THE IMPACT OF USING SOME BRAIN-BASED LEARNING STRATEGIES ON COGNITIVE ACHIEVEMENT AND SOME BASIC SKILLS PERFORMANCE LEVEL FOR BOXING BEGINNERS

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Abstract - This research aimed at identify the effect of using some brain-based learning strategies on cognitive achievement and some basic skills performance level for boxing beginners. Eighty students participated in the main study selected from students of the first class at Faculty of Physical Education for Men, University of Benha. Proposed program using brain-based learning strategies applied implemented with experimental group for 8 weeks, 2 units/week. Tests m questionnaires and evaluation forms used as data collecting tools. Main results indicated availability of statistically significant differences between experimental and control group post measurements in cognitive achievement and some basic skills performance level for boxing beginners in favour of post measurement.

Keywords - brain-based, learning strategies, boxing.

I. INTRODUCTION

Brain-based learning theory is one of the educational trends in modern educational thought in America, and a learning approach based on current research in neuroscience. Brain imaging technology has provided neuroscientists with powerful new tools that help them look at brain's structure and function in humans, which contributed in resolving complex brain processes involved in language acquisition and reading. [1, p.11]

Some educational psychologists have tried to use this information to learn how brain naturally processes information to achieve learning, and define brain structure and functions in different growth stages. Brain hemispheres related studies results proofed that there is two different but integrated methods for processing information in human brain. Humans have single brain, consists of two hemispheres to process information in two different ways. The right brain hemisphere specializes in reconstruction and installation of parts to form an integrated, also identify relations between separate parts; it does not move linearly but works in parallel, while the left hemisphere is linear (step by step) and analyses the parts that form the patterns.[2, p.19] Brain-based learning theory has emphasized that every individual is capable of learning if he or she has an active learning environment that stimulates learners. Every person is born with a brain that processes information and ideas, but traditional learning often reduces the ability of the brain by inhibiting, punishment, ignoring and intimidation. [3] Gardner has used brain-imaging technology to identify multiple types of intelligence in brain different parts. He has identified seven intelligence types started with linguistic intelligence, and has recently added an eighth type the natural intelligence. He believes that every human brain has all the eight intelligences, but many are not developed or under development because of lack of experience. [4, p.169]

Curricula taught in light of brain-based learning theory using different strategies according brain hemispheres characteristics the brain. The right hemisphere has strategies differ from those of left hemisphere, and some teaching strategies used to stimulate both brain hemispheres. These strategies open new ways for investing both hemispheres, namely:cognitive acceleration strategy, brainstorming strategy, obstetric learning strategy, research-based learning strategy, reciprocal teaching strategy, e seven steps strategy, and Jigsawa strategy. Alsalty (2004) identified other strategies consistent with brain functioning principles, including dialogue and discussion strategy that is in line with the brainwork's social nature. [4, p.111-112] [5, p.241, 274]

In spite of the multiplicity and diversity of teaching methods and styles, Physical educators in different fields do not use modern teaching methods, but usually use explanation and model method. Failure to use modern teaching methods, which depends on learner positivity and development of learner personality aspects, laid to this study problem. Researcher believes that if skills taught using explanation and model style, educator task is not different from learners' task in keeping skill educational steps and perform it in front of learner. This led the researcher to use some brain-based learning strategies in learning boxing skills. This educational method advantages include stimulating students' motivation towards learning, raise memory and concentration level, help to summarize the material content in a fascinating and beautiful way. Also it help to use brain hemispheres to support learners' activities, develop their mental abilities on

both brain hemispheres by building educational programs and curricula based on brain-based learning. It also draw educators' attention to both brain hemispheres importance in educational process in general and boxing teaching in particular, and to take into account activating both brain hemispheres functions rather than focusing on left hemisphere and ignoring the right one. Hermann emphasized that students who learn through methods consistent with their brain dominant style achieve high results in both educational learning and achievement. The researcher – as far as he knows- did not find any study on "Effect of using some brain-based learning strategies on cognitive achievement and some basic skills performance level for boxing beginners. This research aimed at identify the effect of using some brain-based learning strategies on cognitive achievement and some basic skills performance level for boxing beginners.

Research hypnotised the following:

1- There are statistically significant differences between experimental group pre and post measurements in cognitive achievement and some basic skills performance level for boxing beginners in favour of experimental group.
2- There are statistically significant differences between experimental and control group post measurements in cognitive achievement and some basic skills performance level for boxing beginners in favour of post measurement

II. RESEARCH TERMS

Brain-based learning: It means the educational environment that allows brain to function as it normally does, and thus works very effectively. [6, p.3]

III. METHODS

Subjects

Eighty students participated in the main study selected from students of the first class at Faculty of Physical Education for Men, University of Benha in the academic year 2017/2018 (first semester). Non-Egyptians, absent, remaining, boxers playing in clubs students excluded. Table (1) demonstrate research population and sample distribution, table (2) results proof sample homogeneity in development and mental variables (skewness between ±3), and table (3) proofs insignificance of differences (T values is not significant at 0.05 level) between control group and experimental group in study variables before study implementation.

Measures

Apparatus

Restameter, Medical scale, Personal computer, and Video camera.

Tests, questionnaires and evaluation forms.

Questionnaire for enquiring experts' opinion about using percentage of multiple intelligences activities and program content.

Raven intelligence test (appendix 2)

Boxing cognitive test for first class (I. A. Ghoniem) [7] (appendix 6)

Skill performance evaluation form (by judges) (M.A. khalifa) [8] (appendix 4)

Proposed program using brain-based learning strategies (appendix 7).

The researcher prepared a proposed educational program using brain-based learning strategies to raise cognitive achievement level and improve basic skills performance level in boxing sport for first class students at Faculty of physical education. The researcher conducted a comprehensive survey of references, scientific research and previous studies related to research area, and then developed the program on the following bases

III. PROGRAM OBJECTIVE

Using brain-based learning strategies for first class students at Faculty of physical education, Benha University to raise cognitive achievement level and improve basic skills performance in boxing.

This overall objective divided into the following sub-objectives:

- Provide student with the cognitive, legal and technical stages aspects of boxing skills (under study).
- Students recognize their strengths and weaknesses while performing boxing skills (under study).
- Give students the ability to observe and think about proper skill performance.
- Provide students with experiences that enable them to interact with new educational situations.
- Give students sense of happiness, satisfaction and cooperation with each other.
- Raise interest and motivation for students to reach high level of performance.

Program development bases:

- Using teaching strategies that are consistent with brainwork nature.
- Students inclusion diverse learning activities for deeper understanding and feedback (multiple intelligence activities)
- Provide a real learning environment that makes learners experiment new things securely.
- Giving students a rest period (mental rest).
- Consider individual differences among students.
- Take into account that program components should be in accordance with objective achievement.

- Program should be appropriate for age stage to which it will apply.
- Provide opportunity for participation and practice for each student at same time.

All program units should contain basic training periods (warm-up, main part, and cool-down). (5) brain-based learning strategies selected according to relative importance as per experts' opinion (at least 80% relative importance selected) (see table 4). Table (5) indicates program timetable

1-

2-

Procedures

Pilot Study:

Conducted on (30) students from research community and not in main study devided into distinctive and indistinctive groups and aimed at:

Identify difficulties may face study implementation and find solutions for it.

Checking tests used validity and reliability (discriminant validity, and test retest validity used, see appendix 4).

Table (1): Research population and sample distribution

Total students recorded in 1st class	Excluded	Research society	Total sample	Pilot sample		Main study sample	
				Distinctive group	indistinctive group	Control group	Experimental group
600	100	500	110	15	15	40	40

Table (2); Research sample homogeneity (n=95)

Variables		Measurement unit	Mean	Median	SD	Skewness
Development variables	Age	Year	18.136	18.00	0.345	2.147
	Length	Cm	177.536	178.00	8.199	1.15-
	weight	Kg	70.536	70.00	7.837	0. 136
Mental ability	Intelligence	Mark	38.852	38.00	4.846	0.707

Table (3): Difference significance between experimental and control group in study variables pre-measurement ($n_1=n_2=40$)

Variables		Experimental group		Control group		Mean difference	T value
		Mean	SD	Mean	SD		
Skill performance level	Ready stance	2.075	0.656	1.950	0.552	0.125	0.921
	Footwork	2.225	0.659	2.100	0.590	0.125	0.893
	Left straight in head	5.450	0.932	5.250	0.898	0.200	0.976
	Left straight in trunk	5.200	0.723	5.075	0.615	0.300	0.832
	Right straight in head	5.375	0.667	5.300	0.686	0.075	0.495
	Right straight in trunk	5.675	0.764	5.500	0.877	0.175	0.952
	Left straight in head defenses	5.475	0.715	5.325	0.883	0.150	0.831
	Left straight in trunk defenses	3.675	0.828	3.550	0.875	0.125	0.656
	Right straight in head defenses	5.250	0.926	5.000	0.987	0.250	1.167
	Right straight in trunk defenses	3.625	0.774	3.400	0.810	0.225	1.262
	Double and triple punch groups	12.250	1.126	12.175	1.278	0.075	0.278
Cognitive achievement level		40.800	5.359	39.975	5.649	0.825	0.669

T significant at 0.05 = 1.991

Study implementation:

Pre-measurement

Students quickly taught skills under study for a week prior to pre-measurement. The researcher conducted the pre-measurement on October 8th and 9th 2017 for development variables, intelligence, Cognitive achievement scale, and skills performance evaluation by three members committee (appendix 5) using skill performance evaluation form.

Main experiment implementation:

Proposed program used with experimental group using multiple intelligence strategies and traditional method (explanation and model) used with control group in the period from October 10th 2017 to December 2nd 2017. Each group taught separately in Stadium of faculty of physical education for men, Benha University.

Post-measurement

Conducted on December 5th and 7th 2017 after completing program implementation using same

method and in same circumstances of pre-measurement for cognitive achievement scale, and skills performance evaluation. Data recorded to be statistically analysed.

RESULTS

Table (6) results reveal statistically significant differences between experimental group pre and post measurements in cognitive achievement and basic skills (under study) performance level in favour of experimental group. Table (7) results reveal statistically significant differences between experimental and control group post measurements in cognitive achievement and basic skills (under study) performance level in favour of post measurement.

Table (6): Differences significance between experimental group pre and post-measurements in cognitive achievement and skill performance level (n=40)

Variables		Pre-measurement		Post-measurement		Mean differences	T value
		Mean	SD	Mean	SD		
Basic skills	Ready stance	2.075	0.656	4.100	0.590	2.025	16.686*
	Footwork	2.225	0.659	4.475	0.506	2.250	20.124*
Attack skills	Left straight in head	5.450	0.932	8.100	0.777	2.650	13.851*
	Left straight in trunk	5.200	0.723	8.425	0.844	3.225	17.179*
	Right straight in head	5.375	0.667	8.925	0.572	3.550	27.551*
	Right straight in trunk	5.675	0.764	8.925	0.572	3.250	26.479*
Defense skills	Left straight in head defenses	5.475	0.715	8.750	0.869	3.275	16.988*
	Left straight in trunk defenses	3.675	0.828	6.225	0.479	2.550	15.559*
	Right straight in head defenses	5.250	0.926	8.875	0.463	3.625	22.817*
	Right straight in trunk defenses	3.625	0.774	6.375	0.490	2.750	19.353*
Double and triple punch groups		12.250	1.126	17.275	0.506	5.025	25.010*
Cognitive achievement level		40.800	5.359	48.950	5.878	8.150	5.782*

T significant at 0.05 level = 2.024

Table (7): Differences significance between experimental and control groups post-measurements in cognitive achievement and skill performance level (n_1=n_2=40)

Variables		Control group		Experimental group		Mean differences	T value
		Mean	SD	Mean	SD		
Basic skills	Ready stance	2.800	0.405	4.100	0.590	1.300	11.481*
	Footwork	2.925	0.266	4.475	0.506	1.550	17.145*
Attack skills	Left straight in head	6.325	0.474	8.100	0.777	1.775	12.321*
	Left straight in trunk	6.025	0.530	8.425	0.844	2.400	15.227*
	Right straight in head	6.975	0.357	8.925	0.572	1.950	18.281*
	Right straight in trunk	6.925	0.416	8.925	0.572	2.000	17.866*
Defense skills	Left straight in head defenses	6.800	0.405	8.750	0.869	1.950	12.854*
	Left straight in trunk defenses	5.075	0.615	6.225	0.479	1.150	9.320*
	Right straight in head defenses	6.425	0.501	8.875	0.463	2.450	22.713*
	Right straight in trunk defenses	5.075	0.266	6.375	0.490	1.300	14.730*
Double and triple punch groups		14.775	0.423	17.275	0.506	2.500	23.983*
Cognitive achievement level		43.375	3.506	48.950	5.878	5.575	5.151*

T significant at 0.05 level = 1.991

DISCUSSION

In light of results, objectives, procedures, and sample selected, the researcher discussed and interpreted results to verify research hypotheses in the following:

Table (6), (7) results indicate that brain-based learning strategies used in the proposed program have contributed to improvement of students' cognitive achievement and skill performance level. These strategies provided an opportunity to stimulate mind, attract attention, active interaction and experiences exchange among students. This means that experimental group exceeded control group because of using brain-based learning strategies that characterized by diversity and innovation in learning process rather than the traditional method, which require great effort to communicate information to student and verbalizing it, students' role is only to listen and listen most of the time.

The researcher returns these results to teaching methods he relied on, which works to stimulate learner's activity and vitality and increase motivation for motor activity. It also give learning situation the happy emotional tone. Also researcher return these results to using brain-based learning strategies appropriate to research nature, which contributed to improving cognitive achievement and skill performance level.

This is consistent with what funderstanding points out that brain-based learning theory has emphasized that each individual is capable of learning if he or she has an active learning environment that stimulates learners. Each person is born with a brain that processes information and ideas, but traditional learning often reduces the ability of learners. Brain by inhibiting, ignoring, or punishing and intimidating. [3]

This is also in line with several study results including Th. Obidat (2003), E. Afana, and Y. Elgeesh (2011), F.M. Said (2011), S. A. Ibrahim (2011), and S. M. Abuzaid (2011), which indicated that brain-based learning is based on set of principles. These principles constitute the first building block in learning to be understood as its true meaning and effectiveness of a proposed program based on brain-based learning theory in development of certain skills. [9], [5]. [10], [11], [12].

This is also consistent with what mentioned by H. Gardner and confirmed by study results of A. Z. Alahdal (2009), M. A. Said (2011), **Y.** M. Mohammad (2012), G. A. Alshamy, A. M. Noubi, & M. S. Alhamd (2013), H. Gardner (2013) and M. A. Said (2018) that Teaching activities and strategies based on brain-based learning theory and multiple intelligence are effective in improving students cognitive achievements and performance. [13], [14], [15], [16], [17], [18].

CONCLUSIONS

Based on research results and in statistical processing and limited by study sample and objectives, it was possible to conclude the following

1- There are statistically significant differences between experimental group pre and post measurements in cognitive achievement and some basic skills performance level for boxing beginners in favour of experimental group.
2- There are statistically significant differences between experimental and control group post measurements in cognitive achievement and some basic skills performance level for boxing beginners in favour of post measurement.

RECOMMENDATIONS

In light of study results and conclusions, researcher recommends the following:

1- Using brain-based learning strategies in program designed for students at Faculty of Physical Education where it helps to raise cognitive achievement and skill performance level in early stages of learning and to reduce learning period, and work to raise their motivation to perform better.
2- Design and use brain-based learning strategies that are appropriate for different age stages and cover all boxing skills, either defensive or attack.
3- There is necessity to held courses to develop faculty staff members and their assistants to use brain-based learning strategies to keep pace with modern development in teaching and learning process.
4- There is necessity to held courses for trainers and teachers on designing and using brain-based learning strategies in all sport activities to keep pace with modern development in teaching and learning process
5- Conducting more studies on different teaching methods to identify its effects and benefit from its results in boxing and other sports as well as on various age stages

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