



## البحث السابع

### **A Sensory Integration Program to Develop Visual Perception Skills Using Virtual Games for Children with Autism Disorder**

**Ibrahim Fatouh Moustafa AL Rifai**

**An English Language Teacher** -

**PhD researcher at the Faculty of Early Childhood Education**

**Prof. Adel Al-Said Ibrahim Al-Banna**

**Assistant prof.Ghada Sabir Abu Atta.**

**Professor and Head of the Department of**

**Assistant prof. of Mental Health,Early**

**ational Psychology - Damanhour University**

**Education for Childhood College, Matrouh university**

## **Abstract**

The study aimed to detect the effectiveness of the Sensory Integration Program to Develop Visual Perception Skills using virtual games in children with autism disorder. A sample of the study consisted of (8) children with autism disorder who had a lack of Visual Perception Skills. The researcher used the semi experimental method with a one-group design with a pre-, post- and follow-up measurement of the illustrated scale for children with autism disorder (prepared by the researcher).

The researcher used the statistical analysis of the data using the X<sup>2</sup>-chi square test to calculate differences between grading levels of age, intelligence, autism, Wilcoxon, and Effect Size calculation using the ETA box, the Mann-Whitney test.

The results of the study showed that there are statistically significant differences in favor of post-measurement of the scores of the Visual Perception Skills of children with autism disorder in favor of telemetry, and the absence of statistically significant differences between the post-measurement and follow- Autism spectrum.

**Key Words:**      **A Sensory Integration Program - virtual games-  
Autism**

## **Introduction**

Autism disorder is one of the most complex and difficult developmental disabilities, and it is one of the most severe and dangerous developmental disorders. Many considered it a form of mental disability, which is not a mental illness, but a disability that cannot be underestimated because it is not rare and represents a percentage that cannot be ignored. Owners of this disorder suffer from many difficulties, whether in social interaction, cognitive processes, language communication.

Recent progress has been made in all aspects of life, especially in the field of special needs and educational technology. The researcher has seen rapid and growing progress in the fields of care, educational, psychological, behavioral, social, rehabilitation and health services. People with autism spectrum disorder (**Fayza Ahmed, 2009, P.15**).

It can be said that most of the children of autism spectrum disorder suffer from a deficiency in some emotional, behavioral, cognitive and social processes and that the disorder in one of these processes necessarily affects the other processes as a result of the intertwining of the processes with each other, so some of the emotional skills of these children were concerned (**Soha Ahmed, 2001, P.37**).

Mahmoud Al-Sharqawi (**2016, P.65**) indicates that autism disorder occurs for one out of every 500 individuals and that its prevalence rate among boys is four times higher than that of girls, and that estimates show that the net annual increase rate in the number of individuals with autism compared to their peers with other injuries from Special needs category.

Visual perception is the visual observation of things and their recognition and initiation in the process is by light reflected from things on the nerve lines, and projected onto brain cells or cortex, which transforms them into images. Recognition is done by associating visual objects with similar images stored in memory Nabil Hafez (2004,45)

Visual perception is defined as the process of interpreting and interpreting visual stimuli, giving them meanings and connotations, and transforming the visual stimulus from its raw form into the gestalt of perception that differs in its meaning and content from the elements involved in it. Perception is also the process by which the input sensations can be given and interpreted, or the process by which the input information can be interpreted to give it a total meaning (Jan, 2007, 151).

Perception is the process by which we can organize, interpret and translate the input sensations in order to understand the environment around us (Baron & Kalsher. & Baron, 2002, 109).

Hisham Al-Hinnawi (2012, P.183) explained most researchers have the ability to infer the emotional state of those individuals we interact with by interpreting different signals such as tone of voice and facial expressions. On the other hand, we can measure how others react to what we say by using similar signals.

Sensory integration is the mechanism of sensory regulation of sensations coming to the brain through different sensory receptors, and the brain classifies, arranges and organizes information and gives meaning to it for use. Therefore, through training, we provide children with a high amount of organized sensory stimuli aimed at developing targeted reactions and responses that support learning and adaptation. Therefore, through training, we provide children with a high amount of organized sensory stimuli aimed at developing their responses without the child making an effort to obtain these stimuli. (Iman Khalaf Aqil Al-Enezi, 2013, 861)

The main goal of sensory integration therapy (SI) is to help the child improve his ability to process and organize sensory information. When the brain is able to organize sensory information, the result is an improvement in performance, life skills, emotional growth, and general growth. It helps your child's brain to develop basic life skills processes (Mohamed Sabry Wahba, 123, 2018, 123).

Virtual Reality (VR) which is a computer simulation based on the real world and provides a multi-sensory and multi-dimensional means through which users can interact in real time, is distinguished from other interfaces technology by two main features: immersion and interaction. Immersion is the three-dimensional feeling of being or "being there" within the virtual environment. This sense of presence enhances learning by increasing attention span, realistic task stimuli, and reducing distraction from extraneous stimuli.(**Aymerich L. (2010, P.43).**)

Virtual Reality imagine that when the day comes when you can completely simulate everything perfectly, the tone of the artist and the camera will return and the designers will begin to find solutions to keep them away from this hateful reality that sometimes kills creativity. (**Dalgarno B., & Lee M (2010, P. 42)**)

The role of virtual reality technology helped autistic patients, as they focused on the physical experience of patients and the importance of virtual

reality technology in real world situations. (M. Wang and E. Anagnostou, 2014, P.24)

Virtual reality classes differ from real classes because the world is predictable, and players interact with a high degree of consistency. Human bodies in the virtual world have unpredictable physical deviations from real humans as their body language and facial expressions, and virtual reality can be used in classrooms in the future to provide a support plan Flexible and affordable for children with autism. (Mohammed Khamis, 2015, P.11)

**Al-Husari (2000, P.9)** stated that we really live in an imaginary world, so many of the events around us are imaginary, cinema, theater, drama and databases. It should have the following characteristics and criteria: (verity, immersion, integration, interactive, personal embodiment, the disappearance of the interaction interface within the environment) and virtual applications that were used for education according to the following categories (virtual educational games, virtual theater, virtual lab, virtual museum, educational environments Virtual (virtual classrooms, training halls, study libraries, virtual universities and scientific conferences).

Concerning the training scenarios, **Khaled Nofal (2010, P.63)** stated their “true potential for those with autism to gain enough understanding of the neurological world that they can make choices in their pursuit of self-sufficiency and happiness, we are gradually shifting perspectives from helplessness to strength.”

the success of the program presented to children with autism disorder depends on the combination of experiences and programs prior to the acquisition of some emotional skills in an integrated psychological framework. **Muller. (2007, P. 78).**

Hence the idea of the current study is the preparation of the program of reading the mind to develop some emotional skills for children with autism disorder.

## **Background of the Problem**

The researcher's sense of the problem stemmed from:

A - Interviews conducted by the researcher with kindergarten teachers, inclusion teachers and parents of autism disorder children, their answers came that autism disorder children have shortcomings in emotional and social skills with themselves and others.

B - Reviewing many previous studies that dealt with the Visual Perception Skills of children with autism disorder using A Sensory Integration Program and virtual reality technology, which showed:

- Children with autism disorder do not possess an amount of empathy, impulse management, and self-control.
- These children's lack of self-understanding and emotion with others.
- Several studies have also recommended the importance of having different therapeutic approaches to provide children with Visual Perception Skills, such as the study of Sally El-Ghanem (2017), Heba Ahmed (2017), Dina Saeed (2016), Basma Morsi (2017), Sherine Boutros (2017), Salwa Rushdy (2012), Ashwaq Siam (2011), Ahmed Abdel Moneim (2016), Wafaa Moamen (2016), Yasmine Ghaly (2013), Hoda Makhoulf (2016), Shahinaz Fathi (2014), Reda Ahmed (2012), Mohammed Kamel (2016), Howida El-Sayed (2011), The problem is:

- 1) Children with autism disorder cannot name their Visual Perception Skills.
- 2) Children with autism disorder do not know how to read pictures of emotions.
- 3) Children with autism disorder cannot control their Visual Perception Skills.

## **Questions of the Problem**

Therefore, the problem of research focuses on the answer to the following main question: **What is the effectiveness of A Sensory Integration Program to Develop Visual Perception Skills Using Virtual Games for Children with Autism Disorder?**

The main question arises from the following questions:

1. What extent does A Sensory Integration Program develop by using virtual games in children with autism disorder?
2. What is the effectiveness of A Sensory Integration Program using virtual games to develop Visual Perception Skills in children with autism disorder?
3. What is the effect of training in children with autism disorder?

## **Purpose of the Study**

**The current research aims to:**

1. Develop and apply A Sensory Integration Program using virtual games to develop Visual Perception Skills in children of autism disorder.

2. Development of Visual Perception Skills for children of autism disorder.

### **The importance of the study:**

The importance of research is as follows:

#### **The theoretical significance of the research lies in the following points:**

1- The scarcity of Arab and foreign studies within the limits of the researcher's knowledge that dealt with: The effectiveness of using virtual games based on A Sensory Integration Program in developing some Visual Perception Skills for people with autism disorder.

#### **The practical importance also lies in the following points:**

1- To test the effectiveness of using virtual games in developing some Visual Perception Skills for children with autism disorder.

2- This study may make room for subsequent studies that suggest new methods and methods that can be used with children with autism disorder.

3- Helping families of children with autism disorder by contributing to the provision of training programs that they can apply at home to train the autistic child on Visual Perception Skills.

4- Preparing the illustrated emotional skills scale for children with autism disorder.

### **Study limits:**

**Time Limits:** The program was implemented in 40 sessions in 2022.

**Spatial boundaries:** The current research was implemented in Matrouh Governorate.

**Human Limits:** The study sample was intentionally selected from autism disorder children from the age of 6-8 years, and that sample was determined through the application of the CARS scale for autism disorder children and that they have verbal language with a slight mental disability in the reality of the sample consisting of eight male children.

### **Tools of the Study**

The study tools are divided into:

#### **Sample equivalency tools, including: First:**

- A. Goddard's IQ Test.
- B. Childhood Autism Rating Scale (CARS) Prepared by / Squealer et al. (1999), Arabization and legalization / Hoda Amin (2004).

#### **Second: Tools for measuring experimental variables, including:**

- A. Illustrated Visual Perception Skills Scale for Children with Autism Disorder / Prepared by the researcher.
- B. A Sensory Integration Program using virtual games / prepared by the researcher.

## **Methodology**

The semi experimental approach was used for the purpose of the study. This approach Recognize the differences between repeated measurements "independent variable and dependent variable", which is based on the measurements (pre-measurement and post-measurement and sequential) of the experimental group.

## **Study Variables**

The procedural definition of experimental variables in the research hypotheses is as follows:

- A) The independent variable:** the program, which is defined as "a set of educational activities (dynamic, artistic, musical, narrative, play)
- B) Dependent variable:** The level of performance of children with autism disorder is measured on the Visual Perception Skills scale after the application of the training program and in the first and second follow-up stages.

## **Definition of terms**

### **Autism Disorder**

It is a type of complex developmental disorder that appears in the early stages of childhood from birth to 8 years of a child's life and results in neurological disorders that affect brain functions and appear in the form of problems in several aspects such as interaction, social communication and play activities. (**American Psychiatric Association, (2013, P.92)**)

### **Visual Perception Skills**

Which is what Daniel Goleman defined to the existence of categories of emotions, including: (anger, sadness, fear, enjoyment, love, surprise, disgust, shame). Of these four emotions (sadness, anger, fear and happiness) people from different cultures recognize and Grant refers to emotional skills as:



(recognizing emotions by their names, expressing feelings, assessing the intensity of feelings, managing emotions, delaying gratification, controlling impulses, reducing tension, distinguishing between feelings and actions). (Hisham El Hennawy, 2012, P.238)

### **A Sensory Integration Program**

Sensory integration is defined as "the child's ability to perceive, understand, and organize sensory information coming from within his body and from the surrounding environment, which leads to the emergence of a normal behavioral response" (14,2005 Anderson & Emmons,)

### **Virtual Games**

The researcher adopts the definition of Howaida Al-Sayed (2011, P.18) procedurally: that virtual reality games are the place that the autistic child can experience in a three-dimensional environment and interact with that environment during the game, and this interaction is an essential part of the game with the aim of developing emotional, social and motor skills. It includes the skill, emotional, and cognitive objectives that are appropriate for the autistic child for his mental and chronological age.

## **Study Results**

The current study proved the validity of the following hypotheses, and the results were as follows:

1- There are statistically significant differences between the mean scores of the children of the experimental group in the pre and post measurements of applying the program on the Visual Perception Skills scale depicted for children with autism disorder.

2- There are no statistically significant differences between the mean scores of the children of the experimental group in the post and follow-up measurements of applying the program on the illustrated Visual Perception Skills scale for children with autism disorder after one month of the post measurement.

## **Field study procedures**

During this study, the researcher carried out a set of procedures that can be summarized as follows:

- a. Seeing references, research, and Arab and foreign journals to collect the scientific material to build the theoretical framework for the study variables.
- b. The researcher searched for the types of virtual games that are shown on the Google Apps and their suitability with children with autism disorder and their characteristics and how to use them in the program sessions to develop Visual Perception Skills for children with autism disorder.
- c. The researcher took the approval of Al Saady Primary School to conduct the field study and implement the program, and it was agreed with the school and on the researcher's work schedule with the children.
- d. Conducting an exploratory study to determine the initial sample for the study of children with autism disorder.
- e. Develop the initial content of the program, and determine the appropriate time for the sessions and their procedures.
- f. A program was prepared to develop Visual Perception Skills using virtual games for children with autism disorder, consisting of several skills and activities.
- g. The experimental sample of children with autism disorder (8) was selected, taking into account the equivalence of the sample.
- h. It was taken into account that the original sample was homogeneous in terms of mental age, intelligence degree and autism percentage.
- i. The illustrated Visual Perception Skillsscale was applied for children with autism disorder (tribal measurement) at Alsaady Primary School.
- j. Determine the most important reinforcers that are useful, and then use them during application.
- k. The program was applied to develop Visual Perception Skills for children with autism disorder for a period of three months.
- l. The post-measurement of the illustrated emotional skills scale for children with autism disorder was applied to children upon completion of the application of the program to show the effectiveness of the program in developing the Visual Perception Skillsof autistic children.
- m. The follow-up measurement was applied with an interval of one month from the time of application of the program to show the continuity of the effectiveness and impact of the program.
- n. Analyzing and processing the data obtained from the study tools that were applied by the Statistical Processing Program (SPSS).
- o. The researcher, through statistical treatments, discussed the results in the light of the theoretical framework of the current research and previous studies.

- p. In light of the research results, their discussion and interpretation, the researcher reached a set of educational recommendations and proposed research.

### **Statistical methods**

The study tools were corrected in preparation for their statistical treatment using the SPSS statistical software package, in order to test the validity of the study's hypotheses, and in preparation for its discussion and interpretation. The data in the current study were analyzed using the following statistical analysis methods:

- 1) Using the Wilcoxon test to calculate the trend of differences between the ranks of the scores of the related samples in repeated measures (pre, post, and trace).
- 2) Calculating the Effect Size using the Eta square in the event that the Wilcoxon value is statistically significant.
- 3) correlation coefficient.
- 4) Cronbach's alpha coefficient.
- 5) chi square test

### **Abstracts**

In light of the study results, the following was concluded:

- 1- Using an interactive program that had great effectiveness in developing some scientific concepts using virtual games.
- 2- The interaction of a child with autism disorder with the activities of the program (using virtual games - without using virtual games) had the effect of raising the level of performance of children in their acquisition of some of the Visual Perception Skills contained in the study program.

### **Study recommendations**

In the light of the results achieved by the study, the researcher recommends the following:

1. Activate the role of technology and electronic programs, especially virtual reality techniques as an effective means to refine and develop some skills in children of autism disorder, who suffer from severe deficiencies in most of them.
2. Attention to educate parents of children with autism disorder and training and involve them in training programs and guidance to the

best ways to enable them to take the hands of their children and work to unify their isolation and help them to acquire different skills and communicate with others, which contributes to reduce many of the problems.

3. Conducting training courses for teachers, psychologists and workers with children with autism disorder on how to use virtual reality technology, especially virtual games.
4. The need to provide appropriate training programs that help children with autism disorder to be self-reliant as much as possible, which may improve their level of psychological and social compatibility.
5. Interest in conducting many studies and research on a larger scale and on more samples.

### **Suggestions for further researches**

In light of the results of this study and the completion of the effort made in the current study and the problems faced by the researcher during the conduct of this study, so the researcher suggests some topics that still need research and study in this field, which are:

1. A study to reveal the effectiveness of virtual reality techniques in treating children with autism disorder.
2. The effectiveness of an electronic behavioral cognitive program based on virtual games to develop the skills of visual-spatial intelligence for children with autism disorder.

### **References**

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author. Google
- Dalgarno, B., & Lee, M. J. W. (2010). What are the learning affordances of 3-D virtual environments? *British Journal of Educational Technology*, 41(1), 10–32. Cross Ref Google Scholar
- Aymerich-Franch, L. (2010). Presence and emotions in playing a group game in a virtual environment: The influence of body

- participation. Cyberpsychology, Behavior, and Social Networking, 13(6), 649–654. CrossRefGoogle Scholar.
- Jane, E., Linda, K., & Marrcial, B. (2007). Behavioral Indexes of the Efficacy of Sensory Integration Therapy. American Journal of Occupational therapy, 61(5), 555-562.
  - Muller, R, A. (2007) The study of autism as a distributed disorder. Mental retard Dev Disable Res Rev. V13(1): p87.
  - M. Wang and E. Anagnostou. (2014). Virtual Reality as Treatment Tool for Children with Autism. V.B. Patel et al. (eds.), Comprehensive Guide to Autism, DOI 10.1007/978-1-4614-4788-7\_130, Springer Science Business Media New York.
  - Shanna L. Burke & Tammy Bresnahan & Katrina Epnere & Albert Rizzo & Matthew Trimmer. (2017). Using Virtual Interactive Training Agents (ViTA) with Adults with Autism and Other Developmental Disabilities. Journal of Autism and Developmental Disorders (2018) 48:905–
  - 912 <https://doi.org/10.1007/s10803-017-3374-z>.

### ثانيا المراجع العربية:

- أحمد الحصري. (٢٠٠٠). منظومة تكنولوجيا التعليم في المدارس الواقع والمأمول، المؤتمر العلمي السنوي السابع للجمعية المصرية لتكنولوجيا التعليم، المنصورة: دار الوفاء.
- خالد محمود نوفل. (٢٠١٠). تكنولوجيا الواقع الافتراضي واستخداماتها التعليمية. عمان، الأردن، دار المناهج.
- سهى أحمد أمين نصر. (٢٠٠١). مدى فاعلية برنامج علاجي لتنمية الاتصال اللغوي لدى بعض الأطفال التوحيديين. رسالة دكتوراة غير منشورة، معهد الدراسات العليا للطفولة جامعة عين شمس.
- محمد صبري وهبة. (٢٠١٨). التربية النفس حركية للأطفال ذوى الاضطرابات النمائية (ذوى الإعاقة الفكرية، وذوى التوحد): النظرية والتطبيق. القاهرة: مكتبة الأنجلو المصرية.

- فايزة إبراهيم أحمد. (٢٠٠٩). فعالية برنامج علاجي سلوكي في تنمية بعض التعبيرات الانفعالية لدى عينة من الأطفال التوحديين. رسالة دكتوراة منشورة، كلية التربية، جامعة دمشق.
- محمد عطية خميس. (٢٠١٥). تكنولوجيا الواقع الافتراضي وتكنولوجيا الواقع المعزز وتكنولوجيا الواقع المخلوط. القاهرة: الجمعية المصرية لتكنولوجيا التعليم.
- محمود عبد الرحمن الشراوي. (٢٠١٦). الإعاقة العقلية والتوحد. كفرالشيخ: دار العلم والايمان للنشر والتوزيع.
- مريم عبد اللطيف أحمد. (٢٠١٤). فاعلية برنامج تدريبي لتنمية بعض مفاهيم نظرية العقل لسيمون كوهين لدى عينة من الاطفال الذاتويين، رسالة ماجستير، كلية البنات الآداب والعلوم التربوية، قسم علم النفس، جامعة عين شمس.
- مريم عبد اللطيف. (٢٠١٥). برنامج قراءة العقل لتدريس مفاهيم نظرية العقل للأطفال الذاتويين وذوي التأخر المعرفي، ترجمة واعداد مريم عبد اللطيف، تقديم منال عمر، القاهرة: مكتبة الأنجلو المصرية.
- نبيل عبد الفتاح حافظ (٢٠٠٤). صعوبات التعلم والتعليم العلاجي القاهرة: مكتبة زهراء الشرق.
- هشام الحناوي. (٢٠١٢). نكاء المشاعر. الجيزة: هلا للنشر.
- هويدا سعيد عبد الحميد السيد. (٢٠١١). فاعلية بيئة واقع افتراضي تعليمية في إكساب الأطفال التوحديين بعض مهارات التفاعل الاجتماعي. رسالة دكتوراة منشورة، كلية التربية، جامعة عين شمس.

## برنامج تكامل حسي لتنمية مهارات الإدراك البصري باستخدام الألعاب الافتراضية لدى أطفال اضطراب التوحد

إعداد

الباحث / إبراهيم فتوح مصطفى الرفاعي

- معلم أول لغة إنجليزية

- باحث دكتوراه بكلية التربية للطفولة المبكرة

أ.د. عادل السعيد إبراهيم البنا  
أستاذ علم النفس التربوي ورئيس قسم علم النفس  
التربوية  
وعميد كلية التربية الأسبق جامعة دمنهور  
مطروح

أ.م.د. غادة صابر أبو العطا  
أستاذة الصحة النفسية المساعد كلية  
الطفولة المبكرة جامعه

### المستخلص

قد هدفت الدراسة الحالية إلى الكشف عن فعالية برنامج تكامل حسي باستخدام الألعاب الافتراضية لدى الأطفال ذوي اضطراب التوحد، وتكونت عينة البحث من (٨ أطفال) من الذكور ذوي اضطراب التوحد الذين لديهم قصور في مهارات الإدراك البصري، واستخدم الباحث المنهج شبه التجريبي ذا تصميم المجموعة الواحدة مع القياس القبلي والبعدي والتتبعي لمقياس الإدراك البصري المصور لدى أطفال ذوي اضطراب التوحد (إعداد/ الباحث).

وقد قام الباحث بالمعالجة الإحصائية للبيانات باستخدام اختبار كا<sup>٢</sup> chi square test لحساب الفروق بين رتب درجات العينة الواحدة في العمر والذكاء ودرجة التوحد واختبار "ويلكوكسون" Wilcoxon، وحساب حجم التأثير Effect Size باستخدام مربع إيتا، اختبار "مان وتني" Mann-Whitney.

**وأسفرت الدراسة إلى النتائج التالية:** إنه توجد فروق دالة إحصائياً لصالح القياس البعدي لدرجات مقياس الإدراك البصري المصور لدى أطفال ذوي اضطراب التوحد لصالح القياس البعدي، و عدم وجود فروق دالة إحصائياً بين القياسين البعدي والتتبعي لدرجات مقياس الإدراك البصري المصور لدى أطفال ذوي اضطراب التوحد.

**الكلمات المفتاحية:** برنامج تكامل حسي - الألعاب الافتراضية - التوحد