Effectiveness of an educational program using a computer in the development of some of the mathematical concepts among mentally retarded educable students and modifying their adaptive behavior

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Abstract

This study aimed to verify the effectiveness of an educational program by using the computer in the development of some of the mathematical concepts among mentally disabled students who are capable of learning and modifying their Adaptive behavior in Rafha province these are (numerical concepts, spatial relationship concepts, the concept of classification, the concept of sequencing, the standard concepts), the sample of the study was selected from primary school pupils from the (intellectual Education classes) in Rafha province at northern border area. The researchers followed the experimental method; to conduct the study where the sample consisted of 16 students who were divided randomly into two groups: experimental group who studied by using the methods and strategies of the behavioral proposed program, and the control group who did not receive any educational program. The program consisted of twenty-one sessions 45 minutes for each and continued for a seven weeks. The researchers used the scale Mathematical concepts and the measure of adaptive behavior to gather information and compare the performance of the subjects of the study on the pre test and post tests for the experimental and control groups. The results of the study indicated that there were statistically significant differences at level (0.05) on the mathematical concepts scale and the adaptive behavior scale among the students in the experimental group and the control group in favor of the experimental group.

Keywords: adaptive behavior- computer - mathematical concepts- mentally disabled.
Introduction:

The concern for children in general, and the disabled ones in particular is regarded interest in the whole community, the progress and advancement of societies is measured by the extent of their interest, attention of them and developing their various skills. Children with mental disabilities are described by being passive learners, are able to perform only routine tasks but are unable to make adaptation or acquire knowledge in school subjects. Some studies have shown the possibility of training these children on performing educational tasks or remembrance tasks by repetition, but such training lacks transfer of the learning effect.

Some officials in the education departments mention that children with mental disabilities may be able to learn counting and the use of simple numbers in limited ways, but they are incapable of acquiring the academic functional skills, while they can memorize the basic postulates of summation and subtraction through repetition, but the concept of summation, subtraction, calculation procedures for such processes are regarded above the level of their abilities (Glidden, 1999: 57-58).

The teaching of mathematics has gained with the progress of systems and software a large share of computer technology as a teaching visual means to help develop thinking in general and mathematical thinking in particular in its various manifestations, it also reduces the necessary learning and teaching time period both at the level of individuals or universities (Khasawneh, Amel, 1992: 293).

Many studies have confirmed the effectiveness of the use of computers in improving the behavior of children with mental disabilities, as well as reducing the time of the modification, as the computer uses has educational effects, it also has behavioral effects. (Sifr, Uhood: 2007: 37).

The American Psychiatric Association approved (Apa A1994) the following definition of mental disability in the fourth edition of the Diagnostic and Statistical Manual of Mental Illness (DSMIV) It is a mental functional performance below the average, IQ of about 70 or lower on the IQ test which is applied individually for children, a clinical report shows functional performance below average.

Classification of Mental disability:

Medical classification: This classification depends on the causes of infection, the degree of infection, time of its occurrence and the clinical manifestations as follows: According to the source of infection it is divided into two types, namely the primary mental retardation (Primary Amentia) which arises as a result of the genetic factors and secondary mental retardation (Secondary Amentia) which is due to environmental external factors or acquired ones as a result of infection with some illnesses or severe environmental social deprivation (Sadig 149-18: 1982).
Classification by clinical manifestations: Through this category, cases are identified through their physical characteristics. These cases are mentioned as follows: Zamlah Down Down’s Syndrome - cases of Hydrocephaly – cases of Macrocephaly - the case of Microcephaly.

Educational Classification: According to this classification, mental disability categories can be divided into the following sections, depending on the educational services that can be provided, which is also called the educational suitability, and refers to it as follows:

- Educable mentally Retarded: intelligence ratio of this category ranges between 70-55 degrees and they are capable of learning some academic skills such as reading, writing and arithmetic and they can benefit from the ordinary educational programs, but their progress is slow compared with the normal students.

- Trainable mentally Retarded: intelligent proportion of this class ranginess between 55-40 degrees, and this group is incapable of learning the basic skills such as self-care and getting dressed. They can do simple tasks that require simple intelligence (Kuafha, Abdul Aziz 62: 2003).

- Unattainable category (those who rely on others): This category is unable to perform the necessary skills for personal needs and they the ability of self-reliance or have a very limited done. Modern technology methods in the field of growth showed that many of the members of this class can acquire some of the skills that will enable them to acquire partial independence which will help them to live in the community. (Shenawi66: 1997).

**Rating according to the Adaptive Behavior:**

This division depends on the ability of the individual to rely on himself in daily life. It also depends on the individual social skills in general and on the extent of their social maturity or ability to achieve social adjustment with those around them) KaramA-Din (87-84 : 1988)

Classification on this basis is in the following form:

- Mild Mental Retardation: Some individuals in this category are referred to as (Educable) because they are capable of benefiting from the ordinary educational programs.

- Moderate Mental Retardation: They are the children whose ratio of intelligence is about (55-40) degree they are slow in developing and using language. Severe Mental Retardation: This category the proportion of their intelligence ranges between(40-25)).

- Profound Mental Retardation: The IQ of this category is less than (25-21) (Abdel Hamid, 30: 1999)
Mentally handicapped children (Educable category) are characterized with many properties that distinguish them from other normal children on one hand and from their peer mentally retarded children on the other hand.

The following is a presentation of these properties:

- **Mental characteristics:** It is the characteristics and attributes associated with the processes relevant to learning, attention, memory, discrimination, thinking and the ability to imagine (Alqraiti, (219: 2001, the mental and cognitive characteristics include several aspects. Below is a presentation for each one of them:

  - **Education:** A mentally disabled child suffers clearly from weakness in the ability to learn and on the achievement compared to a normal child who is in his age. (Kuafha and Abdul Aziz, 70: 2003)

  - **Attention:** Children with disabilities are obviously faced with problems in the ability to pay attention and concentration on the educational skills. Attention of the mentally disabled child will be limited in the length of time, he can not pay attention to more than one thing at a time for a short period, as his attention will be distracted quickly. (Rousan, 137: 2001).

  - **Remembrance:** The ability to remember is closely linked to mental ability, where we find that the mentally disabled child has a general weakness in his ability to remember names, themes and shapes, this is clearly shown in the short-term memory, and the reason for this may be due to the lack of a child's ability to use appropriate strategies to remember that are performed by the normal child, where we find that the disabled child education focuses on sensory learning more than the abstract, so the curriculum given to a mentally disabled must take into account the educational and individual plan for each individual and the teacher must use the appropriate methods of learning and teaching, which depend on the sensory and abstract techniques so that these children can comprehend it (Kuafha and Abdul Aziz, (71: 2003)

- **Social and emotional characteristics:** A mentally disabled child is characterized by some of the social and emotional qualities that are reflected by his mental abilities, which are: withdrawal, hesitation, recurring behavior and hyperactivity and lack of self-control. Abaza, (22-21: 2000)

- **Academic educational characteristics:** Based on the deficiency in the achievement aptitudes among the disable children and the ability of learning and training during the years of study and in the light of the various intelligence co-relations, they are characterized by low and late performance in tests and school activities, and achievement skills. Mentally disabled children at
the age of six are not ready for reading, writing and arithmetic, only if they have the capabilities. (Yahya and Obeid. (138: 2005)

**Mathematical concepts needed for mentally retarded children:**

Mathematical concepts are one of the outputs of the mental cognitive process, the most important characteristics of which are abstraction. So they need a higher level of performance to learn them, considering that these mathematical concepts are the basic foundation for learning mathematics. As those with mental disabilities suffer from a distinct lack of learning mathematical concepts, it was important that we care about them and use the modern teaching aids in teaching these mathematical concepts to them.

Ramadan Badawi (2003: 26) mentions that there is a fundamental goal to teach mathematical concepts, which is: the development of different aspects of mathematical thinking of the child, as well as the development of educational and social values through mathematical learning experiences, Several private objectives stem from this general target:

- The development of the student's imagination, innovative abilities and the power of observation as well as training him to solve problems through mathematical ideas.
- Developing the child taste of beauty to associate with nature and mathematical patterns, geometric shapes, forms of the different numbers and the various formations of them.
- Developing a student’s love and appreciation of the mathematical ideas and their applications.
- Developing the geometric sense and cognitive perception of the child in the space.
- Facilitating the development of primary concepts of mathematics at: numbers, geometry, relationships, classification, logical priorities and processes.
- The development of the value of cooperation, the artwork and completing the work.
- Developing curiosity for modern inventions such as computer, robots, rocket and so forth.

The use of computer in teaching mathematics and improving the adaptive behavior in mentally retarded children:

Computer contributes effectively to the education of pupils with mental disabilities, especially when it offers learning in well sequenced chunks, and allows them to practice learning through careful design of computer programs that conform with the capabilities of these children or students.

Fawzi (2009: 140) stated that among the advantages of the use of technology with mentally disable children, they contribute to increasing the motivation of this class for learning, and it provides many concrete experiences, which will help to overcome their mental weakness and
lack of concentration, moreover, the technology contributes to help mentally disable children gain some life skills.

According to (Raphael and Joseph 2001: 197) there are several teaching aids used in teaching mathematics, the most important and most currently prevalent in the field of education is the computer, it can be through the use of multimedia in which sound, movement and the colors are used, and other influential factors that attract students to study the content of the math course. Therefore, the computer now became an active means in teaching a child how to live, cope and adapt to others, and through their participation in the work on the devices, and with its high strength to attract, excite their interest and motivate them to learn as well as linking them together in relations of friendships, love and intimacy (Magda Saleh 2002: 66)

Research problem:

Mathematical concepts are basic concepts in the lives of all students, whether ordinary or with mental disabilities, despite the different needs of each of them to the quality or quantity of those concepts. The importance of teaching math concepts to ordinary or mentally handicapped educable pupils seems to be clear as it is the main means that develops the child’s independence in dealing with his community and being self dependent in solving everyday life problems that require the use of the basic concepts in mathematics, such as summation and subtraction. (Diab, Fethiye, 2001: 10-11).

Due to the lack of studies in the field of mathematical concepts, the researchers thought of providing scientific material that fit the capabilities of the mentally disabled children, whereas, the most widespread academic problems among children with mild mental disabilities, is the weakness in performing basic mathematical processes, due to the dramatic reduction in IQ, also, this weakness is accompanied by evident decline in cognitive abilities. Also, children with mental disabilities suffer from non-adaptive behaviors, such programs will contribute to modify their behavior to become adaptive with themselves, their disabilities and with members of their community.

Thus, the present study emerged with its educational program using a computer for the development of mathematical concepts and improving the adaptive behavior of mentally disabled educable children. In the light of the above mentioned, the problem of the current study is determined by the, answer to the following questions:

Is the proposed educational program effective in developing the mathematical concepts for mentally disabled educable children and modifying their behavior? This question can be formulated by the following hypotheses of the study:

- "There are no statistically significant differences in mathematical concepts between the experimental and control groups in the post-test on the total score of the mathematical concepts scale."
"There are no statistically significant differences in adaptive behavior between the experimental and control groups in the post-test on the total score of the adaptive behavior scale

"There are no statistically significant relationship between the acquisition of mathematical concepts and improvement of the adaptive behavior of children with mild mental disabilities (educable)."

**Significance of the study:**

The significance of the current study is that it:

- focuses on a segment of learners who need support and care, they are the mentally disabled educable pupils.
- Attempts to develop some mathematical concepts and improve the skills of adaptive behavior of mentally disabled educable children.
- Develops an educational program using the computer and checking its effectiveness in the development of some mathematical concepts to improve the skills of the adaptive behavior of mentally disabled educable children.
- Provides a tool to measure some of the mathematical concepts for mentally disabled educable children.
- Provides an educational program using a computer, that is regarded as a model to be used by some specialists in the field of special education for developing some of the mathematical concepts for mentally disabled educable children.

**Objectives of the Study:**

The research aims to:

- Develop some mathematical concepts among the mentally disabled educable pupils, as well as improving the adaptive behavior through an educational program with the use of computers.
- measure the response of the target sample to the educational program.

**Terminology of study:**

**Tutorial using the computer:** techniques, strategies, tools and methods that are used for the purpose of developing some mathematical concepts by using computer software among mentally handicapped educable pupils.
Concepts: collecting information, events and objects under one name to make it easier for the child to classify into categories of qualities that distinguish them from other concepts (Al-Nashif, Huda:160)

Mathematical Concept: a number of objects to be perceived by senses, can be classified on the bases of certain characteristics known by a name or special symbol.


Classification Concept: classify objects into groups on the bases of its shared characteristics.

The concept of sequence: arranging topics or things in series and sequences according to some dimensions, it also includes arranging things in sequence from the beginning to the end in true logical arrangement the sequential arrangement will either be by size or by number (Saleh, Magda 2009: 152).


Numerical concepts: that the disabled child distinguishes between the numbers (1-10), numerical order, addition, subtraction, equal and unequal groups.

Adaptive Behavior: it is the way or manner in which children perform various tasks expected from their peers, can manifest their behavior (Al-Shakhs, 1998: 13).

Known procedurally in the current research as the score which the testee gets on the adaptive behavior scale.

Educable Mentally Retarded: they are those whose ratio of intelligence (IQ) ranges between 55-70 degrees, and whom we can teach them some academic skills, language and social skills. And they can take advantage of the regular educational programs but their progress is slow compared with normal children (Kawafah, Abdul Aziz, 2003: 62). Researchers will rely on this procedural definition in the current research.

Limits of the study:

- The extent of accuracy of the diagnosis made by psychologists and teachers of Intellectual schools for pupils who have been selected within the study sample as educable mentally retarded pupils.
The content of the training program prepared by the researchers for the purpose of the current study.

Previous studies:

(David, et al, 1992) Conducted a study that aimed to detect the effectiveness of the use of computers to improve skills of the two basic processes summations and subtraction among mentally retarded students. The study sample consisted of 94 students who were divided into two experimental groups, the first group is of (52) students who were required to perform summations tasks, the second one was required to perform subtraction task; where 42 students participated in. The results of the study showed that mentally retarded students in the two groups who were trained by using computer, they acquired addition and subtraction skills and the number of their mistakes are less when compared to the two groups: of students with mild mental retardation and ordinary ones, who have been trained by the traditional method.

(Jaspers, 1994) has also conducted a study to verify the education that aims to improve the strategies of textual analysis of the verbal questions in arthematics, as opposed to education aiming to improve the modeling construction relevant to the meaning of words with the use of sensible raw materials. The study sample consisted of (84) mentally retarded children whose age ranged between (8.16 to 6.8) years, and have been educated by computer-aided teaching. The results of the study showed that those who received education using external modeling showed better performance than the rest of the sample.

In Hammad study (1994), which aimed to investigate the effectiveness of computer use in the acquisition of basic mathematical concepts that consist of eleven concepts among the mentally retarded students, compared with the normal classroom teaching, which does not use a computer. The study sample consisted of 40 students whose ages range between (7-12 years) The sample was evenly distributed into two groups (experimental and control groups) The experimental group studied by using the computer, while the control group studied by using the normal traditional method of teaching. The results of the study showed that the average scores of the students who learn by computer is increased with statistical significance than the average scores of students who have learned with the regular classroom method.

(Mastropieri, 1997) also carried out a study that aimed to determine the extent of mentally retarded children’s benefit from teaching by using computer which includes a strategy of knowledge to solve mathematical problems and portray the problem by animation in form of a tutorial. The sample consisted of (4) mild mentally retarded Children (two male children and two female children). The study found differences in the performance of addition and subtraction in the two pre and post tests in favor of the post test.
(Daniel, 2004) also conducted a study that aimed to discuss the importance of using multimedia which is called the (comp skills) program to train mentally retarded individuals to use the computer skills autonomously within a reasonable period, the study sample consisted of (9) mentally retarded individuals from adults, the average IQ is (60.53) The study revealed the presence of significant differences between the two measurements pre and post tests, in favor of the post test, and the results showed that self-training system multimedia programs via computer improves the use of computer skills among those who are mentally retarded.

Abdul Waris (2008), conducted a study aimed at the possibility of developing the concepts of classification and sequence among mentally retarded children, through a training program using a computer based on the individual training method, the study sample consisted of (40) mentally retarded children, their ages ranged between (1.14-8.9) years, and the mental age ranged between (09.04 to 04.10), while their intelligence coefficients ranged between (55-68) degrees, the sample was divided into two groups, an experimental group and a control one. The study concludes: there are significant differences between the mean scores of the mentally retarded children in the experimental group in the two tests of classification and sequence in favor of the post test and the experimental group.

In Ghamdi study (2010), which aimed to develop some pre-academic concepts in mathematics as well as improving the adaptive behavior through the design of a training program for early intervention by using the computer, for mentally retarded children. The study sample consisted of 20 children who were divided into two groups (Experimental and control) and each group consisted of 10 students with an average age ranging between (01.08 to 08.11) years, their IQ coefficient are less than 55 degrees. The results indicated the effectiveness of the training program used in the development of some of the pre-academic concepts in mathematics as well as the effectiveness of the program in improving adaptive behavior.

Abdul Rahim study (2011) aimed to know the extent of effectiveness of the behavioral program in developing some skills of the adaptive behavior, which are the language skills for the mentally retarded educable children. The sample is formed of two groups (experimental and control group) each group consisted of 10 students whose ages ranged between 10-12 years and the proportion of IQ ranging between (50-75) degrees. The research results revealed that there are statistically significant differences in the post application in favor of the experimental group.

Salmi (2012) also carried out a study aimed to develop some of the pre-school concepts represented in (classification tasks and sequencing tasks) among a sample of medium mental retardation children to improve their social interaction. The study sample consisted of 20 children who were divided into two groups (experimental and control group) and each group consisted of 10 students with an average age between (1/8 to 8/11) years, and IQ ranging between (52-73)
degrees. The results indicated the effectiveness of the training program used in developing some of the pre-academic concepts as well as improving their social interaction.

Ulama (2013), also conducted a study aimed at developing pre-school concepts of (the pre-number concepts and tasks of classification and tasks of sequence) among a sample of children with mild mental retardation. The study sample consisted of 20 children who were divided into two groups (experimental and a control group) each group consisted of 10 students ranging in age from 8 to 12 years and the proportion of IQ between (40-55) degrees. The study results showed the effectiveness of the training program in development of pre-school concepts.

The aim of AL-Gharab study (2013) is to identify the impact of the proposed program which is based on the multimedia to give some social studies concepts to the mentally retarded educable students. By applying it on a random sample of students of the intellectual education schools. The study sample consisted of 44 children who were divided into two groups (experimental, and a control) Each group consisted of 22 students whose average age is 10 years. The results of the study revealed the effectiveness of the program in providing the students of the experimental group with the concepts of social studies in the post test compared with the pre test.

Comment on previous studies:

What general conclusions can be drawn from these studies:

- All studies related to mentally retarded children revealed the effectiveness of the programs and activities in improving the adaptive behavior skills and social interaction, as in (Ghamdi, 2010), (Abdel Rahim, 2011), (Salmi, 2012) studies.
- Most of the previous studies that have been addressed revealed the effectiveness of using computers in developing skills and mathematical concepts for mentally retarded children as in the studies of (David, et, 1992), (Jaspars, 1994), (Hammad, 1994), (Mastropieri, 1997) (Abdul Waris, 2008), (Al Ghamdi, 2010).
- Mentally retarded educable students at the primary stage suffer from severe deficiency in the mathematical concepts and weakness in adaptive behavior.

The method and procedures:

The study sample: The current study sample is formed of 16 students enrolled in some intellectual schools at primary stage in Rafha. Their age ranged between 8:11 years. The subjects of the study have been divided into two equal groups: an experimental group and a control group with a rate of 8 students per group, the two groups are equivalent in age, gender and class. The sample has been selected deliberately from the classes of mentally retarded educable children, which are attached to Harun al-Rashid primary School for the academic year 2015/2016.
Tools of the Study:

**mathematical concepts Scale (prepared by the researchers)**

For the purpose of the Current study, a mathematical concepts scale was used. The scale consists of 27 items that suit the mild mentally retarded children, those whose ages range between 8 and 11 years. The scale has been designed to be applied on the child himself, not relying on the teacher or parents’ viewpoint. Tasks or scale items have been distributed according to the scale five components, which are as follows: (numerical concepts, spatial relationship concepts, the concept of classification, the concept of sequencing, the standard concepts).

Scale validity: the researchers calculated validity by the referee validity method. The test has been presented to a number of referees (eleven university professors working in the field of special education and educators) All the referees agreed on the suitability of scale items to measure (numerical concepts, concepts of spatial relationship, the concept of classification, the concept of sequencing, the standard concepts) with a percentage ranged between (93%-97%) Thus, the validity of the test has been verified after making the amendments requested by some of the referees.

Reliability of the test: the researchers calculated the reliability of the test by test and retest method with a time interval 15 days on the study sample, the correlation coefficients between the two tests was (0.841) that indicates the reliability of the test.

The adaptive behavior Scale (Abdel Aziz Al-Shakhs, 1998): The adaptive behavior scale used in the current study is composed of five basic dimensions. It includes various aspects of life: the level of language development, independent functional performance, family roles performance, professional activity, and the social performance, and behavior estimates vary according to the individual response.

The researchers checked the test validity, where validity correlations were significant at level (0.05) the test reliability has been calculated by the re-test method and with a time interval of 15 days on the sample of the study, the correlation coefficients between the two tests was (0.991), which indicates a high degree of stability.

**Training Program: (designed by the researchers)**

Below is a description of the procedures and the steps followed by the researchers to achieve the main goal of the search. which is building a training program using a computer for the development of some of the mathematical concepts and improvement of the adaptive
behavior among a sample of mentally retarded educable students at the primary schools of thought.

Steps of building the program: the researchers prepared the training program by using the computer, where the researchers formulated a preliminary program, and presented it to a committee of (experts and specialists), seeking the opinions and suggestions about the proposed program validity and its suitability for the development of some of the mathematical concepts and improvement of the adaptive behavior among the Intellectual schools pupils (the mentally retarded educable pupils) at elementary stage. The experts and specialists committee has been formed of a number of staff members at the University of the northern borders.

The contents of the program: The program consist of twenty-one training session, the time allotted for each of them is (45) minutes, 3 sessions per week, where the following are to be done in the session:

- The researcher will be introduced to the children, then they will be introduced to each other and to the computer that will be used throughout the program period.
- That children get to know the concepts that are presented to them and distinguish between them.
- To involve children actively in the activities of the session and its effectiveness.

The following is an explanation of the subject of each session of the training program (the twenty one sessions):

- First session: It is a constructive session to build a positive relationship between the children and the researcher and the children to each other, as well as introduce them to the computer, which will be used throughout the program time, and that the students are to be familiar to the place of application.
- Sessions from the second to the seventh: the child recognizes and trains on the following spatial concepts ("above and below, inside and outside, closed and open, far and near, behind and the front, the beginning and end).
- Sessions from the eighth to the tenth: the child recognizes and trains on the concepts of classification according to (shape, color, size).
- The eleventh session to the twelfth session: the child recognizes and trains on the concepts of sequence according to (length, size).
- Sessions from thirteenth to the fifteenth session: the child recognizes and trains on the standard concepts according to (size, capacity, weight).
- Sessions from sixteen to twenty one: the child recognizes and trains on numerical concepts (numbers from 1-20, rank number ... addition, subtraction from 1-10
Strategies used in the program:

- Individualizing teaching: children are allowed to work separately, each according to his abilities using a computer for every child.
- Drawing attention: child's senses and mind are focused on sequential stimuli through the time of providing expertise.
- Researcher uses the material and moral consolidation to increase the desired responses.
- The researcher performs the desired behaviors and encourages children to perform the same behavior.
- Feedback: where students are provided with information on their performance of the skill.

Application procedures of the study: After the researchers have finished building the training program and the preparation of the study tools, the study was applied by taking the following steps:

- Identify primary schools where there are classes of intellectual education, which mentally retarded educable children whose ages range between 8:11 years, join.
- Survey of mild mental retardation educable children who are diagnosed formally by correct scientific methods and through special tests for diagnosing mental retardation.
- The sample was selected deliberately.
- Distribution of students into two groups (experimental and control group) randomly.
- Before starting the implementation of the program, a pretest was conducted on subjects of the sample study for the two groups: the experimental and control group, that was through the application of the two tools of the study (testing mathematical concepts, adaptive behavior scale).
- The researcher implemented the program (21) sessions time of each session (45 minutes) three times a week.
- After completing the training program, a post test was conducted immediately on the subjects of the study sample for the two experimental and control group through the re-application of the two tools of the study (mathematical concepts test, adaptive behavior scale).
- Conducting the appropriate statistical manipulation to verify the hypotheses of the study using (SPSS).

Methodology of the Study:

Design: The current study was regarded an experimental study that includes three variables: one independent variable, and two dependent variables, the control group and the
experimental group had been used by using a pre test and a post test as follows: see Table (1).


Table (1) Study design

<table>
<thead>
<tr>
<th>The Group</th>
<th>Pre test</th>
<th>Manipulation</th>
<th>Post Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Mathematical concepts</td>
<td>Applying the training program of the Mathematical concepts</td>
<td>Mathematical concepts</td>
</tr>
<tr>
<td></td>
<td>Adaptive behavior</td>
<td></td>
<td>Adaptive behavior</td>
</tr>
<tr>
<td>Control</td>
<td>Mathematical concepts</td>
<td>Without manipulation</td>
<td>Mathematical concepts</td>
</tr>
<tr>
<td></td>
<td>Adaptive behavior</td>
<td></td>
<td>Adaptive behavior</td>
</tr>
</tbody>
</table>

The study variables: The current study consisted of the following variables:

- independent variable: tutorial cognitive behavioral program concerning some mathematical concepts.
- The dependent variables are: (mathematical concepts - adaptive behavior).

The study used many statistical methods for processing the results, they are:
- Correlation coefficients.
- Means, standard deviation.
- T Test for the significance of differences among the averages.

Results of the study and their interpretation:

Results related to the first hypothesis: to verify the first hypothesis, which is stated as: «There were no statistically significant differences in mathematical concepts between the experimental and control groups in the post test on the total score of the mathematical concepts scale?»

To test the validity of this hypothesis, the averages and standard deviations and the "T" value for the significance of differences between the independent groups, were calculated. and Table (2) shows the findings revealed by the researchers on the mathematical concepts scale.
Table (2) averages, standard deviations and the "T" value for the significance of differences between the two averages scores of the control and experimental groups on the post test on the mathematical concepts scale.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Group</th>
<th>N</th>
<th>Average</th>
<th>Standard Deviation</th>
<th>Degree of freedom</th>
<th>T value</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Concepts Scale</td>
<td>Control</td>
<td>8</td>
<td>35.38</td>
<td>35.38</td>
<td>8</td>
<td>3.240</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>8</td>
<td>50.375</td>
<td>8.467</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Is evident from Table (2) that there are statistically significant differences between the average scores of the experimental and control groups on the mathematical concepts scale in the post test in favor of students of the experimental group where the "T" value is significant at level (0.05), this indicates the effectiveness of the proposed tutorial program.

Results of the second hypothesis: to verify the second hypothesis, which is stated as: «There were no statistically significant differences in the adaptive behavior between the experimental and control groups in the post-test on the total score of the adaptive behavior scale?»

To test the validity of this hypothesis, the averages, standard deviations and the "T" value for the significance of differences between independent groups, Table (3) shows the findings revealed by the researchers on the adaptive behavior scale.

Table (3) averages, standard deviations and the "T" value for the significance of differences between the average scores of the control and experimental groups in the post test on the adaptive behavior scale.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Group</th>
<th>N</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Degree of freedom</th>
<th>T Value</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive behavior Scale</td>
<td>Control</td>
<td>8</td>
<td>33.875</td>
<td>27.833</td>
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<td>2.380</td>
<td>0.05</td>
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<tr>
<td></td>
<td>Experimental</td>
<td>8</td>
<td>69.625</td>
<td>32.168</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Shown in Table No. (3) There are significant differences between the average scores of the pupils in the experimental and control groups on the adaptive behavior scale in the post test in favor of pupils of the experimental group where the "T" value was significant at level (0.05), thus this indicates that the use of the program has had an impact on the improvement of the adaptive behavior among.

Results of the third hypothesis: to validate the third hypothesis, which is stated as that «there is no statistically significant relationship between the acquisition of mathematical concepts and improvement of the adaptive behavior of the mentally retarded educable children?»

To test the validity of this hypothesis the correlation coefficient between mathematical concepts and adaptive behavior in the post test of the experimental group has been calculated. Table (4) shows the findings revealed by the researchers.

Table 4 shows the correlation coefficient between the mathematical concepts and adaptive behavior in the post test of the experimental group.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>No</th>
<th>Co-relation</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical concepts</td>
<td>8</td>
<td>0.464</td>
<td>0.247</td>
</tr>
<tr>
<td>Adaptive behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table No. (4) shows the lack of a statistically significant correlation between the average scores of the experimental group pupils between the mathematical concepts and the adaptive behavior in the post test at 0.05 level.

Discussion of the results:

The improvement of the adaptive behavior of the mentally retarded educable children indicates the effectiveness of the educational program, which has had a clear impact on the development of the mathematical concepts, notably among the members of the experimental group compared to members of the control group, resulting in an improved adaptive behavior among children.

the following is a detailed discussion of the results that are related to the hypotheses of the study:

First - discussion of the results that are related to the first hypothesis:

The results of the first hypothesis indicates: The results related to the first hypothesis, which are stated as the following: There were no statistically significant differences in mathematical concepts between the experimental and control groups in the post test on the total
score of the mathematical concepts scale. But, the experimental group that received the training program has shown the impact of that on improving their mathematical concepts.

This was evident by the finding significant differences between the two groups: experimental and control in the post test in favor of the experimental group. The results of this study agree with the results of a (David, et, 1992) study which indicated that mentally retarded pupils in the two groups which were trained by using computer, acquired skills in addition and subtraction processes. And the number of their mistakes was less when compared to the two groups: mild mentally retarded pupils and the normal pupils who have been trained by the traditional method.

It also agreed with (Jaspars, 1994) study, whose results indicated that those who have been educated with the help of the computer and the external simulation showed better performance than the other subjects of the sample.

And also agreed with (Hammad, 1994) study, whose results indicated that the average scores of the students who learned by computer has achieved statistically significant increase than the scores of the students who have learned by the ordinary classroom method.

It also agrees with (Mastropieri, 1997) study, whose results showed that mentally retarded children benefit from teaching by using computer which includes a strategy of knowledge to solve mathematical problems. and the availability of differences on the performance of the two processes of addition and subtraction in the pre and post tests in favor of the post test.

The results of the current study also agreed with the results of (Abdul Waris, 2008) study, whose findings indicated the effectiveness of the training program by using the computer based on individual training method. Moreover, there are statistically significant differences between the average scores of mentally retarded children in the experimental group in the two tests, pre/post tests on the classification and sequence tests in favor of the post test and in favor of the experimental group.

Finally the results of the current study agreed with the results of (Ghamdi 0.2010) study, whose findings indicated the effectiveness of the training program by using a computer for developing some of the pre-academic concepts in mathematics.

Secondly: Discussing the results related to the second hypothesis:

The results concerning the second hypothesis, which is stated as "there are no statistically significant differences in the adaptive behavior between the experimental and control
groups in the post-test on the total score of the adaptive behavior scale. "There are statistically significant differences between the pupils average scores of the experimental and control groups on the adaptive behavior scale in the post test in favor of the students of the experimental group where the "T" value is significant at level (0.05), This indicates that the use of the program had an impact on the improvement of the adaptive behavior among the mentally retarded educable children, and this is generally consistent with several previous studies that pointed to the effectiveness of the use of mathematical concepts development program using the computer on improving the adaptive behavior of mentally retarded educable pupils, the results of the current study has also agreed with the studies of: (Ghamdi, 2010), (Abdul Rahim, 2011), and (Salmi 0.2012), where The results of these studies indicated the effectiveness of the training program used in the development of some of the pre-academic concepts in mathematics, besides the effectiveness of the program in improving the adaptive behavior, as well as the effectiveness of behavioral program in the development of adaptive behavior skills. and the availability of statistically significant differences in the posttest in favor of the experimental group. Other studies showed the effectiveness of the training program used in the development of some of the pre-academic concepts as well as improving their social interaction.

Thirdly: Discussing the results related to the third hypothesis:

The results of the third hypothesis, which is stated as: "There is no statistically significant relationship between the acquisition of mathematical concepts and improvement of the adaptive behavior of mild mentally retarded educable children" indicated that there are no statistically significant differences between the acquisition of mathematical concepts and improvement of adaptive behavior for mild mentally retarded children at level 12:05

The recommendations of the study:

In the light of the previous results; the researchers recommends the following:

- The necessity to use this program by counselors and special education teachers and circulate it to schools that take care of mentally retarded educable children
- The need to conduct studies on the effectiveness of computer use in developing 1 skills and other mathematical concepts among mentally retarded educable children.

Acknowledgement

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