

Evaluation of E- Learning Method as a Mean to Support Autistic Children Learning in Oman

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Abstract

Children with Autism require more attention and care from their peers, particularly those who are active in their schooling. There are far fewer online learning programs and materials available for schooling children with Autism Spectrum Disorder. However, because the use of technology can aid in the education of autistic children, e-Learning systems are one of the areas of inquiry that should be included in autistic children's education in Oman. This study intends to determine the existing state of educational support for autistic children in Oman, as well as to provide a specific solution to aid in the education of autistic children. Because quantitative approaches are appropriate for this type of research, a questionnaire survey was utilized to gather the necessary data. The researchers discovered that impairment in social contact is one of the main challenges faced by autistic children in their daily lives, based on the information received from the Oman questionnaire and the findings of the literature study. Furthermore, these children had moderate autism. There is a shortage of schools, centers, and employees who are meant to be trained to educate autistic children, according to the findings. The findings of this study suggested that a specific e-Learning system be designed and implemented in Oman to support autistic children, which would give them with rapid support under the supervision of the surrounding community, regardless of their background or specialty.

Keywords— E-Learning, Children with Autism, Teaching Environment, Communication, Educational Basics

I. INTRODUCTION

Parents usually notice strange conduct in their children when they are between the ages of a few months and three years. They may not understand what this type of behavior is or what it is called at this point. An expert consultation could indicate that a child has "autism disorder," which is described as a group of disorders that disrupt a child's communication with others and the exchange of relationships with them. The behavior of each child with autism differs from that of the other child, which causes this illness. It ultimately boils down to the fact that they all show several indications of autism. On the plus side, despite having autism, the youngster has many

remarkable skills that draw attention to him and can be a vital component in assisting him in finding the correct treatment [1].

Starting in the first three years of life, a child can acquire autism symptoms, which can lead to isolation and a lack of engagement with others. As a result, autistic children may not develop their language abilities at the same rate as their peers. As a result, autistic children will be unable to communicate or learn using traditional teaching methods during school hours, necessitating the creation of a specific educational system that considers autistic children's unique demands [2]. Efforts to support autistic children began a long time ago, when parents, governments, schools, and non-

governmental organizations (NGOs) implemented special methods to support autistic children. Today, autistic needs vary, so trainings or educational mechanisms for autistic children are dependent on the children's status and the level of awareness of their needs in the surrounding community [3].

This study looks at the current state of autistic children's educational issues in the Sultanate of Oman, with the goal of gaining a better knowledge of their needs and suggesting a viable solution that takes advantage of technological advancements. [4], [5], [6], [7], [8], and [9].

II. REVIEW OF THE LITERATURE

In practically every industrial industry, the use of technology has been shown to increase value [10]; [11]. Technology has begun to play an increasingly important role in education and school management in recent decades. Technology has provided education with the resources and platforms needed to support many curriculums [12]. Because the usage of an e-learning system is a great example of how technology may be used effectively, it was required to assess the effectiveness of using technology with students with special needs [13].

Parents must determine that their child has autism if they notice their child's lack of interaction and social communication. Parents can use technology, such as tablets, to help their children break out of the isolation they often experience as a result of their inability to effectively engage with those around them. Support applications are accessible on tablets and computers, for example, and include tools that the child with autism can utilize to improve their social skills and abilities [14].

Autism affects children's ability to arrange their emotions. This results in a lack of comprehension of their own and others' feelings. The necessity of having technology and computers available to assist children with autism through smart applications that incorporate instructional programs is highlighted here. Emotional intelligence can be easily accessed by a child with autism.

In youngsters with autism, e learning was utilized to extract physiological activity in expression and its relationship to various emotions. Autism is characterized by a lack of emotional strength. Different results were achieved after experimenting with this technology, including heart rate monitoring and facial expressions [15]. It's challenging for caregivers of children with autism to discover a curriculum that reflects the way these children think. This method allows young children to adjust to their surroundings while also assisting them in controlling their reactions. This study establishes a new strategy for assisting youngsters with autism. This method is centered on elucidating commonplace behaviors [16]. Professionals should use e-learning to help a child with autism develop intellect. Using an electronic learning system to calculate this autistic child's IQ. This e-learning system can provide facilities in the form of a personalized lesson that the youngster can utilize to demonstrate his or her intellectual talents [17].

Children with autism have been able to sustain their attention and discern the degree of attention of each youngster using technological interventions. By giving electronic design and adaptable learning tools that sustain the attention of this group of children, electronic interventions have been able to support and aid autistic professionals. [18] used the study to assess facial expressions in a group of youngsters with autism. Finally, experts have come up with a number of findings that show that facial expressions are an important indicator of a child's attention [19].

The study that legislators based their decisions on was able to demonstrate the value of the Internet in e-learning. Following the experiments, 17 teachers were used to carry out this task and participate in the application of this system and experience on their students at the school Banjarmasin in Indonesia. These 17 teachers have come to the conclusion that many lessons will be missed if there are no pupils present. This suggests that the presence of students is the most significant aspect in the educational process' performance, and that its absence results in educational losses for

students who will miss important educational lessons, as well as for teachers who would have to repeat courses. Researchers were compelled to explore for a solution to this issue. They were able to come up with a method that bridges the gap and are currently awaiting approval to connect the Internet to schooling. Children will be able to see the classes they missed while they were away on the internet. The term "e-learning" was coined by researchers to describe this solution. The principle of e learning is based on numerous stages, each of which has the goal of developing and analyzing the principle. These stages are included in the design of an electronic system after determining the problem to be addressed, developing the system, and presenting it to teachers for feedback on the advantages and drawbacks of the educational electronic system, as well as the extent to which it accomplishes the desired goal. [20].

Interest in social development has corresponded with the emergence of ways for expanding research in digital learning since ancient times. People with specific needs and cognitive disabilities are given extra attention in e-learning. E learning can be used to assist a child with autism in socializing with relatives or peers of the same age. In the methodological literature, researchers were able to employ four steps: literature and analysis, comprehensiveness and exclusion, synthesis, and comprehensive study in scientific literature and databases. In the end, several conclusions were drawn, the most important of which are: the scarcity of e-learning studies that address the accessibility of the child with autism, the weakness of the inclusion of accessibility and its criteria, the weakness in the conclusion of special education results, and the replacement of the focus on a range of psychological and neurological disorders with the focus on weakness. [21]

In the past, studies on increasing social interaction in children have been scarce, and efforts to improve the abilities of children with autism have been severely constrained. Researchers, on the other hand, have developed interactive games that aid autistic youngsters in

improving their talents as well as gaining access to proper treatment that improves the therapeutic process. Games have been used as an educational tool for a long time, and we now employ electronic games for the same purpose. Electronic games, in particular, have proven to be an excellent tool in the education of children with autism [22].

Author [23] employed a genuine game that allows the autistic child to use it to examine his sentiments and the way he expresses them, which results in his body movements in general. This study's evaluation is based on exposing 10 autistic children to various sessions of playing this dangerous game while monitoring them with an RGB-D sensor that records three-dimensional movement of the bodies of this group of children in particular. The examination of this study eventually resulted in autistic children's replies and the translation of their facial expressions.

Increased artificial intelligence authorization would have an impact on educational systems as well as users of learning applications. Customers can save time and money by creating additional pages that let them appreciate augmented reality with less effort. The size of these institutions is shrinking. Virtual reality is gaining popularity, and many businesses now offer virtual reality learning systems. This bold initiative provides a powerful incentive for educational institutions to serve persons with low wages and poor educational outcomes. Studies are now looking towards integrating augmented reality into various aspects of society, with a particular focus on improving its utility in educational applications [24].

III. RESEARCH PROBLEM

In Oman, there is a scarcity of studies that look into the issue of autistic children's education. As a result, there are insufficient sources or statistics to explain the current situation of autistic children's education in the community, or the challenges that they or their parents have in ensuring that they receive a suitable education [25].

Also, there is a dearth of schools or centers specialized to educating autistic children, which means that many of them are handled in the same way as other children in terms of education, where they will study using the same resources as other pupils [26].

Previously, there were books with pictures or lists that parents or teachers could use to teach the child with autism about routine life things, such as eating, sleeping, or going out of the house, and the child's communication with the learner was via selecting the appropriate verb from pictures presented to him manually. This could be considered a teaching method for autistic children where the use of visual aids eased communication between the learner and the audiologist.

Autistic children require unique tools or approaches to facilitate communication with their settings [27], and technology can be an effective motivator and support for kids with disabilities [28],[29]. As a result, there is a pressing need to equip autistic children in Oman with a teaching technique or tool that meets their needs; this solution must take use of technological advancements and be tailored specifically for autistic children, as opposed to what is accessible for other children.

IV. RESEARCH OBJECTIVES

This research aims to investigate the current state of autistic children in Oman in a purpose of providing a solution that can contribute to the proper education of autistic children, therefore the following objectives shall be guiding this study.

- To investigate the difficulties that the autistic children or their parents are facing for the autistic children education.
- To identify possible improvement in the autistic children education.
- To suggest suitable teaching method that suits needs of autistic children in Oman.

Research methodology and data collection procedure

This section consists of two parts. First section is the research methodology, and second section

is the procedure of Data Collection as a following:

1. Research Methodology

Based on the nature of this research, a quantitative research method is appropriate for gathering statistical data on the required elements. A questionnaire is a quantitative tool that can be constructed to include standard questions that the target audience can answer. The questionnaire seeks to define educational patterns for children with autism, as well as the availability of appropriate teaching methods or resources, as well as whether it is possible to find a means of electronic learning availability in schools serving children with autism. All of this in order to propose a good approach or tool that can assist children with autism in learning and communicating socially, both with their peers and with those around them in the community in which they live.

The research was possible to discover patterns and select a technique of giving the necessary information for children with autism that will be available on the suggested model by using this questionnaire. The questionnaire might also be used to assign subjects in order to stimulate mental information in this group of children. The questionnaire included both open-ended and closed-ended questions. Where open questions have allowed respondents to express their own perspectives on the studied points, this may aid the research in opening up new horizons and new ideas. The questions were written in a professional manner so that the target respondents could easily understand them. As we all know, people's abilities and capabilities differ. Everything is determined by their culture, education, and life experiences. The questionnaire also included words from specialists who work with autistic youngsters. Incorporates a questionnaire into data analysis in order to achieve the predicted objectives of this research, as well as the possibility of acquiring information that aids the proposed model. Change the questionnaire so that closed questions are also used. That is, we can claim that the answers to these questions include options that allow the respondent to select what best fits his or her opinion.

The availability of these options enables the respondent to respond quickly. When compared to other recognized frequent approaches, closed-ended questions are one of the most popular methods for people who respond to questionnaires, particularly in surveys. Where the respondent can easily choose the response is available in front of the answers offered to him in each question. The speed with which respondents react is motivated by the desire to obtain the greatest number of responses and an easy approach to speed up the process of gathering the required data in a very short amount of time. It also aids in standardizing the responses and identifying a method to address them for easier analysis.

2. Procedure of Data Collection

The necessity of examining the data, this research obtained an examination of the data collected through the questionnaire by using visual and descriptive tools. The purpose of this data examination is to arrive at the lost data and its patterns. In addition, after specifying outliers, statistical assumptions will be ensured and complied with.

Loss of data and its causes, the main reason for data loss is the respondent's inability to answer a number of questions during the questionnaire or even his inability to answer a single question.

ACS	N	Skewness	Kurtosis
	Statistic	Statistic	Statistic
ACS1	29	-.402	-.254
ACS2	29	-.363	-.179
ACS3	29	-.398	-.373
ACS4	29	-.937	.884
ACS5	29	-1.043	.965
ACS6	29	-.124	-.712
ACS7	29	-.485	-.464
ACS8	29	-.481	-.163
EL1	29	-.486	.236
EL2	29	.103	-.371
EL3	29	-.035	-.087
EL4	29	-.318	.251
EL5	29	-.798	.781
EL6	29	-1.359	2.052

Table 1 - Skewness and Kurtosis for Autism child support and E-learning

Table No. (1) Sheds light on the support of children with autism, electronic learning methods in addition to the results related to the items. For this reason, the results showed in Table (6) that there are no major issues related to normal distribution

Respondents' Profile

The sample's characteristics provide information about the gender, age, Your relationship with children with autism, and Degree. The results were obtained by analyzing the children with autism information and demographic variables as illustrated in Table 2.

Measure	Item	N	(%)	Cumulative %
Gender	Male	18	62.1	62.1
	Female	11	37.9	100.0
Age	15-25	11	37.9	37.9
	26-35	9	31.5	69.4
	36-45	6	20.3	89.7
	46-55	3	10.3	100.0
Your relationship with children with autism	Teacher	12	41.4	41.4
	Competent	9	31.0	72.4
	Instructional provider	8	27.6	100.0
	Other			
Degree	High School	10	34.5	34.5
	Diploma	7	24.1	58.6
	B.Sc.	8	27.6	86.2
	Master	4	13.8	100.0
	Other			

Table 2 - The demographic data of Children with Autism s (N=29)

The reliability of the scale used

In Table (3) the reliability measure is used by analyzing and re-examining the sample. Alpha Kronebach is used to ensure the internal consistency of all factors. The iterative process is also used; Determination of volume reliability.

Variable	Sample (n)	Cronbach's Alpha
Section 2: Autism Child Support		
ACS1	29	.832
ACS2	29	
ACS3	29	
ACS4	29	
ACS5	29	

ACS6	29	
ACS7	29	
ACS8	29	
Section 3: E-learning		
EL1	29	.856
EL2	29	
EL3	29	
EL4	29	
EL5	29	
EL6	29	

Table 3 - Cronbach's Alpha Test Results of the Study.

Table 4 shows the descriptive analysis that contributes to supporting autistic children (ACS). In particular, the average value (ACS4), where we find it high.

No.	Variable	N. of Items	Mean	StdD
Section 2: Autism child support (ACS)				
ACS1	Have you heard about kids with autism before?	8	3.86	.923
ACS2	Do you have a family member or know a friend or relative who has a child with autism?		3.85	.945
ACS3	If your answer is Yes for question # 2, Does the area where the child live have a school that support children with autism?		3.81	.865
ACS4	If your answer for question #3 is No, how far is the nearest school form the child home/area?		3.75	.874
ACS5	Availability of specialized teachers for children with autism in these schools.		3.73	.957
ACS6	The method of teaching and learning at these schools is		3.71	.985
ACS7	Based on your answer for question #6, how do you rate the used teaching method		3.74	.984
ACS8	If your answer to Q6 is 2, to what extent do autistic children benefit from e-learning methods?		3.76	.961
Overall of ACS			3,75	.779

Table 4 - Descriptive Analysis for Autism Child Support

The increase in the average value for the Autism Child Support Factor (EL6) in Table (5) shows the descriptive analysis of e learning.

Section 3: E-learning				
No.	Variables	N. of Items	Mean	StdD
EL1	Have been exposed to any means of e-learning previously?	6	3.76	.957
EL2	If your answer for question #1 is Yes, How you rate e-learning method.		4.02	.924

EL3	Do you think e-learning method and support can be used to support child with autism?		3.85	.963
EL4	What kind of Materials should be included in e-learning system for autistic children?		3.88	.958
EL5	What kind of Skills should be included in e-learning system for autistic children?		3.82	.869
EL6	What are the ways that draw the attention of children with autism during education?		4.18	.929
Overall of EL			3.95	.891

Table 5 - Descriptive Analysis of E-Learning

The increase in the average value for the Autism Child Support Factor (EL6) in Table (5) shows the descriptive analysis of e learning.

Table (6) shows sex dependence to obtain variable levels.

Variable	Gender	N	Mean	Std. Deviation	F Value	Sig. (P value)
Autism Child Support (ACS)	Male	18	3.78	.452	1.572	.219
	Female	11	3.71	.312		
E-Learning (EL)	Male	18	3.78	.623	.054	.835
	Female	11	3.76	.643		

Table 6 - Group Statistics in Terms of Gender

Table (7) shows age dependence to obtain variable levels.

Variable	Age	N	Mean	Std. Deviation	F Value	Sig. (P value)
Autism Child Support (ACS)	15-25	11	3.75	.367	.581	.683
	26-35	9	3.77	.234		
	36-45	6	3.76	.234		
	46-55	3	3.73	.346		
E-Learning (EL)	15-25	11	3.76	.283		
	26-35	9	3.71	.675	.755	.587
	36-45	6	3.72	.435		
	46-55	3	3.82	.384		

Table 7 – Level of all available by age

Variable	Relationships	N	Mean	Std. Deviation	F Value	Sig. (P value)
Autism Child Support (ACS)	Teacher	12	3.72	.345	.574	.683
	Competent	9	3.76	.234		
	Instructional provider	8	3.77	.253		
	Other					
E-Learning (EL)	Teacher	12	3.76	.256	.708	.587
	Competent	9	3.69	.676		
	Instructional provider	8	3.73	.456		
	Other					

Table 8 – Level of all available by relationship

Table (8) shows the relationship of the respondent to this child with autism. As he further explained, the levels of all variables are

according to this relationship. This relationship contained four options that allowed the respondent to choose from. These four

relationships are: the specialist, parents, educational provider, and teacher.

Variable	Degree	N	Mean	Std. Deviation	F Value	Sig. (P value)
Autism Child Support (ACS) 20194844 //	High School	10	3.76	.442	.944	.436
	Diploma	7	3.85	.317		
	B.Sc.	8	3.92	.393		
	Master	4	3.73	.344		
	Other	-				
E-Learning (EL)	High School	10	3.67	.745	.706	.587
	Diploma	7	3.82	.636		
	B.Sc.	8	3.87	.716		
	Master	4	4.03	.363		
	Other	-				

Table 9 – Level of all available by degree

Table (9) indicated the academic degrees of the respondent for this questionnaire. We conclude from the results that the degrees of the respondents do not affect at all in providing support for autistic children.

V. RESULTS AND FINDINGS

The outcomes of the previous analytical sections aid in identifying the needs, equipment, and methodologies required for building an electronic learning system for autistic children. In section 7.2 Procedure of Data Collection, it is demonstrated that there is a direct significant relationship between the use of technology in education and motivating autistic children to participate more in the learning process; additionally, demographic factors such as (gender, age, your relationship with children with autism, and education level) have a significant impact on the learning process of autistic children. The findings revealed by table 1. The Skewness and Kurtosis tests revealed that the independent variable is Autism kid support, and the proposed model of E-learning as the dependent variable, which assisted and encouraged them to enhance their learning and communication abilities with the surrounding community.

The proposed model was highly motivated to improve autistic children's involvement. This aided them in addressing the issue of their inadequate social connection. This study revealed that an Electronic Learning System has a promising future as a core aid to promote the

education and communication of autistic children in Oman. However, E-Learning for autistic children remains a hot topic to be debated, and there are several factors to be researched for better alignment with the exact needs of autistic children within certain domains such as in underdeveloped nations, particularly in Oman.

VI. RESEARCH CONTRIBUTION

The contribution of this study to the epistemological study in Electronic Learning is extremely valuable. The study on the Naturalistic the Teaching Approach from the perspective of improving impairments in education and communication of autistic children in Oman, particularly to improve performance and efficiency of teaching and cooperation of autistic children within their Naturalistic surrounding environment at educational Units, was invaluable. This explains how Electronic Learning can make autistic children's educational experiences more meaningful.

In this study, a number of relevant issues have been highlighted and discussed which require the use of appropriate effects of the electronic learning support system for children with autism spectrum disorders, whose input is triple:

- ongoing discussion of factors which affect their daily lives in developing countries by the electronic learning support scheme for autism;

- Knowledge of the benefits and conditions of autism's electronic learning intention;
- A study on how autism children are prepared for EL intention to develop countries' autism (Oman).
- Contribution to Knowledge

This report makes an important and groundbreaking contribution to the field of electronic learning (EL). The focus of this study was the provision of theory for the promotion of electronic learning, for example the model proposed. Distinctive and notable concerns are highlighted that are important in strengthening the intention of students to learn electronically. For example, a thorough understanding of the field of electronic learning in developing countries and the findings that have been found would demonstrate how children behaved humorously, and how the issue of social reactions among autistic children evolved and improved. This was accomplished through the interpretation of aspects such as: (i) immediate surroundings (sound, light, temperature and design). (ii) Private enthusiasm (motivation, perseverance, responsibility and flexibility need); (iii) physiological criteria (entity, opponent, parents, and adults); (iv) (sensual power, comprehension, time, and mobility).

7.1 Model contribution and Research outcome

The investigation of autistic children's electronic learning social interaction as a significant contribution to electronic education is the primary topic of this research. Understanding autistic children's social interactions provides consistency in chosen electronic learning techniques, which ultimately face a number of challenges in order to attain higher performance. Following the model's deployment, proof of concept testing, and evaluation, a demand for the study of autistic children's perceptions of social contact using electro-learning has been discovered.

VII. CONCLUSION & RECOMMENDATION

Autistic children are a particular category of children that require specific attention in order for them to be easily integrated into their communities. Education and the school

environment are two of the most important platforms for assisting autistic children in improving their learning and communication skills. Autistic children, as a distinct situation, require an educational system, resources, and materials that are tailored to their specific needs. Autistic children's position and necessary care in developed nations such as Oman require greater inquiry to better understand their requirements and offer them with appropriate support in the modern era.

This research study investigates the current situation of autistic children in Oman; the collected viewpoints from autistic children's surrounding environment provide insights on the necessary support to their education and communication abilities. The findings showed the importance of developing appropriate tools to support Omani autistic children's education and communication abilities.

Further inquiry is required for future work to define the exact set of criteria of an eLearning system that will be designed and developed specifically for Omani autistic children.

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