

The Effectiveness of Using Mind Maps in Developing some Attention Aspects and the Level of Performance of the Archer

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Introduction and research problem:

Specialists are constantly seeking for developing performance in sports field generally and in the training domain particularly. So they have had a great burden to match with the update and development and they have to make more effort to be compatible with this development and to know what new in methods of learning.

Mind maps are considered as active learning strategies and means of strengthening the memory, retrieving information and generating creative unfamiliar ideas as they are working in the same steps as the human mind is thus helping activate, use brain hemorrhages and arrange information in a way that helps mind read and memorize information alternatively to think linearly and traditionally because it represents an alternative manner taking the individual from all directions and picking up his ideas from any corner. The mind map is the easiest method to store information in the brain and to extract the same from it; hence, it is an active means to draw ideas for developing skill and psychological characteristics (7: 3-6).

Therefore, mind maps are used as an educational means to connect concepts with each other. They stand upon the principle of integration and correlation among ideas and they motivate the ability to visualize and to imagine through a basic central image from which other basic branches connected to the basic image in the center and those branches take a form of curves as the mind prefers the natural organic structure rather than rigid straight forms (6: 143).

In 1960 Roger Sperry M. O. discovered that each of the right and left hemispheres had a special function and he won the Nobel Prize as he discovered that the brain hemispheres were similar in biological functions as each of them had a dynamic area and a union area but each of those hemispheres psychological functions completely different from the other hemisphere (4:20).

Nervous cells are connected with each other with a very complex network and they are interrelated with chemical and electronic codes. Modern science is still unable to know such interactions and communications in details (10: 97).

Cited from Abo Al-Naga Ibrahim a sort of researches and studies has been conducted on purpose to examine to what extent the use of mind maps has been effective in a number of different fields such as the study of Leaf (1988) and the study of Ackerman et al., (1999) resulted that mind maps could be considered as a technique increasing the remain of the effect of learning on the individual, enriching understanding, applying, creating and facing problems in the learner (1: 4).

Attention is considered as one of the important mental skills as it represents one of the basic requirements for good performance that is the core of the success of education or training process. Osama Rateb (2000) emphasized that practicing the control of attention concentration was one of the important psychological skills for the success of performance and achieving enjoyment so that the player could reach the optimal energy zone (3: 269).

The importance of the current research appears in that the archer has to review more than one point to get the best result that is to hit the center of the target with the arrow. He has to check in his stance, posture, holding the bow and fingers on the string, draw and load, anchor, aim and expand, free the arrow and follow-through and these processes will take less than 5sec. to 7sec.

As the sport of archery depends more on mind than a physical sport, it is important to know to what extent the use of mind maps is effective on developing the archer performance to approach the best results desired through improving and developing some aspects of attention affecting the archer performance represented by (intensity, stability and transformation) of attention.

From the foregoing and through the experience of one of the two researchers in the field of archery training who noticed that some young players were unable to gain motor skill and repeating movements related to weakness of ability to remember the skill shape, distraction and weakness of ability to concentrate, therefore, we should take new strategies that help develop thought and increase concentration away from dominant traditional methods in addition to the contribution of the neural linguistic programming mechanism as one of the most important applied behavioral researches with their several techniques containing the mind maps technique depending on mind hemispheric theory. Hence, the current research is trying to answer the following question:

To what extent the use of mind maps is effective in developing some attention aspects and the level of performance of the archer?

Research importance and its need for:

- Adoption of a scientific theory considering the study of integration between mind hemispheres in access to discover new abilities in the young athlete.
- An easy technique to remember information and data coming in some subject through remembering figures drawn in their minds.
- Using a new technique of drawing where the young athlete would illustrate his abilities and creativity that would help develop his skills.

Research objective:

The effectiveness of using mind maps in developing some attention aspects and the level of performance of archer.

Research hypotheses:

- 1- There are significant differences between means of scores of the pre and post-measurements of the experimental and control groups in favor of the post-measurement in all variables.**
- 2- There are significant differences between means of scores of the experimental and control groups in the post-measurements in all variables in favor of the experimental group.**

Research procedures:**Method:**

The two researchers used the experimental method of two groups representing the experimental and control groups and using the pre and post-measurements for each group.

Sample:

It was selected randomly from male young archers registered with the Egyptian Union for age from 11 to 13 years. It included (20) young archers enrolled with the union in 2016/2017 sports season divided into two equal groups representing the experimental and control groups. Moreover, (10) young archers were chosen from the outside the main research sample to compute scientific treatments of tests under investigation.

Tools of collecting data:

1- Test of attention aspects:

It is called Landolt Circles modified by Tchijov and localized by Mohamed Lotfy Taha to measure (attention intensity, stability and transformation) (11: 115). Attachment (1).

2- Skill tests:

Shooting test at a distance of 30 m. Attachment (2).

- Scientific treatments were computed that were reliability coefficient by using reliability of differentiation (significance of differences between the upper and lower quartiles) and stability coefficient by using applying and re-applying the test technique. Attachment (4).
- The ideal map was drawn by the two researchers to conduct evaluation on this base. Attachment (3).

Research executive steps:

The two researchers conducted the following steps for a month in (16) meetings as follows:

- (2) Meetings to identify the idea of the subject of the research.
- (2) Meetings to conduct pre-measurements of skills under investigation and to test some attention aspects.
- (2) Meetings to identify mind maps and their importance in general.
- (3) Meetings to learn mind maps scientifically.
- (3) Meetings to carry out mind maps on skills under investigation.
- (2) Meetings to evaluate what has been learnt and to carry out modifications required.
- (2) Meetings to carry out post-measurements of skills under investigation and to test some attention aspects. Attachment (4).

Statistical Treatments:

- 1- Descriptive statistics.
- 2- Spearman's correlation coefficient.
- 3- Mann Whitney significance of differences (U).
- 4- Wilcoxon significance of differences (Z).
- 5- Percentage of improvement (%).

Presentation and discussion of results:

(1)

Differences between the two groups in the pre-measurement in all research variables (n=20)

Skills	test	Groups	Ranks-x ⁻	Sum of ranks	U	Sig.
Shooting at a distance	30m	Experimental	10.50	105.0	48.0	.912
		Control	10.70	107.0		
Attention aspects	Attention Intensity	Experimental	11.20	112.0	43.0	.588
		Control	9.80	98.0		
	Attention stability	Experimental	12.0	120.0	35.0	0.254
		Control	9.0	90.0		
	Attention transformation	Control	11.20	112.0	43.0	.573
		Experimental	9.80	98.0		

*Significance < 0.05

Data in Table (1) show that there is no significance difference between the two groups in the pre-measurement for responses to the level of performance and attention aspects under investigation indicating that the two groups are equivalent.

Table (2)

Significance of differences between the pre and post-measurements and percentage of improvement in the two research groups in measuring some attention aspects (n=10)

Skills	Experimental group		Z	Sig.	Improve. %	Control group		Z	Sig.	Improve %
	Pre-x ⁻	Post-x ⁻				Pre-x ⁻	Post-x ⁻			
Attention intensity	0.109	0.264	2.8*	0.005	66.0	0.108	0.177	1.2	0.228	12.0
Attention stability	22.43	34.72	2.8*	0.005	54.7	22.23	24.43	1.6	0.109	9.8
Attention transformation	0.014	0.033	2.8*	0.005	135.7	0.013	0.022	1.02	0.143	69.2

Significance < 0.05

Data in Table (2) illustrate that there are significant differences between the pre and post-measurements in the experimental group in favor of the post-measurement in measuring attention aspects under investigation, whereas there is no significant difference in the control group. Percentages of improvement are varied in each group as the highest percentage of improvement is recorded in the experimental group in comparison with the control group.

Table (3)

Significance of differences between the pre and post-measurements and percentage of improvement in the two research groups in measuring the level of performance (n=10)

Skills	Experimental group		Z	Sig.	Improve. %	Control group		Z	Sig.	Improve %
	Pre-x ⁻	Post-x ⁻				Pre-x ⁻	Post-x ⁻			
Shooting	132.30	181.0	*2.8*	0.005	36.8	132.30	138.80	1.22	0.113	5.0

Significance < 0.05

Data in Table (3) show that there are significant differences between the pre and post-measurements in the experimental group in favor of the post-measurement in measuring the level of performance whereas there is no significant difference between the pre and post-measurements in the control group. Percentages of improvement are varied in each group as the highest percentage of improvement is recorded in the experimental group in comparison with the control group those are (36.8%) and (5.0%) in the same order.

The results of Tables (2&3) are in agreement that what are mind maps built on? As mind maps constitute a technique to represent knowledge by managing it in a networking scheme other than linear. Many researchers think that this technique is in consistency with the constructive theory in education emphasizing individuals build their understanding or new knowledge through the interaction between their previous knowledge and ideas and events they are going to learn. Biagah established an integrated theory on the cognitive growth that the knowledge process was laid in building or re-building the knowledge topic (Eppler, 2006).

Mind maps are consistent with the constructive theory that the learner designs the mind map depending on his previous knowledge and ideas stored in his cognitive structure. The study of Harkirat and Makrimi, (2010) indicated that individuals who have learned by using the strategy of educational maps in an educational constructive environment were significantly better than students who have learned traditionally and this was emphasized by Buzan and Buzan, (2006) who indicated that the use of mind maps improved the process of attainment.

The abovementioned tables illustrate that percentages of variation in the experimental group are higher than those in the control group and the two researchers attributed this concern to the use of the new technique by the experimental group helping form the cognitive structure of the individual in respect of its constituents and establishing relationships between them more easily than the traditional technique of learning. Hence, the validity of the 1st hypothesis stating, "There are significant differences between means of scores of the pre and post-measurements in the experimental and control groups in favor of the post-measurement in all variables" is partially emphasized.

Table (4)
Differences between the two research groups in the post-measurement in all research variables (n=10)

Skills	Tests	Groups	Rank-x ⁻	Sum of ranks	U	Sig.
Shooting at a distance	25m	Experimental	15.50	155.0	.000*	.000*
		Control	5.50	55.0		
Attention aspects	Attention intensity	Experimental	15.50	155.0	.000*	.000*
		Control	5.50	55.0		
	Attention stability	Experimental	15.50	155.0	.000*	.000*
		Control	5.50	55.0		
	Attention transformation	Experimental	15.50	155.0	.000*	.000*
		Control	5.50	55.0		

*Significance < 0.05

Data in Table (4) show that there are significant differences between the experimental and control groups in the post-measurement to measure the level of performance and attention aspects under investigation in favor of the experimental group. The two researchers attributed these differences to mind maps considered as an enjoyable and exciting technique

for the learner in developing his skills and getting him new concepts as it is a wonderful technique depending on drawing and replacing words with drawing in a concentrated and brief method to be remembered easily.

Also mind maps is considered as an active technique for concentration as it is working with the brain and it encourages it to create links among ideas. They are considered as visual representation of how the brain works aiming at connecting individual's new knowledge and his previous experience. They help him be integrated and construct concepts and place them in a reasonable framework contributing to develop his own skills. These have been emphasized by several studies stating that mind maps could increase the active role of the learning process that would increase self-confidence in individuals and would develop numerous skills as mind maps constitute a useful technique in proliferation and management of ideas and hence, they form positive trends towards the use of mind maps. Therefore, the validity of the 2nd hypothesis stating, "There are significant differences between means of scores of the experimental and control groups in the post-measurement in all variables in favor of the experimental group" is achieved.

Conclusions:

- 1- There are significant differences between the pre and post-measurements in the experimental group in the level of performance of the archer and in the measurement of some attention aspects in favor of the post-measurement.**
- 2- The highest percentage of improvement in all variables is recorded in the experimental group used mind maps as means of developing the performance.**
- 3- There are significant differences between the experimental and control groups in the level of performance and in measurement of some attention aspects in favor of the experimental group.**

Recommendations:

- 1- E-methods of mind maps should be used in developing attention and different mind skills in improving the effectiveness of physical performance.**
- 2- Training courses should be held for coaches on how to use mind maps practically and precisely.**

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