributes the existence of the statistically significant differences between the two before & after measurements averages of the control group students in the level of knowledge acquisition, to that the teacher in the traditional technique (oral explanation & practical example performance) presents more information about the law of Breast stroke . He also gives information about the common mistakes that may occur during performance, and also information about the technical analysis of Breast stroke studied in the research and its educational steps. Consequently, any information presented to the student will increase his knowledge acquisition and makes an improvement in the level of knowledge acquisition between the before & after measurements in favor of the after measurement.

Sead (2000) [20], Lamiaa Mohamed Ibrahim (2007)[11], Mostafa Mohamed Nasreldin (2208) [15], Ahmed Zaki Othman (2009) [1]and Emad Ahmed Abu Shabana (2010) [8].

The previous display shows that the second thesis is completely achieved.

Table (13) shows that there are statistically significant differences between the two after measurements of the two experimental and the control groups in the level of skill performance and knowledge acquisition (studied in the research), the differences were in favor of the experimental group in the level of skill performance and knowledge acquisition (studied in the research). The researcher attributes the reason of the experimental group superiority over the control group in the level of skill performance and knowledge acquisition (studied in the research) to using the programmed concept mapping in learning which are shown on the computer; as the researcher provided a room near the swimming pool to enable the student to return to the computer whenever he

needed that due to the difficulty of the swimming which they learn. Consequently, the student needs to see the correct performance if necessary, as the computer provides this through displaying Breast stroke continuously. This affords the student a great opportunity to absorb the consecutive stages of Breast stroke performance through the clear vision and the sufficient time during the skill display. The computer also enables the student to control, participate positively and interact with map's contents which resulted in the improvement of the performance level of the experimental group students of the scheduled swimming in the scholastic curriculum.

The researcher also attributes the reason of the experimental group superiority over the control group in the level of skill performance and knowledge acquisition (studied in the research) to that the method of the programmed concept mapping by using the computer which was applied on the experimental group allows the student to see an example of the movement skill through the computer which is characterized by the stable performance whatever how many time was it displayed. Thus, using the computer in learning plays a positive role in forming the proper image of the movement skill and imbeds it in the mind of the student. In addition to the space which the programmed concept mapping allows for the student to freely move inside the map and to link between the technical & the educational aspects etc. all of this led to the absorption, understanding and the easy retrieval of the correct performance of Breast stroke, and also to remove the confusion that may happen in the student's performance in front of the judging committee.

The researcher also attributes the superiority of the experimental group over the control group in the level of the knowledge acquisition to what the programmed map affords of huge quantity of information and conceptions necessary for this skill, besides the student's control of information display according to the speed of his understanding and consequently the student gets the sufficient time to understand and comprehend these information in an interesting manner without any boredom and fatigue. Moreover, the students answer the questions included in the programmed map and the map presents the immediate reinforcement to the student as soon as he answers these questions correctly, it also corrects his wrong answers which help to imbed to correct information and conceptions and consequently increases the rate of students' knowledge acquisition. whereas the traditional technique using the oral explanation and the practical example performance that was applied on the control group students, sees the learners as mere recipients of information; and have a passive role in the educational process which decreases their motivation to learn.

Sead (2000) [20], Lamiaa Mohamed Ibrahim (2007)[11], Mostafa Mohamed Nasreldin (2208) [15], Ahmed Zaki Othman (2009) [1]and Emad Ahmed Abu Shabana (2010) [8].

### Conclusions:

1. Programmed concept mapping positively affects the learning of Breast stroke and the knowledge acquisitions level of the experiment group's students.
2. The traditional technique (the oral explanation & the practical example performance) positively affects the learning of Breast stroke and the knowledge acquisitions level of the control group's students.
3. The programmed concept mapping was more effective and positive than the traditional technique on the learning of Breast stroke and knowledge acquisitions level which indicates its effectiveness.
4. Knowledge test prepared by the researcher has high honesty and persistence interactions and is appropriate for measuring the knowledge acquisitions level of the 3<sup>rd</sup> year students of Breast stroke that included (technical analysis of Breast stroke – common mistakes – law).

### Recommendations:

1. To use the programmed concept mapping in teaching swimming in the Physical Education faculties.
2. To pay attention to introducing new techniques to teaching the physical education curriculum in general and to swimming curriculum in particular.
3. To pay attention to train the teaching member staff and cooperative staff in the Physical Education Faculty on the way of using concept mapping in teaching the different scholastic curriculums.

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