Effectiveness of Teaching Strategies According to the Multiple Intelligences on the Performance Level of Some Basic Skills and the Cognitive Load for Beginners in Karate

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Abstract: This research aims to investigate the effectiveness of teaching strategies according to the multiple intelligences on the performance level of some basic skills and cognitive load for beginners in karate.Subjects were 20 undergraduate students from Faculty of Physical Education, Port-Said University, Egypt and were divided into 2 equal groups (experimental and control), the experimental group taught by the teaching strategies program. For the analysis of the data, the researcher used the package program SPSS. The teaching strategies program based on multiple intelligences lead to improvements in level of some basic skills and cognitive load.

Key words: Karate % Kumite % Teaching strategies % Multiple intelligences %Cognitive load

INTRODUCTION

The progress and the development of nations have become evaluated upon the criteria of its adoption of the modern scientific methods in bringing up children providing them with types of knowledge and thinking that help them to be adaptive and harmonious with this era. This has distinguished the educational system with quality as there has been more concentration on developing the mental capabilities of the learners as much as it can accomplished. It should be stressed, in this regard that, this kind of educational system is concerned with enlightening minds and providing care so as to cope with the aspirations of the society and guarantees the full use of all the modern trends of bringing up whether such trends related with a scientific theory or technical applications.

The theory of the multiple intelligences (M I) of Gardener is regarded as one of the theories that keeps pace with capabilities and concerns of the learners on one hand and with the great volume of the knowledge fields and how they are dealt with on the other hand. Gardener has refused the idea of differentiating intelligence relying only on a unitary quality of mind energy arguing that there are a wide range of cognitive abilities to some extend owned by each individual. This is in addition to the fact that intelligence consists of a set of skills and biological and psychological capabilities that could be exploited and activated in different situations to solve problems or innovate valuable findings [1, 2].

The theory of the cognitive load of Stiller is also one of the important and effective theories concerned with education based on using different teaching strategies stressing on the role of the working memory in education and the issue of the fullness of the memory. It is worth mentioning here that it is the perceptional operations, executed in the working memory, that decides the effectiveness of the teaching and teaching process, as The more the educational process accomplished with no trouble the more the learner can build mental representation and adequate storage in the long-term working memory. Furthermore, the long-term working memory plays a particular role in the process of teaching and the perceptional operations such as thinking, solving problems and exploiting the working memory [3].

Since Karate is one of the subjects assessed in the Faculty of Physical Education in Port Said, which is taught by traditional methods, the researcher has found this research as an attempt to integrate the theories relevant with teaching in the educational programs and to evaluate their effectiveness based on the bringing up trends that recommend the need to follow multiple educational alternatives fitting with the mental capabilities of each Individual.

This research aims to get acquainted with the effectiveness of teaching strategies according to the multiple intelligences on the performance level of some of the basic skills and on the cognitive load for beginners in the sport of Karate.

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Table 1: The statistical significant differences of Mann-Whitney test between the pre-measurement for the control group and the pre-measurement for the experimental group concerning the variables (age- length – weight- the intelligence level-the physical capabilities) in question, n1=n2=10

	Variables	The Control Group		The Experimental group		The Value (z) calculated in Mann-Whitney test	The statistically significant level	The Significance
		The Grade Average	The total Grades	The Grade Average	The total Grades			
1	Age	9.75	97.50	11.25	112.5	42.50	0.58	Insignificant
2	Length	11.10	111	9.90	99	44	0.68	Insignificant
3	weight	8.60	86	12.40	124	31.5	0.17	Insignificant
4	the intelligence level	10.30	103	10.70	107	48	0.91	Insignificant
5	the physical capabilities	10.25	102	10.75	107.5	47.5	0.85	Insignificant

The (Z) indexed in the significance level 0. 05 =23

Table 2: The percentage for each intelligence listed in the multiple intelligence of the experimental group individuals

The Intelligences	Individual Number	The percentage
Linguistic intelligence	9	90%
Logical-mathematical Intelligence	7	70%
Musical intelligence	6	60%
Spatial intelligence	8	80%
Bodily-kinaesthetic Intelligence	9	90%
Intrapersonal intelligence	6	60%
Interpersonal intelligence	8	80%

The Two Hypothesis's of the Research:

C There are statistical significant differences between the mean measurement between the experimental and control groups on performance level of some basic skills for beginners in Karate in favor of the experimental group.

C There are statistical significant differences between the second mean measurement between the experimental and control groups on the cognitive load in favor of the experimental group.

MATERIALS AND METHODS

The sample was selected from the first year students of the Faculty of Physical Education, Port-Said University, Egypt for the academic year 2010/2011 and they have been divided into two groups, one experimental group and the other is a control group, each consists of 10 students.

C The control group is to apply the traditional educational program (Explanation and Model) for 6 weeks scheduled according to two educational sessions per week.

C The experimental group is to apply the educational program based on the teaching strategies that depend on the multiple intelligences for 6 weeks scheduled according to two educational sessions per week using one of the following educational methods:

C Reciprocal Teaching (Social Intelligence)
C The Explanation (Linguistic intelligence)
C The Model (visual intelligence)
C Cognitive map (Dynamic spatial intelligence)
C Bodily-Kinaesthetic exercises (Kinematic intelligence)

The Equalization of the Two Groups of the Research Tools: The pre-measurement: the physical capabilities before the experiment starts.

The First Post Measurement: The basic skills in question after the experiments end.

The Second Post Measurement: The basic skills in question after month from finishing the grade to specify the quarter of the cognitive load.

The researcher has applied the multiple intelligence list on the experimental group.

Table 2 indicates that the linguistic, spatial, bodily-kinesthetic and interpersonal intelligences had the higher values.

Determining the Basic Skills for the Beginners: The researcher has determined the basic skills for the beginners in Karate through a questionnaire form which he himself has prepared [4] and has specified the following skills:

A. The Defensive Skills:

C   Downward block-Gedan-bari
C   Upper block- Age-uke.
C   Outside inward block. Soto-Uke
C   Inside outward block. Uchi-uke
C   Sword hand block. Shoto-Uke.

B. The Basic Skills of Attacking:

C   unge punch. Oi-Zuki
C   Front kick. Mae-geri
C   Roundhouse kick. Mawashi-geri
C   Side kick. Yoko-geri.

RESULTS AND DISCUSSION

Table 3 reveals that there are statistical significant differences between the measurements averages for both the experimental and control groups concerning the performance of the basic skill in favor of the experimental group.

The researcher views this difference is due to the teaching strategies that have been designed according to the multiple intelligences theory. These strategies were maintained to suit the level of the mental capabilities of the learners and considered their tendencies, needs and the individual differences. This is in addition to the plenty of the teaching methods and variations, which is marked by the variety of the opportunity structure to correct the track of the movement performance of each learner individually and saving the possible time for the actual application and feeding variety. This matches with what is referred to by Shearer [5] who states that applying the multiple intelligences theory led students to increase their capacity to memorize information and be realistic and enthusiastic towards education and developing their academic skills.

This comes also in consistent with Haley 's view [6] as it refers to the fact that reliance on the multiple intelligences theory in forming the main feature for the teaching strategies and alternatives for correction has led increase to the students' capacity to memorize information. This also was supported by the studies of Serdar and Yel [7], Abdul-Malik [8] and Saleh [9]. Hence, the first research hypothesis is accomplished.

Also, it is revealed from Table 4 that there is no statistically differences between the first post-measurement and second post-measurement for the individuals of the experimental group. The researcher views this due to the fact that reliance on the educational strategies based on the multiple intelligences theory has created educational environment through involving the students' senses, stirring their motivations towards education and helping them to follow the scientific organized thinking with considering the individual differences. This all led them to have proper understanding of facts, knowledge and performance relevant with the skill performance level. This is matching with Stiller's view in the cognitive load theory. This theory states that utilizing the education strategies based on the multiple intelligences has availed finding a strong cognitive base in the long –term memory that assists managing the working memory and expanding its capacity through raising the quality of the information processing.

Moreover, it is indicated form Table 5 that there is an existence of statistical differences between the first post-measurement and second post-measurement for the individuals of the control group concerning the skill variables in question and in favor of the first post-measurement. The researcher views that all the defensive skills, which have been taught and trained in the beginning of the program, have been repeated to correct the performance mistakes many times during the program. This is due to the fact that such repetition of the defensive skills is the basis upon which the skilful performance is built. This is just as Stiller argues, in this regard, saying that the procedures of the correcting mistakes and the continuous feedback for long times (6 weeks program), has assisted to create a strong cognitive base in the long-term memory in opposition with the unrepeated skills.

Furthermore, Table 6 indicates superiority of the improving percentage of decrease in performance in favor of the experimental group in the second post-measurement for the skill variables in question. The researcher argues that saying that this is due to the teaching strategies have been relying on the multiple intelligences and this led to pursue the effective and significant education helping students to adapt a positive role in assuming the education responsibility through activities based on the multiple intelligences.It is worth mentioning here that these types of activities stimulate the mind pushing the students so as to have effective and smart students capable to solving problems. This is in addition to what Stiller mentioned that finding a strong cognitive base in the long-term memory and

Table 3: The statistical significant differences of Mann-Whitney test between the First Post -measurement for control group and the First Post -measurement for the experimental group in the skill variables in question, n=10

TheSkill Type		The skill Variables	The Control Group		The Experimental group		The Value (z) calculated in Mann-Whitney test	The statistically significant level	The Significance
			The Grade Average	The total Grades	The Grade Average	The total Grades			
Defensive skills	1	Gedan-bari	7.2	72	13.80	138	17	0.01	insignificant
	2	Age-uke	6.35	63.5	14.65	146.5	8.5	0	insignificant
	3	Soto-uke	5.9	59	15.10	151	4	0	insignificant
	4	Ichi-Uke	5.8	58	15.2	152	3	0	insignificant
	5	Shoto-Uke	5.5	55	15.5	155	0	0	insignificant
Attacking Skills	6	Oi-Zuki	5.65	56.5	15.35	153.5	1.5	0	insignificant
	7	Mae-geri	7.4	74	13.60	136	19	0.02	insignificant
	8	Mawashi-geri	6.95	69.5	14.05	140.5	14.5	0.01	insignificant
	9	Yoko-geri	5.6	56	15.40	154	1	0	insignificant

The (Z) indexed in the significance level 0. 05 =23

Table 4: The statistical significant differences of the Wilcoxon Test between the first post -measurement and the second post-measurement for the control group in the skill variables in question, n=10

The Skill Type		The skill Variables	The Number		The Total Grades		Grades Average		The Value(z) calculated from the Wilcoxon Test	The statistically significant level	The Significance
			+	-	+	-	+	-			
Defensive skills	1	Gedan-bari	4	3	18	10	4.5	3.33	0.69 -	0.49	*
	2	Age-uke	6	0	21	0	3.5	0	2.25 -	0.2	*
	3	Soto-uke	5	1	18	3	3.6	3	1.67 -	0.9	*
	4	Ichi-Uke	6	2	27.5	8.5	4.58	4.25	1.35 -	0.18	*
	5	Shoto-Uke.	7	1	29.5	6.5	4.21	6.5	1.65 -	0.10	*
Attacking Skills	6	Oi-Zuki	4	0	10	0	2.5	0	1.84 -	0.07	*
	7	Mae-geri	7	2	40	5	5.71	2.5	2.11 -	0.03	*
	8	Mawashi-geri	8	0	36	0	4.5	0	2.60 -	0.01	*
	9	Yoko-geri	7	1	33.5	2.5	4.79	2.5	2.20 -	0.02	*

The value indexed (z) in the significance level 0.05 =8   *significant

Table 5: The statistical significant differences of the Wilcoxon Test between the first post -measurement and the second post-measurement for the experimental group in the skill variables in question, n=10

The Skill Type		The skill Variables	The Number		The Total Grades		Grades Average		The Value(z) calculated from the Wilcoxon Test	The statistically significant level	The Significance
			+	-	+	-	+	-			
Defensive skills	1	Gedan-bari	4	3	18	10	4.5	3.33	0.69 -	0.49	*
	2	Age-uke	6	0	21	0	3.5	0	2.25 -	0.2	*
	3	Soto-uke	5	1	18	3	3.6	3	1.67 -	0.9	*
	4	Ichi-Uke	6	2	27.5	8.5	4.58	4.25	1.35 -	0.18	*
	5	Shoto-Uke.	7	1	29.5	6.5	4.21	6.5	1.65 -	0.10	*
Attacking Skills	6	Oi-Zuki	4	0	10	0	2.5	0	1.84 -	0.07	-
	7	Mae-geri	7	2	40	5	5.71	2.5	2.11 -	0.03	-
	8	Mawashi-geri	8	0	36	0	4.5	0	2.60 -	0.01	-
	9	Yoko-geri	7	1	33.5	2.5	4.79	2.5	2.20 -	0.02	-

The value indexed (z) in the significance level 0.05 =8

*significant, - insignificant

Table 6: The statistical significant differences of the Wilcoxon Test between the first post -measurement and the second post-measurement for the control group in the skill variables in question, n=10

The Skill Type	The Skill Variables	The Control Group		Percentage of Decrease in performance level	The Experimental group		Percentage of Decrease in erformance level
		post	second post		post	second post	
Defensive skills	Gedan-bari	7.9	6.8	16.18	8.1	7.1	14.08
	Age-uke	8.3	7	18.57	8.4	7.5	12
	Soto-uke	8.2	7.1	15.49	8.1	7.4	9.64
	Ichi-Uke	8	6.9	15.94	8.6	7.8	10.26
	Shoto-Uke	8.1	6.8	19.12	8.8	7.7	14.29
Attacking Skills	Oi-Zuki	8.15	6.9	18.11	8.5	7.1	19.72
	Mae-geri	7.9	6.5	21.54	8.2	7	17.14
	Mawashi-geri	8.1	6.4	26.56	8.7	7.3	19.18
	Yoko-geri	7.8	6.2	25.8	8.5	7.4	14.86

consequently managing the working memory and expanding its capacity through raising the information quality. This led to have the students maintained their skill performance level for 4 weeks despite stopping both any teaching or teaching process and conducting the second post measurement. This matches the findings of Rakh [10] and Hussen [11], hence the second hypothesis is accomplished.

CONCLUSION

Within the limits, the goals, the hypotheses, the used data and the results, the researcher deducted what follows:

C   The superiority of the individuals of the experimental group that used the education program based on the multiple intelligences rather than the individuals of the control group that the traditional method (explanation andmodel) in the basic performance level in question.

C   The same previously mentioned is applicable to the cognitive load.

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