The effect of Electronic Games on Some Physical, Psychological, and Cognitive Aspects For Preschool Children

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Introduction:

Motor activities are considered the most successful educational programs in achieving integrated growth for children in all aspects. Through movement, the child starts to recognize and explore the surrounding world. This natural tendency for movement makes the child learn through movement which is considered a functional introduction to the world of childhood and an effective educational facilitator in developing cognitive, social, and psychological growth for children in their childhood years. Most theories of psychology have agreed that this is the most important period in children growth. (45: 6)

Presumably, in this stage, the child will get what his need of physical activity through the activities of motor education at kindergarten and through daily life activities. Scientific recommendations, issued by scientific organizations interested in children's health and physical activity, indicates the necessity to practice the least physical activity in order to get the required health benefits at kindergarten stage on the basis of two hours a day, provided that one half that time should be for the physical activity through methodical programs, and the second half should be in the form of free motor playing. Physical idleness periods should not exceed two consequent hours a day (535:16).

Despite these recommendations, children generally do not spend enough time in practicing the physical activity that reinforces their health and proper growth. In a study conducted on the level of physical activity for kindergarten children in Jeddah City in Kingdom of Saudi Arabia, it has been found that the level of physical activity is

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low according to three days of continuous monitor using devices for measuring steps. The average number of steps for boys is (7814, 1) step/ day and for girls (5954,3) step/ day. It is a low level of physical activity in this age (11: 3).

Health and physical education experts ascribe this state of physical idleness for children to the reason that they spend long hours playing electronic games which have been recently spread widely, have been brought to most houses, and have been the obsession of children nowadays at the expense of motor games which they always used to practice. Therefore, electronic games have prevailed, imposed themselves, and occupied children's minds and interests (245: 17), (371: 19).

This wide spread of electronic games and increase of hours that children spend in practicing them have made these games enter the educational field powerfully. Several studies have been conducted and emphasized that electronic games have many positive impacts (19: 106), but the extensive use of them for long hours a day lead to health and physical problems such as obesity, osteoporosis, spinal deformities, pain in the hands, and poor motor and fitness (23 : 14), (45 : 15).

Educationalists have recognized the danger of this on children's health; therefore, trends, which call for the necessity of benefitting from the environment of joy and excitement accompanying the practice of electronic games, have increased with the necessity to add a motor element to them through which health risks resulting from the physical idleness accompanying them can be avoided. Hence, the concept of active electronic games has come to existence; these games make children interact dynamically with the game and engage all parts of their bodies while playing as a prerequisite to control the game. At the same time, children will enjoy the excitement and joy accompanying traditional electronic games; this makes them an ideal tool to cure the low levels of physical activity levels. Active electronic games can be an alternative of physical activity. In these games, children are encouraged to move through a motor task

such as walking or running in place with rapid steps, jumping, throwing, balancing, moving the arms, etc. At the same time, they participate in the activity which is enjoyable for them, and the game ends when the activity stops (23: 14).

At the outset of videogames era, videogames were defined as interactive games. A player can interact with these games; however, it has clearly appeared that the concept of interactive game has not really been comprehensive. This definition has only been an unabsolute one that is limited to what can be achieved from points inside the television screen where playing takes place. Classically, the real player (human being) uses their mind and fingers only for movement and activation of events and games; these have not been considered as real interactive games. However, motor games or physical activity games have recently appeared to present the real vision of the concept of interaction between videogames and human player. Recently, American Microsoft Corporation has introduced the new game device XBOX360. This product is considered as a revolution in the field of interactive motor games based on wireless connection systems; the device has been connected directly to the television screen by an audiovisual cable, and it is electronically powered. The device depends on infrared sensors. The device presents a unique motor playing experience; in bowling, for example, it is possible to waive the ball in order to imitate the speed of throwing the ball and its direction on the screen; the same applies to baseball and tennis (23 : 14).

In short, active electronic games are games that require the real player to exert a either great or slight muscular effort such as running, rotating, or using body limbs such as hands or legs as a prerequisite of continuing the game. This type of games mixes the joy of traditional electronic games and benefit of motor games to create a kind of complete interactive amusement (372: 19). Such quality of electronic games is considered a revolution in the field of motor games which began few years earlier to spread across home market powerfully.

As a result, the researcher has reviewed some foreign studies and research that stressed the idea of deploying active electronic games in physical education programs for children such as the study of M. Papastergion (2009) (11) which reports that active electronic games reinforce fitness, motor skills, and motivation to learn. The study of C. Donovan et al (2012) (5) which emphasizes that practicing active electronic games improves heart rate, oxygen consumption, and increase of calories consumed. The study of M. Quinn (2013) (14) reports that participating in active electronic games generates energy levels that correspond to the rates required for the physical activity. The findings of the study of Pohira Vieth have resulted in the effectiveness of videogames in improving fitness and increasing activity and energy among students. The findings of the study of Julie D. Jaime (2011) (7) have resulted in the effectiveness of videogames in improving fitness, increasing students' self-confidence, and improving scientific and social efficiency. The findings of the study of Williams (2010) (20) have resulted in the effectiveness of videogames in improving fitness among students.

Despite the positive results emphasized by foreign research and studies with regard to the feasibility of active electronic games in developing motor skills, positive motor behavior, and what is related to them of cognitive, emotional, and social development. However, this topic has not been searched experimentally in Arab communities till now. Through reviewing Arab research and studies in the sport field, the researcher, to their knowledge, have not touched on such a kind of studies which can contribute greatly to cure low levels of physical activity for children and the resulting health, psychological, and social risks.

Thus, linking electronic games with motor activity leads to introducing motor activity to children in this stage so excitingly and interestingly that they interact with the content of this activity in a lovable way. This will lead to achieve the objectives of teaching motor education for children perfectly. This has

interested the researcher in conducting this research trying answering the question of ,How to recognize the influence of using active electronic games on some physical, psychological, and cognitive aspects for preschool children (5 – 6 years)?

Objectives of the Research:

This research aims to know the influence of using active electronic games with preschool children on:

1- Some physical abilities (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance).

2- Self-concept.

3- Level of academic attainment in motor education.

Differences of the Research:

1- There are significant differences between the averages of pre- and post-measurements of the experimental group in the physical abilities in question for preschool children for the post-measurement average.

2- There are significant differences between the averages of pre- and post-measurements of the control group in the physical abilities in question for preschool children for the post-measurement averages.

3- There are no significant differences between the averages of post-measurements of the experimental and control groups in the physical abilities in question for preschool children.

4 -There are significant differences between the averages of pre- and post-measurements of the experimental group in the social behavior in question for preschool children for the post-measurement average.

5- There are significant differences between the averages of pre- and post-measurements of the control group in the social behavior in question for preschool children for the post-measurement average.

6- There are no significant differences between the averages of post-measurements of the experimental and control groups in the social behavior in question for preschool children.

7- There are significant differences between the averages of pre- and post-measurements of the experimental group in the academic attainment of motor education for preschool

children for the post-measurement average.

8- There are significant differences between the averages of pre- and post-measurements of the control group in the academic attainment of motor education for preschool children for the post-measurement average.

9- There are no significant differences between the averages of post-measurements of the experimental and control groups in the academic attainment of motor education for preschool children.

Terms Used in the Research

1- Electronic Games

"They are a type of games that appear on the screen of the video, computer, or television which the child enjoys playing. It is accompanied with a state of tension, disorder, expectation, and joy in which the child lives. This game is played by one child or more; it has a specific goal, and at the end, there one may win or lose" (189: 18).

2- Active Electronic Games

"They are a type of modern electronic games that require the child to interact dynamically with it as a condition to continue the game. The game stops when the child's activity stops" (604: 11).

3- Motor Education

"They are child-oriented motor activities and take the basic motor skills as their content and the comprehensive growth as their goal" (23: 2).

Procedures of the Research

First: Approach of the Research:

The researcher has used the experimental approach using two groups: experimental and control by adopting the pre- and post-measurement for both groups.

Second: Sample of the Research:

It is a sample comprising (36) boys and girls from al-Shafi Kindergarten and School in Taif City in Kingdom of Saudi Arabia during the second semester of the academic year 2014/2015. Their ages range between (4 – 5 years). The number of the individuals of basic research sample amounts to (16) children, and the number of the individuals of explorative study sample amounts to (20) boys and girls. The basic research sample has been divided as follows:

- **Experimental group:** It consists of (8) children half of

them are boys and the second half is girls. The program of active electronic games has been applied on them.

- Control group: It consists of (8) children half of them are boys and the second half is girls. The program of traditional motor activity has been applied on them inside the kindergarten.

Twenty boys and girls have been deployed (10 boys and 10 girls) in order to represent the explorative study sample for scientific moduli (validity – stability) of tests used in the research and to experiment the program of active electronic games.

The researcher has found the homogeneity of the individuals of research sample (basic and explorative) to make sure that they fall under the normal curve in the following variables:

1- Growth and intelligence variable (age, height, weight); this is illustrated in Table (1).

2- Physical abilities in question (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance) self-concept, and academic attainment of motor education; this is illustrated in Table (2).

Table (1)

Statistical Representation of Individuals of Research Sample (Basic, Explorative) in the variables of "Age, Height, Weight, Intelligence" N = 36

Unit of Measurement	Average	Median	Normal Curve	Torsion Modulus	Flattening Modulus
Month	52.944	53.0	1.881	0.089-	0.133
Centimeter	91.556	93.5	13.321	0.438-	1.408-
Kilogram	18.528	18.0	1.934	0.818	0.772-
Degree	80.861	74.0	15.991	1.287	1.068-

From Table (1), it is evident that torsion moduli range between (0.438- : 1.287), i.e. it is limited to (3±); this indicates the homogeneity of the individuals of research sample (basic and explorative) in the variables of "age, height, weight, and intelligence".

Table (2)

Statistical Representation of Individuals of Research Sample (Basic, Explorative) in physical abilities in question, self-concept, And academic attainment N = 36

Unit of Measurement	Average	Median	Normal Curve	Torsion Modulus	Flattening Modulus
Second	8.428	8.4	2.351	0.010	7.395
Centimeter	47.778	45.0	10.991	0.758	0.850-
Meter	4.988	4.9	1.280	0.113	0.880-
Second	5.047	4.7	1.519	0.646	1.007-
Degree	18.639	19.0	9.607	0.113-	1.114-
Degree	4.361	4.0	2.270	0.477	0.394-

From Table (2), it is evident that torsion moduli range between (0.758: 0.113-), i.e. it is limited to (3±); this indicates the homogeneity of the individuals of research sample (basic and explorative) in the physical abilities in question, self-concept, and academic attainment of motor education. Bothe the researchers have found the parity of the individuals of both groups of research in the following variables:

1- Growth and intelligence variable (age, height, weight); this is illustrated in Table (3).

2- Physical abilities in question (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance) self-concept, and academic attainment of motor education; this is illustrated in Table (4) and Table (5).

Table (3)

The Significant Differences between Research Groups (Experimental and control) in the Variables of "Age, Height, Weight, Intelligence" N1 = N2 = 8

Variables	Unit of Measurement	Experimental Group		Control Group		Difference between both Averages	"T" Values
		Mean	S. Deviation	Mean	S. Deviation		
Age	Month	52.750	2.252	52.875	1.808	0.125-	0.162
Height	Centimeter	91.625	14.422	91.250	14.180	0.375	0.069
Weight	Kilogram	18.375	1.923	18.625	2.134	0.250-	0.326
Intelligence	Degree	81.500	16.388	81.625	16.552	0.125-	0.020

"T" table value at function level (0.05) = 2.145

From Table (3), it is evident that there are no significant differences between research groups (experimental and control) in the measurements of "age, height, weight, and intelligence"; this indicate that both groups are equivalent in those variables.

Table (4)

The Significant Differences between Research Groups (Experimental and control) in the Physical Abilities in Question N1 = N2 = 8

Variables	Unit of Measurement	Experimental Group		Control Group		Difference between both Averages	"T" Values
		Mean	S. Deviation	Mean	S. Deviation		
Speed	second	9.244	3.092	8.369	1.088	0.875	0.999
Muscular ability of legs	Centimeter	45.750	11.081	46.750	10.754	1.000-	0.242
Muscular ability of legs	Meter	4.765	1.439	4.641	1.061	0.124	0.259
0.205	0.125	1.792	4.579	1.413	4.704	Second	Stable balance

"T" table value at function level (0.05) = 2.145

From Table (4), it is evident that there are no significant differences between research groups (experimental and control) in the physical abilities; this indicate that both groups are equivalent in those variables.

Table (5)

The Significant Differences between Research Groups (Experimental and control) in the self-Concept and Academic Attainment N1 = N2 = 8

"T" Values	Difference between both Averages	Control Group		Experimental Group		Unit of Measurement	Variables
		S. Deviation	Mean	S. Deviation	Mean		
0.635	0.875-	2.615	25.375	4.440	24.500	Second	Self-concept
0.497	0.500-	2.550	4.750	2.765	4.250	Second	Academic attainment

"T" table value at function level (0.05) = 2.145

From Table (5), it is evident that there are no significant differences between research groups (experimental

and control) in the self-concept and academic attainment; this indicates the parity of both groups in these variables.

Third: Methods and Tools of Data Collection

1- Intelligence test for Good Enough.

2- Pictorial self-concept test for Ibrahim Kashkoush.

3- Tests of physical abilities in question:

- Test of running for 20 meters (to measure speed).
- Test of standing broad jump (to measure the muscular ability of legs).
- Test of throwing tennis ball to the furthest distance (to measure the muscular ability of the throwing arm).
- Test of standing on one leg (to measure the stable balance).

4- Pictorial cognitive test in motor education. Appendix (1)

The initial version of the test has been prepared comprising (30) pictures; each picture is accompanied with a question that measures a motor concept on the basis of one question per concept. After calculating the moduli of easiness, difficulty, and discrimination of the test concepts, the final version of the test has been concluded. Thus, the test consists of (19) pictures on the basis of (5) questions for basic motor skills, (5) questions for body awareness, (4) questions for direction awareness, and (5) questions for imitation and simulation. The pictures will be displayed for each child individually, and each picture is accompanied with a question to be read by the teacher for the child. Then the child should utter the right answer.

5- (4) XBOX devices and (4) televisions.

6- The suggested C.D for active electronic games.

Scientific Moduli of the Tests Used in the Research:

1- Validity of Tests Used in the Research:

The validity of tests used in the research has been calculated using differentiation validity (blink comparison validity) on the explorative sample comprising (38) boys and girls by finding the upper and lower quartile in the tests in question. Tables (6, 7) show that.

Table (6)
Average, normal curve, T value and its function between both Upper and lower quartiles of the grades of children In the tests used in the research N1 = N2 = 4

The Calculated "T" Value	Difference between both Averages	Lower Quartile		Upper Quartile		Unit of Measurement	Tests
		S. Deviation	Mean	S. Deviation	Mean		
12.205	42.500	0.957	62.750	6.898	105.250	Degree	Intelligence
10.067	25.500	1.291	7.500	4.899	33.000	Degree	Self-concept
2.902	5.520	0.434	5.480	3.780	11.000	Second	Running for 20 meters
14.880	32.000	3.775	33.750	2.062	65.750	Centimeter	standing broad jump
8.094	3.388	0.476	3.438	0.688	6.825	Meter	throwing tennis ball to the furthest distance
11.400	3.903	0.350	3.443	0.588	7.345	Second	standing on one leg
8.307	5.750	0.577	1.500	1.258	7.250	Degree	Cognitive attainment

"T" table value at function level (0.05) = 2.447

Table (6) illustrates the average and normal curve of the grades of children who are characterized with a high level (upper quartile) and grades of children who are characterized with a low level (lower quartile) in intelligence test, pictorial self-concept test, tests of physical ability in question, and academic attainment test.

Table (7)
Significant Differences between the Grades of Children Who are Characterized with a High and Low Level in the Tests Used in the Research N1 = N2 = 4

Z Value	Total of Ranks	Average Ranks	Groups	Tests
2.337	26.000	6.500	Upper quartile	Intelligence
	10.000	2.500	Lower quartile	
2.323	26.000	6.500	Upper quartile	Self-concept
	10.000	2.500	Lower quartile	
2.323	26.000	6.500	Upper quartile	Running for 20 meters
	10.000	2.500	Lower quartile	
2.337	26.000	6.500	Upper quartile	standing broad jump
	10.000	2.500	Lower quartile	
2.309	26.000	6.500	Upper quartile	throwing tennis ball to the furthest distance
	10.000	2.500	Lower quartile	
2.309	26.000	6.500	Upper quartile	standing on one leg
	10.000	2.500	Lower quartile	
2.352	26.000	6.500	Upper quartile	Cognitive attainment
	10.000	2.500	Lower quartile	

"Z" table value at function level (0.05) = 1.96

From Table (7), it is evident that there are significant differences between the grades of children who are characterized with a high level (upper quartile) and grades of children who are characterized with a low level (lower quartile) for the benefit of children who are characterized with a high level (upper quartile) in all the researches in question.

2- Reliability of the Tests Used in the Research

Moduli of the stability of tests used in the research have been calculated using the way of testing and retesting on the explorative sample comprising (38) boys and girls. The researcher has considered the test results relating to validity as the first application, and then applies these tests again under the same circumstances and with the same instructions after 7 days of the first application. Table (8) shows that.

Table (8)

Moduli of the Stability of Tests Used in the Research N = 20

"R" Value	Second Application		First Application		Unit of Measurement	Tests
	S. Deviation	Mean	S. Deviation	Mean		
0.981	16.382	81.450	16.445	80.300	Degree	Intelligence
0.962	8.511	21.700	9.599	20.600	Degree	Self-concept
0.986	2.118	7.947	2.419	8.125	Second	running for 20 meters (speed)
0.916	10.127	50.850	11.443	49.000	centimeter	standing broad jump (muscular ability of legs)
0.957	1.224	5.355	1.309	5.217	Meter	throwing tennis ball to the furthest distance (the muscular ability of the throwing arm)
0.933	1.492	5.197	1.443	5.372	Second	standing on one leg (the stable balance)
0.957	1.791	4.450	2.049	4.250		Academic attainment

"R" table value at function level (0.05) = 0.444

From Table (8), it is evident that the values of coefficients of correlation between the averages of the grades of children who are the explorative sample of study in the first and second application of the tests used in the research

have ranged from (0.916 : 0.986). These values are statistically significant different at the level (0.05) which indicates that they are of high-stable coefficients.

Fifth: Program of Active Electronic Games. Appendix (6)

1- Objective of the Program:

This program aims to know the effect of using active electronic games with a preschool child on some physical abilities (speed, muscular ability of legs, the muscular ability of the throwing arm, and the stable balance) self-concept, and the level of academic attainment.

- Baseball
- Tennis
- Golf
- Boxing
- Table tennis
- Bowling

3- Bases of Choosing the Program's Contents:

- The program's contents should fit with the characteristics of the age stage in question.
- Paying attention to all part of the child's body with a much more attention to his stature.
- The program's contents should be consistent with children's tendencies and desires.
- The program should provide children with opportunities of motor innovation and discovery.
- The program should reinforce the child's self-confidence and self-esteem and accept them.

2- Contents of the Program

The program is three ready discs that are sold in markets. They include the following games:

- American football
- Darts
- Beach volleyball
- Skiing
- Track and field
- Football
- Balance boat

- The program should develop the child's awareness and perception of concepts governing the motor performance such as space, direction, time, effort, and body awareness.
- The program's contents should achieve what they are created for.
- The program's contents should be exciting, interesting, and stimulating.
- The program's contents should be simple and clear.
- Factors of security and safety should be available in the program.

Sixth: Steps of Applying the Research:

1- Pre-Measurement:

Pre-measurements have been conducted for both research groups: experimental and control and parity between them has been found in the variables of (age, height, weight, intelligence, physical abilities in question, self-concept, and academic attainment in motor education) in the period between Tuesday 24th/ 03/2015 and Thursday 26th/03/2015. This is shown in Tables (3, 4, 5).

2- Conducting the Basic Experiment:

The researcher has applied both the traditional program, adopted in kindergarten, on the control group and the program of active electronic groups on the experimental group from Sunday 29th/03/2015 to Thursday 6th/04/2015.

3- Post-Measurements:

The researcher has conducted post-measurements for the experimental and control groups of research in the variables of (physical abilities in question, self-concept, and academic attainment in motor education) in the period between Sunday 7th/06/2015 and Tuesday 9th/06/2015.

Seventh: Statistical Processing:

- T. test
- Average.
- Z. test
- Normal curve
- Percentage
- Modulus of torsion

-Pearson's Coefficient of simple correlation

Displaying and Discussing Results:

First: Displaying Results:

Table (9)

Significant differences between the Averages of pre- and post-Measurement of the Experimental Group in Physical Abilities in Question N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Physical Abilities
			S. Deviation	Mean	S. Deviation	Mean		
29.1	3.318	2.688	1.278	6.556	3.092	9.244	Second	Speed
17.2	3.077	7.875-	9.471	53.625	11.081	45.750	centimeter	The muscular ability of legs
31.5	2.705	1.500-	0.694	6.265	1.439	4.765	Meter	The muscular ability of the throwing arm
34.7	5.247	1.634-	1.045	6.338	1.413	4.704	Second	the stable balance

"T" table value at function level (0.05) = 2.365

From Table (9), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the experimental group in physical abilities in question for the benefit of post-measurement average.

Table (10)

Significant differences between the Averages of pre- and post-Measurement of the Control Group in Physical Abilities in Question N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Physical Abilities
			S. Deviation	Mean	S. Deviation	Mean		
13.4	3.594	1.125	0.716	7.244	1.088	8.369	Second	Speed
8.0	3.522	3.750-	10.014	50.500	10.745	46.750	centimeter	The muscular ability of legs
22.0	1.286	1.020-	1.377	5.661	1.061	4.641	Meter	The muscular ability of the throwing arm
24.8	4.175	1.138-	1.260	5.716	1.792	4.759	Second	the stable balance

"T" table value at function level (0.05) = 2.365

From Table (10), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the control group in physical abilities in question for the benefit of post-measurement average.

Table (11)

Significant differences between the Averages of both post-Measurements of the Experimental and Control Group In Physical Abilities in Question N1 = N2 = 8

"T" Value	Difference between both Averages	Control Group		Experimental Group		Unit of Measurement	Physical Abilities
		S. Deviation	Mean	S. Deviation	Mean		
1.756	0.688-	0.716	7.244	1.278	6.556	Second	Speed
0.848	3.125	10.014	5.500	9.471	53.625	centimeter	The muscular ability of legs
1.465	0.604	1.377	5.661	0.694	6.265	Meter	The muscular ability of the throwing arm
1.420	0.621	1.260	5.716	1.045	6.338	Second	Balance

"T" table value at function level (0.05) = 2.145

From Table (11), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the experimental and control group in physical abilities in question for the benefit of the experimental group.

Table (12)

Significant differences between the Averages of pre- and Post-Measurements of the Experimental and Control Groups in Self-Concept N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Variable
			S. Deviation	Mean	S. Deviation	Mean		
11.7	1.342	2.875-	7.652	27.375	4.440	24.375	Degree	Self-concept

"T" table value at function level (0.05) = 2.365

From Table (12), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the experimental group in self-concept for the benefit of the averages of post-measurement.

Table (13)

Significant differences between the Averages of pre- and post-Measurements of the Control Group in Self-Concept N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Variable
			S. Deviation	Mean	S. Deviation	Mean		
2.5-	0.427-	0.625-	4.536	26.000	2.615	25.375	Degree	Self-concept

"T" table value at function level (0.05) = 2.365

From Table (13), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the control group in self-concept for the benefit of the averages of post-measurement.

Table (14)
Significant differences between the Averages of pre- and Post-Measurements of the Experimental and Control Groups in Self-Concept N1 = N2 = 8

"T" Value	Difference between both Averages	Post- Measurement		Pre- Measurement		Unit of Measurement	Variable
		S. Deviation	Mean	S. Deviation	Mean		
0.578	1.375	4.536	26.000	7.652	27.375	Degree	Self-concept

"T" table value at function level (0.05) = 2.145

From Table (14), it is evident that there are statistically significant differences between the averages of both post-measurements of the experimental and control groups in self-concept for the benefit of the averages of the experimental group.

Table (15)
Significant differences between the Averages of pre- and post-Measurements of the Experimental Group In Academic Attainment N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Variable
			S. Deviation	Mean	S. Deviation	Mean		
8.8	0.375	0.375-	1.188	4.625	2.765	4.250	Degree	Academic attainment

"T" table value at function level (0.05) = 2.365

From Table (15), it is evident that there are no statistically significant differences between the averages of pre- and post-measurements of the experimental group in academic attainment.

Table (16)
Significant differences between the Averages of pre- and post Measurements of the Control Group In Academic Attainment N = 8

Percentage of Improvement	"T" Value	Difference between both Averages	Post-Measurement		Pre-Measurement		Unit of Measurement	Variable
			S. Deviation	Mean	S. Deviation	Mean		
176.3	6.149	8.375-	3.399	13.125	2.550	4.750	Degree	Academic attainment

"T" table value at function level (0.05) = 2.365

From Table (16), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the control group in academic attainment for the benefit of post-measurement.

Table (17)
Significant differences between the Averages of pre- and post-Measurements of the Experimental and Control Groups In Academic Attainment N1 = N2 = 8

"T" Value	Difference between both Averages	Control Group		Experimental Group		Unit of Measurement	Variable
		S. Deviation	Mean	S. Deviation	Mean		
8.833-	8.500-	3.399	13.125	1.188	4.625	Degree	Academic attainment

"T" table value at function level (0.05) = 2.145

From Table (17), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the experimental and control groups in academic attainment for the benefit of the control group.

Second: Discussing the Results:

Discussing and interpreting the results of the first hypothesis:

From Table (9), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the experimental group in physical abilities in question for the benefit of post-measurement.

This result to the use of active electronic games in the learning process which makes the learning process exciting and joyful. This has made students rush upon motor activity without being fatigued or bored. This has had a great effect on improving the level of their physical abilities in question. Active electronic games have attracted children's attention, increased their focus, evoked their interest and enthusiasm, and increased their positivity which has led to develop their physical abilities.

The researcher adds that active electronic games improve the quality of physical activity and

make it more effective. These games increase motivation, expose relationships, facilitate understanding, increase attention, reduce time, and eliminate boredom.

This result is consistent with the results of M. Papastergiou study (2009) (11) which reports that active electronic games reinforce fitness and motor skills, C. Donovan et al study (2012) (5) which emphasizes that practicing active electronic games improves heart rate, oxygen consumption, and increase of calories consumed. The study of M. Quinn (2013) (14) reports that participating in active electronic games generates energy levels that correspond to the rates required for the physical activity. The findings of the study of Pohira Vieth have resulted in the effectiveness of videogames in improving fitness and increasing activity and energy among students. The findings of the study of Julie D. Jaime (2011) (7) have resulted in the effectiveness of videogames in improving fitness, increasing students' self-confidence, and improving scientific and social efficiency. The findings of the study of Williams (2010) (20) have resulted in the effectiveness of videogames in improving fitness among students.

Discussing and interpreting the results of the second hypothesis:

From Table (10), it is evident that there are statistically significant differences between the averages of pre- and post-measurements of the control group in physical abilities in question for the benefit of post-measurement.

The researcher clarify that this result is because the teacher in the traditional method presents skills for children gradually from easy to difficult. The repetition of performing these skills by children has led to make them learn skills properly; this will improve the level of the physical abilities associated with these skills.

The researcher interpret that the improvement of the average of post-measurement in comparison with pre-measurement among the children of control group is ascribed to the competition among children during team learning to show who is superior to the other. This has

led to improve the level of their physical abilities.

This result validates what has been mentioned in the second hypothesis of research hypotheses which provides that "there are statistically significant differences between both pre- and post-measurements of the control group in physical abilities in question for preschool children for benefit of the average of post-measurement."

Discussing and interpreting the results of the third hypothesis:

From Table (11), it is evident that there are statistically significant differences between the averages of both post-measurements of the experimental and control groups in physical abilities in question for the benefit of the experimental group.

The researcher ascribes the superiority of the experimental group children to the control group children in physical abilities in question to the reason that the experimental group children use active electronic games. These games have made motor learning an impressive process for children and motivated children's motives to learn without being bored. This is reflected positively in developing their physical abilities. They also eliminated the feeling of monotony and passivity within children under learning in the traditional method which only depends on oral explanation and performing the practical model.

M. Quinn (2013) (20) emphasizes that the project of integrating active electronic games in physical education curricula proves to be successful as a successful intervention that meets the required criteria of physical education. It also proves to be an effective and positive model at school, encourages the positive behavior at home, and is used greatly inside schools (30: 14).

The researcher ascribes this result to the way of designing active electronic games in terms of smoothness in movement, dazzling colors, and sounds accompanying the performance which attract children's attention. All these factors have an effect in developing and improving the level of physical abilities. However, the traditional method, for which the control

group is subject, misses all these media; it depends only on oral explanation and performing the practical model. This is emphasized by what "al-Ghareeb Zaher, Eqbal Bahbahani" (1999) have mentioned that addressing more than one sense during learning leads to establishing and deepening experiences (57 : 21).

This result is consistent with the results of the studies of Ibrahim Abdelrazik (2005) (1), M. Quinn (2013) (14), Pohira-Vieth (2010) (12), Julie D. Jaime (2011) (7) which showed the superiority of the experimental group to the control group in learning motor skills.

This result does not validate what has been mentioned in the third hypothesis of research hypotheses which provides that "there are no statistically significant differences between both post-measurements of the experimental and control groups in natural skills in question for preschool children."

Discussing and interpreting the results of the fourth hypothesis:

From Table (12), it is evident that there are statistically significant differences between the averages of both pre- and post-measurements of the experimental group in self-concept for preschool children for the benefit of the post-measurement.

The researcher ascribes this result to the use of active electronic games as an attractive educational tool that makes children see themselves in the model that is displayed on TV before their eyes. Children simulate the model and perform different activities including running, jumping, throwing, and balancing masterfully, positively, and confidently as well as the competition among children to show their best motor and physical abilities in addition to the approval, encouragement, and feeling of success by the teacher. All these lead to emphasize their positive look towards themselves.

This corresponds to what "Ibrahim Kashkoush" has indicated according to Baumrind "that children's ability to achieve the objective and try to accomplish the performance represents the basic elements towards their self-

esteem; they view themselves as able ones (4, 3: 13).

This result corresponds to the results of the study of M. Papastergiou (2009) which indicate that the use of active electronic games with children develop their motivation and self-confidence; this will improve their impression about themselves (600: 17).

This result validates what has been mentioned in the fourth hypothesis of research hypotheses which provides that "there are statistically significant differences between both pre- and post-measurements of the experimental group in self-concept for preschool children for the benefit of post-measurement."

Discussing and interpreting the results of the fifth hypothesis:

From Table (13), it is evident that there are statistically significant differences between the averages of both pre- and post-measurements of the control group in self-concept for the benefit of the post-measurement.

The researcher ascribes this improvement in the control group to the reason that in the traditional method, the teacher presents many praise and compliment phrases to children; this generates the spirit of cooperation and competition among them and provides the opportunity for them to express their opinions. In addition, children's efficiency, daring, and bravery in different situations are positive for the self and lead to improve their self-concept.

Rateb al-Khouli (1994), according to "Layman" reports that "motor education improves children's self-concept especially the physical self because children's relationship with their own selves passes through motion. The body and motion are basic contact tools with the soul. Through motion, children develop their abilities of observation, attention, perception, creation, and feeling (52: 8).

This result validates what has been mentioned in the fifth hypothesis of research hypotheses which provides that "there are statistically significant differences between both pre- and post-measurements of the control group in self-concept for preschool children for the benefit of post-measurement."

Discussing and interpreting the results of the sixth hypothesis:

From Table (14), it is evident that there are statistically significant differences between the averages of both pre- and post-measurements of the experimental and control groups in self-concept for the benefit of the experimental group post-measurement average.

The researcher ascribes the superiority of the experimental group children to the control group children to the reason that the experimental group children use active electronic games. This has led to stimulate children's motives towards learning and integration in practicing multiple activities, subsequent social interactions, and personal relationships with their peers such as leadership, mutual influence, communication, thinking, evaluation of their abilities and others' as well as communicating with the teacher. All these have led to develop children's self-concept. This result corresponds with the results of the study of Joseph Naji and Ibrahim Abdelrazik (2006) (10) which indicate the superiority of the experimental group children to the control group children in self-concept.

This result does not validate what has been mentioned in the sixth hypothesis of research hypotheses which provides that "there are no statistically significant differences between both averages of post-measurements of experimental and control groups in self-concept for preschool children."

Discussing and interpreting the results of the seventh hypothesis:

From Table (15), it is evident that there are no statistically significant differences between the averages of both pre- and post-measurements of the experimental group in academic attainment for preschool children.

The researcher ascribes this result to the reason that the program of active electronic games is not accompanied by an audio performance that illustrates the physical movements performed by the child which is reflected negatively on their linguistic, cognitive, and conception

output associated with the motor performance.

This result does not validate what has been mentioned in the fourth hypothesis of research hypotheses which provides that "there are statistically significant differences between both averages of pre- and post-measurements of experimental group in academic attainment for preschool children for the benefit of the post-measurement average."

Discussing and interpreting the results of the eighth hypothesis:

From Table (16), it is evident that there are statistically significant differences between the averages of both pre- and post-measurements of the control group in academic attainment for the benefit of the average of post-measurement.

The researcher ascribes the improvement in the control group to the reason that in the traditional method, the teacher provides the information and concepts associated with the motor skills performed by children which influenced their level of attaining those concepts. This corresponds to the study of Ibrahim Abdelrazik (2005) (1) where the most important results indicate the improvement of the control group individuals in academic attainment because of providing the theoretical information and knowledge associated with performance.

This result validates what has been mentioned in the fifth hypothesis of research hypotheses which provides that "there are statistically significant differences between both averages of pre- and post-measurements of the control group in academic attainment for preschool children for the benefit of the post-measurement average."

Discussing and interpreting the results of the ninth hypothesis:

From Table (17), it is evident that there are statistically significant differences between the averages of both pre- and post-measurements of the experimental and control groups in academic attainment for the benefit of the post-measurement average in the control group.

The researcher ascribes the superiority of the control group children to the experimental group children to the role performed by the teacher in

providing the information and knowledge associated with the performance to the control group in addition to the verbal communication with the teacher during the performance. This has led to the improvement of their academic attainment.

The researcher ascribes the superiority of the control group to the experimental group in academic attainment to the team performance and interaction with one another under the guidance of the teacher in the traditional program. This allows them to conclude information, think, and solve problems with one another. Team activities depend on cooperation and collective performance unlike active electronic games where the individual, pair, or triple performance mostly prevails.

This result does not validate what has been mentioned in the sixth hypothesis of research hypotheses which provides that "there are no statistically significant differences between both averages of pre- and post-measurements of the experimental and control groups in self-concept for preschool children."

Conclusions and Recommendations

First: Conclusions:

1- The program of active electronic games has affected positively on the improvement of the level of physical abilities in question (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance) and development of self-concept for preschool children. However, it has not improved the level of academic attainment for the same sample.

2- The traditional motor program has affected positively on the improvement of the level of physical abilities in question (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance) and development of self-concept in motor education for preschool children.

3- The program of active electronic games has been more effective and efficient than the traditional motor program in improving the level of physical abilities in question (speed, muscular ability of legs, muscular ability of the throwing arm, stable balance) and development of self-concept for preschool children.

4- The traditional motor program has been more effective than the program of active electronic games in improving the level of academic attainment for preschool children.

Second: Recommendations:

1. It necessary to use the program of active electronic games with preschool children in kindergarten
2. Active electronic games should be used to improve the level of physical abilities and upgrade health with preschool children.
3. More studies should be conducted on preschool children about the effect of active electronic games on other psychological features other than self-concept.
4. More studies should be conducted about the effect of active electronic games on further physical and motor abilities to prove their effectiveness.
5. It is necessary to Arabize discs and programs of active electronic games available in markets in order to fit children in Arab countries.

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