The Effectiveness of Computer-Based Learning in Developing Academic Skills for Children with Intellectual Disabilities

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Abstract: Aim: The study aimed to investigate the effect of using a computer-based program in developing academic skills (reading, writing and arithmetic) for children with mild intellectual disabilities as compared to the conventional teaching instructions. Methods: The study was conducted in intellectual institutions in Jeddah, Saudi Arabia. A randomized controlled trial design was adopted in the study to determine the impact of the intervention. The study sample was composed of boys (n = 19) and girls (n = 21) aged 6 – 10 years who were selected purposively, and randomly assigned to the experimental group and control group. The two-division experimental group one for boys (n = 8) and the other for girls (n = 12) in the experimental group was studied by using an academic skills development program or a computer-based program. Results: The results indicated that there is a positive impact of the academic skills development program, which was applied to the experimental group to improve academic skills. The reason for the absence of gender differences in academic skills for the educational program is the similarity of the educational environment and the activities used in the educational program in terms of skills, activities, training methods, similar abilities and intellectual preparations for the genders, and for their interaction with the program itself. In addition, the program corresponds to the developmental characteristics of both genders, and there are no impediments to the application of the program in both genders.

Keywords: educational program, academic skills, intellectual disabilities, computer-based learning.

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Introduction

About 20% of children with intellectual disabilities require assistance in performing basic cognitive activities (Goodley, 2014). In general, individuals with intellectual disabilities show stability in their cognitive and functional levels in puberty, at least prior to age-related changes in later life (Algahtani, 2018). Estimates of the prevalence of intellectual disabilities range from 1% to 3% of the population, depending on whether individuals with mild forms of intellectual disabilities are included (Carey et al., 2009). This may be due to several factors such as cultural and social factors, level of health care, period of discovery of disability and diagnostic methods and tools used to identify intellectual disabilities and the way of dealing with them that differs from society to society. According to the International Classification of Disease, intellectual disability is a condition of arrested or incomplete development of the mind, particularly characterized by impairment of skills manifested through the developmental period. Such skills are those that contribute to the overall level of intelligence, i.e. language, cognitive, motor, and social abilities (Cao & Morley, 2016). The disability originates in the individuals before 18 years of age, when the nervous system is affected or functionally altered. The

disability can be observed for many everyday practical and social skills, also higher cognitive functions. For instance, memory and learning, fundamental processes to acquire knowledge from the social environment and physical (Martín & Pagani, 2014).

Computer and technological support tools are among the most important educational tools used in the field of education (Keengwe, Onchwari & Wachira, 2008). In recent years, attention has been paid to the use of computers in the education of individuals with disabilities in general, and those with intellectual disabilities in particular. Developments in the social, health, educational and technological fields have helped to increase attention to providing the best programs for individuals with developmental and intellectual disabilities, where the computer provides useful opportunities to these heterogeneous groups for learning, recreation, independence and integration into life. The computer – as a means of advanced technology – provides a new introduction and route to the field of learning and education of various subjects and has become a phenomenon with its implications, its justification and its effects on education (Ary et al., 2018; Schunk, 2012). One of the most prominent manifestation of the

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development of the computer is to provide learners the opportunity to experience educational experiences compatible with his/her abilities and speed in learning where the computer allows the learner to move towards the goals as quickly as their capabilities permit.

The use of computers is of great importance in developing the basic cognitive skills of intellectually disabled children if they receive good training (Stendal, 2012). If the teacher is well trained in using the computer as a modern technique of learning, this reduces the effort exerted by him/her in repeating the information to the student, and permits many different teaching methods that the teacher can diversify and benefit from. It is worth noting here, to describe the computer-based learning program in this study as a scheme designed for the purpose of education and training in a coherent manner, to develop the performance of the teacher to suit his/her field and role in teaching, and consists of the objectives, content, educational activities, tools and methods used, with regular evaluation and assessment (Bouqs, 2008). Novak (2010), mentions that in terms of organized and planned efforts, computers provide trainees with renewed skills, knowledge and experience aimed at making continuous positive changes in their

experiences, attitudes, and behavior in order to develop the adequacy of performance. An overall definition of the program as a plan with specific objectives, structured content, and scientific procedures, consisting of a range of methods, purposeful, planned and organized activities, with the aim of developing academic skills using computers for children with intellectual disabilities.

The problem of the present study is the numerous shortcomings in academic skills in children with intellectual disabilities, which often impede their access to educational or pedagogical programs at the same level as their non-disabled peers. The importance of this study in theoretical terms is in highlighting the positive role of the computer in improving some academic skills of mentally disabled people. This study may contribute to increasing the amount of information and facts in children with intellectual disabilities, and their diverse characteristics, whereas the scarcity of Arab studies – within the limits of the researcher's knowledge – dealing with improving some academic skills in children with mental disabilities. Practically, this study has the potential to play an effective role in designing and implementing an academic skill scale for children with intellectual disabilities, through which children with deficiencies in these skills can be identified. Moreover, designing

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and implementing a computer-based program, using some techniques the kinds of technologies, may contribute to improving the academic skills of children with intellectual disabilities. However, there is an urgent need to expand the use of modern technology, computers and multimedia in teaching these children academic skills (reading and writing), and assist them to improve their interactions with others based on the improvement of those skills. Therefore, this study seeks to answer the following main question of the study: What is the impact of using a computer-based learning program to develop the academic skills of children with intellectual disabilities?

From this main research question, the specific research questions were framed as:

1. Is there a significant difference between the performance of the experimental and control groups in the use of academic skills, as measured by the study tools of children with mild intellectual disabilities**?**

2. Is there an interaction between the type of program proposed "computer-based learning program" and gender in the performance of children with mild intellectual disabilities in the development of academic skills?

Hypothesis

1. There are no statistically significant differences at the level of significance (α = 0.05) between the average scores of children with mental disabilities in the experimental and control groups in the development of academic skills.

2. There is no interaction between the type of program proposed and gender in the performance of mentally disabled children in academic skills as measured by the study tools.

Computer Applications in the Field of People with Special Needs

The field of special education has witnessed many changes and developments in the provision of appropriate services to intellectual disabled individuals by introducing modern educational technology into its various programs (Edyburn, 2010). The computer, as a means of advanced technology, is an introduction and method in the field of learning and teaching of various subjects. This curriculum developed with the development of computer systems and theories of learning and became a phenomenon that has its implications, its justification and its effects on education (Ghavifekr & Rosdy 2015). The learner can be exposed to learning experiences commensurate with their abilities and speed in learning. One of the

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most important aspects of computer development is the individualization of education by giving the learner the opportunity to experience learning experiences commensurate with his abilities and speed of learning where the computer allows the learner to move towards the goals as quickly as their abilities allow (Merriam et al., 2007). This in turn improves the quality of learning in the leadership of the individual and management of his/her education and guides him/her in the educational line suitable for their ability (Rea et al., 2002).

Studies have shown that children with intellectual disability learn more quickly if the curriculum is prepared through well-programmed, and carefully and accurately programmed programming. In the Malpass study, the students' achievements improved significantly during the programmed education, and this improvement was evidenced in language skills and the ability to write and calculate (Guskin & Spicker, 1968). Smith et al., (2006) supported Malpass's results when they found that children with intellectual disability in social welfare homes had learned to read and write sentences in the way of programmed teaching faster than those taught without the aid of such technology. The study supported the possibility of educating each disabled person who can hold a pen and write

his/her name and some simple words in the programmed way (Kauffman et al., 2017).

It is expected that, as the use of computers improves the performance of ordinary children, its use with children with special needs will be more effective. This is important because they are in dire need of a multi-sensory educational medium, one that will increase their attention and develop their thinking and increase their motivation to learn. In addition, the computer is a recreational tool, so it helps to improve their psychological and social compatibility that suffers from its decline that mean they need support in these parts (Whalen et al., 2006). Likewise, Lawson (2005) indicated that the computer is a major assistant for servicing people with special needs and contributes actively and effectively in the development of their skills to prepare them for a dignified life and engage them in the labor market.

Mason, Field and Sawilowsky (2004) stated that computer-based learning has different advantages and benefits, as it provides a safe learning environment for students. Other benefits that it offers include: it encourages students to try new things without fear that these things are wrong, to run any experience without the feeling of danger and independence for self and a sense of responsibility towards learning. It

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has been agreed that the computer is a technological tool that can be developed to be an auxiliary source of education for learners with special needs: the use of computers is effective in special education schools because these learners need special programs in line with their levels and abilities (Forgrave, 2002). An example of its application is in teaching mathematics where it has been proved that the program leads to a remarkable progress in mathematics skills among learners with intellectual disabilities, (Shriner & Destefano, 2003). Furthermore, it is important to provide a computer-aided training program to contribute to the development of language in children with intellectual disabilities (Stephen & Kortering, 2006; Ploog et al., 2013).

Academic Skills in Children with Intellectual Disabilities

Reading skills: reading skills is one of the basic academic skills that must be developed in intellectually disabled children. Computer-related education is a common system in many countries of the world, because of the multiplicity of its teaching methods and it is suitable for all categories of students, whether they are gifted, ordinary, slow learners or disabled people (Anderson, 2008). This type of learning includes teaching methods such as: training, coaching, tutoring, problem solving, simulation style, gaming style, and

using educational programs in this type of learning, which generally aims to exercise the student on the concepts studied in the classroom or to present new practical material or develop his/her thinking skills. This type of educational programs can be used within the classroom by the teacher as a tool of promotion or out of class as a tool for self-learning (Hwang et al., 2015). The use of computer literacy for children with intellectual disabilities is of utmost importance and usefulness, as the computer can develop their understanding of a wide range of reading skills, including the dimensions of eye movement on the lines and following the correct reading methods (Hudson et al., 2005).

Writing skill: writing means the ability of the children to copy what is written in front of them, write what the child dictates, and the ability to write what is in his/her thoughts and express themselves. This skill comes after learning the child letters through their voices, and children may be exposed to problems in writing that may be due to poor control of movements. The kinetic sensory skills required to form the characters are weak, and there may not be one definitive reason for the matter (Cosser, 2009). It may be due to neurological disorders or delayed maturity and may be the result of the child's lack of experience in how to

correctly write the letters or the problem in the correct holding of the pen or in the movement of the hand or in visual perception or deficiency in the feedback in the examination of the character formation or kinetic sensory control (Willkins & McWilliams, 2003).

Arithmetic Skill: it is a necessity of daily life, and must be taught to children with intellectual disabilities. The computer has a close relationship with mathematics, as the modern computer arose as a result of the search for a tool that facilitates mathematical and logical processes in mathematics. Computer capabilities and abilities may also include: ability to interact, ability to perform calculations and algebraic operations with great accuracy and speed, ability to draw accurately and clearly, ability to carry out modeling and simulation and finally the ability to clarify and solve some mathematical problems. This is what enables it to be used in teaching mathematics to children with intellectual disability and mild intellectual disability (Sklar, 2000).

Methods

The context of the study is intellectual centers in Jeddah city, Saudi Arabia. The target population for the study was composed of learners aged 6 – 10 years with mild intellectual disabilities. A sample of boys (n = 20) and girls (n = 20) was purposively selected from the identified research population. Purposive sampling technique was considered because of its capability to select participants that meet the inclusion criteria. Children with other associated conditions and other categories were purposively excluded from the study. Out of 45 learners, only 40 were selected for inclusion in the study. Finally, the research work was started with a total sample of 40 children with intellectual disabilities. These children were diagnosed on the basis of screening through the intelligence tests as recorded in their files. No child was selected if he/she was having any other associative disorder at the time of sampling. They were randomly assigned to two groups. One group entailed two sub -groups (A, C) selected by the voting system as an experimental group, and another sub-group (B, D) and selected by voting as a control group. Each group consisted boys (n = 20) and girls (n = 20). The experimental group was subjected to the computer-based system to develop academic skills, while the control group was subjected to the normal learning system that is already in place. The normal learning system entailed the regular instructions in teaching writing, reading, and arithmetic skills. The details of the study design are set out in Table 1 below.

Table 1. *Distribution of sample members*

Group	Sample		Total
	Boys	Girls	
(A, C) Experimental Group	8	12	20
(B, D) Control Group	11	9	20
Total	19	21	40

Study instruments:

Study procedures require the following tools:

– Academic skill scale for reading, writing and arithmetic prepared byte researcher.

– Computer-based Program prepared by the researcher.

Academic Skills Scale:

Table 2 shows some of the characteristics of the academic skill scale for children with mild intellectual disabilities focusing on the assessment of functional academic skills. These include reading, writing, and arithmetic with their pre-requisites:

Table 2. *Characteristics of the academic skills scale for children with intellectual disabilities*

Scale	Age	Measurement areas	Components
The Arabic reading Skills scale for the first primary grade	6-10 years	Verbal expression skills and reading skills	Reading certain stories
Reading skills scale for individuals with intellectual disabilities	6-10 years	The skills of oral reading	Consists of 13 phrases graded in difficulty
Diagnostic list of basic reading skills	6-10 years	Reading skill, and the method of oral reading	Consists of a range of items that measures the decoding of words, oral reading, and analysis of the word
Test the diagnosis of reading skills	6-10 years	Reading skill, speed, and decoding the word	Consists of a subset of tests to measure the level of oral reading
Scale of writing skills	6-10 years	Handwriting skills	Consists of 17 phrases graded in difficulty
Basic math test	6-10 years	Basic concepts, mathematical processes	Consists of 13 sub-tests including numbers
Basic diagnostic list	6-10 years	Numbers, facts, and geometric measurements	Consists of a range of items that measures numbers and percentages

Characteristics of the initial image of the academic skill scale:

- Consists of 10 themes and includes 32 questions representing different parts, through two parts as follows:

- Reading and writing skills, consisting of 5 themes, including 18 questions representing 50 items.

- Account skills consist of 5 themes, and include 14 questions representing 42 items.

Procedures

The study took place over a period of sixteen weeks in the respective institutions. The researcher worked with 40 children with mild intellectual disability with the assistance of classroom teachers. Regarding female special education teachers, one of them was the leader of the study and helped the researcher to conduct this study with female learners who were randomly placed into two groups, i.e. experimental and control. The first group was the experimental group in which a meeting with the special education teachers was used to define what the purpose of the research and provide them with instructions, according to their regular classroom curriculum with the help of their Efficacy of Computer Assisted Instructions on

Academic Achievement of Intellectually Disabled Children.). A computer-assisted instruction (CAI) is defined as an interactive instructional approach in such a way that the computer is solely used as the tool for presenting the learning material and monitoring the learning process taking place among learners (Seo & Bryant, 2009). In all cases, CAI is programmed to adjust for the learners' abilities to an extent where the skills are advanced as required. In some cases, all course contents are delivered by the computer system (Seo & Bryant, 2009). It is interesting to note that CAI is applicable for enhancing reading, writing, and arithmetic skills among learners with intellectual disabilities. Before making an intervention to both the groups, pre-assessment was conducted to evaluate their thinking pattern. One-hour computer assisted instructions were given to the children per day by the special education teachers. During the intervention period, the follow-up process was also done by the special education teachers regarding the proper application in the experimental group. Evidence indicates that teachers should be active participants in CAI to make the use of this technology more effective (Cavalluzzo, Lowther, Mokher, & Fan, 2012). This is the reason why it was important to involve the teachers in the process.

Intervention

A computer-based program, which will also be referred to as computer assisted instruction (CAI) was applied on the intervention group of 20 learners with intellectual disabilities. The purpose of this intervention was to enhance the reading, writing, and arithmetic skills among the learners within the 16 weeks of experimentation with learners with intellectual disabilities. The program was assorted to address the three skills independently. It was administered as illustrated below. As indicated above, the program entailed provision of computer assisted instructions to the learners with intellectual disabilities in teaching reading, writing, and arithmetic skills.

a. Reading skills

To enhance the reading skills of the 20 learners, the program was designed to encompass the test-to-speech technology. According to Zhao (2007, p. 35), speech technology is 'technology that enables machines to receive and accept human oral language as input and respond with human or human-like oral language as output.' To add to this, Thompson (2005) defined text-to-speech technology as a multimedia program that can convert computer text to digitized speech, which means that it converts media from text to verbal formats. According to Zhao (2007), this technology curbs the decoding problems that impair comprehension of text by disabled learners. The program is designed to provide repetitive visual and auditory cues that enhance comprehension of texts.

The 20 learners were offered a tablet each, and the teacher directed them to the www.starfall.com website, which was found to be the best platform for learning phonics. The link that was opened for the learners on their respective tablet computers is https://www.starfall.com/h/ltr-sv-a/maw-an/?sn=ltr-classic

In this program, words are pronounced loudly by the computer and students directed to insert the missing letter. The program does not accept wrong letters. This means that the students hear, view, and act according to the direction given by the program. To achieve better results, the teachers who took the role of research assistants helped the learners who failed to insert the right letters in the blank spaces after several attempts. For uniformity purposes, the same words were availed uniformly to all 20 students to avoid bias.

b. Writing skills

The 20 learners with intellectual disabilities were subjected to a computer-based writing program to enhance their

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writing skills. The teaching was done at school using four computers – two for the girls and 2 for the boys. Four steps were involved in this process.

Step 1 – Dictating a word by the computer and displaying it visually on the screen in   large fonts and bright colours.

Step 2 – Displaying the picture of the item/action dictated by the computer program

Step 3 – Displaying of the printed word on a clean sheet of paper

Step 4 – Writing and rewriting of the words under the printed version immediately after listening to the dictation by the computer.

See the following diagram for illustration of the process undertaken in teaching writing skills.
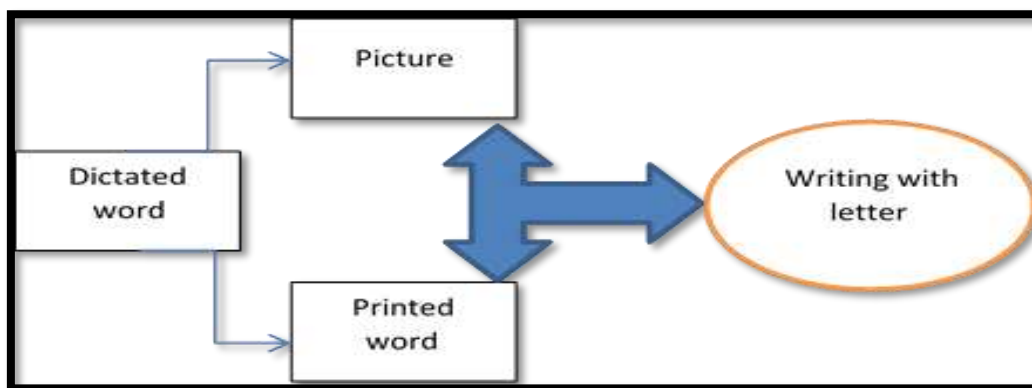

Figure 1. The process undertaken in teaching writing skills.

The role of the teachers was to inspect the process and ensure that the learners were spelling and writing the words correctly. The words were displayed and dictated on the computer screen for at least 3 minutes to enable the learners to write. A further step was undertaken to involve the learners' caretakers as home schooling was requested. For instance, the parents were asked to monitor the learners at close intervals to aid them in rewriting the specific words on the printed sheet until they ensure the page is filled up. The sheets were collected by the researcher after two days for analysis.

c. Arithmetic skills

In the study by Stultz (2017), the author's focus was to review the current scholarly evidence on the use of CAI to teach mathematics to learners with intellectual disabilities. This indicates that there have been previous efforts to study this intervention. In the current study, the focus was to improve the efficiency of simple addition among the 20 participants. The program was launched in the respective portable computer tablets for each learner. The following steps were undertaken.

The program was initiated where the addition of simple digits was displayed on the screen. The program enabled verbal pronunciation of the digits on display while highlighting each digit in green at different times when mentioning them. All additions were presented in the vertical format. The program then directed the learners to provide the answers to the simple arithmetic by dragging the correct answer from the provided multiple choices to fill in the space left for the answer. The program automatically rejected incorrect answers by highlighting the answers with red colour and producing a beep sound. The program is designed to ensure that the learners select the correct response before proceeding to the next problem. The learners were assisted by the teachers whenever they faced challenges in finding the correct answers. The learning skill was then assessed on week 4, week 8, and week 12 before making the final follow up on week 16. The learners were assessed on vertical addition by being presented with a paper-and-pencil addition test as per the above-mentioned intervals. Their respective results were recorded by the researcher for comparison with the control group.

Measures to Verify the Validity of the Scale

1. "Trustees validity": The scale has been presented to a group of arbitrators specializing in intellectual disability, with the aim of judging the scale's themes and its suitability and the extent of the affiliation of each question to its theme. Arbitration resulted in agreement on most questions, and omitted some questions that were not agreed upon.

2. Content Validity: This type is intended to identify the extent to which the dimensions that make up the scale are linked to the scale as a whole, and the correlation coefficient between each question and the overall degree of the themes to which it belongs was calculated using "Carl Pearson" Way. The result was that all correlation coefficients between the themes of the scale and the total degree were statistically significant at the level of (0.01), confirming the validity of the scale.

Measures to Verify the Reliability of the scale

- "Test-retest Method" to the sample of the rationing, and then calculating the correlation coefficients between the grades of individuals in the first and second applications, its magnitude was (0.82), with high value at the level of (0.01), demonstrating the reliability of the academic skill scale.

"Split-half method": By applying the scale to the sample of the rationing and correcting it according to the key of correction and recording the grades of individuals on all questions, and splitting the degrees of the measurements to two equal sections.

Scale Final Image Characteristics

The scale consists of two parts, 10 themes, 26 questions, and 70 items, as shown in the Table 3.

Table 3. *Themes and number of items of the final image of the academic skill scale for children with intellectual disabilities*

Part	Themes	Numbers and numbers of parts
Reading and writing skills	1. Reading and writing words.	1, 2, 3, 4; each question consists of 4 parts.
	2 - Reading and writing simple sentences.	5, 6, 7, 8; each question consists of two parts.
	3 - The distinction between the reading functions.	9, 10; each question consists of two parts.
	4 - Reading comprehension.	11 consists of two parts.
	5 - Written expression	12 consists of 4 parts.
Arithmetic Skills	1 - Read and write the numbers.	1, 2, 3, 4; each question consists of four parts.
	2 - Ranking, sequencing.	5 consists of four parts.
	3 - Classification.	6, 7; each question consists of two parts.
	4 - Correlations, simple calculations.	8 consists of four parts.

The child's degree in each part was determined by calculating the number of correct answers, so if the number of correct answers is less than 50% the skill level of the child is weak, and if the number of answer is between 50% - 75% it is a medium skill level, and if the number of answers is more than 75% it is a high skill level.

Statistical Methods Used

To answer the questions and hypotheses of the study, the statistical Packages of Social Sciences (SPSS) were used to calculate arithmetic averages, standard deviations, and Analysis of covariance (Ancova).

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Findings

The findings of the statistical analysis are as presented below.

Table 4. *The scores of the experimental and control groups*

Group Type	M ranks	Rank	U	W	Z	Significance
Control	9,1	55	0	55	4,-2-	Function at level 0 0,01

Table 5. *Results of analysis of variance associated with arithmetical averages for improving academic skills*

Source variance	Total squares	The degree of freedom	Average squares	P calculated	Statistical significance	Practical significance
Academic skills	62.935	1	62.935	59.273	0.000	51.87%
Ordinary	217.141	1	217.141	204.506	0.000	78.81%
Gender	0.233	1	0.233	0.219	0.642	0.40%
Teaching method	1.739	1	1.739	1.638	0.206	2.89%
The error	58.398	55	1.062			
Total	309.400	59				

Discussion

The use of computers in the educational process for students with special needs is of the utmost importance and an effective role in increasing their academic achievement and social interaction. It can develop their self-confidence and self-esteem, but if this process is to succeed in changing the lives of these students positively, this tool should be "computer" adequate and able to be used in an easy and uncomplicated manner. There is ample evidence of the ability of computers to positively influence the lives of children with intellectual disability and other people with special needs. The results of this study show that computer-based learning is more effective in compare to traditional regular teaching instructions. This is because, using computer and equipment will prepare an active learning environment that is more interesting and effective for both teachers and students. The results are in line with a research findings by Macho (2005) that proved using computer in education would enhance students' learning. However, this study proven the computer helps to improve academic skills as students are well-behaved and more focused. Moreover, this study proved that students learn more effectively with

the use of computer as lesson designed are more engaging and interesting.

For the first hypothesis: **There are no significant differences at the level of significance (α=0.05) between the average scores of children with intellectual disabilities in the experimental and control groups in the development of academic skills**, the results showed that there were significant differences at the level of statistical significance (0.05) on the academic skill scale attributable to the variable of teaching method, for the benefit of the experimental group. That is, there is an impact of the academic skills development program, which has been applied to the experimental group to improve academic skills. To verify the validity of this hypothesis, the researcher applied the academic skill scale to the control and experimental groups after applying the proposed program, and monitoring the scores on the impact of the computer-based program on each group and processing them statistically using the Mann Whitney test. The scores of the two groups are set out in Table 4 as follows:

From table 4, the value of U is statistically significant at 0.01, which indicates that there are significant differences between the mean scores of the two groups in the distance measurement on the skill scale for the benefit of the post application.

This indicates a significant change in the skill scale, where interaction with others and participation in the business, listening to what is required of him/her, due to the fact that the control was not exposed to the proposed program while the experimental was only exposed.

For the second hypothesis: **There is no interaction between the type of the suggested program and gender in the performance of intellectual disability children in academic skills as measured by the study tools.** The results of the study indicated that there were no statistically significant differences (0.05) between the results of the experimental group due to sex, and the percentage of total interaction was only (2.89), which is weak. This means that there is no difference in the responses of children with intellectual disabilities whether male or female, on the scale of academic skills. This indicates that their acquisition has evolved with the two genders at the same level, and this explains the impact of the educational program studied by children with mental disabilities regardless of the gender of the learner. The researcher attributed the reason for the absence of gender differences in the academic skills of the educational program to the similarity of the educational environment and the activities used in the educational program in terms

of skills, activities and training methods and the similar abilities and mental preparations of both genders and to deal with the program itself. Further, the program corresponds to the developmental characteristics of both, and there are no barriers to implement the program for both genders.

Table 5 shows a significant difference (0.05) between the two special arithmetic averages = α) significance level. Improving academic skills in children with the intellectual disability of the dimensional response is attributable to the variable method teaching, as shown in Table 4, there is no difference (0.05) between the averages = α) is significant at the significance level the mathematics of improving academic skills in children with intellectual disability of the dimensional response are attributed to variables of the study: gender, and interactive variable gender). Teaching as illustrated by the table, the significance of the process (volume effect) of the study variable (teaching method) has been valued (78.81%), which means that the zero hypothesis was not rejected coincidentally, but because of the relationship of correlation (large) according to the standard between the variable of the study (style) and improving academic skills in children with intellectual disability, it can be said that Computer Assisted

Instructions play a significant role in the skills development of intellectually disabled children in all dimensions. Repetition of words spoken by the special education teacher, more easily after the presentation of Computer Assisted Instructions, plays a significant role in skills development.

Recommendations:

- Generalization of this study on who works with intellectual disability children.

- Training teachers and parents to use the training program with intellectually disabled children.

- The need for further studies on academic skills for students with intellectual disabilities.

- The need to provide computers in sufficient numbers of classes of intellectual disability students.

- The importance of providing interesting computer-based learning programs suitable for students with intellectual disability so as to meet their specific educational needs.

- Provide training programs for teachers to increase their competence in this aspect and motivate them to use computers in teaching.

– To open the school for two to three hours in the evening for students who do not have such equipment in their homes or lacking the facility to use the computer; this will benefit these students during the school day.

Conclusion

Using the computer based program for teaching reading, writing and arithmetic skills with the effectiveness of special education, it is necessary to determine the quality of programs and design so as to ensure the increase of achievement of students, and should apply technology in the field of special education and the process of identifying good programs according to specific criteria that will contribute effectively to the benefit of students. It may be concluded that the attraction of the computer screen, the different attractive colors and figures, motivated children with intellectual disability to maintain their interest in the academics. It can be said that it is possible only because of the attractiveness of the task and its presentation on the electronic screen. In the end, the computer is only a machine, but its useful programs that meet the needs of the learner are what make it effective (Edwards, McMillon & Turner, 2015). The characteristics of the educational program are therefore the cornerstone of the achievement

of mentally retarded students coupled with correct teaching methods by teachers familiar with and efficient in computer use. In conclusion, the very first stage of using computer must be effective to make sure that, teachers and students are able to make the best use of it. Thus, preparations of a technology-based teaching and learning begin with proper implementation and supports by the school top management. If the using a computer in schools take place appropriately from the very beginning stage and the continuous maintenance are adequately provided, will result in a huge success and benefits for both teachers and students. The use of computer especially in teaching and learning is more about practicality as compared to theories and that is why teachers must be given time to learn and explore it, face the "trial-and-error" phase before they are completely comfortable with its usage and able to make use of it for teaching and learning.

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