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# **The American University in Cairo**

## **School of Global Affairs and Public Policy**

**The Integration of Children with Autism in the  
Egyptian Society by the Use of ICT Tools**

**A Thesis Submitted to the Department of  
Journalism and Mass Communication**

by

*Aline Samir Bahari*

**In Partial Fulfillment of the Requirements for  
The Degree of Masters of Arts**

**Under the Supervision of Prof Dr. Hussein Amin**

The American University in Cairo  
School of Global Affairs and Public Policy

The Integration of Children with Autism in the Egyptian Society by the Use of ICT Tools.

A Thesis Submitted by

**Aline Samir Bahari**

To the Department of Journalism and Mass Communication

(May / 2016)

in partial fulfillment of the requirements for the  
Degree of Masters of Arts

Has been approved by

Name DR. Hussein Amin  
Thesis Adviser  
Affiliation Professor JRMK - AUC  
Date May 8, 2016

Name Dr. Naila Handy  
Thesis Second Reader  
Affiliation Associate Professor Chair JRMK - AUC  
Date May 8, 2016

Name Dr. Rasha Allam  
Thesis Third Reader  
Affiliation Associate Professor JRMK - AUC  
Date May 8, 2016

Name Dr. Naila Handy  
Department Chair  
Date May 8, 2016

Name \_\_\_\_\_  
Dean of GAPP  
Date \_\_\_\_\_

## **DEDICATION**

To my brother:

Karim Bahari,

Your presence in our lives made it different...

I learnt a lot from your unspoken language...

And it is mainly because of you being here that I thought of reaching where I am now...

Although I don't usually express it:

I Love you much BROTHER <3

## ACKNOWLEDGEMENTS

At this point of my life, I look back... And yes I thank each and every one I know... Each one added something special. This thesis took sometime to be completed, not because of any reason except that I always strive to do the best. And for this virtue, I have to bow in respect to my parents: Astrid & Samir BAHARI... You made me the person I am today, you pushed me to have the degree and are always there for me even at this stage of my life. I am immensely fortunate to be your daughter.

Akram TINAWI, my role model, husband and life friend, thanking you comes easy for always sincerely believing in me; your support was instrumental in completing this journey. Thank you for being "You"!

Youssef & Samir TINAWI, the pair of jewel God granted me with... Who, although younger in age, have a remarkable indispensable supportive role in my daily life!

Academically, I really think I need to invent a new Thank You word in vocabulary for my professor and thesis supervisor Dr Hussein AMIN. Words are not enough to Thank You, not only for the academic part, encouragement and push, but also for the "Yes, u can" feeling you kept on boosting. Your support is something I'll always cherish.

Each and every one in the department of Mass Communication is part of this thesis. I learnt a lot and it's thanks to each of you. In alphabetical order of surname, Prof Rasha Abdulla: you are actually the one who pushed me to apply for the degree to start with, Thank you! Prof Mervat AbouOuf: besides your academic tutoring, your endless positive attitude taught me a lot in life. Prof Rasha Allam accepting to be part of the thesis reading committee with your warm and encouraging email meant a lot to me. Prof Naila Hamdi, double thanks for what you taught me and for being part of my thesis reading committee. Prof Amani Ismail, although I knew you very recently, I was very touched by your helpfulness, concern and goodwill. Last but not least, Prof Kevin Keenan, who in fact taught me lots of important academic information. The topping of the cake, the department's pillar: Nesrine... Thank you for being there for each of us, always helpful, always nice.

To my friends, my rocks: Hala TOUTA, Yousra ELSAYED and Hanan OMARY. You are the most supportive, caring and sincere friends I ever had. I thank the degree for knowing the three of you. A friendship I certainly treasure.

The top of all my heartfelt gratitude goes to my Creator, the Lord of all... Thank YOU for blessing every step...

## ABSTRACT

Autism has been discussed through the fields of medicine, sociology or psychology all over the past decades. Today, however it is being discussed through a different lens: 'Communication'. Being privileged by so many virtues, the Mass communication field not only spreads information, news and discusses views but also bonds people together. In that sense, Children with Autism should be part of this dynamic sphere, with the use of Information and Communication Technologies (ICT) tools, integrating those suffering from autism within the Egyptian society.

A Descriptive Survey research clarifies the actual use of children with autism to ICT tools through the perspectives of their parents and their caregivers. A comparison between both views interweaving with various demographic criteria clarifies a larger outlook of the issue.

The topic was explored through the Uses & Gratification and Digital Divide theories and further added the Laswell Model to elucidate possible clarifications to realize the integration of children with autism in the Egyptian society through the use of ICT tools. 'Who, says what to whom' principle is scrutinized to identify the best mode to address the information to the children with Autism and make it reach them, based on research and experience.

Although the innate limitations of children with Autism can impede integration willingness, the role of ICT can be shaped to serve the parents and caregivers with valid ideas, information and handling mechanisms with the aim of supporting the children with Autism to develop improved behavioral patterns. These techniques will help people affected with autism to be more accepted within the society's social code of conduct, and consequently more integrated. High importance is given to early intervention that avoids the hassle of unlearning negative traits.

The research proved that neither the standard of education nor the financial capabilities of the parents, directly affects the child with Autism's acquisition of ICT tools thus the integration within the society. Computer tablets in particular and various ICT tools in general are provided, but the main issue is the awareness and training of the parents and caregivers to know that the child's use should be accompanied and tutored for best outcomes.

A further step in the research focuses on the correct choice and use of the applications installed on the computer tablets and assistive ICT tools to be tailored to help each child's personalized need.

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## Chapter I.

### INTRODUCTION

#### **1.1. Background of Study:**

Through the years, the idea of being different has not been accepted by our society. “Throughout history, people with disabilities have been defined as many things: deserving victims of divine punishment, objects of scorn, sideshow freaks, medical case studies, recipients of charity, and poster children” (Pelka, 2007, xi). Even in colloquial use of language, they were referred to as handicapped children, or more specific to the study: children. This has been rectified by the United Nations convention on the rights of persons with disabilities in 2006, clarifying that a disability is not an adjective; it is a state that might be temporary. Accordingly, guidance has been clear to use person, or Children, with – whatever is the disability- rather than the disability before the name of the person. In other words, the reference should always be: a child with autism, and not an autistic child. (Appendix F).

Not only have they been often secluded from one another, but they have also been cut off from information or knowledge relevant to their day-to-day lives. In response, supporters and rehabilitation experts have founded a developing system of communication services to connect individuals with disabilities, their relatives, and experts to the information they need to know. The initiation of personal computers has been of precise use in this respect. (Pelka, 167)

## **1.2. History and Overview of Autism:**

Technically, Autism has been identified as “a disorder characterized by severe difficulties in social interaction and communication, and with unusual behaviors. Once thought of as rare, autism is now recognized as being common.” (Volkmar & Pauls, 1133 (2003).

Back in 1943, the Austrian child Psychiatrist, Dr Leo Kanner, at John Hopkins University, published a paper entitled “Autistic Disturbances of Affective Contact,” in which he portrayed the behavior of eleven children, mostly boys. The boys had a mixture of strict social and inconstant linguistic dysfunction paired with restrictive repetitive behaviors as described by Kanner. In this document, Dr Kanner clarified that by observing one of the children, he realized that the child would not observe anyone that comes or goes, and would not seem glad at the sight of any playmate or his father or mother. The child would seem practically drawn into his shell and living within himself. Kanner’s meticulous portrayal of the eleven children in his research stressed that these children had an ailment that diverged significantly and exceptionally from anything described so far. (Kanner, 217 - 218 as cited in Irwin et al. 2011 )

It is reported that Dr. Kanner, clarified Autism as mainly being an innate disturbance of emotional contact. By this he meant that, in contrast to typical babies, these children came into the world without the usual significance in other surrounding people. In general, for developing babies, people are specifically the most attractive thing in the environment. Kanner believed that the inconvenience for children with autism in dealing with the surrounding social world was genetic in nature. In other words, these children were thus born with it. (Volkmar 2015, page 3)

In Kanner’s original research describing Autism in 1943, he discerned autism from schizophrenia, particularly as some children with autism had been formerly identified with the latter malady. Kanner identified that children suffering from schizophrenia faced some

normal development prior to their behavior change. Essentially, schizophrenic children withdrew from formerly existing social relationships, while children with autism, en revanche, “failed from birth to ever form these social relationships”. (Irwin, 5) Kanner also noticed that children with schizophrenia were keen to resolve their difficulties by setting aside from a circle with which they had been involved. Contrariwise, children with autism would carefully start to participate ‘*more*’ with their surrounding world, as they grow older. As clarified by Irwin et al. (2011)

In 1943, Kanner also made several remarkable explanations based on his case studies. He associated the large head size in approximately half of the subjects and accordingly assumed a genetic inherited basis for the disorder. Kanner further hypothesized that the essential syndrome in children with autism was an incapability to relate themselves in the conventional manner to situations or people from the beginning of their life. (Kanner, 242). They were portrayed as being: (i) “autistic aloneness”; (ii) “a failure to use language to effectively communicate (e.g. mutism, echolalia, and overly literal language)” disturbances of language and speech (iii) repetitive, constricted activity and an “anxiously obsessive desire for the maintenance of sameness” (Kanner, 245); and (iv) “good cognitive potential” shown in “excellent rote memory” (Kanner, 243) on performance tests. Undeniably many of these typical and uncommon conducts explained by Kanner, remain fundamental to today’s description and understanding of the disorder. That being said, Geschwind, 2011 expounds that, “until the 1980s autism was still not considered as a separate disorder in the guidebooks of psychiatric identification, nor was it considered to be biologically based”. (Geschwind, 409). On a different note, Wetherby also added that individuals suffering from Autism have become stereotyped as non-interactive and non-communicative. He further also explained that they actually lack the awareness, competence and intentionality of the language use to convey messages to their surrounding society. (Wetherby, 1986)

Kanner derived the term “Autism” from Bleuler (1911), a Swiss therapist, who had also generated the term “schizophrenia.” Irwin et al further proceeds with the link to the term: The Greek word autos meaning ‘self’ and ismos (a suffix of state or action), “autistic” was made to portray the auto-centric thinking and evident extraction from the social world by children suffering from schizophrenia. This was also a major characteristic of those children Kanner studied. Hence, progressively the adjective, “autistic,” led further to the noun, ‘autism’” (Kanner as cited in Irwin et al, Page 3) but there’s far beyond in the description of autism than just the word itself.

Irwin further resumes that preceding Kanner’s case studies, individuals with similar mannerisms were probably perceived as being either mentally insane or retarded. Indeed, since Kanner first published case studies of these children whom he had labeled ‘autistic’, there have been several re-interpretations of historical accounts of ‘odd’, or mentally retarded children or emotionally disturbed, which may, in fact, have been autistic. (Irwin et al, 3) Having said that, Irwin continues, it was not until Kanner that an effort to categorize children with autism was made, with precise criteria with which to identify them.

Kanner’s 1943 publication has been followed by various attempts of redefining Autism. It has consequently been known as far from a categorical, uniform syndrome but as a persistent disability with typically heterogeneous indicators. Though Autism has been represented by the hypothesis of an ‘autism spectrum’, (Wing 1991) what should or shouldn’t be included on this scale of Autism, remains controversial.

At the turn of the century, a major amendment in the perspective emerged due to the revolutionary twin studies of Rutter and Folstein that revealed a genetic liability to the disorder, providing undeniable indications to its biological origins, says Geschwind in definition and evolution of Autism Spectrum Disorders (ASD). Geschwind states that contemporaneously, plus-ou-moins the past two decades, both researchers L. Wing and J.N.

Constantino were preoccupied with the concept that autism signifies a “quantitative spectrum of impairments, rather than representing discrete disorders”. (Geschwind, 410) From this standpoint, the term ASD tries to manifest the concept that patients denote a clinically inconstant population that endures pathologic stages of quantitative differences in the major mental and behavioral disrupted domains rather than a definite clinical disorder. The idea of how these two fluctuating conceptualizations, autism as a unitary ailment in comparison to a spectrum of dysfunctions, relate to underlying reasons is a key interrogation facing the field, clarifies Geschwind. Additionally, in what way the clinical fields relate to underlying dysfunction in the specific reasoning domains is basically unknown, although some clues are starting to develop, according to Mundy (2010) & Charman (2011).

The expression Pervasive Developmental Disorder (PDD) denotes the principal group of disorders to which autism pertains. In other words, “autism is a kind of PDD like apples are a kind of fruit”, clarifies Volkmar. He states numerous conditions, which are now formally recognized within this class. :

- Autism (also referred to as autistic disorder.
- Infantile autism or childhood autism.
- Rett’s disorder.
- Childhood disintegrative disorder (CDD) (also sometimes referred to as Heller’s syndrome or disintegrative “psychosis” disorder.
- Asperger’s syndrome or autistic psychopathy.
- Asperger’s pervasive developmental disorder not otherwise specified (PDD-NOS) (sometimes termed atypical PDD or atypical autism).

Volkmar further explains that the terms PDD and PDD-NOS are sometimes confusing. The term PDD technically refers to all these disorders— that is, to the entire group of conditions. The term PDD-NOS is a specific diagnosis included within the PDD category; it refers to a

condition in which the child has some troubles suggestive of autism, but these don't seem to fit the better defined diagnostic categories - it is essentially a term for conditions that are suggestive of autism but "not quite" autism. Paradoxically, this condition is probably the most common pervasive developmental disorder but is also the least studied. Although the term ASD is commonly used, it is not an "official" term but generally means the same thing as PDD, that is a disorder somewhere in the autism "ballpark." (Volkmar, 2015 (PAGE 2))

### **1.3 Communication with children with autism:**

In the beginning of their article, Social Behavior in Autism, James B. Grossman, Alice Carter and Fred R. Volkmar clarify that Autistic clinical features revolve around three main deficiency practices that hinder their communication and social interaction:

- (1) Qualitative impairment in reciprocal social interaction;
- (2) Qualitative impairment in verbal and nonverbal communication and imaginative activity;
- (3) Markedly restricted repertoire of activities and interests.

Not far from these core-diagnostic features are other traits that might be detected as common but not universal to children and adults with autism, such as, incapability to accept transitions or changes together with unusual responses to the environment and/or distinctive interests or attachments. Besides, stereotyped movements include hand flapping, and body rocking. (Carter, 1997)

These detailed communication topographies being enumerated, a clear picture is drawn of how "Communication deficits are a defining characteristic of Autism Spectrum Disorders (ASD)", as stated by American Psychiatric Association, 2000.

Numerous of the most effectual teaching strategies for building language come from the field of applied behavior analysis (ABA) (Matson, Benavidez, Compton, Paclawskyj, & Baglio, 1996). ABA-based intervention programs classically use deep-rooted behavior-analytic

teaching/intervention techniques such as shaping, positive reinforcement, chaining, prompting/prompt fading, imitation, extinction, modeling, and other behavioral measures to teach communicative behavior to children with ASD. (International Handbook of Autism and Pervasive Developmental Disorders / Autism and Child Psychopathology Series 2011, pp 367-379)

The main communication channel to reach these children being so sophisticated; researchers and caregivers have always been on the lookout for parallel means to break Autistic seclusion.

#### **1.4 Virtual Environment Concept:**

As far as Virtual Environment (VE) concept is concerned, it has been in use since the end of the XXth century. Many applications of Information and Communication Technologies (ICT) have been created, utilized and made known. VEs are mainly computer-generated three-dimensional (3D) and very representatively realistic illustrations that offer controlled and sheltered situations used to demonstrate needed skills and abilities correlated usually with a certain level of hazard. VEs normally offer repetition and practice exclusive of real-world's stress. Moreover, a VE can sustain human-to-human interaction by connecting people together and permitting them to communicate through the Internet. (Churchill et al., 2001).

The use of Information and communication tools in the learning process of children with autism and communicating data and knowledge to their restrictive capacities of acquiring knowledge have taken several routes all over history. In that sense, virtual environments have played a pivot, yet debatable, role in achieving milestones of communications with these children. The Virtual Environment is, in a sense, the umbrella that comprises any interaction between the child suffering from autism and the ICT tool.

### **1.5 Autism & Virtual Environment Relationship:**

The two issues studied here have an interesting link. They are the exact opposite in speed.

Mingling the fast changing Information and Communication Technologies (ICT) to the slow learner Autistic is the main study's focus. This research will be examining the kinds Information and Computer Technologies (ICT) applications mainly relying on Virtual Environments (VE) serving children with autism worldwide in general as in Europe and United States of America and in Egypt in particular. The main study revolves around the use of ICT as a tool for inclusion of the individuals with autism into the Egyptian society using the first Arabic speaking application 'Kalami' on computer tablets.

### **1.6 Statement of the Problem:**

Mass communication is the unseen glue between people that bonds them. Dealing with the communication between children with autism and the society is not as straightforward of an issue that is easily available in books and previous research.

The study revolves around a topic that needs lots of insight based on the expertise of those actually involved in the day in day out communication between the children with Autism and their society. With this light shed, to reach a well-rounded picture of the topic, a questionnaire was administered to those dealing with these children whether parents or caregivers. In addition, personal in-depth interviews were conducted to clarify a multitude of angles discussed in academic documents.

Exploring previous theoretical and hypothetical scientific research done on the topic has helped tremendously formulate solid structure for the thesis framework. Having said that, the literature material leaves the reader perplexed about ambiguous issues in certain areas: Why does this child do that? Why should you talk to him / her with such technique? Why is he viewed as such from the society? These are persistent questions in the minds of parents and caretakers of children with Autism, which will be tackled all through the study to reach



whether the use of ICT will make a difference in the integration and communication process of these children and their surrounding society.

According to previously explored literature, it's only in recent times that associations for the care of intellectual disabilities in general and autism in particular have been scattered all around Egypt, serving various socio-economic classes with their main target being to shelter-teach these individuals.

Since children with autism, in most cases, stand as a clustered society, this research will explore the degree to which new Information and Computer technology (ICT) offers a good opportunity for such integration. Barriers appear as two main issues: their mental age capabilities as a first criterion, second is the financial status of the child with autism family.

As mental age is a relative concern in these children case, the thesis will unravel its importance. While in general, social integration and personal communication revolves highly around human capabilities, children with autism are to a high degree vulnerable to such a benchmark. How far is their acquisition of knowledge capacity? Is it a press-button problem solved issue? Would ICT really resolve the difficulties with integration and communication difficulty?

The second criterion being the financial standpoint, and as financials play a master role in all lives, the research will thus investigate the importance of such factor in context of the study.

As ICT in general, or computer tablets in particular, are relatively ranked as costly gadgets, the thesis will unravel if a link exists between the financial capabilities of the family and the acquisition of such technology as a facilitator for knowledge grasp.

## Chapter II

### THEORETICAL FRAMEWORK

“As societies become increasingly complicated and diverse, the audience has less opportunity to make direct contacts with the social environment. Media and various communication tools, in turn, become surrogate agents for information gathering” (Rubin and Windahl 1986). Mental Handicaps variations in general, and Autism in particular, make us wonder who fits where in the echelon of knowledge and communication. While the Mass communication arena tackles each and every individual characteristics to be able to reach him / her using their “sensitive sockets”, children with autism are dealt with as a bundle regardless of their subtle important variances. Exploring these variations using the lens of Mass Communication theoretical foundations, will unknot lots of discrepancies hindering the integration of children with autism within the Egyptian society.

#### **2.1. Elimination of Spiral of Silence Theory:**

To correctly choose applicable theories to fit the topic, elimination of the theory that unjustifiably prevailed for so long, and on which mental handicap social acceptance have been based in previous generations, becomes a must. In light of the literature review, for ages, children with autism have been marginalized. As Pelka correctly stated, people with disabilities have been described as many things throughout history: Objects of divine punishment, substances of scorn, recipients of charity and even medical case studies. (Pelka, xi) which perfectly fits the essence of the spiral of Silence, the theory that puts emphasis on the idea that a person is less likely to express his opinion on a topic if he/she feels a minority for fear of isolation from the majority. And this goes on in a vicious circle, the idea feeding itself of being more and more alienated. Today, society’s evolution, dictates that the media is no longer a one-sided message sender. It is a blender of various capacities and mentalities

dealing together under the wide communication umbrella. All through the world you are given opportunities to voice your choices and opinions. Having said that, the topic of the research was explored in light of both the uses and gratification approach and the Digital Divide Theory; setting aside the firm old spiral of silence.

## **2.2. Uses & Gratifications Theory Explained:**

What McQuail straightforwardly used to call a sub-tradition of media effects research (McQuail, 1994); mass communication scholars refer to it today as the uses and gratifications (U&G) approach! Looking back in the history of Mass Communication research field, a methodology was established to analyze the satisfactions, fulfillments and enjoyments that appeal and grasp viewers to the types of media and the kinds of content that gratify their various and diverse psychological and social needs (Cantril, 1942).

According to Klapper, early effects research adopted the experimental or quasi-experimental approach, in which communication conditions were manipulated in search of general lessons about how better to communicate, or about the unintended consequences of messages (Klapper, 1960).

“What Media do to People?” as questioned by Katz back in 1959, is the essence of the Uses and Gratification theory. It is what you do with the medium you are using to help serve your purpose of this use. At this turning point of the history of mass communication, the media user was no longer regarded as the one at the receptive end, but rather the one who chooses the medium which satisfies his / her need. Proving the theory through the years ranged from studies on a two week newspaper strike that occurred in 1949, where individuals were asked to think of what “they missed”. In 1965, Berelson underlined the same idea, what their answers were to ‘what they missed’ reflected what they were using the newspaper for. Social acceptance, awareness, weather forecasts etc... In other words, the newspaper is the same,

but what these people used it for is what they decided it helps them with. Elihu Katz also used Riley and Riley's study in 1951 about the media stories children use for integration in the society, while other children use these same stories for a different purpose: fantasizing in this case.

Within the same context, more than a decade back, in 1944, Herzog observed the purposes soap operas satisfied for steady listeners. Some found emotional relief from their problems, some escaped and a third group found solutions. It is the need the medium fulfills for you by using it. (Tankard, 294)

In 1969, Blumler and McQuail used the Uses and Gratifications approach. The core of the uses & Gratifications theory revolves around the idea that the tool is there and each and every one would apply its use to what suits his/her usage. The model puts more focus on the message receiver, not on what the media is offering. You pick and choose from what is offered, you are not obliged to sit on the receiving end. Accordingly, people take more of active roles in interpreting the media messages and integrate them in their day-to-day lives. In other words, according to the theory, people use the media to meet their needs and fulfill specific gratifications. Dominic L. Lasorsa also correctly states in the Diversity in Mass Communication Theory Courses Essay: "While much of the focus of mass communication theory is on what the media do to people (i.e., media effects), uses and gratifications theory deals with what people do with the media."

Having said that, when an autistic child is able to handle a tablet, it is tailored to his / her needs with relevant and appropriate applications. And this makes the implementation of such a theory quite tangible. Here we sense what the child 'does with the media'.

As Severin & Tankard 2011 put it, Uses & Gratification theory is radically based on the idea that each individual uses the media channel according to the gratification it fulfills to with.

“Katz, Gurevitch and Hass (1973) classified person's needs of mass media into the following five categories:

1. Cognitive needs: acquiring information, knowledge and understanding
2. Affective needs: emotional, pleasurable or aesthetic experience.
3. Personal integrative needs: strengthening credibility, confidence stability and status
4. Social integrative needs: strengthening contacts with family, friends and so on.
5. Tension release needs: escape and diversion.” (Severin & Tankard, 296)

According to McQuail, Most scholars agree that early research had little theoretical coherence and was primarily behaviorist and individualist in its methodological tendencies (McQuail, 1994). The researchers shared a qualitative approach by attempting to group gratification statements into labeled categories, largely ignoring their frequency distribution in the population. The earliest researchers for the most part did not attempt to explore the links between the gratifications detected and the psychological or sociological origins of the needs satisfied. They often failed to search for the interrelations among the various media functions, either quantitatively or conceptually, in a manner that might have led to the detection of the latent structure of media gratifications.

According to T. Ruggiero, Interactivity meaningfully reinforces the fundamental U&G concept of active user (Ruggiero, 2000). It has been well defined as “the degree to which participants in the communication process have control over, and can exchange roles in their mutual discourse” (Williams, Rice, & Rogers, 1988, p. 10). Furthermore, Mass Communication literature suggests six user-oriented scopes of interactivity beneficial for the U&G approach:

1. Threats (Markus, 1994),
2. Benefits (S. Ang & Cummings, 1994),

3. Sociability (Fulk, Flanagin, Kalman, Monge, & Ryan, 1996)
4. Isolation (Dorsher, 1996)
5. Involvement (Trevino & Webster, 1992)
6. Inconvenience (Stolz, 1995; Thomas, 1995).

On a further note, Ha and James (1998) mentioned five magnitudes of interactivity: choice, connectedness, playfulness, information collection, and reciprocal communication. They also proposed that for “self-indulgers” and “Web surfers,” the playfulness and choice dimensions of interactivity fulfill self-communication and entertainment needs. For task-oriented users, the connectedness dimension fulfills information needs. For expressive users, the information collection and reciprocal communication dimensions allow them to initiate communication with others of common online interests. Ha and James assessed dimensions such as information collection and reciprocal communication as higher levels of interactivity. Playfulness, choice, and connectedness were viewed as lower levels of interactivity.

Heeter (1989) also defined interactivity as a multidimensional concept: amount of choice provided to users, amount of effort a user must exert to access information, how actively responsive a medium is to users, potential to monitor system use, degree to which users can add information to the system that a mass undifferentiated audience can access, and degree to which a media system facilitates interpersonal communication between specific users.

Thus, the real advantage to interactivity for individual users is not simply multi-media videos, online shopping, or obtaining information on demand. Just as the Lotus 1-2-3 spreadsheet allowed users to create their own business plans and models, interactivity may offer users the means to develop new means of communication (Dyson, 1993) and greatly increase user activity. After all, interactivity is not only the ability to select from a wide array of Internet merchandise or “surf” 500 or more television channels. Technologists such as Nelson (1990) argued that human computer activities represent the human impulse to create interactive

representation. Dutton, Rogers, and Jun (1987) suggested that interactivity displays “the degree to which the new communication systems are capable of responding to user commands” (p. 234).

Severin & Tankard, 2001 highlighted that the uses and gratification approach highlights a significant point: this is the pioneer theory tackling the ‘active audience’ (page 302). It underlines that the mass communication user is the one in control. In other words, the individual chooses the usage of the media for as many numerous different purposes as it suits them. This being said, Uses and Gratifications theory might significantly contribute to our understanding when moving further into the users challenged with more and more choices within the digital age. Severin and Tankard (2001) In the light of this theory, The ICT used by Autistic persons choice relies on the satisfaction of their aspired needs depending on the gratification or necessity sought that may range between increasing learning curve to full integration within the society.

### **2.3.Knowledge Gap:**

According to Tichenor, Donohue, & Olien, 1970, the knowledge gap hypothesis is mainly built on the idea that information is distributed unevenly in the society; and that socioeconomic status (SES) is the basic element of how much individuals are familiar with public affairs. In essence, the role of SES unveils in both direct and indirect ways. They further illustrate: Primarily, crowds with more complex status characteristically voiced in terms of culture and education; these acquire grander amount of information than those of a lower standing group. Second, high status clusters are better situated to obtain and develop public affairs news from the mass media (Tichenor, 1970). Accordingly, the spread of information in a given society acts to expand the gap in civil and political knowledge amongst society’s subdivisions. (Moore, 1987)

### **2.3.1. Digital Divide leads to Knowledge Gap:**

In 2001, The Organisation for Economic Co-operation and Development (OECD) had defined the digital divide as variances between regions, households, companies, or individuals related to their access to and usage of ICT. (Vehovar et al, 2006) Cullen 2001, explains it more by clarifying it as the division that may emerge due to historical, socioeconomic, educational, geographic, or generation factors, or even due to incapability of individuals (Cullen, 2001, p. 311). Vehovar et al further goes into saying that such explanation of the digital divide is unproblematic at this stage. However, struggles result from the absence of a more consistent or rather standardized and developed operationalization. For example, according to Vehovar et al, one feature of the complexity lies in the numerous technologies that are involved. Although the actual term “digital divide” only appeared after the Internet’s expansion in the 1990s when the first scholarly papers appeared around 1997 by Katz & Aspden, 1997; conversely, this term does not exclusively refer to the Internet. Other important ICT tools like personal computers, cellular phones, etc... are also highly relevant to digital divide issues clarified Vehovar et al. (Vehovar et al, 2006) In 2003, Chen & Wellman correctly drew the attention to the fact that the digital divide is not a simple binary Yes/No question (Chen & Wellman, 2003). Rather, they clarified; that the digital divide is a continuum ranging from physical, cognitive, to content access (Chen & Wellman, 2003).

As Shana M. Mason, a graduate student and instructor in the Department of Communication Studies at New Mexico State University in Las Cruces, New Mexico. And Kenneth L. Hacker, Professor of Communication Studies in the Department of Communication Studies at New Mexico State University put it in their document Applying Communication Theory To Digital Divide Research explain that lots of research tackling the digital divide emphasize on highlighting the absence or presence, widening or closure of gaps in access and usage. Those



researchers who actually document trends in Internet usage gaps provide valued information to the field. However, the binary nature of the arguments frequently blocks or avoids theoretical development that could possibly explain the important consequences of these gaps. They further mention that although some records support arguments that the gaps will resolve themselves, considerable available data indicate that some gaps are aggravating. (Mason and Hacker, 2003)

On a further note, scholars describe the current Digital Divide gaps caused by Internet access and computer usage as demographic. It is a segregation that can be categorized by age, gender and ethnicity. Some academics and policy analysts also debate that, due to natural marketplace dynamics, the gaps will naturally and eventually come to an end. This argument is supported by studies cited to demonstrate how increasingly the previous Information and Communication Technologies (ICT) or "have-nots" are turning into "haves." On the other hand, data cited by other scholars, who claim the Digital Divide gaps to be insistently problematic, show that the gaps are stable and some have been increasing. This argument, however, is supported by the usage of the same data sources used by those claiming that the Digital Divide is non-problematic. (Yang & Grabe, 2014)

Yet, it's argued by many communication scientists that IT usage has some tangible benefits to it, and that having large numbers of people with poor or no IT access is a significant issue. The debate, though, raises the question of whether or not IT access inequality for some people causes "structured social inequality" as it is referred to be. Tranter and Willis (2002:2). Hence, this form of inequality was also described by others as new a form of Communication and Information Technologies reinforcing the societal leverage of those who most possess the resources (Van Dijk, 1999). Moreover, It's also argued that, as a result of this situation, members of the community with high levels of power partake in more decision-making in the society than those with lower levels of power. Concerns by these

communication scientists arise over such social divisions that could lead to permanent societal structures, create a “real threat to democracy” (van Dijk 1999:236) and turn unequal access to resources into a social norm. The validity of these concerns may rely on the way communication theories are used to explain the Digital Divide debates eloquence.

## Chapter III

### LITERATURE REVIEW

#### **3. 1. What is Autism?**

Throughout history, explanations and definitions of what Autism is have been explored and discussed in various books, numerous journals and many scholarly articles. As the description of Autism appears within a wide array, “Deviant of social development”, is the most focused and to the point by Volkmar and Paul in 2003. They further elaborate, that although certain social skills appear over time, even the highest-functioning individuals have noticeable complications exchanging in the social world. While regularly connected with some point of mental handicap, the pattern of cognitive abilities in autism is uncommon. Children with autism have some strength that might be seen in non-verbal capabilities but their limitations in verbal tasks are usually apparent. In parallel, exceptional savant skills may be existent, especially in the fields of music or drawing talents or date calculations. According to the authors, fact remains that some children with autism never advance with meaningful language. For those who do, speaking is actually different from normal children in various ways. Significant patterned comportments can be also stereotyped or repetitive and might sometimes include self-injury, and eccentric responses. Having said that, children who suffer from mental retardation without autism could also show certain strange gesticulations or mannerisms, but they do not present the same level of deviant social development as in autism. (Volkmar & Pauls, p1133, 2003)

### **3.2. Children With Autism And Communication:**

“Clear communication includes sending, giving, or exchanging information or ideas and extends to the tone and manner in which people deal with each other” (Caine, p63, 2009)

Communication in the context of children with autism is a very challenging issue. As the main autistic feature revolves around being resilient to change, the responsibility of the caregiver to introduce information requires a certain degree of determination. Equally, as verbal communication is impaired, the child has a remarkable difficulty to express his/ her feelings or desires.

Various researches showed that about half of people with autism do not succeed to develop any day-to-day operative & practical language (Lord, Rutter, & Le Couteur, 1994; Tager Flusberg, 2000). Within the populace that is able to develop language, and in comparison with those not identified as autistic, children with autism’s linguistic milestones are remarkably delayed. Rate of examples vary from not one single word by the age of two, to no communicative expressions by the age of three as stated by the American Psychiatric Association, 1994. In their article, ‘Comprehension of verbal terms for emotions in normal, autistic, and schizophrenic children’; Van Lancker, Cornelius & Needleman explicated that besides children with autism’s low capability of identifying emotional and non-emotional adjectives, their Labeling of objects besides the unfitting or untimely use of adjectives and verbs is also a chief characteristic in autistic’s linguistic capabilities (Van Lancker, Cornelius & Needleman, 1991). Cornelius & Needleman (1991).

Having an idea of what Autism entails, it becomes somehow clear that there are various reasons to say that individuals might have noteworthy impairments as far as their general social capacities of generating ideas and spontaneous behaviors are concerned. This is also reported coherent to their high rate of repetitive behavior and their characteristic dislike of change and unfamiliar situations. (Turner, 1999) Hence, the reason why individuals with

Autism might prefer using ICT since the speed of communication is relatively slower and they are given the chance of repeating the information before responding. (Rajendran, 2006)

### **3.3. The previous use of Virtual Environment (VE):**

M. Dubois & I. Vial From Laboratoire de Psychologie Sociale, Université Pierre Mendès, Grenoble, France, declared in their article: ‘Multimedia design: the effects of relating multimodal information’, that in general cases, while the interaction between the written word, the sound and the image of things presented in multimedia programs is believed to develop memorization significantly; these techniques tend to blend different means of communication without observing the importance and the usefulness of the consequential combinations of features. To teach a new word, for example, CD-ROMs for foreign language learning typically present the word together with its translation in written and oral modes, supplemented by an illustration. To them, Multimedia production is simply nothing more than mixing different media in combination with each other (M. Dubois & I. Vial, 2000). Accordingly, they further elucidated that when information presented contains more than one source of information (visual and verbal for example), the process of sequential encoding is assumed to establish different meaningful relations based on the two primary representations. The more the presentational structures of presented educational material support such associations, the more learning and assimilation will take place. (M. Dubois & I. Vial, 2000)

### **3.4. Autism Tailored VE:**

In ‘Multimedia interfaces for users with high functioning autism: An empirical investigation’, article, Ouriel Grynspan et al emphasis on subject matters that are relevant to human–computer interaction in the particular case of autism. Software targeting specific communicative disorders attributed to autism is designed along with an experiential protocol to test this software is designed. This software manages the game’s interface and logs users’

actions. In this human–computer interface, speech, text and images are involved. Exploring the impact, ten adolescents with autism, in parallel with ten other adolescents typically developed adolescents were assigned the use of this software for thirteen sessions, once a week for each. The evaluations of the applicants’ skills were performed on the first and last sessions. Results revealed that contestants with autism had lesser performances on multimedia with richer interfaces, as they seemed to lack the ingenuity of organizing the offered multimodal sources of information. (Grynspan,1) In their document: ‘The use of innovative computer technology for teaching social communication to individuals with autism spectrum disorders (ASD)’, Wainer & Ingersoll, from Michigan State University, explicitly underline the use of technological intervention targeting the basic social-communication interaction of persons with autism: the main deficit of their condition. Studies that used advanced innovative technology, such as virtual reality and interactive computer programs directly deliver involvement determined to focus on the development of the social and communication skills of ASD individuals. Wainer & Ingersoll further state that this field of study is still relatively new, and accordingly, most of the published literature is either exploratory or descriptive in nature.

### **3.5. Interactive White Board (IWB) used in Class with Children with Autism:**

The introduction of Interactive Whiteboards (IWB) for the education of people on the Spectrum produced kind of a blast in the field. As the first in the field of interactive learning, it was originally widely used but had many practical drawbacks with the capabilities of children with Autism.

According to Shannon et al, IWB offers a multimodal and concrete interface, which nurtures the learning capabilities of children with special educational needs. Having clearly stated that, they correspondingly refute it clarifying that the usage of this tool in the classroom

negatively affects the children. Each special needs child has his / her own communication obstruct, their arrangement within the classroom requires a lot of effort to attract each child's attention and for the teacher to amalgam them in one 'territory' is remarkably challenging. (Shannon, 2009)

Accessibility Partners published in 'Interactive Whiteboard Technology: strategies for special needs students' article in 2011 that the prospective benefit of an IWB appealing interactive lessons needs is significant to students with special education, the mixture of auditory, verbal, and tactile features boosts participation and motivates them to learn, using multisensory methods that are far more interactive than in a flat, two-dimensional display of a blackboard.

In 2011, Bethany Stiefel presented a research, 'Interactive White board's implementation in self-contained Special Education Classroom' explaining that IWBs are mainly used for low academic instructions and thus have limited uses, mainly for video or teacher led interactive websites. Therefore, according to the survey, while most of the teachers surveyed felt that they had sufficient training on using the IWB to promote instruction, one hundred percent of them considered that more professional development is needed to better meet the needs of the students. (Stiefel, 2011)

A vivid example is extracted from 'Learning with technology articles'; where Kathleen McClaskey, the president of EdTech Associates ([www.edtech-associates.com](http://www.edtech-associates.com)), and a 26-year old veteran working on integrating technology in the classroom. McClaskey is also an instructor and consultant for Universal Design for Learning, and a member of the International Society for Technology in Education (ISTE). Together with Randy J. Welch, MA, CAGS, the chief program officer for the Spaulding Youth Center, which is a residential treatment center in Tilton, New Hampshire; for youth and children with clinical and neurological disorders. In this article, they speak about Katie, a 12-year-old girl diagnosed with a primary diagnosis of autism and multiple disabilities. At the start of the project, Katie

was apparently only able to hold attention for only five minutes without staff intervention. She was frequently disruptive, and her partaking in class was mainly based on whether she enjoyed an activity or not. Her principal way for communicating her needs or wants would be to growl, throw a tantrum, and be aggressive to the staff. They used hand-over-hand technique to teach Katie to touch the whiteboard to make sounds and animation. As the Project advanced, Katie learned to generalize formerly learned skills, such as pointing to icons on the whiteboard. On the long run, Katie progressed to imitating her colleagues and then to making personalized unique decisions. Prior to this project, no one would ever believe that Katie would be capable of this level of social knowledge. By the end of the first year, Katie was waiting for her turn to use the board without help from staff and was taking social hints from her peers. Her ability to attend to lessons increased to 45 minutes. Most surprising was Katie's language development connected with programs explained on the interactive whiteboards.

In parallel, her teacher, Theresa, had marginal experience using software with her students with autism, and she was hesitant about using this new device. But her reservations turned to excitement almost straightaway as she began experimenting with the use of whiteboard. When testing, she faced the fact that the pictures and visuals helped nonverbal students tell the stories they longed to express.

As a daily routine, she implemented the Whiteboard for attendance, where the students had to circle or mark their photo to denote they were present.

At the end of their article, McClaskey & Welch concluded that the Interactive Whiteboard created a setting where students with autism could become more absorbed and active in their learning. On the other hand, the teachers were also increasingly motivated to use these new ways of teaching, as students were acquiring new, and often unexpected, skills each day.



But still, further in 2011, as recommendations in their study, Czyzewski, A and Kostek, B. emphasized that in the future, multimodal interfaces will involve human senses in a wider way through the synergy of merging technologies, online and onsite junction, tailored education. Such encouragement of interface usage would effectively help struggling special education learners by stimulating different senses to focus attention. (Czyzewski and Kostek, 2011).

### **3.6. Worldwide Applications created under the umbrella of Virtual Environment intervention for Autism:**

#### **3.6.1. BALDI The USA 3D – ICT Instructor:**

In 2003, Alexis Bosseler and Dominic Massaro innovated a 3D computer-animated computerized instructor: BALDI: a personified conversational agent that creates precise visible and auditory speech, paired with credible facial expressions, gestures and emotions.

Using the Language Wizard/Player program, a packed combination of pictures, text, audio replay and animated faces ‘BALDI’, a talking head, teaching language skills for ASD children. The picture identification of the spoken words production constitutes the lesson plan in BALDI. The use of such an animated tutor gives the opportunity to individuals with ASD to have a full ranged experience: hear the spoken language, read the text, and view a talking head all together, instead of being exposed to only one of these. (Bosseler, 2003)

According to Bossler & Massaro, BALDI operates based on a language-tutorial application that helps develop language, vocabulary, and listening skills. This Language-Wizard Tutor permits easy presentation of language involving the connection of spoken words with relevant pictures.

In his MA dissertation, “Perceiving Talking Faces: From Speech Perception to a Behavioral Principle”, Dominic Massaro had researched and proved that the human face offers visual

communication through the production of speech that increases successful communication (Massaro, 1998).

While it is believed that the voice alone is habitually sufficient for communication, Massaro elucidates that watching the movements of the tongue, lips, jaw, and face accentuates simplicity of the auditory message. Spoken message is additionally enriched by the narrator's gestures, facial expressions and emotions. (Massaro, 1998, Chapters 6, 7, 8).

According to the American Psychiatric Association, 1994, diagnosing Autism can be narrowed down to their restricted capacity to construct and understand spoken language. In parallel, Barker, Heimann et al and Moore & Calvert, published that Computer-based teaching can be perfect for persons with special needs. (Barker, 2003; Heimann et al., 1995; Moore and Calvert, 2000).

### **3.6.1. How BALDI Works:**

The study mainly consisted of two stages. First stage, measured acquirement and retaining of common vocabulary, while second stage tested whether this vocabulary acquisition was solely due to the Language Wizard/Tutor or other parallel outside sources and whether these assimilated words could be in any way generalized to different or new images basically outside of the Language Wizard/Tutor environment. BALDI's personified conversation instrument offers both vocal and facial learning support. These Vocabulary lessons, comprising over 550 vocabulary articles, were constructed with the picture identification of the spoken words production and chosen from the program of two schools. The contestants were eight children with autism, ranging from 7 to 11 years of age. All of the students showed delays in all areas of academic performance, specifically in language and adaptive performing. The study's phase one results denoted that these youngsters successfully acquired many new words, structural constructions, and notions. Nevertheless, while all of

the children showed learning capabilities, there is an underlying possibility that the children learned these words elsewhere. (With a speech therapists or in their school for instance).

To conclude whether it is the program that is actually responsible for the knowledge acquisition, the children were instructed and trained using a within-student multiple baseline design (Baer et al., 1968) constituting stage two of the study. According to this phase parameters, two sets of words' categories were uninterruptedly being verified while a third set was being tested and trained in parallel. As the contestants were able to identify notably more words after the application of teaching and training compared to their pre-training performance, this shows that their learning was thanks to the program, concluded the researchers. Additionally, the children were able through this learning to generalize new images in unplanned or random locations, and to interact independently from the Language Wizard/Tutor. This absorbing and retaining of new grammar, vocabulary and language use is a noteworthy achievement for children with autism , as Massaro & Bosseler explain.

### **3.6.1.2. Constraints in using BALDI due to Autism limitations:**

As Carolyn Bryson from Indiana University Medical Centre puts it in her testing results, Children with autism incline to have problems assimilating information through cross-modal implications required for further perceptual and language development. (Bryson, 1970) Accordingly, Massaro & Bosseler contemplate that they tend not to really benefit from the presence of the BALDI face. Furthermore, as Happé states it, Children with autism are inclined to evade the face-to-face communication with others (Happé, 1996) and therefore would have less involvement with visual communication from the face. For this, Massaro & Bosseler carried out experimental test for two conditions: Baldi face and voice in parallel to voice only. They then evaluated if the Baldi face increased the rate of learning for responsive measures. Using an alternating treatment design (Barlow and Hayes, 1979)

where each learner received each of the two given learning situations simultaneously. The order of performance of the two settings balanced throughout days. This alternating treatment design excludes inter-subject irregularity and allows a straight observation of the two conditions (Barlow and Hayes, 1979). In the situation where studied children with autism do not obtain significant information communicated by the face, then it would be expected to obtain no discrepancy in learning curve between the two given conditions: voice & face; versus voice only.

### **3.6.2. HANDS The European ICT Assistant:**

According to Mintz, whose book “Touching the Future Technology for Autism” (2012) is mapping the objectives of the HANDS project, no application for computer tablet or mobile devices has been developed specifically to support young adults with cognitive and social impairments. In this context, Mintz also adds that the work of the international multi-disciplinary project: HANDS, has established a set of mobile applications with the aim of developing social life skills. Educational researchers, psychologists and teachers working with autistic persons together with a couple of software companies designed the suite of HANDS project applications. These were tried and evaluated in four institutes for young people with ASD in Denmark, Hungary, Sweden and UK. (Mintz, 2012)

HANDS project is a mobile phone application for young people with autism.

HANDS was thus chosen as an acronym for: “Helping Autism-diagnosed teenagers Navigating and Developing Socially”. The project’s main aim is to develop an Information Communication Technology (ICT) answer to assist young people diagnosed with autism to progress social and other everyday skills.

Hence, this project should let them become better integrated in the society with the high aim of avoiding community marginalization with all its pertaining negative consequences. Hands

project is based on latest human-computer interaction (HCI) research: Persuasive Technology. Using two Microsoft Windows Mobile prototypes, they also developed a prototype version for the Android platform; the toolkit is mainly developed on ideas from persuasive technology. This technology is mainly focused on affecting, thus altering the individual's behavior through incentive.

It is designed to make it possible for a tutor to customize individual or special tools for daily life for his students. The main idea of HANDS relies on an individually developed toolkit instigated on the student's smart phone. HANDS toolkit features have been made in order to make it possible for the teacher and the student in cooperation to design specific tools, which can support the student in dealing with the problems in daily tasks or difficult situations.

HANDS prototype toolkits have been run-through and appraised based on interviews, observations and log-data stored on the server along with various tests carried out at the four test schools partners.

#### **3.6.2.1. HANDS founders:**

It is a European-Union subsidized scheme with nine partners:

- 1) Three universities,
  - a. ELTE University, providing research in psychology with a specialty in autism.
  - b. London South Bank University, providing research in teaching of young people with autism.
  - c. Aalborg University, Denmark, providing research in Persuasive Technology and Human Computer Interaction.
- 2) Two software companies:
  - b. Wirtek A/S, Denmark and Wirtek SRL, Romania, is developing the

mobile software solutions for the mobile device.

- c. Edvantage Group, Norway, providing advanced content and learning solutions.

3) Four schools for ASD young people.

- a. Helen Allison School, UK.
- b. Egebakken, Denmark.
- c. Svedenskolan, Sweden.
- d. Autism Foundation, Hungary.

The partaking of these highly interdisciplinary associates covering pedagogies, psychology, computers and information science stands as a backbone for the project.

### **3.6.2.2. HOW 'HANDS' WORKS:**

HANDS is purely based on Mobile Persuasive technology: also known as Captology- derived from the acronym CAPT: 'Computers As Persuasive Technology'- is a field initiated by Professor B.J. Fogg, Stanford University in 1996. In his book: Persuasive Technology – Using Computers to change what we change and do (2003) Professor Fogg defines Persuasive Technology as “any interactive computing system designed to change people’s attitudes or behaviors” (Fogg, 1). This was first introduced as a computer system named ‘Body Awareness Resource Network’ (BARN) in the late 1970s where it was designed to tutor adolescents about health issues and focus their attitude towards these issues explicates Fogg. (Fogg, 1) Through the book, Fogg clarifies how interactive technology can be influential in three main ways: tools, media or social actor. When the interactive system is a ‘tool’, Fogg elucidates that a tool system makes the deeds performed by the target easier to perform because it leads him / her through a certain process or by given calculations that motivate the user. He further explains that in the case of being a ‘medium’, the system will let the user explore some cause-effect bonds that enlightens certain relations or help practice

a given behavior. As a 'social actor', Fogg considers the device persuasive by cheering the handler with positive feedback in modeling or representing prearranged goal compartment or by social support.

Fogg, further defines Persuasive technology tool as being "an interactive product designed to change attitudes or behaviors or both by making a desired outcome easier to achieve" (Fogg,

32) Persuasive technology come in seven types according to Fogg:

1. Reduction, simplifying (Fogg, 34)
2. Tunneling, guided persuasion (Fogg, 34)
3. Tailoring, presenting relevant information (Fogg, 37)
4. Suggestion, right time intervention (Fogg, 41)
5. Self-monitoring, like tests or tracking (Fogg, 44)
6. Surveillance, observation of behavior (Fogg, 46)
7. Conditioning, strengthening target behavior or direct a compartment into a habit.  
(Fogg, 50)

On a different note, To Fogg, Computers as Persuasive Media, "can shape attitudes and behavior by providing compelling simulated experiences" (Fogg, 61) it allows people to explore cause & effect relationships; provides them with directed experiences and helps them rehearse a certain behavior. (Fogg, 62)

Last but not least, Fogg goes into stating that:" No studies have shown exactly how computing products trigger social responses in humans, but at all times people respond to computers as though they were living beings" (Fogg, 89) He goes on classifying the Persuasive social actors computers into five social prompts that influence the user. Physical: face, eye, movement; Psychological: Humor, personality, feelings; language: interactive, spoken or language recognition; praise and social dynamics: turn taking, good work praise, answering questions and social roles: Doctor, opponent, pet and teacher. (Fogg, 91)

### **3.6.3. 'Kalami' the Egyptian ICT Assistant:**

#### **3.6.3.1. Creators of Kalami:**

Kalami mobile application was generated and produced by conjunction of The Egyptian Advance Society for Persons with Autism & Other Disabilities is a registered non-for-profit organization under No. 4646/99 with the Egyptian Ministry of Social Solidarity. and Vodafone Egypt Foundation efforts. The program consists of the Pictures Exchange Communication System (PECs), which helps non-verbal persons with various disabilities to communicate with those around them using their mobile.

#### **3.6.3.2. Kalami Brochure:**

As explained in Kalami Application's official brochure, "there are more than 650 million persons with disabilities around the world today. The World Disability Report, published by the World Health Organization (WHO) and World Bank (WB) in 2011, states that 15% of the world population have some form of disability. This percentage is estimated to rise to about 32% by the year 2026. ADVANCE Society, hence, aims to provide persons with disabilities with a wide range of life span remedial, educational, vocational and rehabilitation services necessary for them to proceed towards independence and better inclusion within the Egyptian community".

In simple wording, the brochure clearly explains the main essence of Kalami application: "Persons with disabilities often suffer from discrimination and social exclusion, have fewer economic opportunities and higher rates of poverty. Persons with non-verbal disabilities have difficulties in communicating with others as they cannot express themselves effectively and they may often have difficulties in understanding what is being said to them. Since people around them may not understand their way of communicating, many of them thus communicate using non-verbal means such as signing, gestures, communication books or electronic communication equipment."



It further elucidates: “To enable persons with disabilities to be better included in this era of technology, it has become imperative to search for innovative ways to communicate, hence emerged our idea of employing mobile technology to support the communication of persons with disabilities, especially those who are non-verbal. We discovered that some applications have emerged but most proposed applications were available in languages other than Arabic and not easy to use by children”.

Advance team’s idea was to design and produce a mobile application based on the Pictures Exchange Communication System (PECs), which would help non-verbal persons with disabilities to communicate with those around them using their mobile. PECS was developed in 1985 as a unique augmentative alternative communication (AAC) intervention system for individuals with Autism Spectrum Disorder (ASD) and other related developmental disabilities.

#### **3.6.3.3. What is Kalami:**

Kalami application is the first Arabic Augmentative and Alternative Communication (AAC) high technology tool to use with people suffering from little to no speech. It was originally designed and constructed based on the study of the Arabic Language development and its structure Kalami can be installed and operated through computers, tablets, or smart phones. It is a mobile application based on the Picture Exchange Communication System (PECs) within the AAC technology.

The program was originally intended to construct on the strengths of non-verbal persons with disabilities, and their capability to comprehend pictorial information and interpreting it into a picture showing what they want to say by simply touching the picture to generate related sounds, allowing the formation of expressive language.

#### **3.6.3.4. Kalami's Top Features:**

There were many considerations taken into account when creating Kalami app including:

1. The drawings and symbols used were created by Advance to suit our Egyptian culture.
2. Voice options were designed to give the choices for a boy's voice, girl's voice, woman's voice, and man's voice to appropriately fit with different intended users.
3. Each user's strengths, abilities and needs could be matched when choosing which mode to apply, i.e.: picture only, picture + word, word only.
4. Built in support features were provided such as allowing saving commonly used sentences/phrases into the "favorites" files.
5. Provides access to 500 pictures and symbols.
6. Kalami comes in various levels, whenever a level is acquired; an additional bunch is added to the application to widen the child's exposure in vocabulary.
7. Kalami fully relies on Augmentative and Alternative Communication (AAC)

#### **3.7. Augmentative and Alternative Communication (AAC) Explained:**

As part of Assistive technology, augmentative and alternative communication (AAC) devices work together as an access means for language expression. (Akcakaya et al, 2014)

Augmentative and Alternative Communication (AAC) is basically an umbrella term that comprises the communication methods that complement the conventional handwriting or speech, where the comprehension or production of spoken or written language are for any reason, impaired. AAC can be a long-lasting supplement to a person's communication. The main idea of augmentative communication is to use the full abilities the communication-impaired person already has, with the aim of bypassing and/or compensating for areas of the impaired function.

With the recent high-tech developments and the growing awareness of the variety of communication choices available to persons with a widespread range of disabilities, the potential is there to provide more and more people with an improved level of communication.

(Millar & Scott)

Rose A. Sevcik, an Associate Professor of Psychology at Georgia State University in Atlanta. Is now the Coordinator for the American Speech-Language-Hearing Association (ASHA) Special Interest Division 12: AAC. Together with MaryAnn Ronski, a Professor of Communication, Psychology, and Educational Psychology & Special Education at Georgia State University, they elucidate in their document: 'AAC: More Than Three Decades of Growth and Development'; that for more than thirty years now, the arena of Augmentative and Alternative Communication (AAC) has tackled the communication needs of persons who cannot always rely on speech for functional communication. According to Sevcik & Ronski, who both have more than 20 years of focused exploration on the communication development of children with severe developmental disabilities and the construction of interventions to simplify children's communication, some speech-language pathologists (SLPs) rely on AAC as a last recourse when all efforts at natural speech have rated unsuccessful, falsely thinking that AAC will hamper the development and use of natural speech. However, they added that latest research indicates just the opposite. Depending on the person's communication needs, AAC can be used to complement current speech, and substitute the dysfunctional speech. They also indicated that studies have revealed that AAC can be used as part of language interference approaches to improve youngsters' speech and verbal skills. Some of those who use AAC systems could cultivate spoken and vocal language proficiencies after involvement with AAC.

As Allen & Shane 2014 put it, AAC is progressively integrated into helping references for children with ASD and results concerning aftereffects of these approaches are largely promising. Accordingly, mobile technologies have gained remarkable grounds to assist persons on the autism spectrum disorder (ASD). Furthermore, they added that as various indications suggest that family support contributes to positive outcomes for individuals who use AAC. Selecting suitable services to teach communication associates plays an important role in outcomes. They further elaborate that adding an AAC device can expand the parent's responsiveness to their child's communicative compartments. When schemes like the use of expectant interval, usage of open-ended queries, and molding of AAC system use are used, constructive changes happen in both the caregiver and the child using the AAC device. Examples of this vary from better social-pragmatic abilities, augmented partaking in conversations, to improved range of communicative tasks at large. This being said, the fruitful incorporation of an AAC technique into a child's life commands commitment and persistent support from caregivers and parents.

Having said that, they further proceed stating that not much is known about the influences mobile technology revolution would have on these individuals on the long run. (Allen & Shane, 2014)

### **3.7.1. Augmentative and Alternative Communication (AAC) History**

According to Alper 2015, several nonspeaking persons use tools frequently mentioned to as Augmentative and Alternative Communication (AAC) devices to increase other methods of communication (such as nonverbal gestures and non-lexical sounds such as laughter) and as an alternative to verbal speech.

AAC devices vary from low-tech (plastic communication boards and picture cards) to high-tech types (computer based).

Electronic AAC systems offer persons with substantial expressive language impairments (due to disabilities such as cerebral palsy, traumatic brain injury and Autism). These have tools for words, symbols, and images selection to communicate their feelings and converse with their entourage through synthetic and/or digitized speech.

Preceding microcomputers, electronic AAC devices were immobile and custom made at a cost between of \$15,000 & \$50,000.

Initial electric communication then took the form of particular systems to control typewriters relying on substitute inputs (such as a straw that sends indicators to a device through inhales and exhales). It was in 1978, when priced at \$2,000, that the Phonic Ear Handi Voice, was the first transportable commercial voice-output communication support aid. It originally came in two types: one with a keyboard for pictures, words, and symbols and another with a keyboard looking like a calculator that necessitated that operating users learn hundreds of three-digit encryptions or codes to speak a single word. Moreover, contrary to its appellation, the four pound (almost 2kgs) Handi Voice was not simple to handle; rather, “saying something with this device was like chiseling words into a stone tablet,” noted a user stated Alper et al 2015. (Alper 2015)

As US legislation such as the Act of 1973 and Education for All Handicapped Children Act in 1975, were to fund such assistive technologies, and due to their advancements in microelectronics Canon and Texas Instruments (TI), were thus incentivized to enter the assistive communication aids market in the late 1970s and early 1980s.

In 1977, Canon presented the Canon Communicator, which was basically a portable tape typewriter “for non-oral, motor impaired persons.” The Communicator was in a 1980 national print newspaper advertisement celebrating the company’s 25th anniversary together with other Canon products such as the Sure Shot automatic camera and the Palm Printer

calculator. “In addition to general consumer items,” the ad clarified, “Canon’s optic, electronic and engineering capabilities contribute to industrial productivity, as well as professional and humanitarian aims.”

Correspondingly, TI clearly marketed the Vocaid as a devoted AAC device and as a one of the company’s product family. Launched in 1982, the Vocaid was a direct derivative of Touch & Tell toy, a pre-existing TI product and introduced a year earlier. In both Touch & Tell and Vocaid, printed swappable panels overlapped a touch pad that, when pressed, triggered an electronic circuit to vocally articulate sounds, numbers, letters, words, and phrases. In 1983, a US Congress’ Office of Technology Assessment report mentioned that the Vocaid “might well have never been modified and commercialized had Texas Instruments not already had a running start on this technology.”

The Touch & Tell was based on TI’s prior inventions in artificial speech and solid-state memory. In 1978, the TI Speak & Spell toy became the first consumer electronic device to duplicate the human vocal tract on a single chip of silicon. (Alper 2015)

### **3.7.2. Debate about Children with Autism not benefiting from VE:**

Although Persons with Autism have a fairly strong penchant towards electronic media and visual-processing skills and using computer technology would be particularly fitting and motivating for these individuals (Shane & Albert, 2008); The ASD population’s main hinder being the discomfort they experience when facing unpredictable social settings (Charlop-Christy, Le, & Freeman, 2000); accordingly, also Relying on predictable, controlled and standardized environment, using a computerized intervention, allows the person to perform at his or her own ability level and pace (Golan & Baron-Cohen, 2006). Instructional video modeling, one of the primary technology uses for persons with ASD has been the focus way of skills teaching for many years. Currently, virtual reality and interactive computer

programs generated a far better influential capability for them. (Bellini & Akullian, 2007) As far as language is concerned, the impairment in individuals with ASD is somewhat common. Consequently, interventions addressing this specific population focus primarily on the elaboration of verbal and nonverbal communication skills (National Research Council, 2001).

In his dissertation to Rutgers University For the doctoral degree in Special Education, Dr Handleman, clarified that Children with autism have eminent problems socially. Not only in acquiring language, but further in adjusting the skills they acquire to settings or individuals different than what they received in training initially. (Handleman, 1979) Having said that, Dr Edward Carr & E. Kologinsky further explained that rigorous and intensive training is fundamental in teaching Children with autism to apply these skills on different settings using various people and repetitive similar situations. (Carr & Kologinsky, 1983)

In 2000, a study conducted by Moore and Calvert was based on comparing the influence of computerized language command to that of a human teacher-driven language instruction for fourteen children between the ages of three and six with ASD. The Participants were randomly appointed to one of the two instructional setups. In both layouts, object-labeling exercises were utilized to introduce vocabulary words. Participants were thus asked to select a specific vocabulary item and were encouraged when the correct item was designated. In the case where a participant did not correctly respond, verbal insights were offered until the correct answer was selected. The teaching exercise was similar in the two conditions. The teacher-driven relied on the teachers to orally prompt for the labeling of the objects and to show reinforcement by verbal praise or the chance to play with a wanted object. The computerized training program, on the other hand, provided sensory reinforcement for right answers using animation, music, attractive colors, and exotic sounds. Additionally, once the participant would correctly select a vocabulary item three times in a row, an exciting visual together with an acoustic simulation would appear on the screen. Outcomes were measured

using a choice of receptive vocabulary test with image cards done by the teacher. Results showed that the children of the computerized training group were able to identify more vocabulary words, they spent more time “on the task”, and they indicated a sturdier wish to pursue with the program after the completion of the study than the children in the teacher-trained group (Moore & Calvert, 2000). Concluding, Moore & Calvert state that these preliminary results insinuate that computerized educational programs may be highly motivating and effective for enhancing receptive vocabulary acquisition for children with ASD. Having said that, as the outcome measures only the assessed receptive language, it is actually unknown whether any increases in meaningful vocabulary skills were achieved as a subordinate consequence of this particular learning program. In all cases, they added, the progress of practical and expressive language in young children with ASD remains unclear.

### **3.7.3. Statistics of Autism:**

Obtaining an accurate estimate of children with Autism in Egypt was not an easy task. However, some guidelines were obtained from different sites worldwide; especially those concerned with mainstream health information and health professionals. For this, RightDiagnosis.com provided prevalence and incidence numbers for Autism worldwide and in each country, including Egypt as part of Northern African countries. Prevalence of Autism: 1 in 500 to 1 in 2,500 (NIMH); 1-in-1000 to 2-in-1000, depending on diagnostic criteria while the Prevalence Rate for Autism: approx 1 in 500 or 0.20% or 544,000 people in USA.

As cited by Buggey, 2007, Table and figure (3.1) are the approximate records available. Although almost ten years back, they serve as a yardstick to measure the actuality of such learning and communication disability. Justification for Egypt being the highest percentage of Autism cases in this table, might be due to it being the highest in population rate amongst them as retrieved from statistics.



**Table (3.1): Estimate of Autism cases in Northern Africa**

Autism in Northern Africa		
<u>Egypt</u>	152,234	76,117,421 <sup>2</sup>
<u>Libya</u>	11,263	5,631,585 <sup>2</sup>
<u>Sudan</u>	78,296	39,148,162 <sup>2</sup>

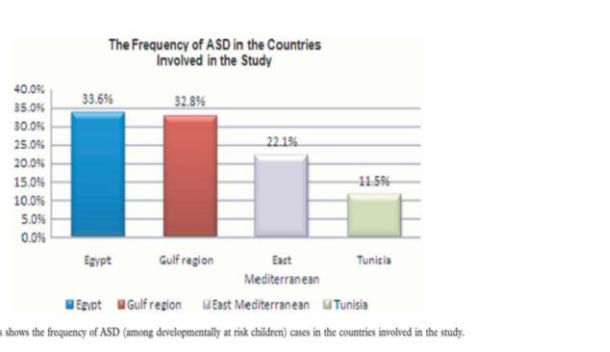


Figure 2. This shows the frequency of ASD (among developmentally at risk children) cases in the countries involved in the study.

**Figure (3.1): Northern Africa Autism cases statistics.**

(Buggey, 2007)

**2.7.4. The Handicapped in Egypt, in general:**

As cited on the site of the Egyptian government, the Children's Act No. 12 of 1996 contains a special chapter on the care of children with special needs; where the role of the State and the civil associations and non-governmental organizations in the provision of educational services for children with special needs. On a separate note, digital estimates of the Central Agency for Public Mobilization and Statistics, and of UNICEF, clarify the estimated percentages predictive for the years (2006/2007, to 2011/12, 2016/2017) of the total population estimates and found that the rough estimates of disability in Egypt is in the following table:

**Table (3.2): Disability Estimate Statistics in Egypt:**

2007/2006	2012/2011	2017/2016
2.490.126	2.686.476	2.899.180

Although Disabilities' help in Egypt have been mainly dominated by charitable sides and founded by the care of parents and friends of persons with disabilities; it has witnessed a significant development in recent years. As a matter of fact, there is a higher tendency into a more holistic approach based on rights and respect for the privacy of the person with a disability and independence. Accordingly, the national council for disability has been established in April 2012 under the chairmanship of the President of the Council of Ministers (ncda).

This information has been retrieved from sites where the last update is not further 2009, but coincide with information obtained verbally from many of the interviewees who confirmed the number of intellectual disabilities in Egypt in general are more or less 3 million without segregation of the disease or the nature of the handicap. Accordingly, Autism is comprised within these numbers, as no specific official information is available regarding Autism in particular.

## **Chapter IV.**

### **METHODOLOGY**

Back In 1976 Bouchard had originally explained that more than one technique should be used in the validation procedure to confirm that any discrepancy echoed is a result of the trait and not of the method. Consequently, the combination of two approaches enriches the persuasion that the outcomes of the study are valid information and not a systematic product. Further, in 1978, Denzin improvised the term Triangulation and defined it as the mixture of methodologies in the analysis of the same issue. (Jick, 1979)

As far as this study is concerned, studying the issue of integration of children on the Autism Spectrum within the Egyptian society using ICT from a Mass Communication lens will be a descriptive research based on a triangulation research approach where both qualitative and quantitative research methods are used to investigate the hypotheses and the research questions. This will help provide a well-rounded picture about the perspective of the certified caretakers and professionals dealing with the children with Autism versus the parents and the family of these children.

As a descriptive research, this study monitors the actual use of various ICT tools in general and tablets in specific by children with Autism. The thesis compares the viewpoint of parents versus caregivers in the use of ICT tools by those children. As previously clarified, all family members respondents are grouped as parents, while any professional help, caregiver, teacher or assistant is with the caregivers group.

In a simpler form, in this study, the descriptive research is basically describing the people who took part in the study in terms of their use of ICT tools and the level of their integration within the Egyptian society.

#### **4.1. Descriptive Research Explained:**

Quoting Knupfer and McLellan, (1972) “Descriptive Research holds an important place in the study of human interaction and learning. Indeed, the descriptive component is critical to educational research because educational events cannot be reduced to controlled laboratory environments”. (Knupfer & McLellan, 1972) They also further defined descriptive research as not falling precisely within the classification of either quantitative or qualitative research methodologies. On the contrary, it can operate features of both, often within the same study. In other words, the expression descriptive research basically refers to the type of research question, plan, and data analysis that will be applied to a given topic. Last but not least, while inferential statistics aspire to define cause and effect, descriptive statistics articulate what the topic actually is on tangible grounds. (Knupfer & McLellan, 1972 )

As explained in *Descriptive Research Design: Definition, Examples & Types*, 2016, Descriptive research goes by three main techniques:

1. **Observational**: Observational studies revolve around the basic idea of watching people do what they are doing. In this, we have two categories, namely field observation, which is also known as naturalistic, where the researcher observes the studied subjects in their natural environment and thus has no interference by the researcher. It simply reports actions and activities that occur by the subjects in natural contexts. Worth noting that naturalistic observation typical restraints are its incapacity to evaluate the real causes of conduct, and the impossibility to define if a certain observation is truly demonstrative of what habitually happens. The other category is the artificial environment, which is also known as the controlled laboratory setting, where unlike the naturalistic study, in artificial environment the researcher observes the subject in a kind of laboratory setting. Although this bequeaths the researcher a little control

over what occurs within the research study, it actually ruins some of the genuineness that one might get from field observation.

2. **Case Study**: Case studies are still a type of observational research that includes a comprehensive or in other words, in-depth study of a specific group or a certain person. Case studies have two main drawbacks, 'expectancy effects' and 'atypical individuals'. The first includes the experimenter's primary biases that may influence the actions taken while managing the research, which might affect the interpretation of the applicants' description. The second may also lead to insignificant generalizations and thus reduce external validity.
3. **Survey**: Surveys come in different modes, either by handling questionnaire or by interviewing people face to face. Which makes it basically defined as a brief discussion or interview with an individual about a precise topic. This makes surveys different than observation, in the fact that you ask the person to describe the issue, instead of watching him / her. Surveys have an asset of time, as they are not as time consuming as observation, because the person actually knows the situation better than a researcher would discover after weeks of watching. The only drawback would be in case of lying, where the person might thus mislead the researcher.

Having stated them all and due to the delicate nature of the topic, observation would not be helpful as the fact of a stranger being present could intimidate or stress the children with autism and hence affect the behavior of their caregivers. Consequently, Survey research presented the ideal solution where people dealing with children with autism would easily answer the direct and specific questions at their convenience and ease. As further explained, all family members respondents are grouped as parents, while any professional help, caregiver, teacher or assistant is with the caregivers group. Results shall be a guide to

the use of ICT tools as gears for the integration of the children within the Egyptian society. According to Gall and Borg, most quantitative research aim at finding out ‘what is happening’, consequently survey methods are commonly used for descriptive data. (Gall et al, 1996).

#### **4.2. Qualitative and Quantitative Research Methodologies overview:**

The study will employ in-depth interviews together with a survey questionnaire in order to explore ICT tools actual usage by children with autism and their integration within the Egyptian society. As Wimmer and Dominick explicate in Mass Media Research - An Introduction - textbook, qualitative research basically means that it’s based on quality rather than quantity; accordingly, personal in-depth interviews with experts in the domain, constitute an important pillar of information supply in the research. As everything in life, in-depth interviews have many drawbacks and remarkable benefits. Having said that, they do remain distinctive for certain reasons:

- In-depth interviews present a widespread background about the reasons respondents give certain answers. In other words, chosen respondents’ values, opinions, motivations, feelings and experiences are obtained with elaborate data. Thus presenting a wealth of detailed information.
- Respondents’ non-verbal responses are observed and taken into consideration. In this study, where the topic considers a vulnerable minority, knowledge obtained from in-depth interviews is more accurate, given the sensitivity of the topic.
- They are less structured and can be customized according to the interviewee. You can in fact improvise a question based on the respondent’s answer to a previous question. This is basically a unique trait in in-depth interviews. Hence, answering open-ended questions, the setting allows asking follow up questions.

- The rapport built between respondents and researcher makes it easier to approach certain areas of discussion concerning the topic that might be taboo in other settings. As the study focuses on a challenging period of one's life in dealing with children with Autism, unless a certain relationship is developed, the personal feelings and incentives the respondent has lived is not shared in a normal research setting.

In parallel, some shortcomings to in-depth interviews remain in the shadow. As this kind of interviews is typically done using a non-random sample, generalizability is sometimes a problem. Furthermore, since interviews are usually non-standardized and each respondent may choose to answer a somewhat different version of a question, we can also have one-off answers to certain questions that erupted within the interview. Subjectivity and sensitivity to interviewer bias is also a drawback to be taken into consideration. (Wimmer & Dominick, 2014)

On a further note, the Advantages and disadvantages of survey research being:

1. Standardized set of answers to choose from makes the method more structured. No explanation or follow up is needed.
2. External validity can be considered, as the sample can be representative of the population. Consequently, results can be generalized.
3. Notable Objectivity of researcher.
4. Reliability, as everybody gets the same question under the same circumstances.

The choice of such research methodology, survey questionnaire, helps second the in-depth interviews with validation and in a way generalization, which are the main drawbacks of interviews.

In light of the above, this research will be analyzed through both in-depth interviews and survey questionnaire, to get a better overview of the prevailing situation.

#### **4.3 Research Methods Used:**

This study uses the descriptive research method specifically the survey method to comprehend the real integration of the children with autism within the Egyptian society. Further, the actual use of various ICT tools in general and tablets in specific and their use of the applications by the children with Autism as viewed by their families, caregivers and teachers.

Comparative method was also used as a part of the descriptive research method to compare the viewpoints of the parents versus the one of the caregivers as far as the child with autism is concerned. Furthermore, this same method was also used to parallel the parents' opinions according to their educational level and financial income.

A survey research questionnaire was administered targeting those dealing with the children with autism: parents, siblings, caregivers and teachers. Hence, while studying the uses of ICT for the integration of Children with Autism in the Egyptian Society, an important step is also to examine any connection between ICT tools and Children with Autism's capabilities. Comparisons were done mainly paralleling the responses of parents versus the caregivers on the handed out questionnaires. Another parallel relationship would be between ICT tools availability and family's financial status.

#### **4.4. Research Tools:**

For this thesis, the use of both questionnaires and in-depth interviews helped unlock many interwoven issues in the communication procedure between the children with autism and their family and caregivers as their primary society and further with the society in which they live in general.



#### **4.4.1. Questionnaire:**

This study's research tool used consists of a self-administered questionnaire in either English or Arabic distributed among pertaining teachers, parents, siblings and caregivers of children with Autism chosen from the list of available organizations in Cairo Governorate.

##### **4.4.1.1. ICT Tools Studied in the questionnaire:**

While Information and Communication Technologies (ICT) are of a wide variety, the study focuses mainly on six of them, namely:

1. **Interactive white board:** Back in 1801, when the traditional blackboard was invented, it was revolutionary. Nowadays, the interactive white board is the new digital era classroom-teaching tool. It is a relatively large display connected to a computer and used with a projector that basically projects what is on the computer's desktop onto the board's surface. The device can thus be controlled by easily using fingers or pen, which supports interaction. With its exponential uses this instructional technology helps presenting the required information on a large scale, and the interaction it demands creates an agreeable teaching atmosphere. Schools and organizations dealing with children with Autism make use of such invention to generate a relatively easy teaching atmosphere. (Betcher, 2009)
2. **Personal Computers:** While widely used, a glimpse of why personal computers are listed within the research will mainly be to clarify that it presents the information on a screen that is wider than tablets and mobiles, while being smaller than the IWB. A personal computer is also stable and used while on a desk or table.
3. **Laptop:** A laptop, as commonly known, is a portable computer and is thus used within the list of studied ICT tools as its screen is actually smaller in size than the

computer, yet again larger than the tablet or the smart mobile phone. A laptop is also operated anywhere, which is a different aspect than the personal computer.

4. **Tablet**: The currently used android or I-pad tablet, is basically a compact sized, versatile device. The chief competitor to the Apple Ipad is the Android operating system, which was created by google and runs on device produced mainly by Google, Samsung and many others. Known for their high-speed processors, vast storage capacity large display and wireless data connections, tablet computers are widely used by many teaching entities nowadays.
5. **SmartPhone**: As broadly used, smartphones operate a variety of applications beyond communication and entertainment. Although the majority of Children with autism are not able to exploit all smartphones potentials, they are used within the research list because of pocket size and the ambulatory asset. This being said, in comparison to the others listed within the research, smart mobile phones are the smallest in size.
6. **Interactive Preliminary toy**: Departing form the idea that toys are also learning instruments, the listing of the interactive preliminary toy is based on the idea of the computer chip installed in the toy, and according to which the child interacts while correctly pressing the required button. Blue Square, Green Triangle etc... this form of ICT tools is what is introduced to any child at the earliest learning stage, which sometimes might be before the autism is diagnosed.

As far as applications are concerned, the five listed in the survey are those generally used for learning abilities.

1. Opposites are used as a basic logic building application.
2. Face book is the main social interaction application used around.
3. I-Autism is specially tailored for children with autism,

4. Talking Tom can serve a wide variety of learning grounds.
5. Kalami is the first Egyptian application teaching and expressing in spoken Egyptian Arabic.

The study also sheds light on the launch and use of “Kalami” as the first Egyptian Mobile application addressing real day in day out communication topics for the integration of persons with autism in the Egyptian society as seen by both parents and caregivers who responded to the survey questionnaire.

#### **4.4.2. Interviews:**

The study revolves around a topic that needs lots of insight based on the expertise of those actually involved in the day-in, day-out communication between the children with Autism and their society. With this light shed, personal interviews conducted clarify a multitude of angles discussed in academic documents. Exploring previous theoretical and hypothetical scientific research done on the topic has helped tremendously formulate solid structure for the thesis framework. Having said that, the literature material leaves the reader perplexed about ambiguous issues in certain areas: Why does this child do that? Why should you talk to him / her in such technique? Why is he viewed as such by the society? These are persistent questions in the minds of parents and caretakers of children with Autism, which will be tackled all through the study to find out whether the use of ICT will make a difference in the integration and communication process of these children and their surrounding society.

Within the path of this study, capitalization was on personal interviews with experts in the Domain, Alphabetically ordered by Surname:

- **Dr Yvette Abdel Malek, PhD**
- Speech and AAC Consultant.
- Board member representing Egypt in International Society for Alternative Augmentative Communication ISAAC.
- Member in Build AAC Project Committee for emerging AAC nations.
- Member in Egyptian Society for Phoniatics and Logopedics.
- Master Degree in Special Needs (Alternative Augmentative Communication) from Oslo University, 1998.
- PHD in Effective Programme Using AAC with people with intellectual disabilities from Arab Research and Studies Institute 2008
  
- **Dr Nadia Adib Bamieh, Ph.D.**
- Expert in the field of disability issues and inclusive education
- Consultant for national and international agencies in the field of Special Education
- Chairperson of the Very Special Arts/Egypt, an affiliate of the Kennedy Center in Washington DC
- Co-founder and Board member of NAS Foundation for Persons with Disabilities
- Doctor of Philosophy in Special Education from the University of Florida, USA, 1997
- Master of Education in Special Education from the University of North Florida, USA, 1987
- Bachelor of Science in Special Education from Illinois State University, USA, 1965
  
- **Eng. Tarek Yehia El Fakharany**
  - Bachelor of Computer Science 2003 - "Modern Science and Art (MSA)"
  - 12 Years in Software Development and Oracle Database Expert
  - Founder of ta2heal March 2015

- **Dr Mohamed El Henawi, MA**

- Executive Director, Exceptional Training Center, the Egyptian Society for Developing Skills of Children with Special Needs (ADVANCE).
- Nominated for Ph D in Special Education (Learning difficulties), Faculty of Education, Ain Shams University.
- MA Special Education, Faculty of Education, Ain Shams University, focus on Academic Skills for Children with ASD.
- Established the Arab Network for Autism (ANA)

- **Eng, Ahmed Mahfouz Gadallah**

- Bachelor of Computer Science 2000 - Elsadat academy" in Maadi
- 15 Years experience in Software Development and Software Project Management Microsoft MVP
- Founder of Ta2heal March 2015

- **Prof. Maha Helali, MA**

- Chairperson the Egyptian Advance Society for Persons with Autism & Other Disabilities (ADVANCE)
- Managing Partner, Learning Resource Center (LRC)
- Board member the National Council for Disability Affairs, (NCDA)
- Chairperson the Egyptian Foundation for Inclusive Education (IEF)
- President Inclusion International Middle East & North Africa (II-MENA)
- Secretary Arab Network for Autism (ANA)
- Ashoka Fellow 2007

**Dr Youssef Ibrahim:**

- Head of Autism and Special Education in el Ghad el Moshreq Association.

**Mrs Amira Mansour:**

- Owner of Learning Center “Mamlakati” for special education. Established in March, 2012
- Diploma in Special Education from Faculty of Pedagogical Education, Ein Shams University.

**Dr Olfat Naguib, PhD.**

- Head of Assesment and Empowerment Unit in Seti Organization, Caritas, Egypt.
- Phd in Psychological Studies. High Institute for Childhood Studies. Ein Shams University.

**Prof. Dalia Soliman, Psychologist.**

- Co founder of “Kodorat” Association.
- ‘Autism Speaks’ ambassador in Egypt.
- Med in Special Education, Autism, Birmingham University, UK.

#### **4.5. The Sample:**

The research topic tackles a minority of the society whom are considered a sensitive cluster making the topic a delicate and personal one. Accordingly, a non-probability sample is chosen for this study. Namely: Purposive Sample. The Purposive sample is where the researcher selects the elements to be interviewed based on certain characteristics that fit the research. These specific traits or characteristics usually fit a certain purpose according to given conditions. Consequently, those who fail to meet these criteria are eliminated. In other terms, this sample is deliberately, non-randomly selected. (Wimmer and Dominick, 2014)

As Wimmer and Dominick (2014) clearly state: “Purposive samples are used frequently in mass media studies when researchers select respondents who use a specific medium and are asked specific questions about that medium” (Wimmer and Dominick, 2014, page 94). This required sample, which ideally fits the study, has two main filtering questions in the questionnaire to identify the required sample. Parents, caregivers or siblings are determined by a clear Yes or No first question: “Are you related to Children with Autism?” while pinpointing those using ICT tools is done by question 8: Is the child with autism you know using any Information and Communication Technologies (ICT) device? Which is also a Yes or No question.

Similarly, to facilitate reach the parents, siblings, caregivers and teachers of Children on the Autism Spectrum in general, another purposive sample helps identify them: Snowball Sampling. This term is often used in scientific research and is known as ‘referrals’ in private sector research. The main theme behind it is that one or two respondents who qualify within the set of criteria that fit the needed sample are contacted and then asked to provide researcher with the names of people who fit the required criteria. This in reality facilitates the introduction to organizations. A list of Available organizations and NGOs responsible for

Children with Autism in Egypt, out of which the sample has been drawn, is available in Appendix I.

The generated survey results were listed in the following tables where most are also clarified by supplementary charts. A total number of 150 respondents completed the survey. Only 130 were valid. This included parents, relatives, siblings who were grouped under the label “Parents”. In parallel, caregivers, teachers and Experts of the field, were labeled “Caregivers”. Most charts were measured and ranked by the respondent’s degree of education and their children with Autism’s biological Age bracket.

A total number of 150 questionnaires were distributed and collected within the listed organizations. Due to missing important answers to the questionnaire, some were dismissed and accordingly only 130 were eligible to the sample. The choice of Arabic or English is presented to the interviewee according to his / her preference.

#### **4.5.1. Description of the sample:**

The sample is described by gender, area of residence, age, educational level, parents income and above all by whether or not the person is in contact with a child with autism and the length of the relationship period for the respondents, in addition to the age of the child with autism, which is in other words, the length of the relationship with the parents. Furthermore, an Internet Demographics chart (MCIT 2015) and a chart clarifying the Frequency of Households using Social Networks (MCIT 2013) are enclosed as Appendix G and H respectively.

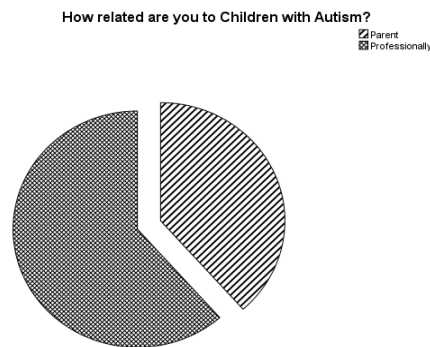


#### **4.5.1.1. Participants as per their relationship to the child with autism:**

Table & figure (4.1) clarify the sample distribution by relationship to the child, whether parent or professional:

**Table 4.1: Frequencies and percentages of parents and caregivers in the survey.**

	Frequency	Percent
Parent	50	38.5
Caregivers	80	61.5
Total	130	100.0



**Figure 4. 1: Percentage of Parents and caregivers as respondents**

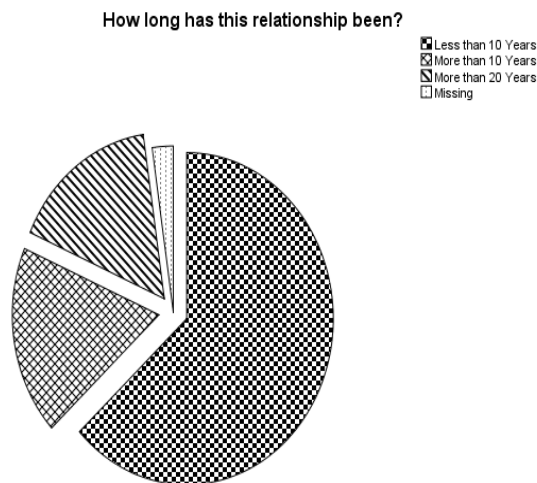
As shown in Table (4.1) and Figure (4.1) more than half the sample is of the Caregivers linked group. So this can comprise teachers, assistants, caregivers or high calibers of the field. They represented 61.5% while Parents or actually family members were 38.5% only. This large discrepancy of percentage of respondents, may be related to both psychological and social restrictions in communication that do not easily allow people to refer to that parent as a child with autism parent as a normal situation. Accordingly, it was rather difficult to reach lots of parents, whereas the professional segment was more easily accessible through their work places.

**4.5.1.2. Period of relationship with the child with Autism on the professional level:**

Table and chart (4.2) show the relationship with the child with Autism on the professional level

**Table 4.2: The Frequency and Percentage of the period of time of the caregivers’ relationship with the children of Autism:**

	Frequency	Percent
Less than 10 Years	82	64.6
More than 10 years but less than 20 years	24	18.9
More than 20 Years	21	16.5
Total	127	100.0
Missing System	3	
Total	130	



**Figure 4.2. Percentage of caregivers’ relationship with children in time**

Table and figure (4.2) show the partition of the 61.5% of the professionally linked cluster segregated into three groupings:

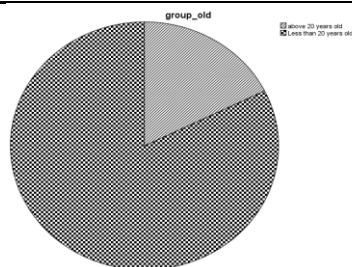
- Less than 10 years: Those represent 64.6%, thus more than half of the caregivers' sample.
- More than 10 years but less than 20 years: Those being 18.9%, which is an indication of some continuity of caregivers in the field.
- More than 20 years: 16.5% pursued their career with children with autism.

**4.5. 1.3. Age of child with autism:**

Average age recorded was (30.09), with standard deviation (31.74). Thus, the researcher, through the experience gained in the topic, believed that the concern the parents have to increase the learning curve of their child with autism diminishes after the latter reaches an average age of 20. Accordingly, this interval variable was also studied as a nominal level; by separating the sample age into two categories, namely above 20 years old and below 20 years old. Table and figure 4.2 here below highlights the frequency and percentages of the two categories.

**Table 4.3. Age of child in two categories**

	Frequency	Percent
Above 20 years old	23	17.7
Less than 20 years old	107	82.3
Total	130	100.0



**Figure 4.3 Age of child below and above 20 years old.**

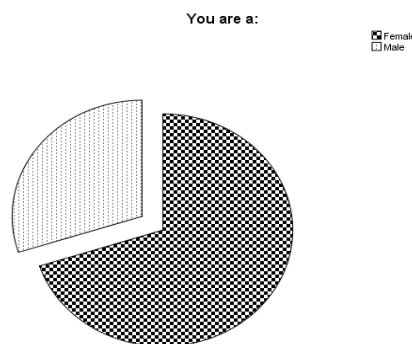
As shown in figure 4.3, more than 8/10 of the sample's age is less than 20 years old, which gives credibility to the research as being a topic of interest to the parents of children with autism. Those whose children are beyond 20 years old of age, might be considered tired of trying new inventions, plus the fact that they are relatively not ICT familiar in comparison to the younger ones.

**4.5.1.4. Gender:**

Table and figure 4.4 show the gender repartition of the survey.

**Table 4.4: Frequency and Percentage of Gender Repartition within the study:**

	Frequency	Percent
Female	91	70.0
Male	39	30.0
Total	130	100.0



**Figure 4.4: Percentage of Gender repartition within the study**

Table and Figure (4.4) illustrate that both male and female respondents took the survey and actual respondents are (91) females to (39) males, with a calculated percentage of 70 to 30 % where females represent the majority of the respondents. As in normal settings, children are more dealt with by mothers; which is not different in our course of the study. Female teachers and mothers represent a higher percentage in the study's population.

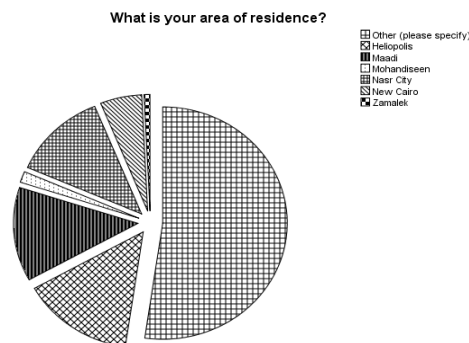
**4.5.1.5. Area of Residence:**

Areas of residence were originally segregated into five main ones, and respondents were requested to specify their area of residence among the six closed-ended categories. The last category of areas choice was: ‘others’, to cover those not listed in the closed ended options..

Table and figure (4.5) represent the frequency and percentage Areas of residence.

**Table 4.5: Frequency & percentage of areas of residence:**

	Frequency	Percent
Heliopolis	19	14.6
Maadi	17	13.1
Mohandeseen	2	1.5
Nasr City	16	12.3
New Cairo	7	5.4
Zamalek	1	.8
Other	68	52.3
Total	130	100.0



**Figure 4.5. : Illustration of Areas of Residence by percentages.**

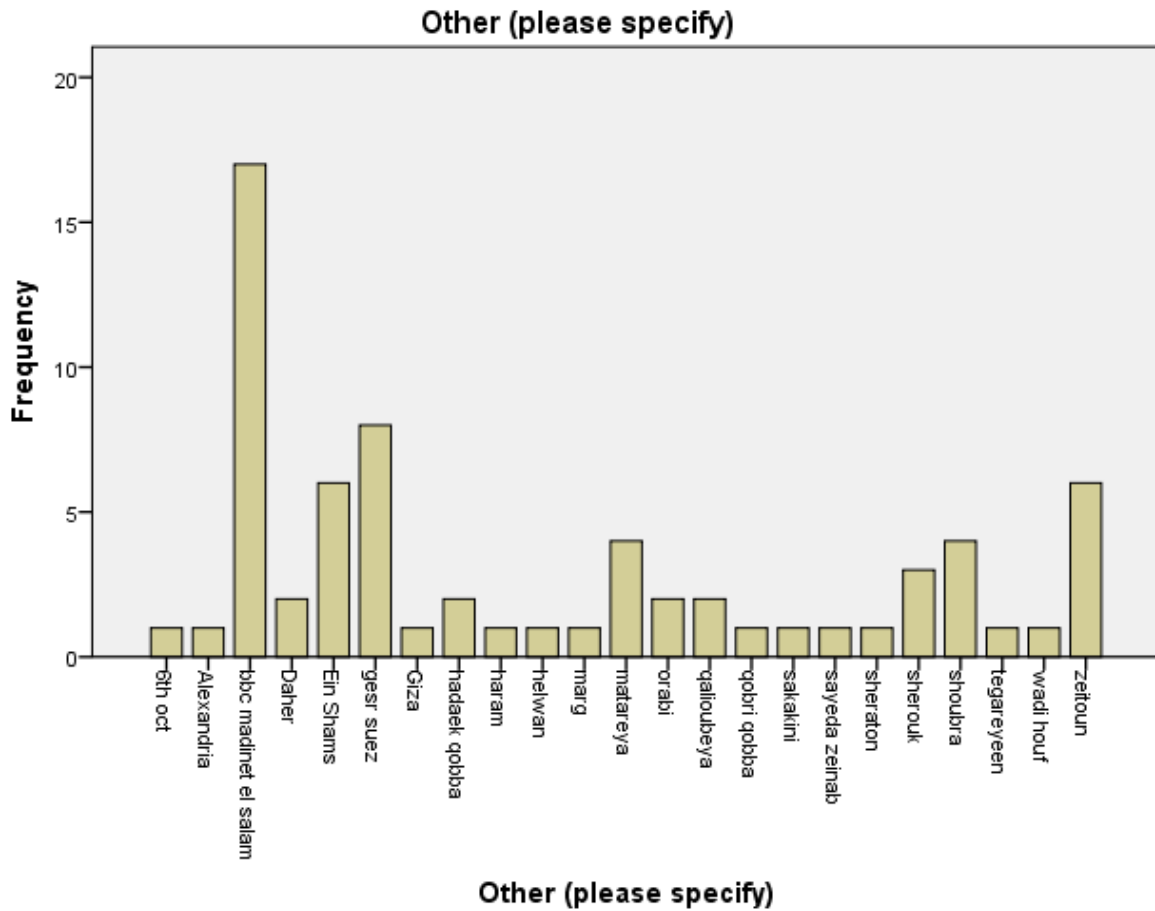
Setting aside the 52.3% of “other” areas of residence illustrated here below in table (4.6); the majority of the respondents reside in Heliopolis, representing 14.6 %. Those residing in Maadi and Nasr City are relatively similarly represented by 13.1% and 12.3% of the sample

respectively. New Cairo residents represent only 5.4%, followed by Mohandessein's residents 1.5%. Lastly, only 0.8 % of the sample is residents of the Zamalek district.

As observed from table and figure (4.5), 'others' category represent 52.3% of the sample, this is processed separately by table and figure (4.6) here below.

**Table 4.6: Frequency and percentage of sample repatriation in “other” areas.**

	Frequency	Percent
6th oct	1	1.5
Alexandria	1	1.5
bbc madinet el salam	17	25.0
Daher	2	2.9
Ein Shams	6	8.8
gesr suez	8	11.8
Giza	1	1.5
hadaek qobba	2	2.9
haram	1	1.5
helwan	1	1.5
marg	1	1.5
Other Areas		
matareya	4	5.9
orabi	2	2.9
qalioubeya	2	2.9
qobri qobba	1	1.5
sakakini	1	1.5
sayeda zeinab	1	1.5
sheraton	1	1.5
sherouk	3	4.4
shoubra	4	5.9
tegareyeen	1	1.5
wadi houf	1	1.5
zeitoun	6	8.8
Total	68	100.0
Missing	62	
Total	130	



**Figure 4.6:** The repartition of respondents in ‘other’ areas

The repartition illustrated in Table and Figure (4.6) show a remarkable majority of the respondents reside in the area “bbc – Madinet el salam” where they are all inhabiting around the Ghad el Moshreq association. In this sample, they represented 25% of the remaining ‘other’ open-ended category in the questionnaire. This is followed by 11% in Gesr el Suez, and then come both Zeitoun and Ein shams areas with 8.8%. Shoubra and Matareya are both represented by 5.9% equally, while Sherouk area is represented by 4.4%. A smaller, but important percentage of 2.9% are represented in areas of Hadaek el Qoba, Daher and Orabi evenly. Giza, Haram, Helwan, Tegareyeen, sherouk, Sheraton, sayeda Zeinab, Sakakini, Qobri El Qobba and 6oct are the smallest representation of 1.5%.



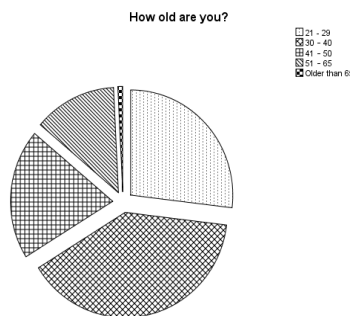
This made the repartition of the sample more representative on most of Greater Cairo, thus including Qalyoubeya and Giza besides most of Cairo governorates tackled

**4.5.1.6. Age of respondents:**

Respondents are categorized according to five age categories listed in the following table. Respondents who were less than 21 years old were excluded. This is because, as sensitive the topic is, both IRB and CAPMAS permits were issued on the restriction of interviewing adults.

**Table 4.7: Frequency and Percentage of age of respondents, both Parents and Caregivers**

	Frequency	Percent
21 - 29	35	26.9
30 – 40	51	39.2
41 – 50	26	20.0
51 – 65	17	13.1
Older than 65	1	.8
Total	130	100.0



**Figure 4.7: Percentage of age of respondents, both Parents & caregivers**

As shown in Table and figure (4.7) the middle-of-the-road respondents are (51) out of (130), representing 39.2% of the sample and are within the 30 – 40 age bracket. Respondents fitting

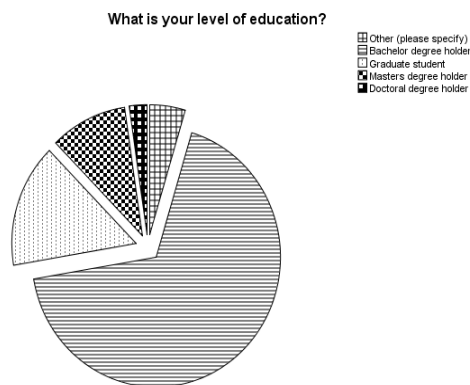
within the age group from (21 – 29) years old come second, representing 26.9%. Both (41 – 50) year olds and (51 – 65) years old had close representation in the sample, 26 % and 27 % respectively. Only 1 respondent representing 8 % of the sample is older than (65).

**4.5.1.7. Level of education:**

Respondents were asked to specify their level of education within four close-ended categories for Bachelor Degree holders or above, and one for “others” in case of those who did not obtain a Bachelor degree.

**Table 4.8: Frequencies and percentages of the respondents’ educational level**

	Frequency	Percent
Other (please specify)	6	4.6
Bachelor degree holder	88	67.7
Graduate student	20	15.4
Masters degree holder	13	10.0
Doctoral degree holder	3	2.3
Total	130	100.0



**Figure 4.8: Pie Chart illustrates the level of the education in the samples studied**

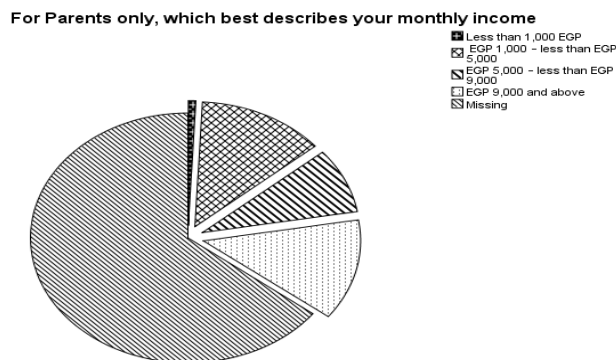
As shown in Table and Figure (4.8), a remarkable weight of the sample is of the bachelor degree holders, representing 67.7%. Followed by Graduate students 15.4% of the sample. Whereas, 10% are master's degree holders and only 2.3% are PhD holders. Those holding certificate less than Bachelor degrees represented 4.6% of the population sample.

**4.5.1.8. Monthly Income:**

Parents Respondents were asked to choose between four close-ended offered classifications of the family’s monthly income.

**Table 4.9: Frequency and Percentage of Family monthly income:**

		Frequency	Percent
Income	Less than 1,000 EGP	1	2.2
	EGP 1,000 – less than EGP 5,000	17	37.0
	EGP 5,000 – less than EGP 9,000	11	23.9
	EGP 9,000 and above	17	37.0
	Total	46	100.0
Missing	System	84	
Total		130	



**Figure 4.9.: Illustration of the level of monthly income in the samples studied**

As shown in Table and figure (4.9), a 37% is equally spread between the two categories representing EGP 1,000 – less than EGP 5,000 and EGP 9,000 and above. Followed by 23.9% for those within the EGP 5,000 – less than EGP 9,000 bracket. Only 2.2% represented the less than LE 1000.

#### **4.5.2. Associations for Children with Autism in Cairo out of which the sample is drawn:**

Most of the associations serving children with handicaps in Egypt are private entities that were basically founded by the parents of children with various handicaps. Although covering diverse socio-economic standards, the following were chosen because of their disposal to serve children with autism. The availability of public schools for this domain proved to be scarce or rather non-existent in Egypt.

##### **1. The Right to Live Association 1981 - EL 7aq Fil Hayat.: <http://righttolivecairo.org/>**

RTLA is a non-profit organization registered with the Ministry of Social Solidarity under no. 2855 for 1981 and is governed by a voluntary Board of Directors. It first started out in the courtyard of the Delivrande School in Cairo. Nine women, most of them being mothers of intellectually disabled children, wanted to provide their children with a place where they can learn, play and socialize. And hence, the project started as a recreational club for ten children that met twice a week after school hours. This service quickly evolved and by 1983, with the help of many organizations and individuals who had faith in the cause, four classrooms and a dining room/kitchen were built in the school courtyard to create a provisional center to educate and train 30 children and youths with intellectual disabilities from 9 am to 4 pm daily, 10 months a year. In 1984, RTLA bought a plot of land in the Heliopolis Sheraton district and plans were set to establish a four phase project,

which included a school, sheltered production workshops, training center for personnel and residential care services. The first phase of the project was finished and work began in the new center in November, 1987. Today RTLA enrolls more than 200 persons with intellectual disabilities, benefiting from its various programs and facilities, in addition to many community programs that focus on training specialists working in the field, providing parents counseling, creating employment opportunities for the intellectually disabled and participating in national projects that aim at improving services provided to persons with special needs. The motto of the association is: “We are not disabled, we are differently abled”.

2. **Bassmet Amal:** is a civil charity association for the health and social care of children with special needs. The association has three branches in Manial, Helmeya and Sayed districts in Cairo. It was founded in 2000 under registration number 4771.
3. **RSNC Ressala Special Need Centre:** <http://www.resala.org/ar/activities-listing>  
RSNC is an organization that provides a variety of services for children with intellectual disabilities in general and Autism in particular with 60 branches spread all through the country. It is a subdivision from Ressala NGO, registered as under No. 444/2000 with the Egyptian Ministry of Social Affairs.
4. **EL Ghad El Moshreq (Bright-Tomorrow):** a group of parents of children with special needs - Mental Handicap and Mobility – decided to establish the association for the care of their children through a specialized center for the integrated care of people with special needs in all fields (Education - - medical and rehabilitative). The association is established under No. 3,641 of 1989. Under the supervision of the Egyptian Ministry of Social Affairs.

- 5. Ahab Allah:** The association was founded in 1988 under the patronage of the Sacré Coeur Heliopolis (SCH) School nuns. The main aim of the association is to aspire to higher services for special education children by providing integrated care in education, training and rehabilitation practices to help them reach independence and social integration as much as possible. AhabAllah is a registered non-for-profit NGO under No. 3575/1988 with the Egyptian Ministry of Social Affairs.
- 6. Advance:** <http://www.advance-society.org/> It started with a group of dedicated parents and families of Persons with Autism and Other mental disabilities founded The Egyptian Advance Society for Persons with Autism and Other Disabilities. "ADVANCE", is a registered non-for-profit NGO under No. 4646/99 with the Egyptian Ministry of Social Affairs.
- 7. Seti:** <http://www.seti-center.com/> was established in 1986 to contribute to facing the problem of mental disability including Autism. Seti is derived from Caritas - Egypt associated with Caritas International. Caritas Egypt No. 1150 on 25 / 11 / 1967, was initiated in June 1967 after the war to assist many socio economic classes who were evacuated or relocated from the devastated areas without discrimination for color, gender or religion.
- 8. The Egyptian Autism Society:** <http://egyptautism.com/Default.aspx?SID=2> The Egyptian Autistic Society is a non-profit organization licensed by the Ministry of Social Affairs under license number 4625. It was founded in early 1999 with the mission of accommodating for persons with Autism and their families. The Society's main aim is to provide Early Intervention services to those identified with autism, the earlier the intervention the better is what they fully believe in. The emphasis on Early Intervention is to teach the child how to cope

with his/her handicap from an early age. The Society caters to children with Autism between the ages of 2-11 years of age. Key persons and professionals in the society range from psychologists, occupational therapists, speech therapists, special education teachers and trained staff .

#### **4.6. Pilot Study and Pretesting:**

Pretesting is an essential step that should be carried out before administering any survey; this increases the data quality that is expected to be generated from the survey. (DeMaio, Rothgeb, & Hess, 1998).

The questionnaire was first checked by a specialist in education in Cairo University to check the face validity of the survey questions. The remarks were thus updated to be conforming to her guidance.

Further, 7 questionnaires were distributed among a pilot group of parents and caregivers dealing with children with autism. In the pilot study process, they answered the survey questions and their highlighted remarks were taken into consideration and alterations were done accordingly. In general, the pretest conducted showed that all the questions were relatively easy to understand. Those with ambiguity were corrected. This was mainly focusing on language use and understandability.

The daily life of the entourage of the children with autism revealed to be highly busy and overwhelming due to the fact that they are actually living for them in the tiniest detail of daily life. Hence the questionnaire length had to be carefully monitored to suit both the integrity of the study and their tight and pressured schedule according to the time they could allocate for the research.

As far as technicalities were concerned, some reported that many children with Autism are easily introduced to the use of Interactive Preliminary Toy, which are a rudimentary version of ICT tools; these were added in the questionnaire to the list of ICT tools used.

On a different note, an important issue was also tackled that according to neurological autism traits the child with autism concentration span might be relatively short, and could leave the device open in his / her peripheral awareness spectrum but wouldn't really focus on its usage. This option was mentioned supplementary in Q12.

#### **4.7. Research Hypotheses:**

**RH1:** The caregivers of children with autism make more use of ICT tools than their parents.

**RH2:** The Higher the educational level of the parents, the more their use of ICT tools with their children with Autism.

**RH3:** The Higher the financial capabilities of the parents, the more their use of ICT tools with their children with Autism.

#### **4.8. Research Questions:**

**RQ1:** How much is the child with Autism already integrated in the Egyptian society:

- a. As Viewed by Parents?
- b. As viewed by Caregivers?

**RQ2:** How much is the child with Autism already Using ICT tools:

- a. As viewed by Parents?
- b. As viewed by Caregivers?

**RQ4:** How much is the child with Autism already Using Tablets:



- a. As viewed by Parents?
- b. As viewed by Caregivers?

**RQ5:** Are there any differences between the computer tablet usages of Parents versus Caregivers?

**RQ6:** Are there differences of use of computer tablets by the child with autism based on their parents':

- a. Educational level?
- b. Financial capabilities?

**RQ7:** How much is the child with Autism already using applications?

- a. As viewed by Parents?
- b. As viewed by Caregivers?

**RQ8:** Are there differences in the usage of applications by the child with autism based on their parents' and Caregivers views?

**RQ9:** How effective is the use of applications in facilitating the child with Autism's integration in the society. As viewed by:

- a. Parents ?
- b. Caregivers?

#### **4.9. Variables Studied and levels of measurement:**

- 1) The actual integration of children with autism in Egyptian Society: The variable was measured through 4 statements on a Five-point Likert-scale in the questionnaire from strongly agree to strongly disagree. The level of measurement is interval. The statements in question (5) are as follows:
  - Family Birthday / Reunion
  - Friends with kids visits or outings
  - Siblings outings
  - Handicapped gatherings
- 2) The variety of ICT usages by children with Autism: the variable was measured through 5 nominal questions. (Questions 7 to 12)
- 3) The variety of Tablet usages by children with Autism: the variable was measured through 2 nominal questions (13 &14)
- 4) The variety of Applications' usages by children with Autism. The variable was measured through 2 questions.
  - Q17: which is a 5 statements question on a Four-point Likert scale in the questionnaire from 'Very' to 'Don't know about it'. The level of measurement is interval.
  - Q18: which is a 5 statements question on a Five-point Likert scale in the questionnaire from 'Extremely Effective' to 'Negatively Effective'. The level of measurement is interval
  - The statements in question (17 &18) are as follows:
    - i.autism
    - Kalami

- Facebook
- Talking tom
- Opposites

5) Demographic Variables:

- a) Categorizing the relation with the child with autism: nominal variable
- b) Period of relationship with the child with Autism on the professional level: ordinal variable
- c) Period of relationship with the child with Autism as a parent: interval variable
- d) Gender (Male or Female): nominal variable
- e) Area of residence: nominal variable
- f) Age: Ordinal variable
- g) Educational Level: Ordinal variable
- h) Monthly income: Ordinal variable

**4.10. Operational Definitions:**

While Parents and siblings are already well defined as per their vocabulary value; the researcher's operationally defined teachers in this survey as the person responsible for the education of the child with Autism within an organization framework. Caregivers are either the teacher's assistants or the child's personal attendant for any Para-curricular activities. Therefore, such status is left open to comprise any of the listed people assisting persons within the Autism Spectrum. In this study, parents, relatives and siblings were grouped under the label "Parents". In parallel, caregivers, teachers and Experts of the field, were labeled "Caregivers".

In dealing with children on the autism Spectrum, the person with autism is identified as a "child" regardless of his / her biological age as the capabilities pertaining are more related to

the mental age and individual abilities rather than the actual birth age. In that sense, the study will not rely on the biological age. Having said that, the question of the age will be to represent how long the parents have been exposed to a child with autism; en-revanche, the Caregivers category is measured by a simple ‘how long have you been in the field’ direct question. The reason for administrating the survey among different Autism care entities is to obtain a well-rounded picture of the study’s subject in the actual Egyptian society.

In demographics, greater Cairo comprises: Qalyoubeya, Giza and Cairo.

#### **4.11. Survey Design:**

The Survey questionnaire is hypothetically divided into Five parts, the five parts are the ICT usage in general, the Tablet in particular and last but not least the applications operated; followed by the demographics using mainly the gender, age, educational level, area of residence and income.

##### **1. The Integration of children with Autism within the Egyptian Society as a fact:**

Questions 5 and 6 cover this part. Question 5 gives an overview of the actual integration of the child with Autism within the Egyptian Society as seen by Parents versus Caregivers. Likert scale is designed to clearly show the inclination towards the integration idea with all ramifications of possible situations as seen from parents or caregivers views to answer RQ1. Question 6 clarifies the reason of integration or alienation tendencies, thus providing analytical answers to RQ1.

2. **The variety of ICT usages by children with Autism:** This part is covered by Questions 7 to 12.

- **Q7:** Probes about the actual use of ICT tools, which serves as answer to RQ2 as viewed by Parents and Caregivers.
- **Q8:** Elucidates a list of reasons in case the child does not use ICT tools, which gives more clarification to answering RQ2 as thought by parents versus caregivers.
- **Q9:** Measures RQ2 to know the child with Autism's actual Usage of ICT tools in terms of the variety of devices operated.
- **Q10 & Q11:** Measure the child's accessibility to ICT tools, whether used at home based on the family's financial capabilities; or at school or the association where he /she goes which still adds to the information of the actual use of the child pertaining to RQ2. The two questions further helped studying the three main research hypotheses RH1, RH2 and RH3. They gave a clear insight regarding the use of Caregivers and parents for ICT for the children with autism in general; plus any possible distinction of the child with autism use of ICT based on their parents Educational level and / or financial capabilities.
- **Q12:** Also responds to RQ2 of actual ICT tools consumption in time.

3. **The variety of Tablet usages by children with Autism:** This part is covered by Questions (13) and (14). These questions Cover RQ4 tackling the variety of Tablet usages by children with Autism out of the list of ICT tools. This is scrutinized as viewed by Parents in comparison to how it is viewed by Caregivers. These four questions also cover answers to RQ6 where the distinction of the child with autism

use Tablets based on their parents' Educational level and financial capabilities is studied.

4. **The variety of Applications usages by children with Autism:** Questions 15 and 16 cover this part. These two questions mainly answer the child with Autism actual Usage of Applications As viewed by Parents versus Caregivers which answers RQ7 and further, also tackle the distinctions of the child with autism use of Applications based on their parents' Educational level or Financial capabilities. Additionally, they also cover RQ9, which enquires about how effective do Parents and Caregivers view the use of applications in facilitating the child with Autism's integration in the society as.

5. **Demographics:**

- **Q1:** This is a filtering question, to identify if respondent is related to any child with Autism.
- **Q2:** Identifies the relationship to the child; and is thus categorized as Parent or Caregivers
- **Q3:** Shows credibility. The child might not be known to the caregiver for a sufficient time to judge. Further, this is used for Caregivers length of exposure versus the age of the child for Parents data.
- **Q4:** Gives an overview if the biological age of the child has any effect, it measures which age is more prone to ICT, or is it not related. Most literature highlighted that children with autism are usually dealt with according to mental age, but in the research, this criterion might show that the child's surrounding is not interested to keep on investing or introducing new appliances after the birth age of 20.

- **Q17; ; Q18; Q19; Q20; Q21**: general demographics of gender, area of residence, age, education level and income; which serve answering most of the research questions interweaved with the other listed variables.

**4.12. Statistical Analysis:**

The statistical analysis used in this study followed the SPSS statistical program (version 20). The following statistical parameters were calculated as shown below, Wimmer and Dominick (2014). Hypothesis testing was conducted using the same software.

**4.12.1 Average rating of agreement:**

The mean rate of Likert scale levels, calculated in case of agreement levels as:

$$\text{Average rate } \Sigma = (\text{scale weight} * \text{frequency} / \text{total})$$

**4.12.2 Percent % agreement:**

$$\text{Average rate} * 100 / 5$$

**4.12.3 The Chi-Square ( $\chi^2$ ) Test:**

$\chi^2$  is used to test the homogeneity of distribution of any two variables. We assume the null hypothesis that the 2 distributions are similar.  $\chi^2$  will measure if the null hypothesis is true or false.

$\chi^2$  is calculated as the summation of the squares of the differences between expected and observed values as a ratio of the expected value, Wimmer and Dominick (2014).

$$\chi^2 = \Sigma \frac{(\text{Observed} - \text{expected})^2}{\text{expected}}$$

The significance of the resulted value of  $\chi^2$  is measured by its probability parameter  $p$  at 0.05 or 0.01 levels of probability. If the  $p$  value is  $<0.05$  or  $<0.01$ , the calculated value of  $\chi^2$  is significant or highly significant and the distributions of A & B are different (not the same). If  $p$  is  $>0.05$ , the calculated value of  $\chi^2$  is not significant and the distributions of A & B are similar.

#### **4.12.4 Likert Scales:**

**A.** In order to facilitate the interpretation of the results, the researcher used the following method to determine the 5 level of the Likert scale answers. Where the weight given to the given alternatives is:

Strongly agree = 5,

Agree = 4,

Neutral = 3,

Disagree = 2,

Strongly disagree = 1,

Accordingly, classifying the answers to five equal levels along the following equation:

The category lengths = Maximum Value – Minimum Value / Number of Alternatives

$$= (5-1) / 5 = \underline{\underline{0.8}}$$

**Table (4.10): The distribution of the categories according to the scale used in the survey**

<b><u>Scale</u></b>	<b><u>Range of Mean</u></b>
<b>Strongly Agree</b>	5.00 – 4.21
<b>Agree</b>	4.20 – 3.41
<b>Neutral</b>	3.40 – 2.61
<b>Disagree</b>	2.60 – 1.81
<b>Strongly Disagree</b>	1.80 – 1.00



**B.** In order to facilitate the interpretation of the results, the researcher used the following method to determine the 5 level of the Likert scale answers. Where the weight given to the given alternatives is:

Extremely Effective = 5,

Effective = 4,

Neutral = 3,

Non Effective = 2,

Negatively Effective = 1,

Accordingly, classifying the answers to five equal levels along the following equation:

$$\begin{aligned} \text{The category lengths} &= \text{Maximum Value} - \text{Minimum Value} / \text{Number of Alternatives} \\ &= (5-1) / 5 = \mathbf{0.8} \end{aligned}$$

**Table (4.11): The distribution of the categories according to the scale used in the survey**

<b>Scale</b>	<b>Range of Mean</b>
<b>Extremely Effective</b>	5.00 – 4.21
<b>Effective</b>	4.20 – 3.41
<b>Neutral</b>	3.40 – 2.61
<b>Non Effective</b>	2.60 – 1.81
<b>Negatively Effective</b>	1.80 – 1.00

**C.** In order to facilitate the interpretation of the results, the researcher used the following method to determine the 4 level of the Likert scale answers. Where the weight given to the given alternatives is:

Very Frequently = 3,

Frequently = 2,

Seldom = 1,

Don't know about it = 0,

Accordingly, classifying the answers to five equal levels along the following equation:

The category lengths = Maximum Value – Minimum Value / Number of Alternatives

$$= (4-1) / 4 = \underline{\mathbf{0.75}}$$

**Table (4.12): The distribution of the categories according to the scale used in the survey**

<u>Scale</u>	<u>Range of Mean</u>
Very Frequently	3.00 – 2.26
Frequently	2.25 – 1.51
Seldom	1.50 – 0.76
Don't know about it	0.75 – 0.00

#### **4.12.5 Research Hypotheses Testing Used:**

- RH1, RH2 & RH3: are tested using Frequencies, Percentage, Mean, Standard deviation, order and chi square.

#### **4.12.6 Research Questions Testing Used:**

- RQ1, RQ2, RQ4, RQ7 and RQ9 are tested using Frequencies, Percentage, Mean, Standard deviation and order.
- RQ5 and RQ6 are tested using Frequencies, Percentage, Mean, Standard deviation, order and chi square.

## Chapter V.

### **RESULTS and DISCUSSION**

The results of this study were processed and entered into the Statistical Package for the Social Sciences software (SPSS Version 20).

The results are divided into two sections. The first section lists the survey results and the second section shows the qualitative interview results.

Each research question's calculated outcome is presented as Parents' followed by Caregivers' responses to facilitate showing the resemblance or discrepancy of both groups on a given subject.

The results are listed in the following tables, most illustrated by accompanying charts showing both Parents versus Caregivers viewpoints simultaneously.

#### **5.1. Testing Research Hypotheses:**

**RH1: The caregivers of children with autism make more use of ICT tools than their parents.**

This hypothesis is tested through the usage of chi square test to identify differences between the ICT tools' usage of Parents versus Caregivers through the answers of the survey sample to questions (7 and 9).

- a. Differences in the use of the child with autism to ICT tools by both parents and caregivers: The Chi square equal to 1.504 (1) is non significant in which p value is equal to 0.220 indicating similar distributions of parents versus caregivers opinion in children with autism using ICT tools.

- b. Differences in the use of ICT tools by children with autism using IWB, Personal Computers, Laptop, smart phone and Interactive preliminary toy between parents and caregivers: The Chi square equal to 2.088 (1), 0.379 (1), 0.626 (1), 0.228 (1), 0.482 (1) respectively is non significant in which p value is equal to 0.148, 0.538, 0.429, 0.633 and 0.482 respectively, thus indicating similar distributions of parents versus caregivers opinion in children with autism in their usage of IWB, Personal Computers, Laptop, smart phone and Interactive preliminary toy respectively.
- c. Differences in the use of the child with autism to ICT tools by both parents and caregivers specifically concerning the tablet use as on of the ICT tools surveyed. The Chi square equal to 5.963 (1), which is significant as p value is equal to (0.015) indicating different distributions of parents versus caregivers' opinion in children with autism using the tablet.

These results support RH1 partially as far as computer tablets are concerned only.

**RH2: The Higher the educational level of the parents, the more their use of ICT tools with their children with Autism.**

This hypothesis is studied through the usage of chi square test to identify differences between the ICT tools' usage of Parents' educational level and financial capabilities through the answers of the survey sample to question (9).

- a. Differences in the use of IWB, Personal Computers, Laptop, tablet and smart phone according to the educational level of the parents of children with autism: The Chi square equal to 2.426 (3), 3.843 (3), 2.562 (3), 4.078 (3), 3.874 (3) respectively is non significant in which p value is equal to 0.489, 0.279, 0.464, 0.253 and 0.275 respectively,

thus indicating similar distributions of parents educational level in the use of their children to IWB, Personal Computers, Laptop, tablet and smart phone respectively.

b. Differences in the use of Interactive Preliminary toy by the child with autism according to the parents' level of education: The Chi square equal to 9.083 (3), which is significant as p value is equal to (0.028) indicating different distributions of parents' level of education in their child's use of the Interactive Preliminary toy.

These results refute the hypothesis except for the interactive preliminary toy.

**RH3: The Higher the financial capabilities of the parents, the more their use of ICT tools with their children with Autism.**

a. Differences in the use of IWB, Personal Computers, Laptop, tablet and smart phone according to the socio economic standard (SES) of the parents of children with autism: The Chi square equal to 2.965 (2), 4.272 (2), 1.378 (2), 1.732 (2), 3.695 (2) respectively is non significant in which p value is equal to 0.227, 0.118, 0.502, 0.421 and 0.158 respectively, thus indicating similar distributions of parents SES in the use of their children to IWB, Personal Computers, Laptop, tablet and smart phone respectively.

b. Differences in the use of Interactive Preliminary toy by the child with autism according to the parents' SES: The Chi square equal to 8.129 (2), which is significant as p value is equal to (0.017) indicating different distributions of parents' SES in their child's use of the Interactive Preliminary toy.

These results refute the hypothesis except for the interactive preliminary toy

## **5.2. Answering Research Questions:**

### **RQ 1: How much is the child with Autism already integrated in the Egyptian society?**

Answered by questions number 5 and 6 and represented in two categories with both parents and caregivers' opinion simultaneously.

The following summary table represents the opinion of parents versus the caregivers who participated in the current study on the child with Autism's actual integration in the Egyptian society.

**Table 5.1: Frequency, Percentages and Averages for type of gatherings as viewed by Parents.**

Type of Gatherings		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Order
1	Family Birthday / Reunion	F	1	5	15	13	3.76	1.07	1
		%	2	10	30	26			
2	Friends with kids visits or outings	F	2	8	10	21	3.54	1.09	2
		%	4	16	20	42			
3	Siblings Outings	F	3	7	15	15	3.44	1.14	4
		%	6	14	30	30			
4	Handicapped Gatherings	F	6	3	12	18	3.50	1.24	3
		%	12	6	24	36			
Average Mean							3.56		

As shown in table (5.1) and in reference to table (4.10), the average of integration of the child with autism in the Egyptian society is (3.56) which represents that the sample surveyed “Agrees” on the integration within the Egyptian society as per the above table.

The various types of gatherings results are:

- **Family Birthday / Reunion:** Ranked as first order with a mean of (3.76) which represents that the parents “Agree” on involving their children with autism in the family gatherings and birthdays, as per the reference provided in table (5.1).
- **Friends with kids visits or outings:** Ranked as second order with a mean of (3.54) which represents that the parents still “Agree” on involving their children with autism in the Friends with kids visits or outings, as per the reference provided in table (5.1).
- **Siblings Outings:** Although still scored “Agree” with a mean of (3.44), it’s ranked the 4<sup>th</sup> within the types of gatherings, as per the reference provided in table (5.1). Which emphasizes the explanation the parents gave on Q6 stating that it is not very

recommended to stick a child to the bother or sister, even in normal situations to maintain the identity of each child and to avoid bullying. In the case of a child with autism, the latter reason is more taken into consideration.

- **Handicapped Gatherings:** Ranked as third order with a mean of (3.50) which represents that the parents still “Agree” on involving their children with autism with Handicapped gatherings, as per the reference provided in table (5.1). Having said that, as a reply to Q6, some of the parents had clarified that they prefer not. The reason they gave was to avoid more alienation.

As a general overview, Table (5.1) shows that although the Parents do already have a level of acceptance of the idea of integrating their children with Autism within the Egyptian society as the average mean was calculated to be 3.56; this still does not reach the ‘Strongly Agree’ mean beyond (4.21) as per the reference provided in table (5.1) which tells that there are some hinders to actually perform the integration. Which in other words might mean, that parents actually want to integrate the child, but there is a resistance from the society that lacks awareness in the communication with the child with autism. As clarified from above list of these suppositional occasions, while the tendency goes first in order to family reunions and gatherings, still stops as ‘Agree’ because, as clarified in their reply to Q6, the child with autism might not be very welcomed in some occasions or cases because of lack of comprehension of the behavior or communication. The same goes for friends’ gatherings and large outings. The last in order being joining the siblings in their outings and activities with an explanation highlighted in Parents’ answers to question number (6) in the questionnaire, where they elaborated that the child needs to feel part of the family and the society, and this adds to his / her social interaction experience in the long run. On the other hand, regarding the siblings outings, parents replies elucidated that this can lead to bullying to both children from their friends as one reason, and second that even in standard families it is not



recommended for a child to include his younger or older sibling within a friends' outing, with the aim of keeping each child's identity.

**Table 5.2: Frequency, Percentages and Averages for type of gatherings as viewed by Caregivers.**

Type of Gatherings		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation	Order
1	Family Birthday / Reunion	F	2	2	23	38	3.77	0.87	3
		%	2.5	2.5	28.8	47.5			
2	Friends with kids visits or outings	F	2	2	21	38	3.82	0.88	1
		%	2.5	2.5	26.3	47.5			
3	Siblings Outings	F	1	3	22	38	3.81	0.84	2
		%	1.3	3.8	27.5	47.5			
4	Handicapped Gatherings	F	1	2	34	31	3.63	0.81	4
		%	1.3	2.5	42.5	38.8			
Average Mean							3.75		

Considering that the 'Agree' range of an average Mean should be between (4.2) and (3.41), as clarified in table (5.2) above shows that Caregivers also have a high level of acceptance of integrating the children with Autism within the Egyptian society as the average mean was calculated to be (3.75).

The various types of gatherings results are:

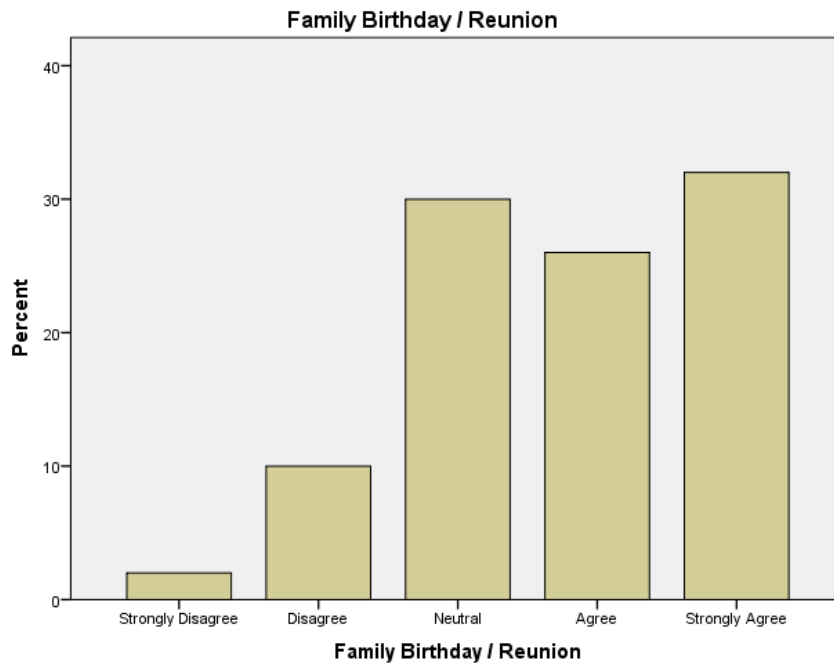
- **Family Birthday / Reunion:** Ranked as third order with a mean of (3.77) which represents that although the caregivers do "Agree" on involving the children with autism in the family gatherings and birthdays, as per the reference provided in table (5.2), and this mean is very similar to the parents' one being (3.76), the family gatherings are ranked as 3<sup>rd</sup> in order of actual integration as viewed by the caregivers versus 1<sup>st</sup> by parents.
- **Friends with kids visits or outings:** Ranked as first order with a mean of (3.82) which represents that the caregivers "Agree" on involving the children with autism in

the Friends with kids visits or outings, as per the reference provided in table (5.1). Knowing that the parents' responses showed a mean of (3.54) and ranked it second, it might be an indication that although this is how it should be, as caregivers and professional opinion report it, the parents are less willing to go out and integrate with their friends' children.

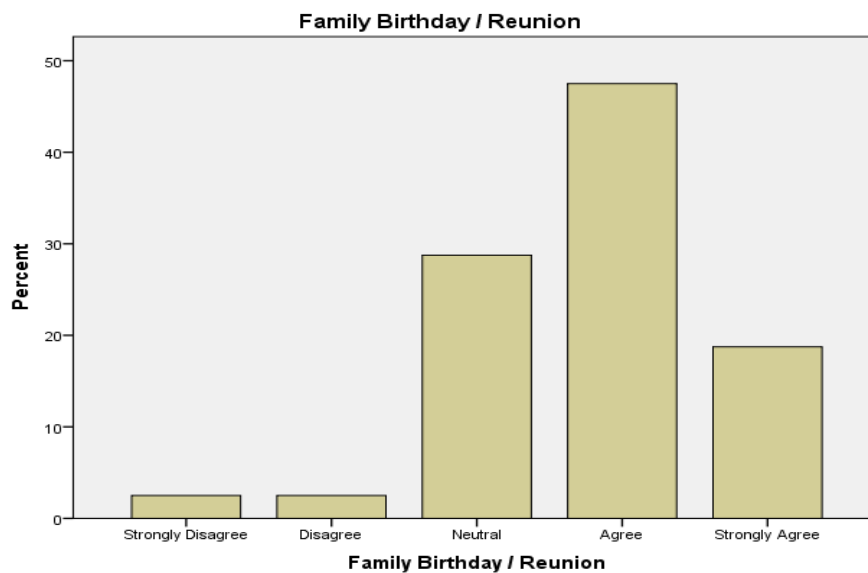
- **Siblings Outings:** With a mean of (3.81), caregivers ranked siblings outing as second in order, in comparison to fourth in the parents' opinion. Which again emphasizes the difference between what should be done, and what is actually happening.
- **Handicapped Gatherings:** Although "agree" is the mean indication, this gathering type is last Ranked by caregivers, with a mean of (3.63); Caregivers replies to Q6, clarified that in some cases, a child with a problem might imitate another problem, thus multiply the negative traits, and consequently increasing the social alienation.

The following charts are a graphic illustration of both tables' information by event as viewed by the Parents versus the Caregivers respectively.

**1. Family Birthday / Reunions:**



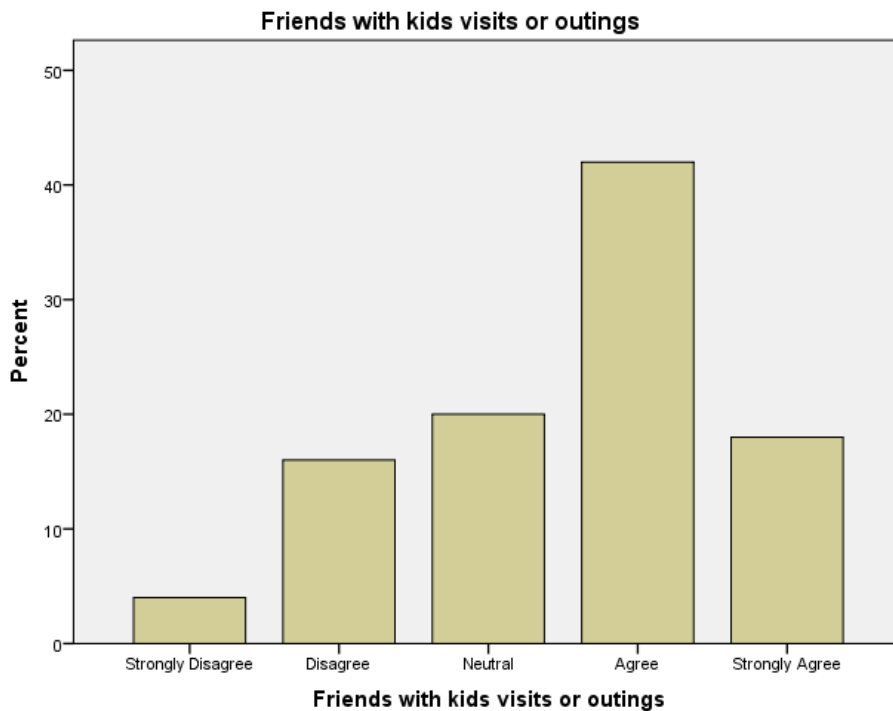
**Figure 5.1: How Parents viewed children with Autism integrated within Family outings events.**



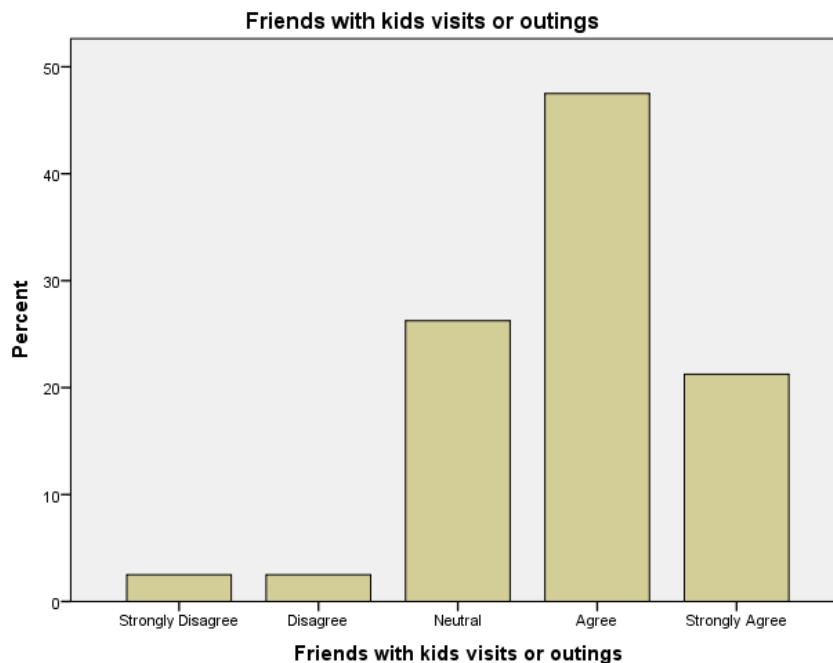
**Figure 5.2: How Caregivers viewed children with Autism integrated within Family outings.**

The two charts face to face show that both parents and caregivers “agree” on the importance of the child’s acceptance and integration within his own family and attending all their gatherings.

**2. Friends with kids visits or outings:**



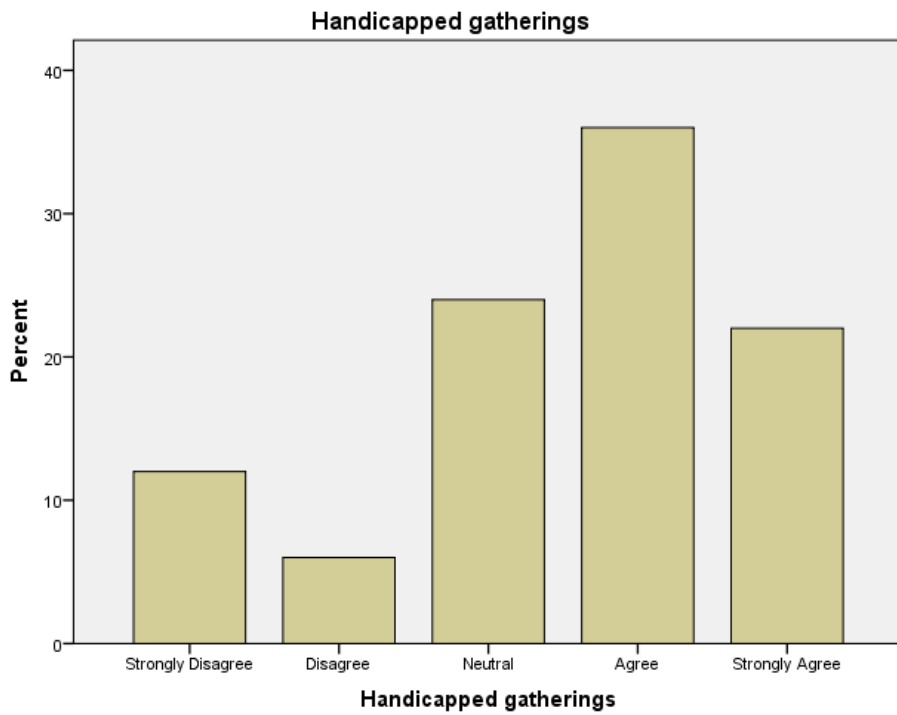
**Figure 5.3: How Parents viewed children with Autism integrated within Friends outings events.**



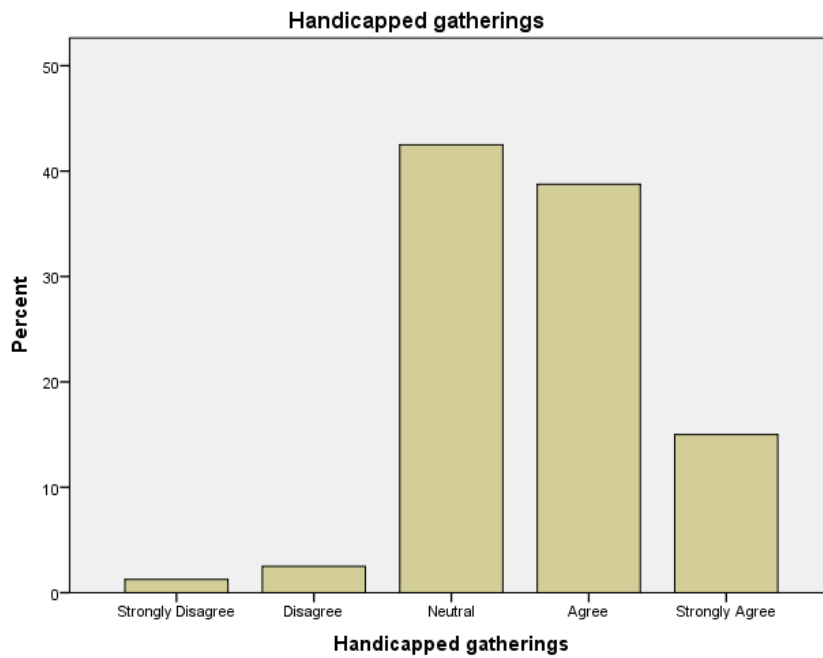
**Figure 5.4: How Caregivers viewed children with Autism integrated within Friends outings events.**

The two charts face to face show that both parents and caregivers “agree” on the importance of the child’s acceptance and integration within his own family and attending all their gatherings.

**3. Handicapped Gatherings:**

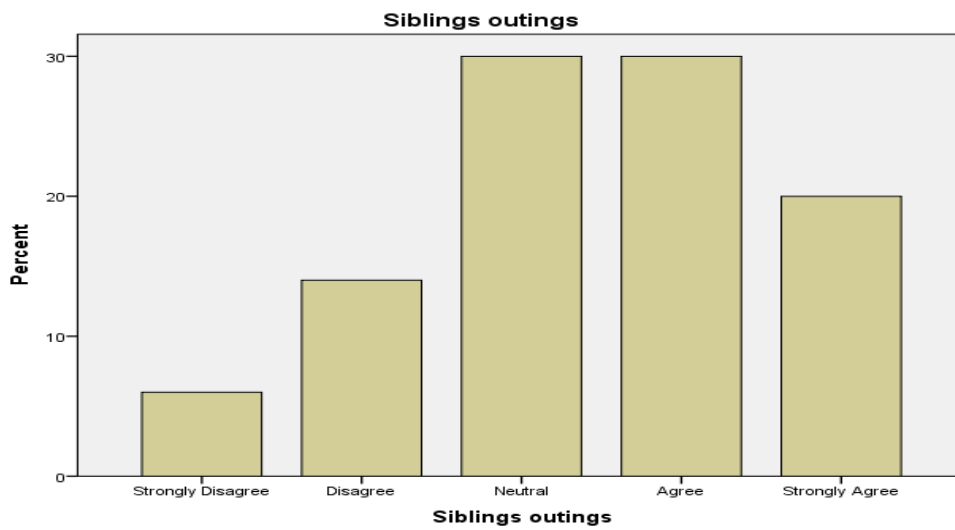


**Figure 5.5: How Parents viewed children with Autism integrated within Handicapped gatherings**

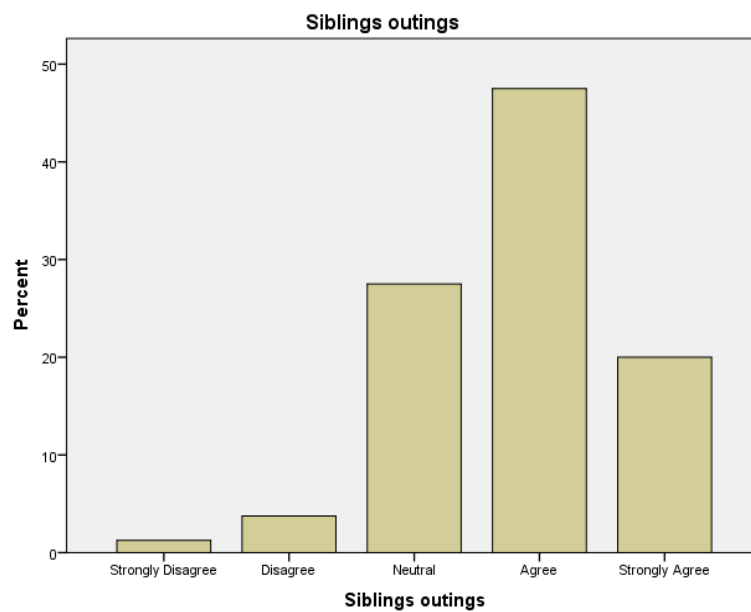


**Figure 5.6: How Caregivers viewed children with Autism integrated within Handicapped gatherings**

#### **4. Siblings Outings:**



**Figure (5.7): How Parents viewed children with Autism integrated within Siblings Outing events.**



**Figure (5.8): How Caregivers viewed children with Autism integrated within Siblings Outing events.**

**RQ2:** How much is the child with Autism already Using ICT tools:

- a. As viewed by Parents?
- b. As viewed by Caregivers?

RQ2 was answered considering both Parents and caregivers' views respectively, through questions 7 to 12 from the survey questionnaire.

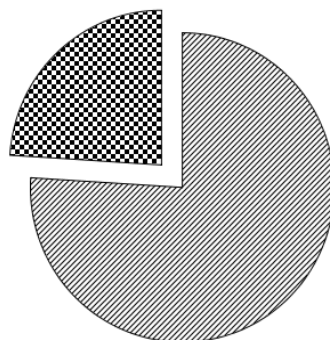
a. How much is the child with Autism already Using ICT tools as viewed by **Parents**?

Table (5.3) and figure (5.12) clarify the percentage of the use of ICT tools by the children with autism in general, (Q7) as viewed by the parents.

**Table (5.3) The child actually uses ICT or not, as viewed by parents.**

	Frequency	Percent
Yes	38	76.0
No	12	24.0
Total	50	100.0

Is the child with autism you know using any Information and Communication Technologies (ICT) device?  
 Yes (Please Proceed to Q10)  
 No (Please Proceed to Q9)



**Figure (5.9): The child actually uses ICT or not, as viewed by Parents.**

As shown in table (5.3) and figure (5.9), 76% are actually using ICT tools, which represents more than ¾ of the Parents’ sample used. Which gives high credibility in their responses and opinion regarding the use of ICT tools by their children with autism as this gives an indication of familiarity with the ICT tools, which is the researcher’s main topic.

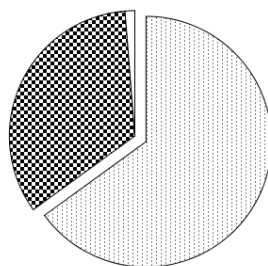
b. How much is the child with Autism already Using ICT tools as viewed by **Caregivers**?

Table (5.4) and figure (5.10) clarify the percentage of the use of ICT tools by the children with autism in general, (Q7) as viewed by the Caregivers.

**Table (5.4) The child actually uses ICT or not, as viewed by caregivers.**

	Frequency	Percent
Yes	52	65.8
No	27	34.2
Total	79	100.0
Missing System	1	
Total	80	

Is the child with autism you know using any Information and Communication Technologies (ICT) device?  
 Yes (Please Proceed to Q10)  
 No (Please Proceed to Q9)  
 Missing



**Figure (5.10): The child actually uses ICT or not, as viewed by Caregivers.**

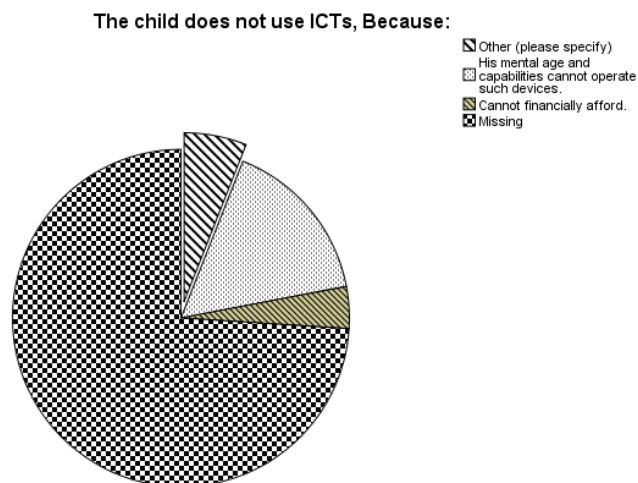


As shown in Table (5.5) and figure (5.10), the positive feedback is bigger than the negative; approximately 66% reported usage, while less than 1/3 were not using ICT tools, which identifies with the response of the parents.

To know the reason for not using ICT tools as viewed by the parents, we used (Q8) in the survey questionnaire for clarification; Table (5.5) and figure (5.11) shows the reasons of not using ICT tools through the lens of the parents.

**Table (5.5): Why the child doesn't use ICT tools as seen by Parents**

	Frequency	Percent
Other	3	23.1
His mental age and capabilities cannot operate such devices.	8	61.5
Cannot financially afford.	2	15.4
Total	13	100.0
Missing System	37	
Total	50	



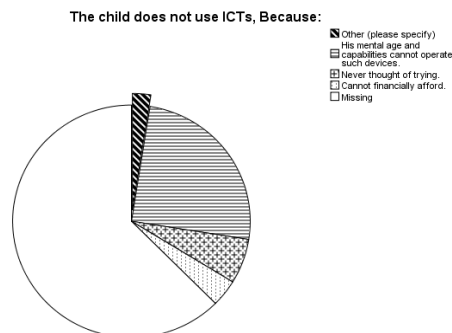
**Figure (5.11) Why the child doesn't use ICT tools as seen by Parents**

As shown in table (5.5) and figure (5.11), 61.5% of the parents responded that their children with autism are not able to use ICT because of their mental capabilities. Although 15.4% reported financial incapability, 23.1%, responded with an outstanding logical reason being to avoid the isolation of the child with autism, in other terms, one-way communication from the ICT tools, might accentuate the autism trait of social seclusion, which highlights the awareness of the parents of such tendency.

To know the reason for not using ICT tools as viewed by the caregivers, we used (Q8) in the survey questionnaire for clarification; Table (5.6) and figure (5.12) shows the reasons of not using ICT tools through the lens of the caregivers.

**Table (5.6) The child does not use ICT, Because: as seen by Caregivers**

	Frequency	Percent
Other	2	6.7
His mental age and capabilities cannot operate such devices.	20	66.7
Never thought of trying.	5	16.7
Cannot financially afford.	3	10.0
Total	30	100.0
Missing System	50	
Total	80	



**Figure (5.12) Why the child doesn't use ICT tools as seen by Caregivers**

As shown in table (5.6) and figure (5.12), almost 67% of the caregivers responded that the children with autism are not able to use ICT because of their mental capabilities, which is compatible with the parents' results. Although only 10% reported financial incapacabilities probably based on their working environment offers, 16.7 %, responded with a surprising reason amongst the 'other' option stating that 'they never thought of trying'. If we can find any logical interpretation, this might be for financial reason or for the lack of experience as most these respondents were fresh graduates. The last 6.7% also highlights the isolation fear, but the discrepancy of the percentage is backed by the caregivers' experience and variability of tool availability, which minimizes the importance of this reason from the caregivers' point of view.

Q9 herewith gives us an insight of the kind of ICT tools used more specifically. Table (5.7) clarifies the numbers of listed tools as seen by Parents.

**Table (5.7) what kind of device is used? as seen by Parents:**

Interactive Whiteboard	Personal Computer	Laptop	Tablet	Smart phone	Interactive preliminary toy
3	9	20	31	17	7

The order shows:

1. Tablet
2. Laptop
3. Smart Phone
4. Personal Computer
5. Interactive preliminary toy
6. Interactive Whiteboard

An interpretation of this ranking might be related to both financial reasons and mobility of device.

**Table (5.8): What kind of device is used? As seen by Caregivers:**

Interactive Whiteboard	Personal Computer	Laptop	Tablet	Smart phone	Interactive preliminary toy
9	18	24	32	24	8

The order shows:

2. Tablet
3. Laptop / Smart Phone
4. Personal Computer
5. Interactive preliminary toy
6. Interactive Whiteboard

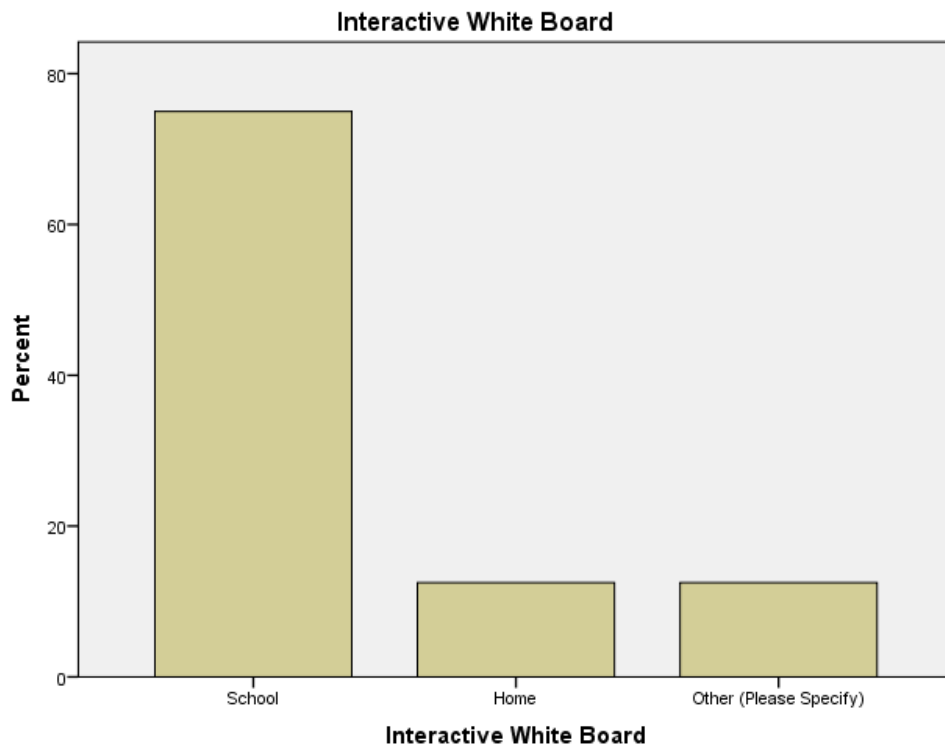
Which is very similar to the parents' viewpoint, again, both financial reasons and mobility of device might be the reason behind such order.

These ICT tools are used in both School and home; Table (5.9) shows the percentage and frequency of their use in both places as seen by parents:

**Table (5.9): The percentage and frequency of ICT tools use in School and Home as seen by Parents**

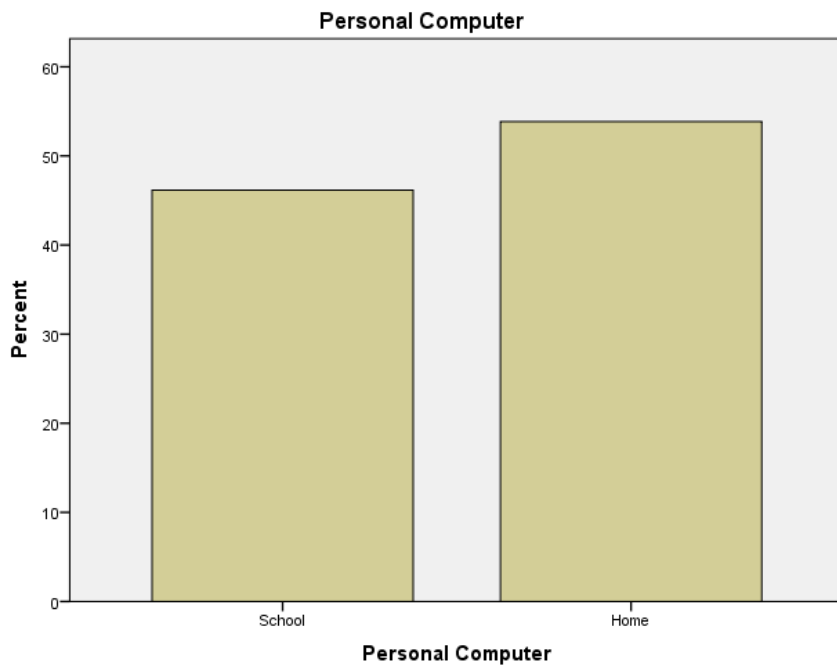
Device		School	Home	other	
1	Interactive White Board	F	6	1	1
		%	75	12.5	12.5
2	Personal Computer	F	6	7	-
		%	46.2	53.8	-
3	Laptop	F	4	19	-
		%	17.4	82.6	-
4	Tablet	F	2	28	-
		%	6.7	93.3	-
5	Smart Phone	F	1	17	-
		%	5.6	94.4	-
6	Interactive Preliminary Toy	F	2	5	1
		%	25	62.5	12.5

**1. Interactive White Board:**



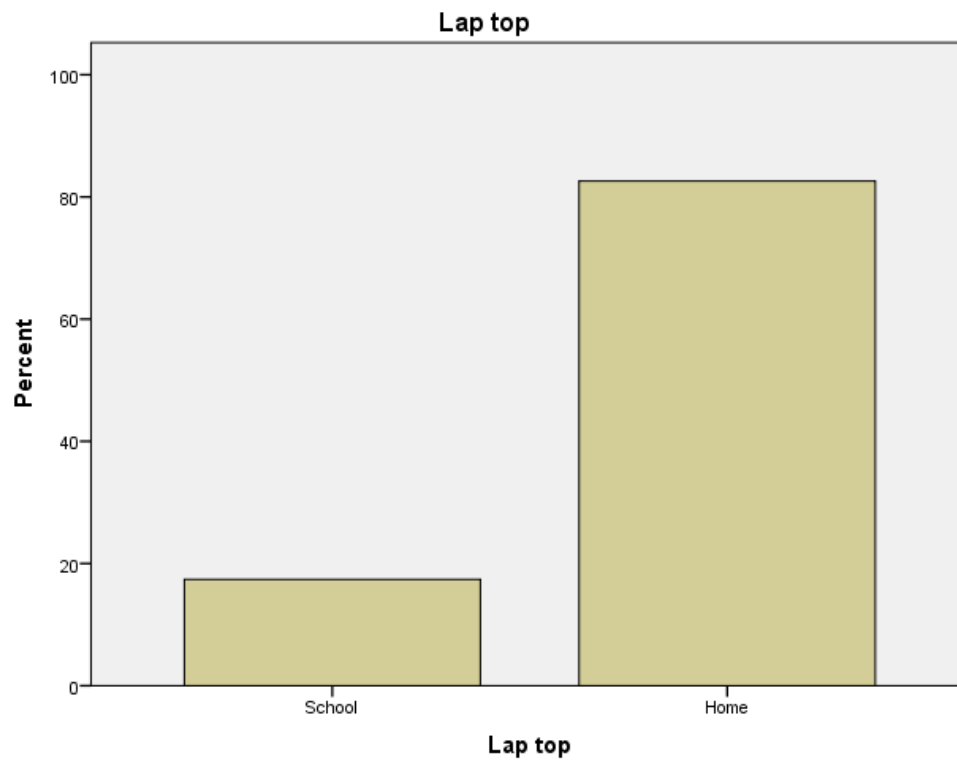
**Figure (5.13) Operation of IWB as replied by parents**

**2. Personal Computer:**



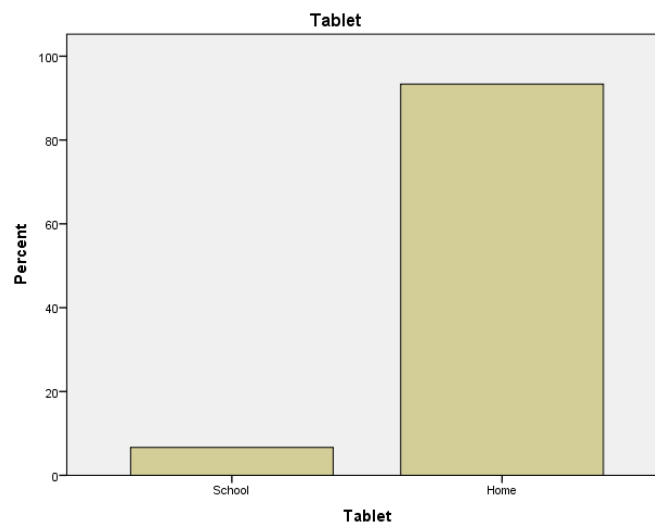
**Figure (5.14) Operation of Personal Computer as viewed by Parents**

### **3. Laptop:**



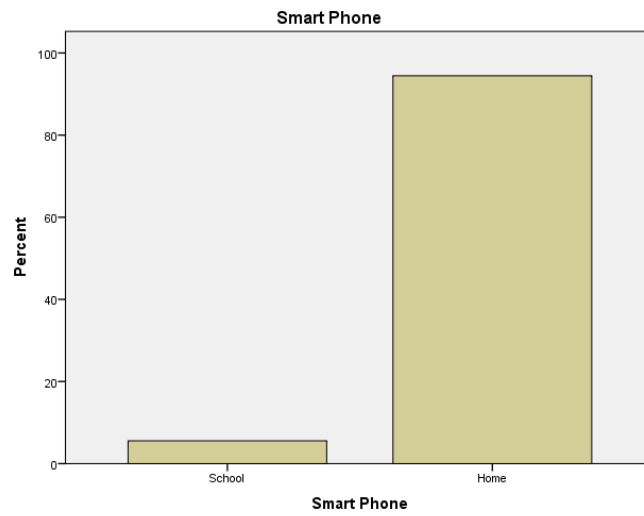
**Figure (5.15) Operation of Laptop as viewed by Parents**

### **4. Tablet :**



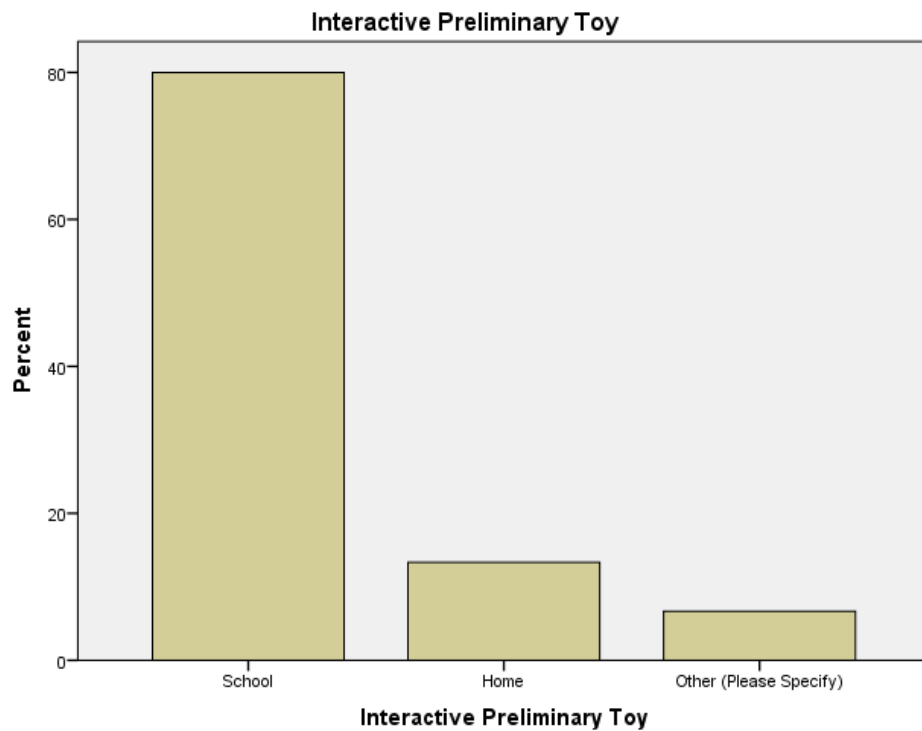
**Figure (5.16) Operation of Tablet as viewed by Parents**

**5. Smart Phone:**



**Figure (5.17) Operation of Smart Phone as viewed by Parents**

**6. Interactive Preliminary Toy:**



**Figure (5.18) Operation of Interactive Preliminary toy as viewed by Parents**

According to parents, the IWB is used in schools 75%, which makes sense as this is a relatively expensive device and is more prone to be in schools view its size and accessibility. The 12.5% who reported home use of IWB, might be misled especially that the majority of the sample does not really represent a high SES standard as observed from areas of residence. The remaining 12.5%, was ticked as 'others' but wasn't specified, which might reflect a variety of options including a relative's house or club or a nearby library. As shown in table (5.9) and figure (5.13).

As shown in table (5.9) and figure (5.14), The Personal Computer was reported as being used in schools and homes within an equal 50% range approximately. Which might be linked to financial reasons view the relatively low price of the personal computers. Durability and resistance to chock is another valid feature of this ICT tool in specific. Considering the SES characteristic of the survey sample, this choice of interpretation seems more appropriate.

The laptop, tablet and Smart phone were reported to be used in schools (17.4%), and at home (82.6%), (6.7 %) and (93.3%), (5.6%) and (94.4%) respectively this remarkable difference between the school and home use which stands to logic due to the nature of the ICT tool in terms of price and durability, as shown in table (5.9) and figures (5.15 to 5.18).

Last but not least, the interactive preliminary toy recorded 62.5% as home as opposed to 25% in schools, and this difference is very much justified as this tool is used at a very preliminary stage of childhood where the child might not been into school yet as shown in table (5.9) and figure (5.18).

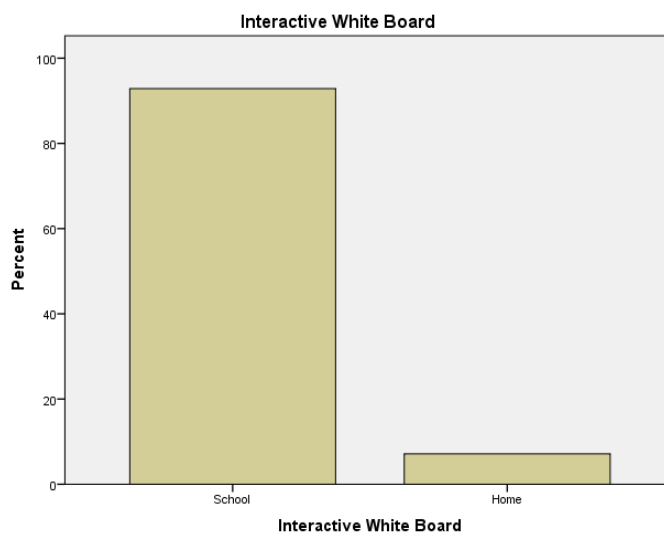
In comparison, the ICT tools used in both School and home are shown in Table (5.10) representing the percentage and frequency of their use in both places as seen by caregivers.



**Table (5.10): The percentage and frequency of ICT tools use in School and Home as seen by Caregivers**

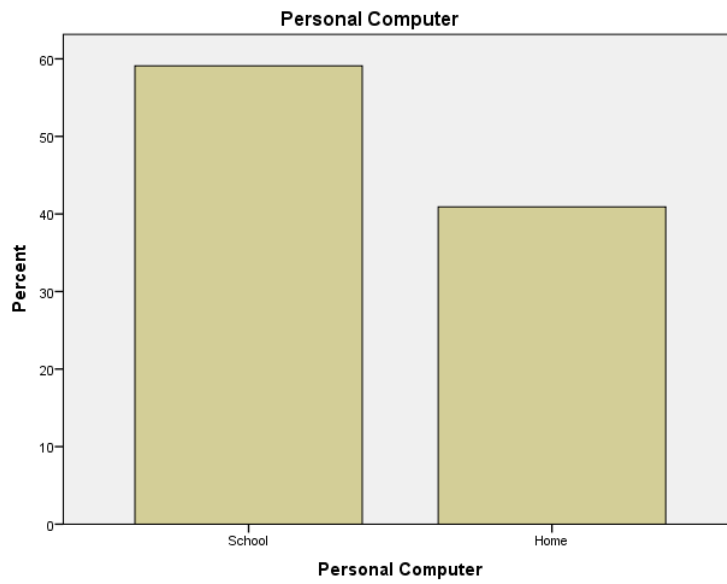
Device		School	Home	Other	
1	Interactive White Board	F	13	1	-
		%	92.9	7.1	-
2	Personal Computer	F	13	9	-
		%	59.1	40.9	-
3	Laptop	F	5	18	1
		%	20.8	75	4.2
4	Tablet	F	14	19	-
		%	42.4	57.6	-
5	Smart Phone	F	5	23	-
		%	17.9	82.1	-
6	Interactive Preliminary Toy	F	12	2	1
		%	80	13.3	6.7

**1. Interactive White Board:**



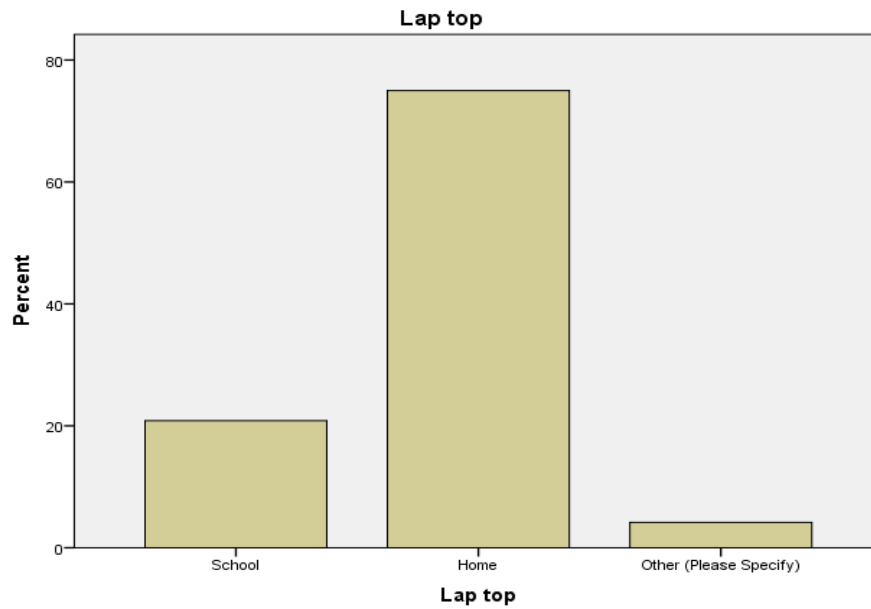
**Figure (5.19) Operation of IWB as replied by Caregivers**

## 2. Personal Computer:



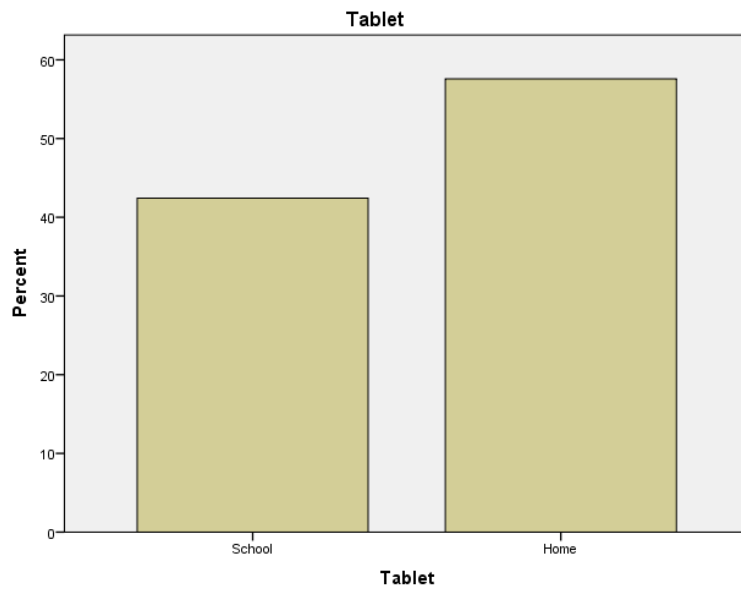
**Figure (5.20) Operation of Personal Computer as viewed by Caregivers**

## 3. Laptop:



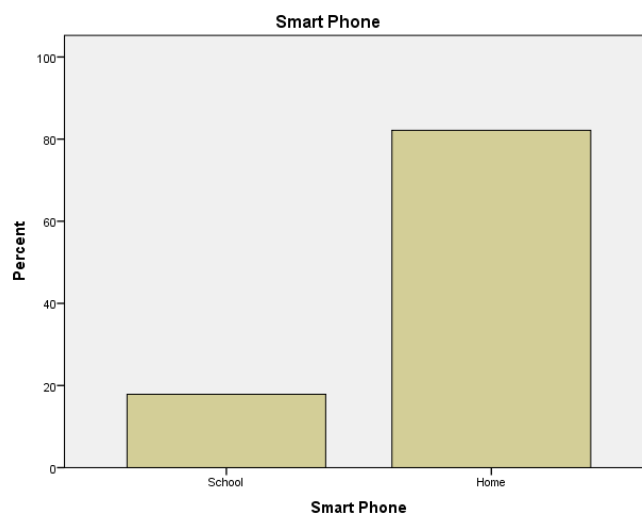
**Figure (5.21) Operation of Laptop as viewed by Caregivers**

**4. Tablet :**



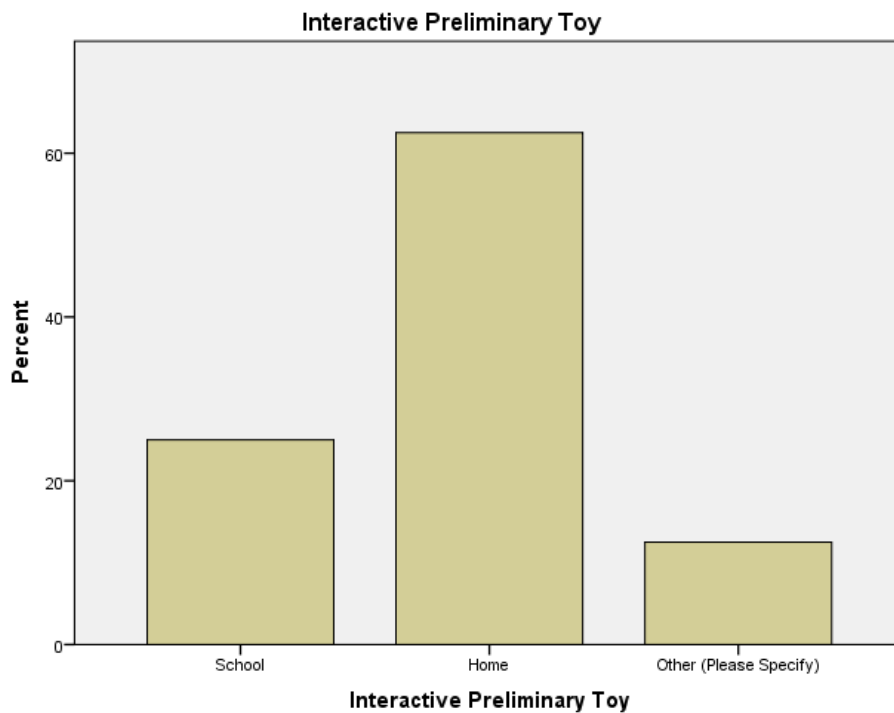
**Figure (5.22) Operation of Tablet as viewed by Caregivers**

**5. Smart Phone:**



**Figure (5.23) Operation of Smart Phone as viewed by Caregivers**

## **6. Interactive Preliminary Toy:**



**Figure (5.24) Operation of Interactive Preliminary toy as viewed by Caregivers**

According to Table (5.10) and figure (5.19), caregivers reported that the IWB is used in schools 92.9%, and 7% at home. This high level is backed by the caregivers' awareness of the tool's characteristic of being similar to a blackboard, which makes it more suitable to be in schools.

The Personal Computer shown in Table (5.10) and figure (5.20) was reported to be used in schools and homes by approximately 60% and 40%, which is also due to the value for money and durability aspects of the device.

The tablet use in Table (5.10) and figure (5.21) was reported to be used in schools and homes by approximately 42.4% and 57.6%, which shows a relatively matching level of operation of the tablet ICT tool in both school and home.

As shown in table (5.10) and figures (5.21 and 5.23), The laptop and Smart phone were reported to be used more at home with percentages of 20.8% at school and 75% at home and

17.9% at school and 82.1% at home respectively. Which is conforming to the home use of these devices.

Caregivers also reported the use of (80%) of interactive preliminary toy use at school, which might be due to the facility of use of this ICT tool to the children with autism especially those with marginal mental abilities as shown in table (5.10) and figure (5.24).

The child's experience in using ICT tools undoubtedly affects the degree of his / her benefit from each of the following tools. In light of this statement, this experience has been classified into four categories in Q11 of the survey questionnaire, as clear in table (5.11) this is as viewed by the parents in the surveyed sample.

**Table (5.11): The percentage and frequency of the time of use of ICT tools in years, as seen by Parents**

Device			Less than 5 Years	Less than 10 Years	More than 10 Years and less than 20years	More than 20 Years	Not applicable
<b>1</b>	Interactive White Board	F	5	1	1	1	42
		%	10	2	2	2	84
<b>2</b>	Personal Computer	F	2	7	2	2	37
		%	4	14	4	4	74
<b>3</b>	Laptop	F	10	10	-	-	30
		%	20	20	-	-	60
<b>4</b>	Tablet	F	22	7	1	1	19
		%	44	14	2	2	38
<b>5</b>	Smart Phone	F	13	5	1	-	31
		%	26	10	2	-	62
<b>6</b>	Interactive Preliminary Toy	F	5	1	3	-	41
		%	10	2	6	-	82

**1. Interactive White Board:**

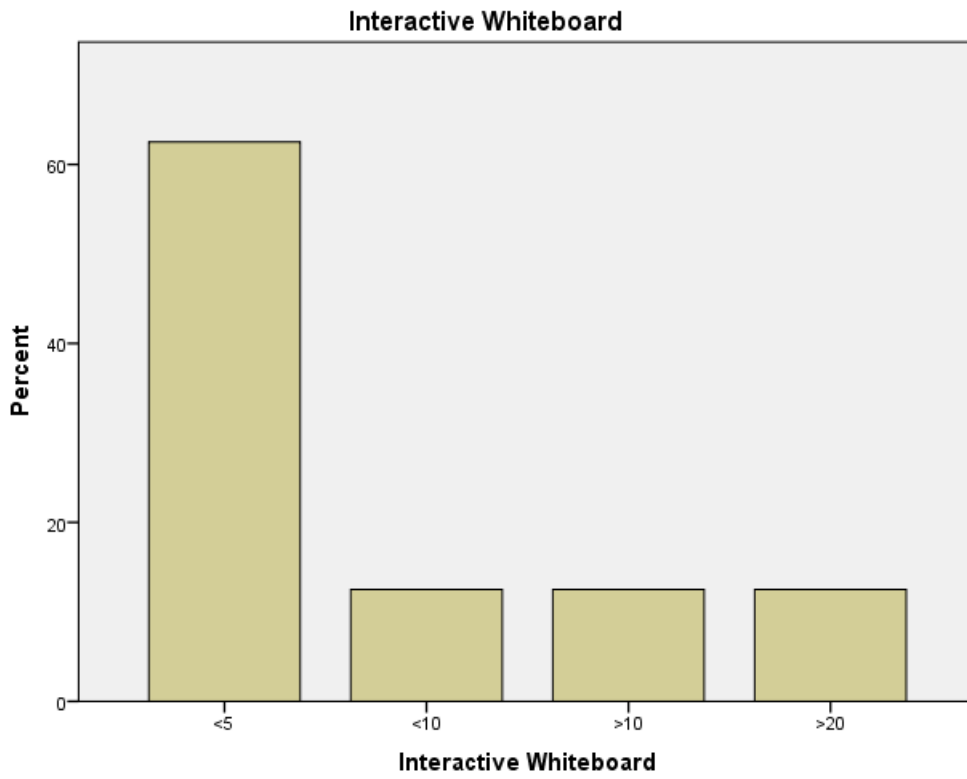
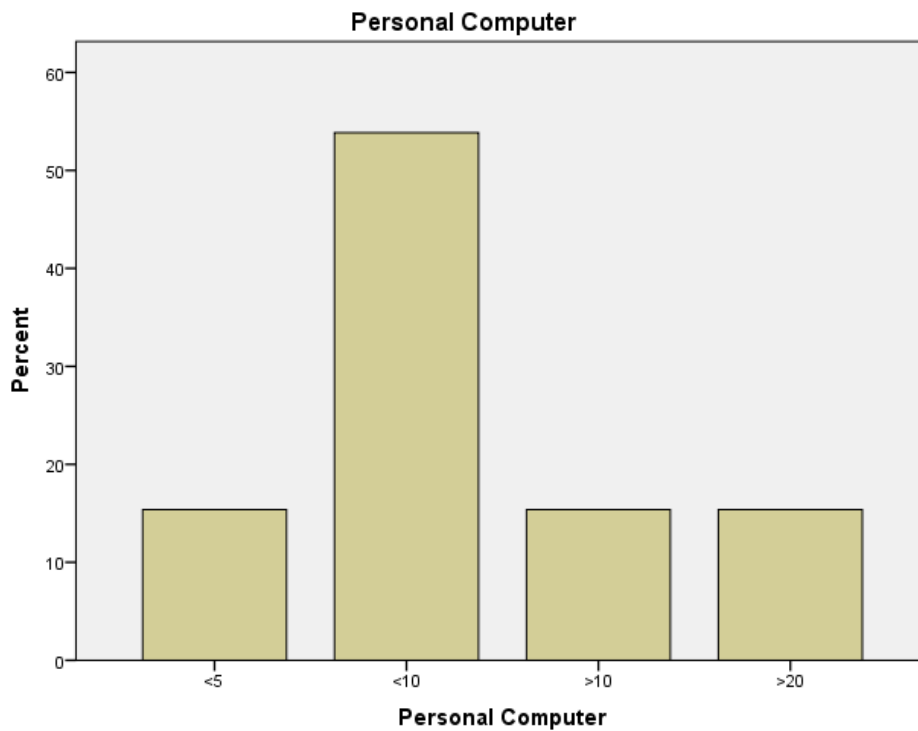


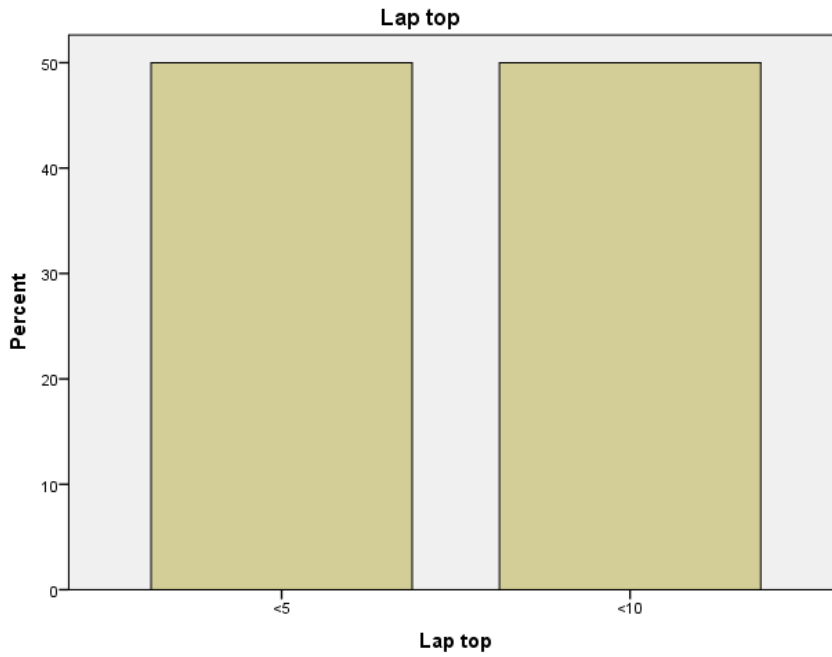
Figure (5.25) Child with autism use of IWB in years, as seen by Parents

**2. Personal Computer:**



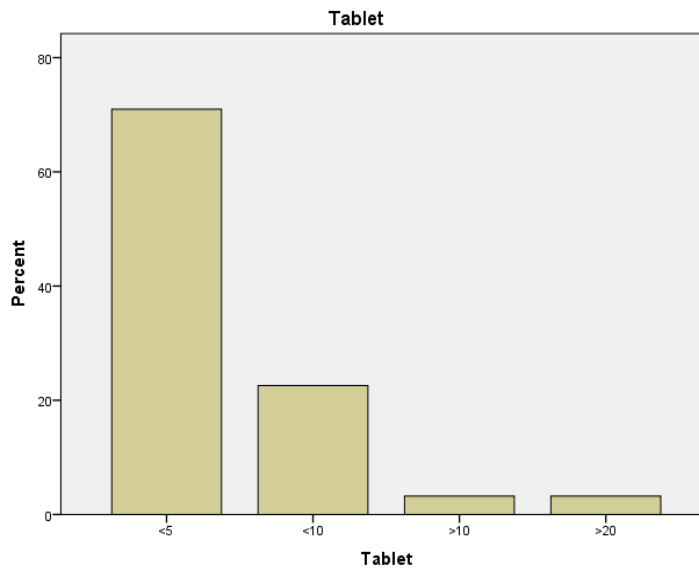
**Figure (5.26) Child with autism use of PC in years, as seen by Parents**

**3. Laptop:**



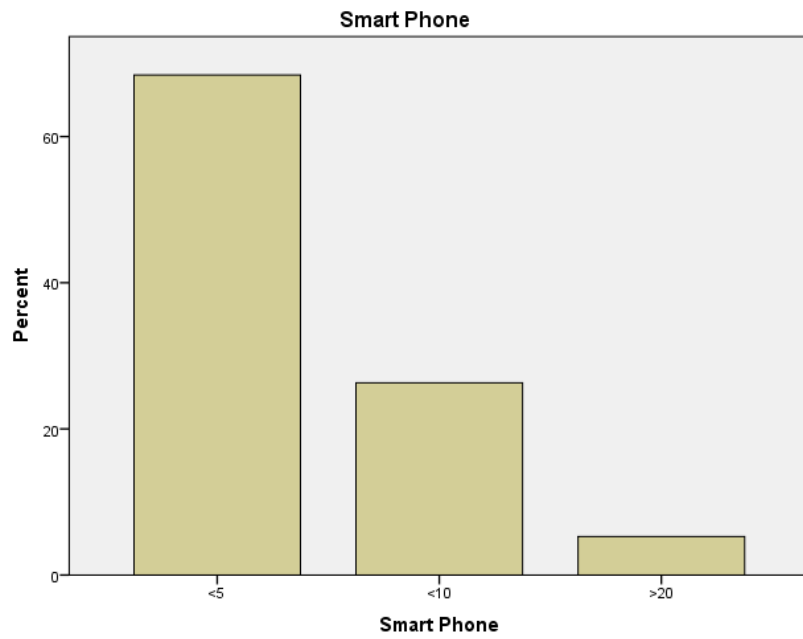
**Figure (5.27) Child with autism use of laptop in years, as seen by Parents**

**4. Tablet:**



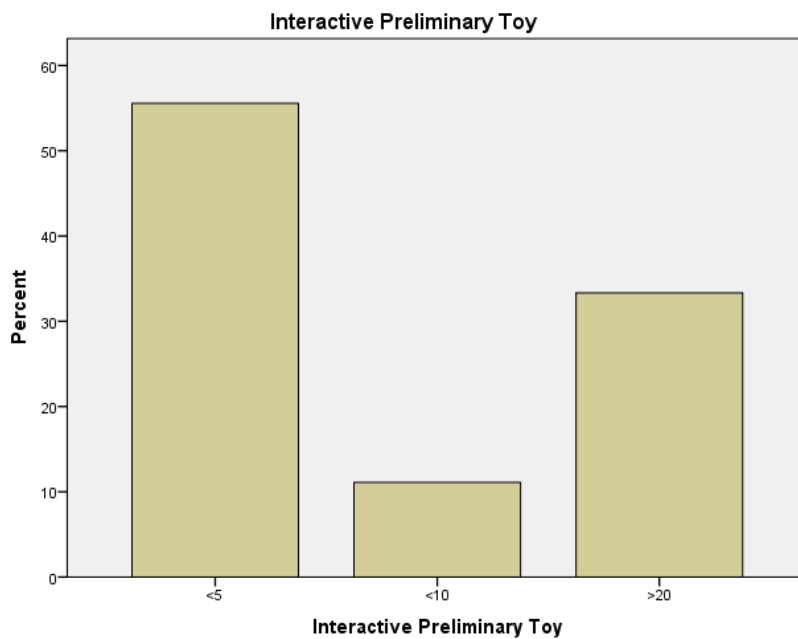
**Figure (5.28) Child with autism use of Tablet in years, as seen by Parents**

**5. Smart Phone:**



**Figure (5.29) Child with autism use of smart phone in years, as seen by Parents**

**6. Interactive Preliminary Toy:**



**Figure (5.30) Child with autism use of Interactive Preliminary Toy in years, as seen by Parents**



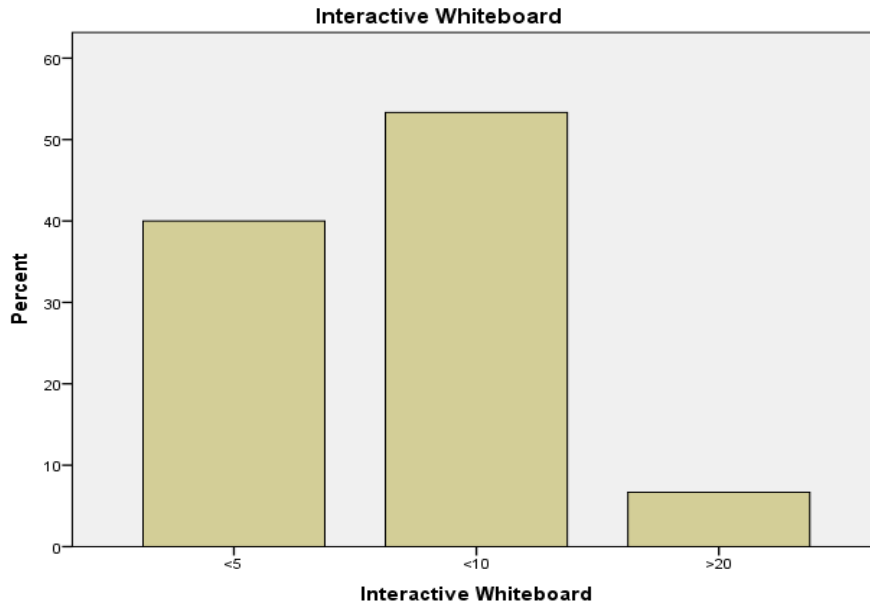
Table (5.11) reflects the use of updated ICT tools within the last 10years as viewed by the parents. This corresponds with the actual usage of the majority of the tools by most people. Especially in the case of IWB, Laptops, Tablet and Smart phones. Lesser percentages were for the interactive preliminary toy and the personal computers, which were surpassed by the newer technology.

The experience of the child in ICT tools usage in years as per Q11 of the survey questionnaire, as clear in table (5.12) this is as viewed by the caregivers in the sample.

**Table (5.12): The percentage and frequency of the time of use of ICT tools in years, as seen by Caregivers**

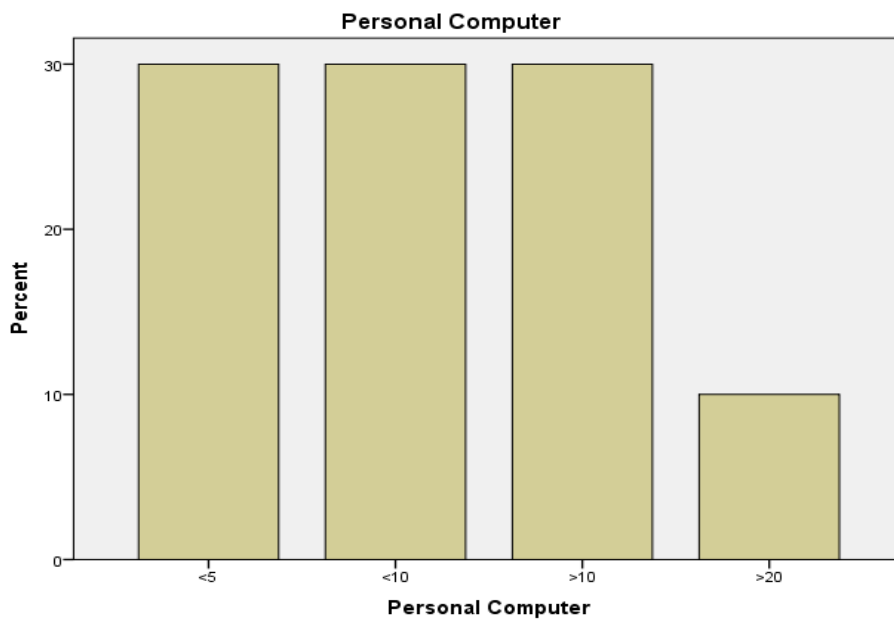
Device			Less than 5 Years	Less than 10 Years	More than 10 Years and less than 20years	More than 20 Years	Not applicable
1	Interactive White Board	F	6	8	-	1	65
		%	7.5	10	-	1.3	81.3
2	Personal Computer	F	6	6	6	2	60
		%	7.5	7.5	7.5	2.5	75
3	Laptop	F	10	7	7	3	53
		%	12.5	8.8	8.8	3.8	66.3
4	Tablet	F	19	7	5	2	47
		%	23.8	8.8	6.3	2.5	58.8
5	Smart Phone	F	15	5	6	-	54
		%	18.8	6.3	7.5	-	67.5
6	Interactive Preliminary Toy	F	8	3	3	2	64
		%	10	3.8	3.8	2.5	80

**1. Interactive White Board:**



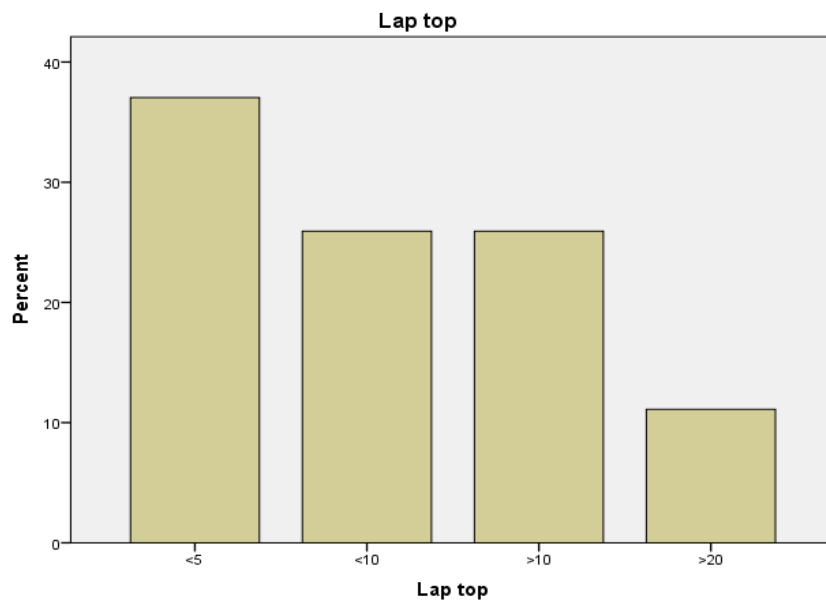
**Figure (5.31) Child with autism use of IWB in years, as seen by Caregivers**

**2. Personal Computer:**



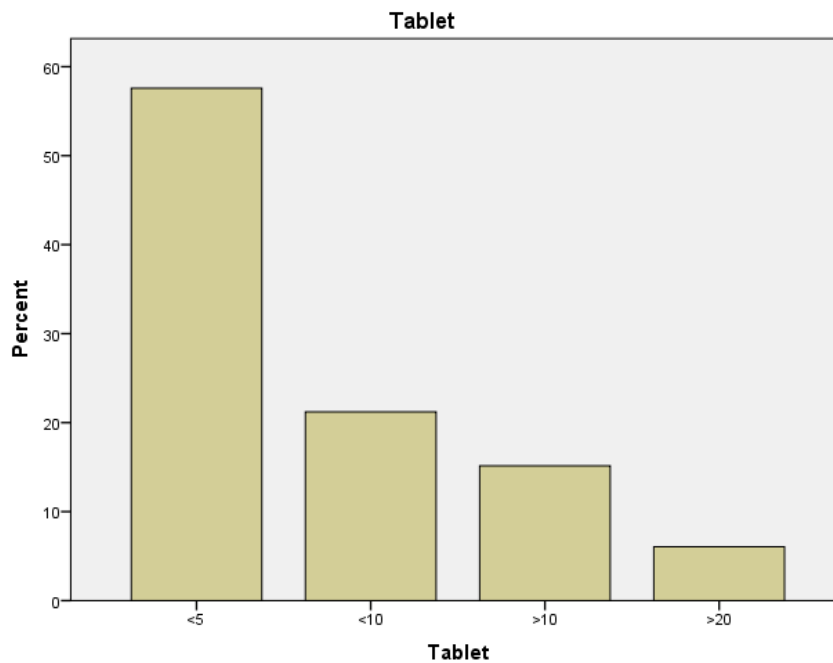
**Figure (5.32) Child with autism use of PC in years, as seen by Caregivers**

**3. Laptop:**



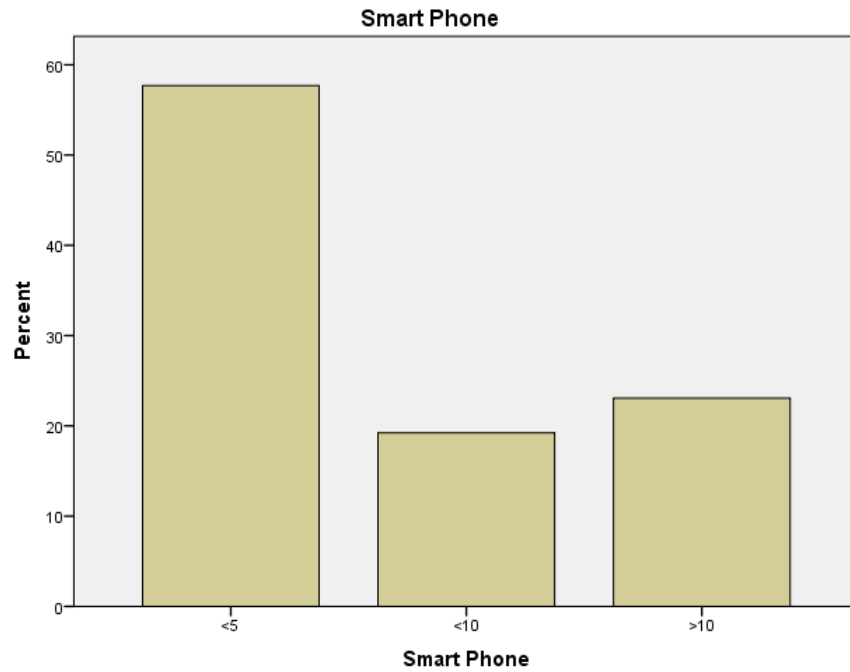
**Figure (5.33) Child with autism use of LapTop in years, as seen by Caregivers**

**4. Tablet:**



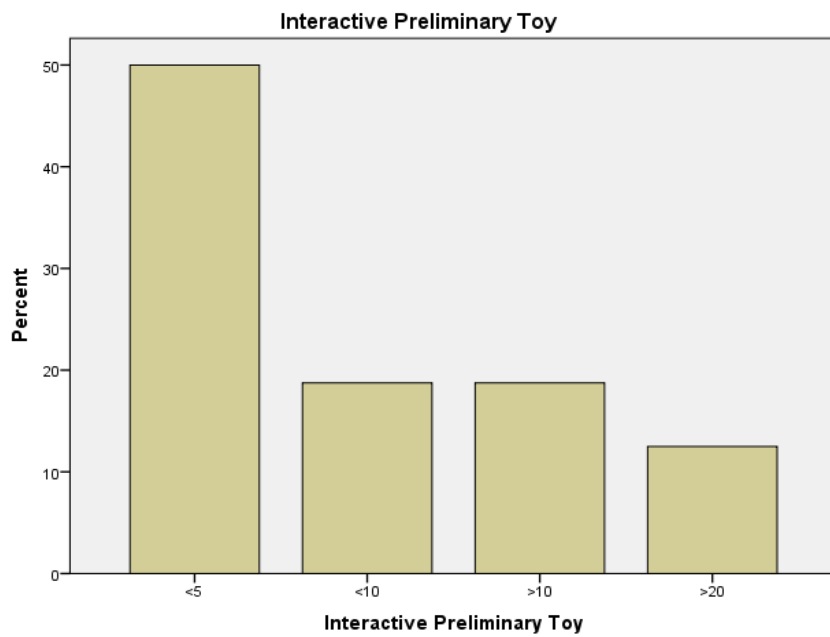
**Figure (5.34) Child with autism use of Tablet in years, as seen by Caregivers**

**5. Smart Phone:**



**Figure (5.35) Child with autism use of smart phone in years, as seen by Caregivers**

**6. Interactive Preliminary Toy:**



**Figure (5.36) Child with autism use of Interactive Preliminary Toy in years, as seen by Caregivers**

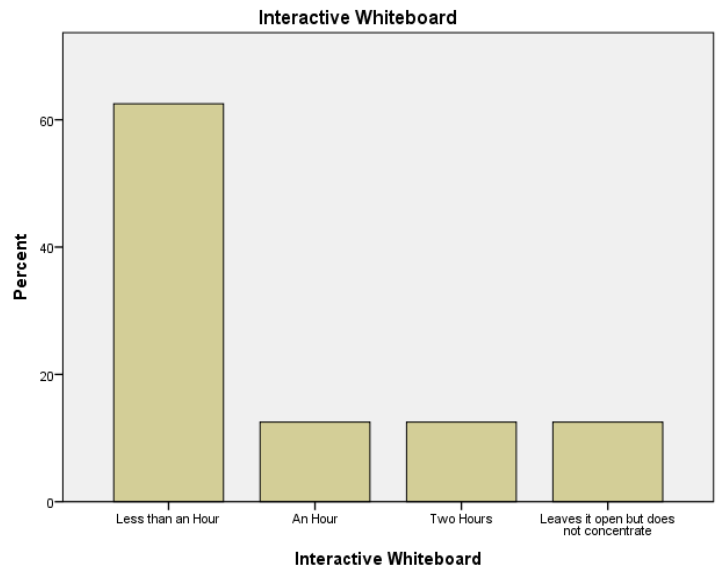
As shown in table (5.13) and figures (5.31 to 5.35) , New technology’s range of use is more inclined towards the past ten years, because its actually only since then that such technology became handy. Having said that, a dispersion of frequencies and percentages goes through the table more as viewed by caregivers, due to the fact that they are more prone to the usage of ICT all through their work career, thus their usage awareness would be higher.

Daily use of ICT tools within the day of children with autism as viewed by the parents.

**Table (5.13) Frequencies and percentages of time spent by child on ICT tools per day, as viewed by Parents**

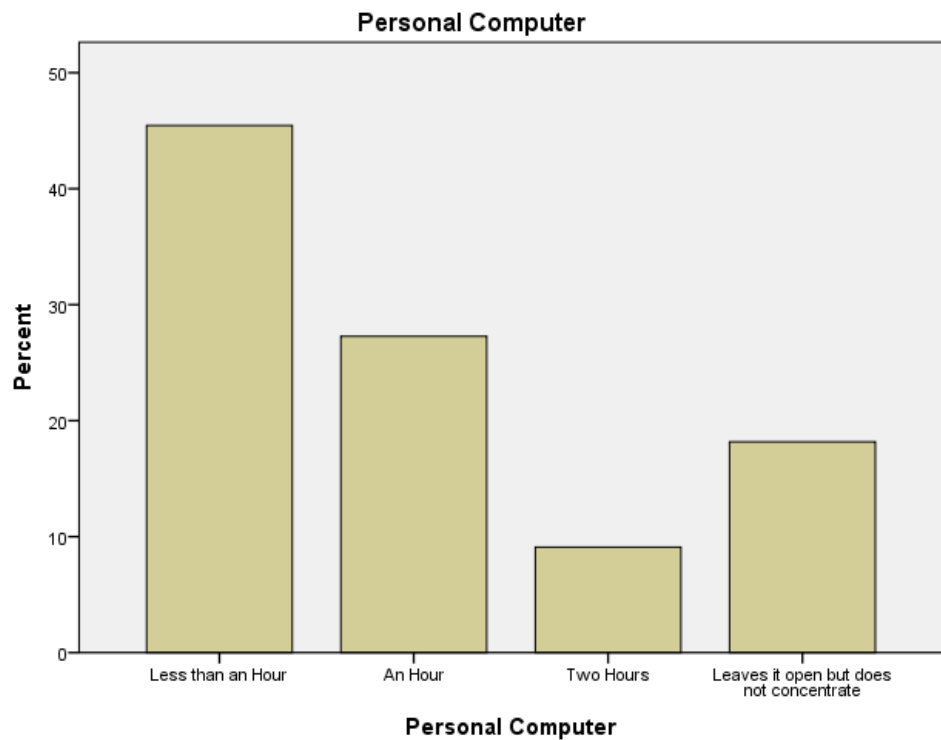
Device			Less than an hour	An hour	Two hours	Leaves it open but does not concentrate
1	Interactive White Board	F	5	1	1	1
		%	62.5	12.5	12.5	12.5
2	Personal Computer	F	5	3	1	2
		%	45.5	27.3	9.1	18.2
3	Laptop	F	10	2	5	3
		%	50	10	25	15
4	Tablet	F	9	5	12	3
		%	31	17.2	41.4	10.3
5	Smart Phone	F	7	2	7	2
		%	38.9	11.1	38.9	11.1
6	Interactive Preliminary Toy	F	7	1	-	2
		%	70	10	-	20

**1. Interactive White Board:**



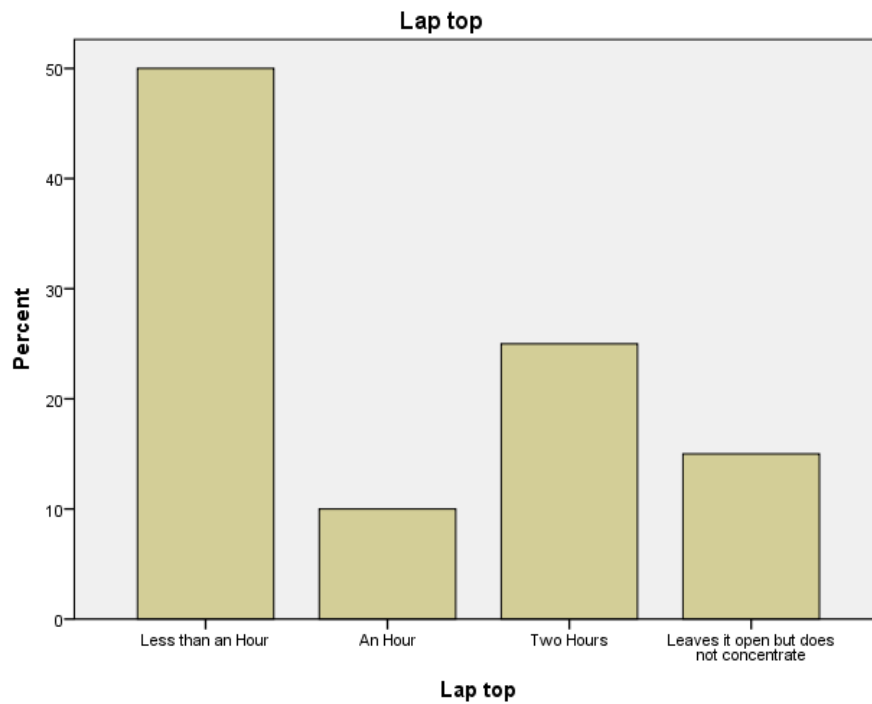
**Figure (5.37) How much time the child uses IWB per day as seen by Parents**

**2. Personal Computers:**



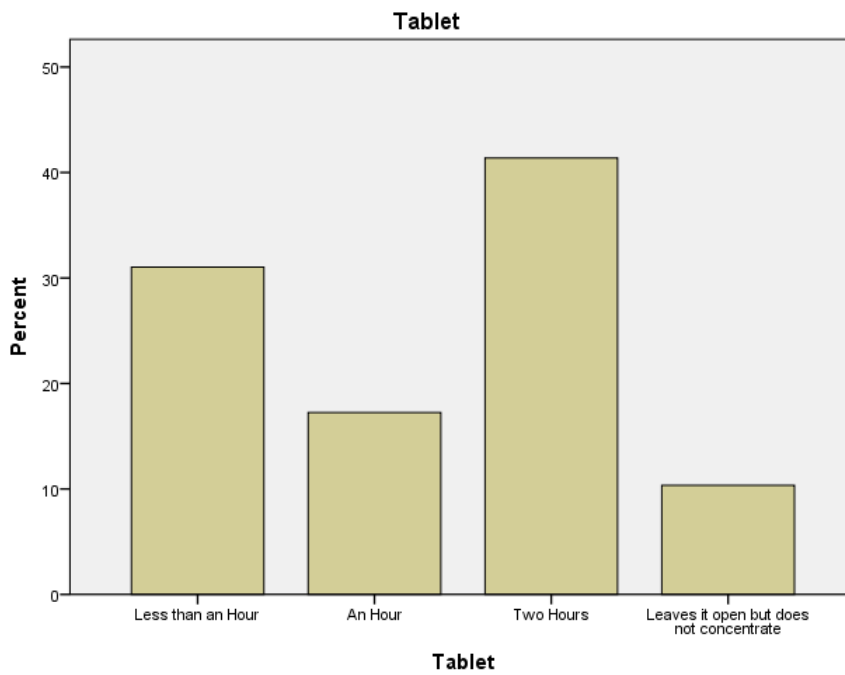
**Figure (5.38) How much time the child uses PC per day as seen by Parents**

**3. Laptop:**



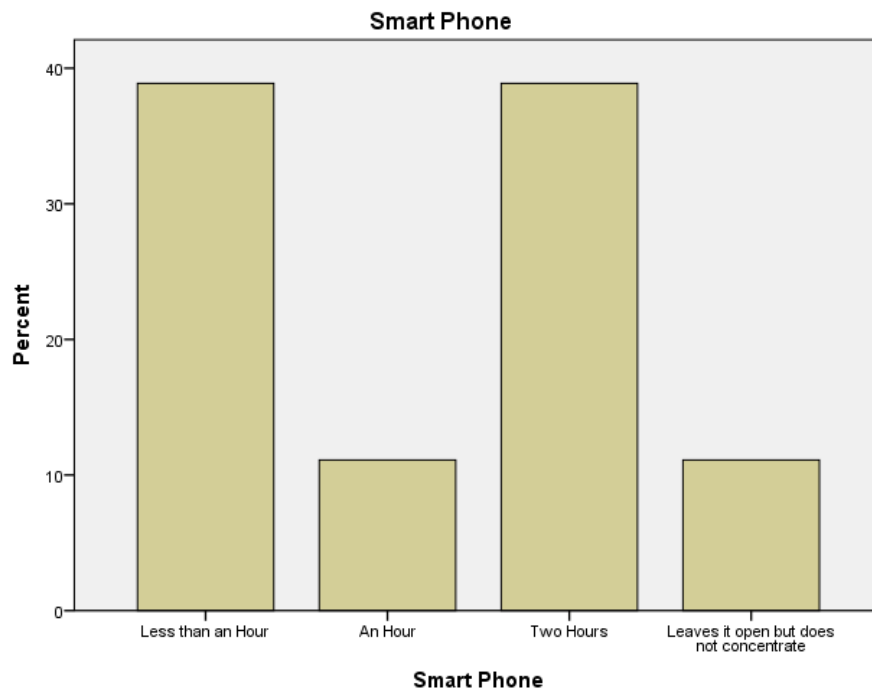
**Figure (5.39) How much time the child uses Laptop per day as seen by Parents**

**4. Tablet:**



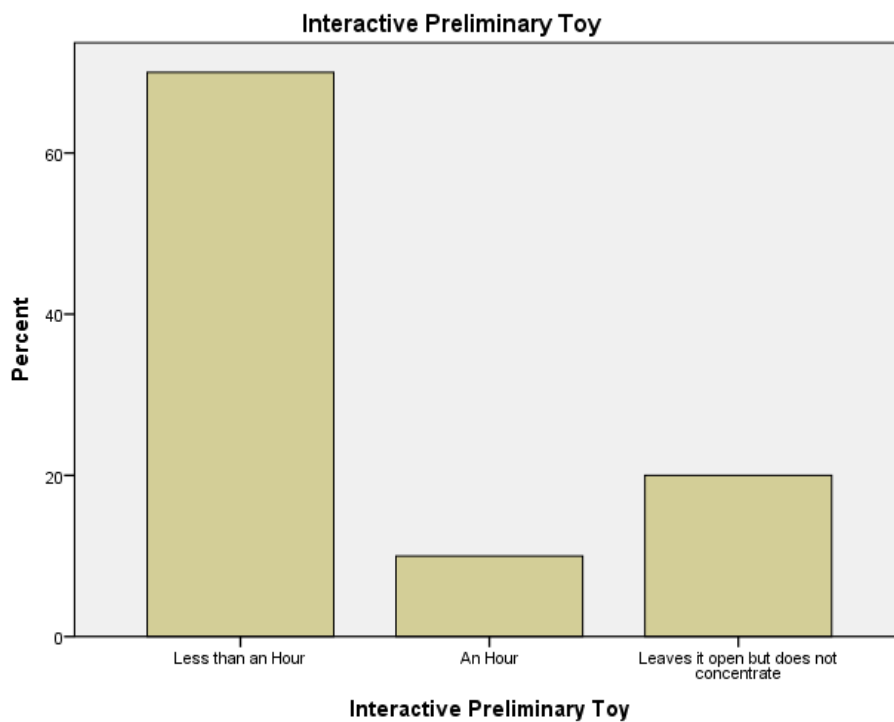
**Figure (5.40) How much time the child uses Tablet per day as seen by Parents**

**5. Smart Phone:**



**Figure (5.41) How much time the child uses Smart Phone per day as seen by Parents**

**6. Interactive Preliminary Toy:**



**Figure (5.42) How much time the child uses Interactive Preliminary Toy per day as seen by Parents**



Both Results, in table (5.13) and figures (5.37 to 5.42) show that the majority of the parents (31% to 70%), reported ICT usage for less than an hour per day. However, the tablet and the smart phones were stated around 40% for two hours. This is possibly based on the mobility of the device and the possibility of use out of home / school boundaries.

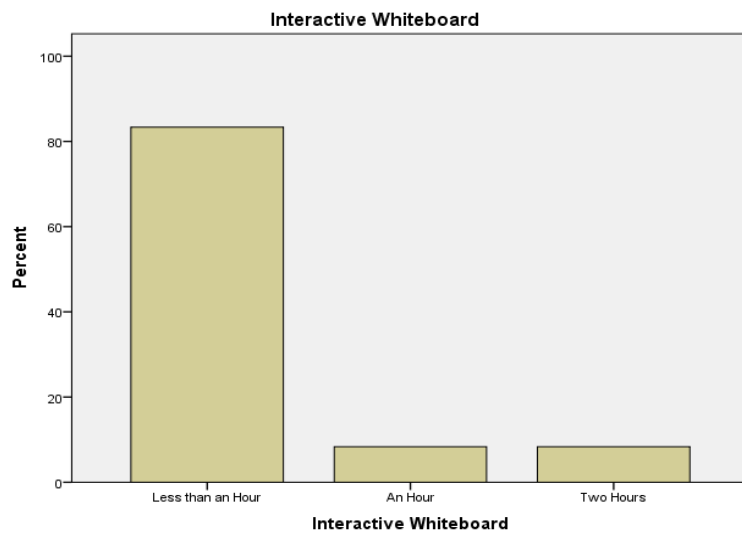
More than 10% to 20% of the parents' sample further stated that the device can be functioning but the child is not concentrating. This corresponds to one of the autism characteristics of short concentration span.

Daily use of ICT tools within the day of children with autism as viewed by the Caregivers.

**Table (5.14) Frequencies and percentages of time spent by child on ICT tools per day, as viewed by Caregivers**

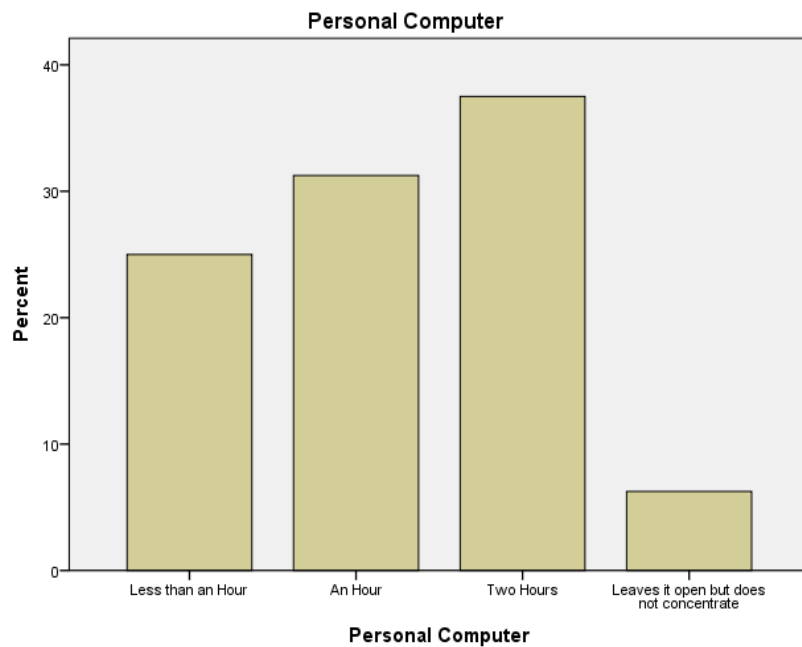
Device			Less than an hour	An hour	Two hours	Leaves it open but does not concentrate
<b>1</b>	Interactive White Board	F	10	1	1	-
		%	83.3	8.3	8.3	-
<b>2</b>	Personal Computer	F	4	5	6	1
		%	25	31.3	37.5	6.3
<b>3</b>	Laptop	F	5	7	8	-
		%	25	35	40	-
<b>4</b>	Tablet	F	8	5	12	3
		%	28.6	17.9	42.9	10.7
<b>5</b>	Smart Phone	F	7	2	12	4
		%	28	8	48	16
<b>6</b>	Interactive Preliminary Toy	F	9	2	1	-
		%	75	16.7	8.3	-

**1. Interactive White Board:**



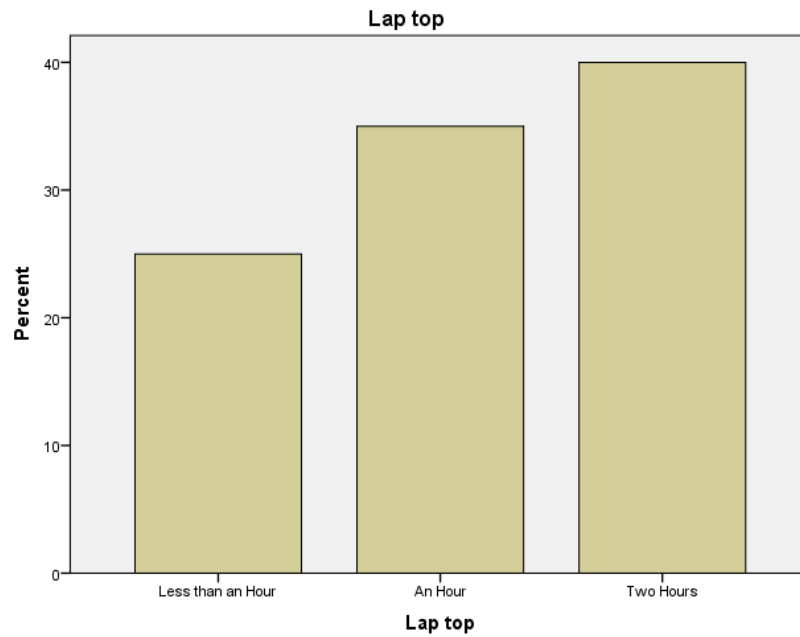
**Figure (5.43) How much time the child uses IWB per day as seen by Caregivers**

**2. Personal Computers:**



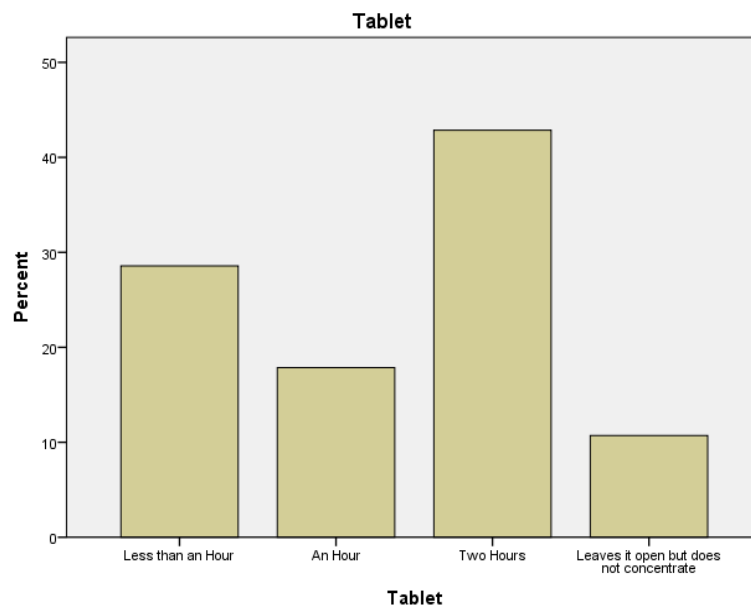
**Figure (5.44) How much time the child uses Personal Computers per day as seen by Caregivers**

**3. Laptop:**



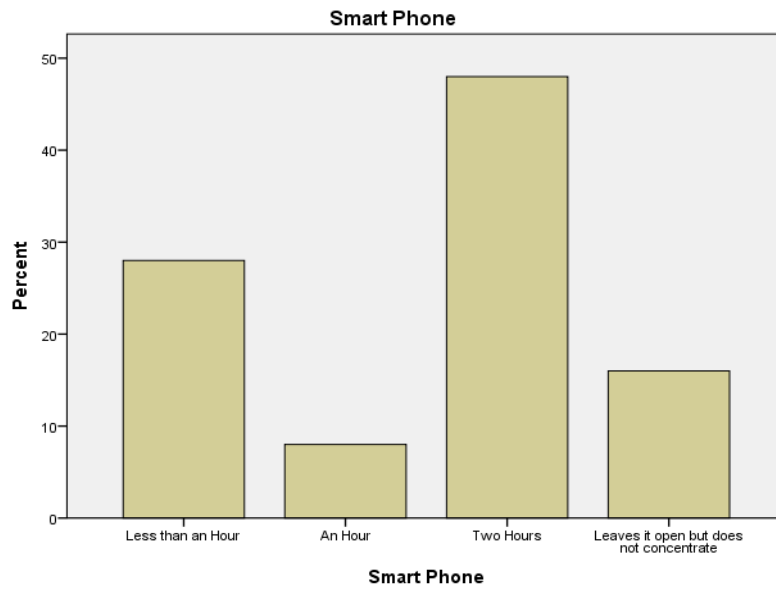
**Figure (5.45) How much time the child uses Laptop per day as seen by Caregivers**

**4. Tablet:**



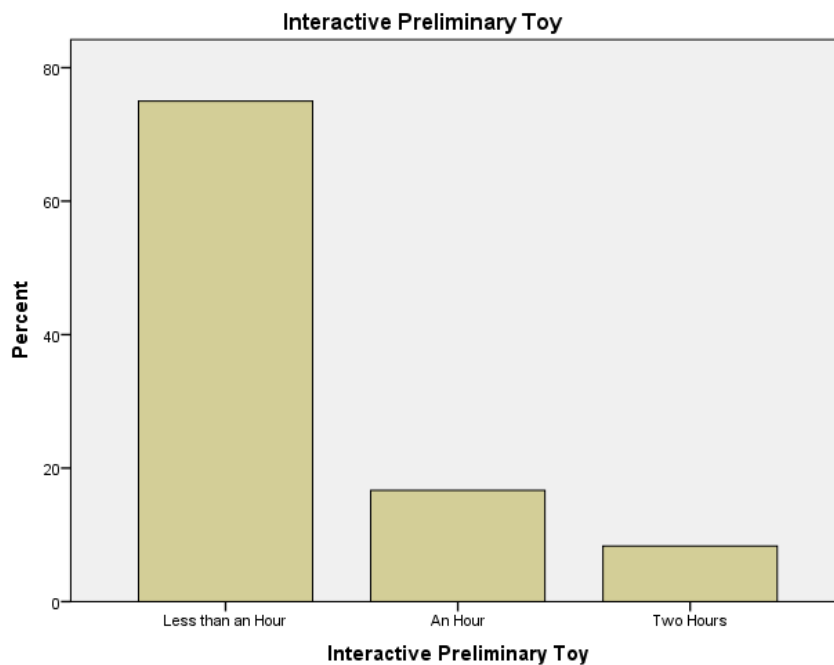
**Figure (5.46) How much time the child uses Tablet per day as seen by Caregivers**

**5. Smart Phone:**



**Figure (5.47) How much time the child uses Smart Phone per day as seen by Caregivers**

**6. Interactive Preliminary Toy:**



**Figure (5.48) How much time the child uses Interactive Preliminary Toy per day as seen by Caregivers**

As shown from table (5.14) and figures (5.43 to 5.48), Percentages and frequencies tend to reflect the nature of the professional / teacher relationship to the child. IWB, 83% less than an hour because this follows a class schedule and its probably one device per school / association. The interactive preliminary toy 75% less than an hour also stems from the nature of the teachers to only use it as a start point then to move to a more complicated or advanced tool like laptops or tablets.

As far as the two hours option is concerned, tablets, personal computers and laptops also scored above 40% approximately, which reflects the proper use of such tools within academic framework.

Last but not least, we can sense a remarkable drop in the “Leaves it open but does not concentrate” percentages, as caregivers have a specific target and time frame within which he/ she operates with the child with autism.

**RQ4: How much is the child with Autism already Using Tablets:**

**a. As viewed by Parents?**

**b. As viewed by Caregivers?**

**a. How much is the child with Autism already Using Tablets as viewed by parents?**

This research question is answered through the usage of frequencies and percentages through the answers of the survey sample to question (13 & 14). Table (5.15) highlights the frequencies and percentages of tablet usage as viewed by parents.

**Table (5.15) Frequencies and percentages of tablet usage as viewed by parents.**

Application		As seen By Parents	Rank	
1	Autism Related	F	4	4
		%	8	
2	Children Learning Applications	F	24	2
		%	48	
3	Games	F	29	1
		%	58	
4	Social Media	F	11	3
		%	22	

As shown in table (5.15), the ranking of tablet applications recorded unexpected ranks as follows: 1. Games

2. Children Learning Applications
3. Social Media
4. Autism related

Games scored 58%, which is above half of the sample surveyed, with a first rank of the four applications. This can be explained by an assumption that it might be mainly an aspiration for integration by using similar applications as peers of same age.

Autism related, on the other hand were ranked last of the four applications studied with only 8% of the sample. The explanation to this result might be that the parents avoid the usage of this kind of applications in fear of it being an acknowledgement of the negative connotation of autism related applications. However, 48% of the parents admitted the usage of the tablet application for learning, which again emphasizes on their feelings of sameness with other children in the society. The usage of Social media recorded as 22% of the sample, reflects the fear parents have on their naïve children who might be in contact with strangers through social media open gates.

**b. How much is the child with Autism already Using Tablets as viewed by caregivers?**

Table (5.15) highlights the frequencies and percentages of tablet usage as viewed by caregivers.

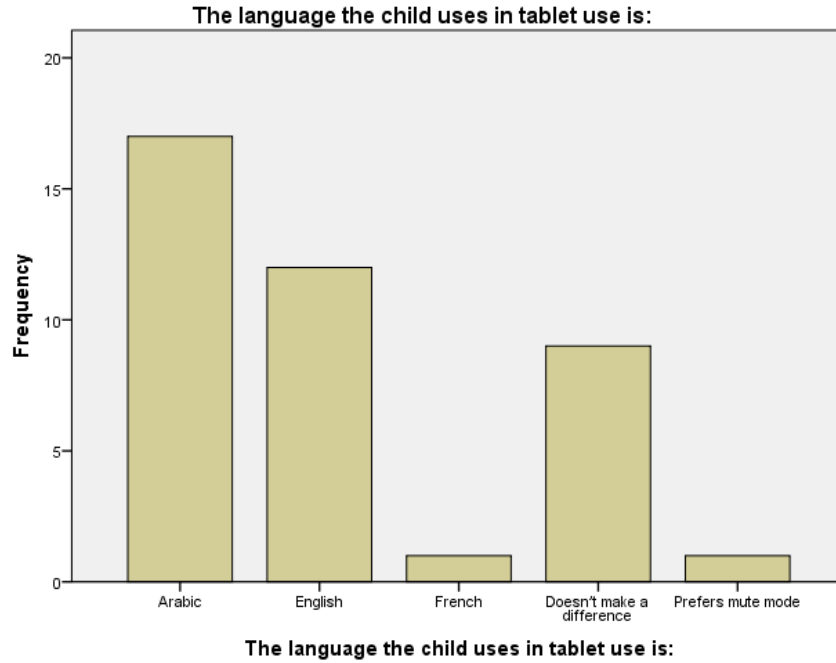
**Table (5.16) Frequencies and percentages of tablet usage as viewed by Caregivers.**

Application		As seen By Parents	Rank	
1	Autism Related	F	18	3
		%	22.5	
2	Children Learning Applications	F	31	2
		%	38.8	
3	Games	F	37	1
		%	46.3	
4	Social Media	F	12	4
		%	15	

With quite a similar ranking, games marked the first tablet application usage with 46.3% and 38.8% for the learning applications by the caregivers. This is then followed by the autism related applications as the 3<sup>rd</sup> in rank with 22.5%, which is a remarkable difference than the parents' view. However, the explanation to this emphasizes that the caregivers' first priority goes to what can teach the child regardless of any social pressure. Having said that, they still employ games as a learning tool that is easily accepted by the child based on the fact that he / she is familiar with them through their home use.

**Table (5.17) Frequencies and percentages of tablet language usage as viewed by Parents.**

	Frequency	Percent
Arabic	17	42.5
English	12	30.0
French	1	2.5
Doesn't make a difference	9	22.5
Prefers mute mode	1	2.5
Total	40	100.0

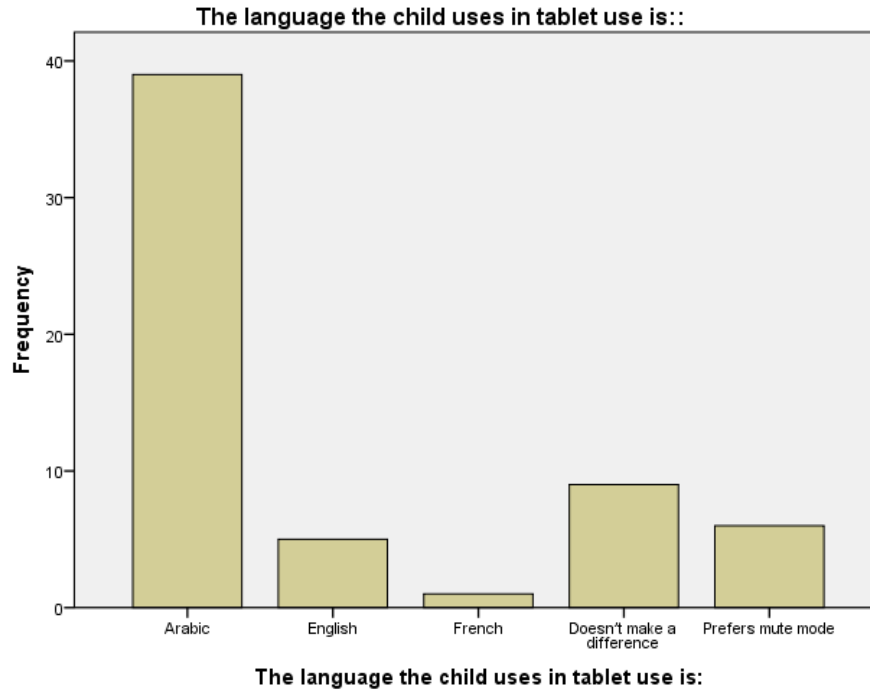


**Figure (5.51) Percentages of tablet language usage as viewed by Parents**

**Table (5.18) Frequencies and percentages of tablet language usage as viewed by Caregivers.**

	Frequency	Percent
Arabic	39	65.0
English	5	8.3
French	1	1.7
Doesn't make a difference	9	15.0
Prefers mute mode	6	10.0
<b>Total</b>	<b>60</b>	<b>100.0</b>





**Figure (5.52) Percentages of tablet language usage as viewed by Caregivers**

As noticed, both parents and caregivers reached a related percentage for “doesn't make a difference” 2<sup>nd</sup> rank, 22% and 15%. The interpretation for this might pinpoint that while Language is the main basis of communication; however, in the case of children with autism, regardless of the language used, voice can be considered noise and might affect concentration as explained by interviewees, namely Ms Helali. Accordingly, it is sometimes more advisable to remove the sound and restrict the information to visual inputs. Once the information becomes ‘familiar’, sound can be introduced at a later stage. A point that needs to be highlighted to parents and caregivers: children with autism learn differently!

**RQ5: Are there any differences between the Tablet usages of Parents versus Caregivers?**

This research question is answered through the usage of chi square test to identify differences between the Tablet usages of Parents versus Caregivers through the answers of the survey sample to question (13).

a. Differences in the use of applications: Learning applications, Games and social media applications according to the parents and caregivers views: The Chi square equal to 1.079 (1), 1.700 (1) and 1.035 (1) respectively is non significant in which p value is equal to 0.196, 0.131 and 0.216 respectively, thus indicating similar distributions of parents and caregivers viewpoint regarding the use of applications in computer tablets respectively.

b. Differences in the use of applications: autism related, according to the parents and caregivers views: The Chi square equal to 4.601 (1), which is significant as p value is equal to (0.025) indicating different distributions of parents' view point in their child's use autism related applications in the tablet.

This result confirms and supports RQ4's results' which indicate that caregivers use autism related tablet applications with a different connotation than the use of the parents'.

**RQ6: Are there differences of use of Tablets by the child with autism based on their parents':**

**a. Educational level?**

**b. Financial capabilities?**

This research question is answered through the usage of chi square test to identify differences of use of Tablets by the child with autism based on their parents': educational level and financial capabilities through the answers of the survey sample to question (9).

a.1. Differences in the use of Tablets by the child with autism based according to the educational level of the parents of children with autism: The Chi square equal to 3.425 (4), 1.245 (4), 4.421 (4) and 4.726 (4) respectively is non significant in which p value is equal to 0.485, 0.871, 0.352 and 0.317 respectively, thus indicating similar distributions of parents educational level in the use of their children to of Tablets by the child with autism respectively.

b. Differences in the use of children with autism to Tablets according to the educational level of the parents of children with autism: The Chi square equal to 6.126 (3), 3.926 (3), 2.759 (3) and 0.797 (3) respectively is non significant in which p value is equal to 0.106, 0.270, 0.430 and 0.850 respectively, thus indicating similar distributions of parents educational level in the use of Tablets by the child with autism respectively.

These results show that neither the parents' educational level, nor their financial capacities play a pivot role in the choice of the applications used by children with autism. This being said, it sheds a light on the aforementioned point regarding the individualistic abilities of each child with autism.

**RQ 8: How much is the child with Autism already using applications?**

**a. As viewed by Parents?**

**b. As viewed by Caregivers?**

RQ7a is answered by question (15) of the survey questionnaire.

The following summary table represents how frequent the child with autism uses applications as seen by the parents.

**Table (5.19) The child with Autism actual Usage of Applications: As viewed by Parents.**

Application			Very Frequently	Frequently	Seldom	Don't know about it	Mean	Standard Deviation	Order
1	iAutism	F	2	46	-	2	1.96	0.44	2
		%	4	92	-	4			
2	Kalami	F	2	36	4	8	1.64	0.80	4
		%	4	72	8	16			
3	Facebook	F	14	34	-	2	2.20	0.63	1
		%	28	68	-	4			
4	Talking Tom	F	6	25	9	10	1.54	0.95	5
		%	12	50	18	20			
5	Opposites	F	3	40	1	6	1.80	0.72	3
		%	6	80	2	12			
Average Mean							2.285		

As shown in table (5.19) and in reference to table (4.12), the average mean scored (2.285), which reflects a “Very Frequently” census as viewed by parents.

Although the mean for the four applications studied varied: (1.96, 1.64, 2.20, 1.54, 1.80) for iAutism, Kalami, Facebook, Talking Tom, Opposites applications respectively; which shows that the parents surveyed “frequently” use all the applications studied in the research.

RQ7b is answered by question (15) of the survey questionnaire.

The following summary table represents how frequent the child with autism uses applications as seen by the caregivers.

**Table (5.20) The child with Autism actual Usage of Applications: As viewed by Caregivers**

Application			Very Frequently	Frequently	Seldom	Don't know about it	Mean	Standard Deviation	Order
1	iAutism	F	11	65	1	3	2.05	0.54	1
		%	13.8	81.3	1.3	3.8			
2	Kalami	F	11	58	2	9	1.88	0.77	5
		%	13.8	72.5	2.5	11.3			
3	Facebook	F	13	56	2	9	1.91	0.79	4
		%	16.3	70	11.3	2.5			
4	Talking Tom	F	11	63	4	2	2.03	0.53	2
		%	13.8	78	5	2.5			
5	Opposites	F	7	66	2	5	1.93	0.40	3
		%	8.8	82.5	2.5	6.3			
<b>Average mean</b>							<b>2.450</b>		

As shown in table (5.20) and in reference to table (4.11), the average mean scored (2.450), which reflects a “Very Frequently” census as viewed by caregivers.

Although the mean for the four applications studied varied: (2.05, 1.88, 1.91, 2.03, 1.93) for iAutism, Kalami, Facebook, Talking Tom, Opposites applications respectively; which shows that the caregivers surveyed “frequently” use all the applications studied in the research.

Comparing both opinions of parents and caregivers, i-autism application ranked as advanced as 2<sup>nd</sup> and 1<sup>st</sup> respectively. At the same time, while kalami seemed a promising application with various learning difficulties problems’ solving, being the only application in Egyptian Arabic, it ranked 4<sup>th</sup> and 5<sup>th</sup> respectively. Which might be because of lacking of some marketing efforts. This was also underlined by Dr Naguib and Mrs Mansour who were not aware of it.

**RQ8: Are there differences in the usage of applications As viewed by Parents and Caregivers?**

- a. Differences in Talking Tom application usage of the child with autism by both parents and caregivers. The Chi square equal to 19.237 (3) is significant in which p value is equal to 0.000 indicating different distributions of parents versus caregivers opinion in the use of applications by the children with autism. This backs the results obtained to RQ7, which show the discrepancy between the parents and caregivers who ranked Talking tom as 5<sup>th</sup> and 2<sup>nd</sup> respectively. This result shows the knowledge of the caregiver in using such application within the learning process, while the parents might not be aware of such asset.
- b. Differences in the usage of applications by children with autism using i-autism, kalami, Facebook and Opposites between parents and caregivers: The Chi square equal to 3.971 (3), 5.474 (3), 5.225 (3) and 1.562 (3) respectively is non significant in which p value is equal to 0.265, 0.140, 0.0156 and 0.668 respectively, thus indicating similar distributions of parents versus caregivers opinion in children with autism in their usage of the applications respectively.

**RQ9: How effective is the use of applications in facilitating the child with Autism's integration in the society.**

- a. **As viewed by: Parents.**
- b. **As viewed by Caregivers.**

To answer RQ9, calculations of frequency, percentage and ranking show the response of the sample of the parents on question (16) on the survey questionnaire.

- a. Table (5. 21) the Frequency and Percentage of applications' efficiency in the integration of the child with autism in the Egyptian society as viewed by the parents.

**Table (5.21) Frequency and Percentage of applications' efficiency in the integration of the child with autism in the Egyptian society as viewed by the parents.**

Application		Extremely Effective	Effective	Neutral	Non Effective	Negatively Effective	Mean	Standard Deviation	Order	
1	iAutism	F	-	1	47	2	-	2.98	0.24	1
		%	-	2	94	4	-			
2	Kalami	F	-	1	39	6	4	2.74	0.63	4
		%	-	2	78	12	8			
3	Facebook	F	1	-	47	1	1	2.98	0.42	1
		%	2	-	94	2	2			
4	Talking Tom	F	1	3	36	7	3	2.84	0.71	3
		%	2	6	72	14	6			
5	Opposites	F	-	1	45	3	1	2.92	0.39	2
		%	-	2	90	6	2			
Average Mean							2.89			

As shown in table (5.20) and in reference to table (4.10), the efficiency of the applications in the integration of the child with autism in the Egyptian society as viewed by the parents. The average mean (2.89) reflects that the parents find the use of the studied applications as “Neutral” in general. It is also not surprising that each application’s mean falls within the ‘neutral’ range as well. Having said that, the implication might be that not one application could attract the attention of the parents from the standpoint of social integration of their child with autism. Accordingly, these applications might be a tool to kill the time of the child with autism.

b. Table (5. 21) the Frequency and Percentage of applications' efficiency in the integration of the child with autism in the Egyptian society as viewed by the caregivers.

**Table (5.22): Frequency and Percentage of applications' efficiency in the integration of the child with autism in the Egyptian society as viewed by the Caregivers.**

Application		Extremely Effective	Effective	Neutral	Non Effective	Negatively Effective	Mean	Standard Deviation	Order	
1	iAutism	F	-	2	72	2	4	2.90	0.49	4
		%	-	2.5	90	2.5	5			
2	Kalami	F	-	2	62	11	5	2.76	0.60	5
		%	-	2.5	77.5	13.8	6.3			
3	Facebook	F	4	6	60	9	1	3.03	0.66	1
		%	5	7.5	75	11.3	1.3			
4	Talking Tom	F	1	8	66	2	3	3.02	0.57	2
		%	1.3	10	82.5	2.5	3.8			
5	Opposites	F	-	5	69	4	2	2.96	0.46	3
		%	-	6.3	86.3	5	2.5			
Average Mean							2.93			

As shown in table (5.22) and in reference to table (4.11), the efficiency of the applications in the integration of the child with autism in the Egyptian society as viewed by the caregivers. The average mean (2.93) reflects that the caregivers also find the use of the studied applications as “Neutral” in general, which is conform the parents’ view. It is also not surprising that each application’s mean falls within the ‘neutral’ range as well. Having said that, the implication might be that caregivers also see that not one application could attract the attention of the children with autism to help them in their integration.



### **5.3. Digital Divide Theory Reasoned from the Perspective of Autism Integration:**

The correlation between financial capabilities and knowledge acquisition has always been intensely debated in normal settings, let alone when tackling children with autism cases and their integration in a developing country such as Egypt.

Dr Sorin Adam Matei, Associate Professor of Communication at Purdue University, has methodically studied the link between information technology and social integration and has published various papers and articles in communication journals. Matei believes that, essentially, the Knowledge Gap Hypothesis advocates that more information does not necessarily imply a better-informed public, or, at least, that not all members of the public will be better informed to the same degree. On the contrary, Matei adds that, while some members of the community might become better informed, some others might, in fact, lag behind in terms of information, learning, or knowledge about current salient issues. He explains that, in documented by charts cases, information gain curve slopes are quicker for some and flatter for others. According to Matei, the angle of the slope seems to be determined more by socio-economic status (SES). Matei then complements the study analysis by stating that within this process, given more information and educational resources, the individuals who have better chances to absorb them will eventually benefit more from them than those who cannot. That said, while the materially richer become even richer intellectually, the poor reap far fewer benefits from this intellectual evolution. The difference is thus not defined in terms of “some get, while some lose,” but rather, “some get, while some get even more” (Matei, 2012). Consequently, we may conclude that knowledge acquisition is mainly based on what the individual is able to grasp from what is not only framed, but also offered within the financial tool buying capacity. When applied to this study, I will borrow the Knowledge Gap concept, highlighting the differences in obtaining

information, and attach it to the mental capacities and information-seizing capabilities diversity. While with any given tool, some ‘get it’, some others simply cannot. Put another way, it is not the sender so much as the receiver; it is not what one says or how, it is very basically “*to whom*” one is saying it. To put it more lucidly, the Internet and social media use accelerate many tasks and activities, considered a better way of doing things. Children with Autism, however, are limited by their own capacities, even when they have access to tools making information flow faster. This is because they are not capable of following the flood; to them, ‘slower’, in most cases, actually means ‘better’.

The following interviews with ‘hands-on’ experienced individuals explain in simple wording how complex Autism can be in grasping information.

#### **5.4. Interviews**

Interviews with experts in the field were conducted to gain hands-on experience regarding the topic of this research. Most interviewees had interlocking opinions; by this, I mean that, although each one’s idea represented a separate building block, put together these ideas complemented the whole picture. This is because each interviewee could see the topic of integration of children with autism by the use of ICT through his or her own lens and based on their studies, experience, and knowledge.

##### **5.4.1. Translation Experience into Action:**

One noteworthy participant, Maha Helali, exemplifies the “parent” who became the “expert”, creating as a result the main Egyptian communication application in colloquial Egyptian Arabic, Kalami.

Helali presented a general synopsis of what Autism is and what it entails from both the perspective of the parent and the expert; this vitalized the silent descriptive information available in books.

Autism is a hidden handicap, which is not necessarily ‘seen’ since it has no physical trait or identity. Helali explains that when meeting a person with autism, we realize that his or her behavior or attitude is strange, without having been forewarned by any physical trait. She added that we all know that we have five senses; however, there is an additional sense that ‘makes sense’ of all the senses, an awareness that might be lacking with Autism. An example of this, according to Helali, is a banana; we know its taste, shape, color and so on, forming a complete idea of what a banana is from every sense recorded, resulting, in turn, in a complete picture. However, children with autism’s senses have different degrees of intensity, which are higher or lower than the usual senses. In a noisy atmosphere, someone would tell a friend that they couldn’t hear him. This is not because one suddenly became hearing-impaired; rather, it is because the brain gave an order to stop the reception from the sense flowing into the auditory disturbance. The same principle applies to these children with autism who are, unfortunately, incapable of sensory prioritization. In a room where people are talking, we do not listen to the sound of the clock ticking because this sound is peripheral to our interests at that time. In the case of children with Autism, they behave as if they cannot hear us because they consider what the environment is offering them as ‘noise’; so, they simply block it. However, if we were to open a packet of chips, on the other hand, the child with autism would automatically become alert. Since this is recorded as a ‘friendly’ noise, the hearing is ‘allowed’. This explains how they behave with all the remaining senses. Let us take auditory noise and visual noise, for example. Visual noise refers to various patterns around a certain design, say, a ‘beach’ theme. If we draw blue sea and yellow sand, the child with autism might correctly identify the scene. However, if the picture depicts children playing, a ball, refreshments, and boats with the sea and shore in the background, the child with autism will consider this as visual noise and become reluctant to show interest. Interweaving the same logic, eye contact is a difficult step for children with autism, thus creating a major social and

communicative barrier. The more his senses are affected, the more a child with autism will retreat and close up the use of these affected senses. Early intervention does help tremendously in cases of Autism, states Helali, because one can train the child to prioritize and concentrate on what he knows from the information offered, thereby minimizing the unexpected or the unfriendly. Nevertheless, when dealing with children with autism, we have to monitor the 'noise' we present around any information, whether auditory or visual, to prevent them from subconsciously blocking the entry.

According to Helali, Autism is a universal impediment. Children with Autism do not suffer from one ailment that is curable. In order to achieve integration within the Egyptian society, those unaffected by autism have to come to terms with the dissimilarities, variations and differences of others; and learn to communicate regardless of capacities' divergences. A major blessing in divine creation is the variation in humankind; the fact that we are not the same makes us keen to discover the 'other' and try to communicate with him or her. This is why we, as a group of mothers with children affected by autism, came up with the idea of establishing the Advance Association, after which we set up the Kalami Application.

As a mother, my dilemma was that I wanted my son, Moustafa, who is mostly non-verbal, to be able to communicate (60% of autism cases lack verbal communication). Communication with his sister was not problematic, unlike with his cousins of the same age. Apart from the basic needs that we could identify out of experience, there was no way to communicate.

When I started reading about how I can help my child, about four years ago, I realized that all related applications or software were in English... My thoughts centered on creating something in Arabic, and more in Egyptian Arabic, as that is what he is hearing us communicating in. I became determined to find a solution to my son's communication problem.

Since this endeavor needed money, which I simply did not have, I touched base with Eng. Amr Shady, who won the Endeavor Prize for Egyptian Entrepreneurs. Winning this award helped him to establish his own company, AT telecom. Despite trying to help me on the technological side, he also realized that the issue is too big and needs a lot of money.

In 2014, Vodafone launched the Mobile for Charity trophy. I then started to wonder at the insistence on software when mobiles are so handy and widely used. Accordingly, my thinking shifted towards apps which I told myself sounded 'doable'. We ultimately ended up among the last three runners-up. And then we went on to win the award to pursue the Kalami vision.

To make Kalami a reality, we faced numerous streams Helali reflects. Autism is a universal impediment, or, rather, a spectrum as has been scientifically acknowledged. To illustrate this term, she explains that support needs range from high to low, as do those who can or cannot communicate easily. Each child with autism is completely different, based on IQ, sensory needs, and adaptive behavior, the three main criteria in mainstreaming a child with autism in a school or class.

The first version of Kalami included 50 basic words for communication, steadily increasing to 150, then 250, reaching the current number of 500. The trial 50 word application is available for free on the Net, and has been downloaded by Egyptian users locally and abroad.

In accomplishing the First alpha trial version, we worked with 19 associations in 12 governorates to cover all of Egypt. Through the trial period, we realized how diversified the vocabulary is within the different governorates as well as dialects within colloquial Egyptian Arabic. This meant we needed to come up with a common word to accommodate these variations; since the child is already word-use impaired, we had to generalize while retaining

the association to avoid the occurrence of any ‘noise’. This underscores the point that what a child with autism does not identify with represents ‘noise’ to this child.

#### **5.4.2. Autism Empowerment through Technology:**

Another example in the vanguard of special education is Dr Nadia Adib. At an academic level, Adib served the field with milestone achievements that greatly enhanced the sphere of children with learning difficulties. As far as ICT usage is concerned, she considers that society would more easily accept a child with a learning disability who can manage an ICT tool. She sums this up by stating that a child with autism practicing with a computer tablet increases the chances of finding common ground with others of rather than if this child is sitting doing nothing or throwing a tantrum. If we use the term ‘mental retardation’, according to Adib, the stereotype excludes them from being able to do anything like normal children. So, using an ICT tool is instrumental to their potential acceptance in the society, increasing the likelihood of their being viewed with a more positive attitude than the negative prevailing typecast. Taking things one step further is considering what type of application the child is operating; is it a game? Or, is it a learning tool application? Is it any of the common or current ones normal children are operating? This by itself creates a kind of ‘social status’ as she puts it. She further asserts that the younger the parent and the child, the more inclined they are to introduce ICT tools for learning, and, accordingly, for integration within the surrounding society. In this case, word of mouth can help significantly to establish the child’s ‘compatibility’ with his peers, creating common ground for conversation with the child with autism. That said, Adib made an important observation regarding the use of ICT tools with children with autism: given the autism tantrum characteristic in case of disturbance, certain games can create a euphoric overreaction status. In response, if left unmonitored, the child can overreact to a specific ‘game situation’, thus creating an unwanted social episode that can affect the child’s positive portrayed image.

Generally speaking, Adib insists that survival in today's world depends on technology literacy, meaning it is no longer an option. Accordingly, as members of the society, children with autism and various other learning difficulties must be trained to operate such tools. It goes without saying, she added, that the younger they are, the more easily they can grasp the technology.

“There is more in inclusion, than being included” said Adib, explaining that misinformation is a main obstruction in communication with persons with learning disabilities. She cites several ‘myths’ regarding their perceived lack of abilities, creating a stereotype that affects interaction with them. Leading awareness campaigns and generating applications are a main point she raised. One suggestion included inviting children with learning disabilities to attend social events that showcase their talents in using ICT that would eventually, by word of mouth, generate a more positive idea of their capabilities. Although Adib concedes the difficulty of reaching a significant majority, she feels that interested people may search for information to educate themselves. Then, by the power of the social wheel, word would quickly spread that these children are ‘Differently Able’. In fact, this supports the “Right to Live Association’s slogan: “We are not disabled, we are differently abled”.

#### **5.4.3. The Socializing Effect of Technology on Autism-Affected Individuals:**

Dr Dalia Soliman, another Special Education expert, and founder of the Egyptian Autism Society, believes that as children with Autism are more visual, the bigger and larger the screen of the ICT tool used, the more helpful to the child in grasping the information, thus enabling interaction and integration within the society.

Soliman states that the Egyptian Autism Society is empowered with HD players, similar to huge IPADs. Children showed better improvement using these devices, according to Soliman. Normal computer Tablets also help children with Autism comprehend and train

on social skills through the applications available for social skills training, added Soliman. However, Kalami was not included in the applications the association used as they are not yet aware of its availability.

Soliman agrees with Adib regarding the fact that the use of computer tablets does play a positive role in the integration of the child with Autism with his same age group peers. Beside the positive image, the applications that facilitate language communication break down some barriers.

Soliman is also a great believer that many children with Autism have above average skills; once these skills are identified, the child can excel in a different domain when trainers identify his talents and make use of them. In a similar vein to Helali, Soliman emphasized that early intervention is essential.

Soliman further suggested that adding visuals to the text facilitate national curricula, thus assisting students with Autism to grasp the material more easily. She also clarified that this service is actually provided to their students at the Egyptian Autism Society association.

#### **5.4.4. Different views and similar views:**

The other experts within the field of teaching children with autism have been interviewed and were mainly speaking about the topic of the study regarding using ICT for the learning process with the aim of integrating children with autism within the Egyptian society. With both pro and con fully backed according to their experience in the field, a full clear understanding of the picture was crystalized as explained hereunder.

While Dr Youssef Ibrahim, Head of Autism and special Education department at el Ghad Moshreq association, believes that communication with Autism cases mainly features repetitiveness and consistency, he explained that when introducing ‘the flower’ for example; the word ‘flower’ then needs to be repeated in the same tone and entourage settings to help achieve optimum grasp of information. Once the sound is altered for any reason, say if either



the teacher mood or the environment's experiences changes, the child might process this as a different 'entry', thus distorting information acquisition.

Conversely, Dr Olfat Naguib, the head of assessment and family empowerment unit at Seti association, states that since a salient autism feature is avoidance of personal and eye contacts, the children with autism do prefer to live in their own world, evading interpersonal communication. In Naguib's view, the ICT use would nurture this isolation feature and create a higher alienation situation.

When asked to comment on this observation, Dr Ibrahim explicates that such a problem could be manipulated by the proper use of the ICT tools. He further elucidated that as in all situations; a person needs to follow guidelines. If the child were left alone with the device for an indefinite time, Ibrahim asserted then this would definitely be a misuse of ICT on all fronts comparing it to the image of TV as a surrogate babysitter dating back to the 1980s. However, using the ICT device with a guiding caregiver within a specific time frame provides the child with lasting benefits due to the ICT uniformity feature, thereby enhancing the child's scope of knowledge, as Dr Ibrahim stated.

The issue of proper use of time has been tackled in parallel by Dr Mohamed el Henawy of the Advance association. El Henawy promoted the use of tailored ICT for children with autism as an effective tool of information acquisition, conjecturing that the child with Autism needs a certain length of time of repeated material to reach a tangible learning curve. It is an unfortunate fact, however, as pointed out by El Henawy, that in practical life allowed time cannot be extended. Given the nature of school based activities, each child is thus given a certain time slot in order to accommodate all students. Accordingly, while a child needs a given amount of exposure time to a target issue, he / she also needs continual tutoring to cumulate these minutes and hours on a weekly basis. El Henawy observed that if the family supports application of the same program at home, this repetitive process of the information

entry might benefit the child knowledge path. He also emphasized that this process should combine precision with brevity so that the child could benefit from having the same word or concept offered in same manner, thus magnifying the possibility of acquisition.

It is worth mentioning that El Hennawy belongs to the Kalami initiator group; his overarching example was based on the Kalami program use, where the tone of voice and gender of the speaker is tailored to the applicant, to comply with those used in the school or institution the child is enrolled in, thus exposing the child to a uniformity of information flow.

Another point clarified by El Hennawy is that the use of Kalami is assigned by the teacher, very much like homework, to expose the child to the same given item within a set time frame according to his / her individual grasping and mental capabilities.

Nevertheless, Dr Ibrahim has some reservations about the Kalami application expounding that it might suppress any existent verbal knowledge already acquired. That is, when the child wants to drink and the application is utilized to ask for water, the child will find it easier than to forcibly articulate words. To prevent this, he recommended that the sound and picture link be solely used for teaching rather than as a communication tool.

Dr Yvette Abdel Malek, an ardent advocate of personal interaction in ICT use, seconded Dr Ibrahim's point, clarifying that Autism's main traits revolve around isolation, avoiding social interaction and eye contact absentia. Accordingly, left alone with a machine, the child is fully in his comfort zone and does not need to communicate nor learn any social skills. Because once he is able to press the button, he obtains his primary needs. That said, this same argument supports Dr Naguib's concerns about avoiding leaving the child on a one on one basis with a non-human device, which increases his alienation tendency.

Furthermore, in the case of children with autism, ICT tools may prove to be a double edged weapon. Used as a teaching tool, ICT might serve some, especially when using the

repetitiveness and steadiness assets. As stated by many of the interviewees, the tool must be used with a caregiver or a parent. If left alone with the device, the child develops more of his innate seclusion preference, undermining the possibility of increased integration.

To clarify, if a speech therapist wants to teach the child the word “door”. Two options are proposed: either to leave the child with any of the previously mentioned tools evolving monotonous repetition of the word “door” with the same pitch, voice, surrounding and manner which actually fulfills the Autism traits’ needs for consistency and stability. The second option entails accompanying the child in the use of the tool. Although studies revealed that information uniformity enables the child to grasp it, Abdel Malek feels that the first option might induce the child to produce more of a mechanical sound of the words, due to the built in tendency towards echolalic use of words; in contrast, if the child is monitored and tutored while using the tool, several positive outcomes may develop. As highlighted by AbdelMalek, children with autism need to have personal communication imposed, because they tend to be self-centered and refuse to deal with others. In teaching the child the word “door”, therefore, she recommends that the caregiver shows the door, demonstrates going in and out of the door, opening and closing the door, in order to replicate the social episode involving use of the door. All these actions would be accompanied by repeated utterances is of the word door, together with the use of the ICT device for sound repetition practice. According to Abdel Malek, the information will, on the long run, be processed more effectively, suggesting that using ICT tools in conjunction with the role play of normal social situations helps teach the child the word in its appropriate social context. In turn, this would assist the initial integration goal.

#### **5.4.5. IT and Special Education:**

To gain a different angle of the issue, I interviewed Information Technology (IT) specialists, Engineers Tareq EL Fakharani, and Ahmed Gadallah (Doudou & Tata) as they preferred to be called. These two friends and colleagues actually studied IT and decided to create “Ta2heal” which is an application they shaped to serve various handicaps, and basic learning difficulties. Although the main theme excludes Autism solutions as such, Doudou and Tata take on Autism awareness campaigns, applications and parents’ guidance. Their application was originally inspired by their desire to help dyslexia related learning problems. Once established, they have been focusing on tailoring the application to serve further problems. Due to their somewhat limited experience in the education field, however, they mainly focus on customizing their IT capabilities to serve as many clusters of learning difficulties as possible.

As far as Autism in specific, Doudou and Tata do not consider themselves as competing with Kalami Application. On the contrary, they are trying to tailor their computer knowledge to help create assessment plans for teachers, and thus create individual profiles according to specific needs. They also believe that specialists in the educational field have more of a guiding role in shaping their computer capabilities to create more applications with functions that can serve a wider variety of learning or information grasping difficulties. That is, those who have technical skills create tools, while education specialist handles the content. However, they are fully aware that it is only through those actually dealing with the children that they can help produce the facilitating software.

Projects in the pipeline include awareness applications to educate parents about different education problems, how to identify them, and discover optimum solutions to teach their child and minimize communication hindrances. Ideally, it's the Computer experts along with the special education professionals that can, hand in hand, generate the most suitable tailored

program. While the task itself is not difficult, what is challenging is to find the right specialist who can guide IT towards better use to serve learning difficulties.

## Chapter VI.

### CONCLUSION

The findings of this study revealed several important concerns to the communication field.

Ranking mental capacities in children with autism in practical life does not stand to any coherent criterion. It is mainly an individual case-by-case issue. Although there are many scientific screening tests and in general a child with autism has a rate on “the Spectrum”, each case is unique in the sense of what the child can actually conceptualize. Unfortunately, children with autism’s limitations can severely hamper integration willingness. Nevertheless, the role of ICT can be molded to be used to serve enrich the supporting people with valid information, ideas and coping mechanisms so that they can improvise techniques of developing proper language and forming better behavioral patterns to help have people affected with autism more accepted in the society and consequently more integrated.

Interestingly, a parallel thread can be drawn between the traditional Laswell model and the results of this research. Communicating with children with autism ideally matches the old school of Laswell’s model built on the credo: “Who, says what, to whom”. Based on the Literature Review, children with autism’s communication difficulties are hindered by some neurological shortcomings. A step further in the literature clarified that given certain criteria like repetitiveness of tone; person and situation might make the flow of information subtler. The way material is presented and the uniformity they require in communicating; creates an ideal experimental field materializing from the forerunner of communication theories. In theory, dissecting the model and tailoring it to children with autism communication will lead the research discussion to certain well defined points.

- The personal acceptance the autistic child has towards a person has a remarkable weight in the process of accepting the information, materializes The WHO

- The WHAT is the offered information which differs individually in case of children with autism as per his / her mental age, hampers and capacities
- WHOM, refers to the child with autism himself, around whom all this research revolves

Since ‘Who can do what?’ is not a scientific question, no real research could be built upon this very important issue for the Children with autism. When dealing with them in real life situations, we realize that it is what they grasp that becomes primordial rather than what we want to teach them. In many cases, it has absolutely nothing to do with financial capabilities, and children with autism’s limitations can fetter integration willingness.

Accordingly, when an autistic child is in an environment where he / she is expected to communicate, these rudimentary labels of ‘WHO, WHAT and to WHOM’, become very important gatekeepers; the slightest alteration may remarkably enhance or impede the message dramatically.

As realized from the answers to most Research Questions and RQ9 in specific, the research tends to focus on the fact that ‘one size fits all’ applications provide no assistance to children with autism in general, including in their integration within the society.

In the study, children with Autism are viewed as a target with whom others can communicate by means of special tools, applications, and learning trajectories. Regarding the nature of the surveyed sample, specifically the average age of children with autism related to the parents, the researcher acknowledges that 80% of them fell under the below 20 years of age bracket. This might indicate that the topic of the research regarding the ICT tools is appealing to these parents whose children are below 20 years old. The remaining 20% might be representative of a generation who is not necessarily ICT oriented. This gives credibility to the results of this research.

Children with Autism have been thought of as a target to communicate with, by special tools, applications and learning trajectories. However, ICT are called Tools, which underlines that one needs to know how to use them to get the best benefit. It all has to do with the personal touch. A child with Autism might benefit from the ICT tools to integrate him or her in the society. But that will not happen directly. “Interpersonal communication problems cannot be solved by pressing a button” correctly stated Dr Abdel Malek. The benefit drawn shall be from the proper use of ICT by the child’s entourage. Identifying Autism traits and showing the society how to deal with individuals suffering from these ailments, would undoubtedly set a path of clearer communication, thus diminish the isolation of the children with autism integration within the Egyptian society.

This study additionally revealed that in various cases, parents and caregivers pose the main hindrance of communication between the child with Autism and the Egyptian society. This does not rise from any bad intention; but on the contrary, in wanting to make up for the child’s problem, they tend to facilitate too many communicative tasks around the child by simply trying too hard and taking over most of the time. This caring but misguided attitude act leads on the long run place severe psychological pressure on the caregiver, and mainly the parent, eventually leading to seclusion, as they cannot continue living the child’s day-to-day life in a vicarious manner. That said, there is a glimmer of hope; and solution might be easier than thought. With parents increased awareness of how to deal with their child with autism, what to do and what to avoid doing, and reliance on their dedication and unwavering loyalty; only they can identify the fine line of their intervention in their child’s life and hence acting responsibly and know when to step back and watch him / her doing. As the research underlined, each child with autism is an individual case and the role of caregivers and professionals would be to guide and support parents with adequate practices and orient them to what suits the child. Consequently, it is not surprising that cultivating communication



skills is the principal focus of almost all early intervention programs for children with autism. The principal property of early intervention is the fact that the child will not have to unlearn poor ways of coping with his handicap, e.g. throwing a tantrum as an instinctive technique of getting what he needs or wants. The system of such intervention takes place throughout the use of approaches and designed tactics in the form of a particular provision like special teaching curricula and communication structures; thus developing of day-to-day social skills and behavior adjustment techniques. Varied studies proved that the application of such approaches into the everyday lives of these children proved effective in reducing typical of individuals with Autism behaviors. Early intervention close monitoring enable children with Autism to interpret what they see in the world they live in; know what to expect and comprehend how to deal in similar situations, thus be more independent on the long run.

The outcomes of the study further clarified an essential aspect, that neither education nor financial capabilities are the real impeding factors in the child's integration within the Egyptian society. It is rather the lack of awareness and reluctance of the parents to morally accept the charge of dealing and teaching their 'different' child. This probably stems from a cultural belief embedded within the not highly educated society that does not easily assume the idea of dissimilarities. Having said that, the emotional burden on the family doubles, not only to deal with their child who has learning difficulties, but to also face the society that is not used to accept differences. The relatively monumental effort needed to deliver and reach the information in comparison to siblings drains the family on the long run due to the fact that no progress is sensed on a short term. In other words, whatever the standard of education or financial capabilities, parents and schools do provide various ICT tools, most importantly computer tablets for their value for money, as well as easiness and mobility in comparison to the other ICT tools studied. In that sense, the awareness issue becomes what to do with the tablet? Which applications to download or use? Realistically thinking, the non correct

utilization of the computer tablet potentials leads unfortunately to the happening that the child is left with the device until he / she loses interest.

Dr O. Ivar Lovaas observation that: “If they can’t learn the way we teach, we teach the way they learn” (Lovaas, 1987) summarizes the issue perfectly. The available ICT tools featuring a range of applications are what we actually need to work on. Both Autism applications and software need to basically have a very important feature; they need to be individually tailored to fit each child’s needs. It is then that the child with autism will have a place in the society that is willing to go the extra mile to “teach the way they learn”.

## **Chapter VII**

### **Limitations of the Study**

- As the study surveyed was based on a non-random purposive sample, the results cannot be generalized. Therefore, the study lacks external validity.
- Unavailability of studies and reports conducted on Children with Autism in the Egyptian society in general, and their use of ICT in particular.
- Bureaucracy hindrances in obtaining information from NGOs and specialized organizations.
- Emotional boundaries set by parents and families of children with Autism made them reluctant to discuss their problems or speak out about their personal experiences.
- Social constraints of alienation restricted the survey to the purposive sample and snow-ball techniques.
- Scarcity of published scholarly research and statistics on children with Autism in the Egyptian society.
- The sensitivity of the topic prevented conformity to a traditional Question & Answer survey format. The main reason for various situations would be answered with “It depends”; thus increasing the difficulty of statistical measurements.
- Limited parameters about the topic, plus bureaucratic recommendations prevailing in conferences, mainly directed to gratify bosses or sponsors.
- Key people claim ‘the ideal situation’ as an indisputable given, portraying the settings at their pertaining institutions as conforming to Utopian standards.
- Children with Autism cannot report what happens; accordingly, information is always obtained from a third party.

- Children with Autism will not show quick improvement, development, advance or progress before a long term of time.
- High levels of decreased awareness about Special Education in general, and Autism cases and features in particular, created many situations where parents agreeing to be surveyed realized their child is not the right target of the study.
- Many questions on the questionnaire were left unanswered for several reasons:
  - Lack of education
  - Lack of awareness of survey benefits
  - Reluctance to ameliorate situation
  - Secrecy trend regarding financial background
  - ‘I know it all’ predominant motto, which prohibits clarifying questions.
- Countless surveys were marginalized because respondents decided to write their personal views instead of answering the questions.
- Internet questionnaire survey program did not have a language alteration option; accordingly, only English questionnaires could reach a certain segment of the society. The Arabic-speaking majority had to be personally handed a printed copy.

## **Chapter VIII.**

### **Recommendations**

- ❖ Most Associations' pamphlets still refer to the children with intellectual disabilities as mentally handicapped, or even mentally retarded; this description should be altered to conform to the UNICEF guidelines within the Convention on the Rights of Persons with Disabilities.
- ❖ National policy should include distributing and financing computer tablets to all public schools to access informative applications.
- ❖ Parents and Caregivers must be trained and aware of ICT tools' benefits for better integration.
- ❖ Since children with Autism cannot report what happens, and will not show signs of rapid improvement, development, or progress before a considerably lengthy period, creation of applications and software should focus on monitoring any slight improvement in their learning process.
- ❖ National schools should be encouraged to create affiliated classes serving children with learning disabilities. Sharing the same ICT tools within the same school entourage, children with learning disabilities will be better integrated with their peers on the long run.
- ❖ There is a notable lack of studies and reports conducted on children with Autism in the Egyptian society in general, and their use of ICT in particular; this gap should be addressed and included in national planning.
- ❖ Launching competitions on a national level can unveil dormant youth capabilities in creating more helpful learning tools.
- ❖ Establishing an informative group on social media to increase societal awareness

regarding how learning-disabled persons 'are differently abled'.

- ❖ Building young parents' awareness of what Autism is, how it can be identified, and the benefits of early intervention would facilitate smoother integration of children with autism within the society.
- ❖ Providing informative applications that clarify how to identify Autism to benefit from early intervention.
- ❖ Conference outcomes generate a wide array of bureaucratic recommendations, which are mainly directed to gratify superiors or sponsors; their implementation in reality should be monitored.
- ❖ Official statistics tend to be out of date regarding all handicaps in general, and Autism in particular. These need to be updated more often.
- ❖ Information about Autism is imprecise. The CAPMAS should exhibit more enthusiasm in issuing up-to-date and detailed demographic statistics counting Autism as a distinctive element from handicaps.
- ❖ Information used in the study was retrieved from sites last updated not beyond 2009, coinciding with information obtained verbally from many of the interviewees who confirmed that the number of general intellectual disabilities in Egypt is roughly three million without segregation of the ailment or the nature of the handicap. Accordingly, Autism is comprised within these numbers, as no specific official information is available regarding Autism in particular.
- ❖ Simplifying national curricula and including a visual component on computer tablet applications as an efficient teaching aid to students with learning difficulties. Once the information is simplified in a more tangible and visual format, many of the children with Autism are able to comprehend it.

- ❖ Generating cognizance of Autism traits in national curricula, thus emphasizing that there is a way to interact with children with Autism, though slightly different. Once highlighted, it can create smooth communication, thus easier integration within the Egyptian society.
  
- ❖ Maintaining the initiative conducted this year about “Blue for Autism” on the 2<sup>nd</sup> of April as part of the international awareness campaign. In fact, blue lights, the color code for Autism, lighted most of Egypt’s monuments and landmarks. It was the first time to happen, in Egypt, and continuity will establish awareness on the long run.

## **Chapter IX**

### **APPENDICES**

- APPENDIX A: Survey Questionnaire in English**
- APPENDIX B: Survey Questionnaire in Arabic**
- APPENDIX C: Interview guiding Questions**
- APPENDIX D: IRB Approval**
- APPENDIX E: CAPMASS Approval**
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- APPENDIX I: A list of Available organizations and NGOs in Egypt**



## APPENDIX A: Survey Questionnaire in English

Dear Sir / Madam,

My name is Aline Bahari, and I am doing my MA in Mass Communication at the American University in Cairo about the 'Integration of Children with Autism in the Egyptian Society using Information and Communication Technologies (ICT) under the supervision of Professor Dr Hussein Amin.

Your participation and the information you provide here are fully voluntary and are solely for this research purposes and shall remain confidential and anonymous.

Considering how valuable your time is, the entire questionnaire should not consume more than 10 minutes all in all.

Please feel free to add any remark you deem necessary at the end of the questionnaire.

Thank You ☺

- 1) Are you related to Children with Autism?
  - a. Yes
  - b. No (Please Terminate)
  
- 2) How related are you to Children with Autism?
  - a. Parent
  - b. Professionally
  
- 3) How long has this relationship been?
  - a. Less than 10 years
  - b. More than 10 years but less than 20
  - c. More than 20 Years
  
- 4) How old is the child? -----

5) Does your child usually attend family or friends' visits?

Type of Gatherings	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Family Birthday / Reunion					
Friends with kids visits or outings					
Siblings outings					
Handicapped gatherings					

6) Kindly give a reason for your answer in Q5.

-----  
 -----  
 -----  
 -----

7) Is the child with autism you know using any Information and Communication Technologies (ICT) device?

- a. Yes (Please proceed to Q 8)
- b. No (Please proceed to Q 9)

8) The child does not use ICTs, Because:

- a. His mental age and capabilities cannot operate such devices.
- b. Never thought of trying.
- c. Cannot financially afford.
- d. Other: Please Specify -----

9) What kind of device does he / she use? (Kindly check as many as used)

- a. Interactive Whiteboard
- b. Personal Computer
- c. Lap top
- d. Tablet
- e. Smart Phone
- f. Interactive Preliminary Toy

10) Where does the child operate the Device (s)?

<b>Device</b>	<b>School</b>	<b>Home</b>	<b>Other (Please Specify)</b>
Interactive White Board			
Personal Computer			
Lap top			
Tablet			
Smart Phone			
Interactive Preliminary Toy			

11) How long has the child been using the device / devices? (Tick as many)

<b>Device</b>	<b>Less than 5 Years</b>	<b>Less than 10 Years</b>	<b>More than 10 Years</b>	<b>More than 20 Years</b>
Interactive Whiteboard				
Personal Computer				
Lap top				
Tablet				
Smart Phone				
Interactive Preliminary Toy				

12) How much time does he / she use the device PER DAY in average?

<b>Device</b>	<b>Less than an Hour</b>	<b>An Hour</b>	<b>Two Hours</b>	<b>Leaves it open but does not concentrate</b>
Interactive Whiteboard				
Personal Computer				
Lap top				
Tablet				
Smart Phone				
Interactive Preliminary Toy				

13) The child's use of Tablet is: (as many)

- a. Autism related
- b. Children learning applications
- c. Games
- d. Social Media

14) The language the child's uses in Tablet use is:

- a. Arabic
- b. English
- c. French
- d. Doesn't make a difference
- e. Prefers mute mode

15) Did your child use any of the following applications before?

<b>Application</b>	<b>Very Frequently</b>	<b>Frequently</b>	<b>Seldom</b>	<b>Don't know about it</b>
iAutism				
Kalami				
Facebook				
Talking Tom				
Opposites				

16) Kindly rate the following applications that best represent how you consider that such applications helped your child integrate easier in the society?

<b>Application</b>	<b>Extremely Effective</b>	<b>Effective</b>	<b>Neutral</b>	<b>Non Effective</b>	<b>Negatively Effective</b>
iAutism					
Kalami					
Facebook					
Talking Tom					
Opposites					

17) You are a:

- a. Female
- b. Male

18) What is your area of residence?

- a. Heliopolis
- b. Maadi
- c. Mohandiseen
- d. Nasr City
- e. New Cairo
- f. Zamalek
- g. Other, Kindly Specify:

19) How old are you?

- a. 21 - 29
- b. 30 – 40
- c. 41 – 50
- d. 51 – 65
- e. Older than 65

20) What is your level of education?

- a) Bachelor degree holder
- b) Graduate student
- c) Masters degree holder
- d) Doctoral degree holder
- e) Other, Please specify \_\_\_\_\_

21) For Parents only, which best describes your monthly income?

- a) Less than 1,000
- b) EGP 1,000 – less than EGP 5,000
- c) EGP 5,000 – less than EGP 9,000
- d) EGP 9,000 and above

Thank you for your valuable participation ☺

## APPENDIX B: Survey Questionnaire in Arabic

بعد التحية،

أنا ألىن بحري، وإننى فى صدد إعداد درجة الماجستير فى الإعلام فى الجامعة الأمريكية بالقاهرة حول "دمج الأطفال المصابين بالتوحد فى المجتمع المصرى باستخدام تكنولوجيا الاتصالات والمعلومات (ICT)" تحت إشراف الأستاذ الدكتور حسين أمين.

تعتبر مشاركتكم والمعلومات التى تقدمونها هنا طوعية تماما وحصرية لأغراض بحثية وستظل سرية. نظرا لمدى قيمة وقتكم ، لن يستغرق الاستبيان بأكمله أكثر من 10 دقائق. لذلك ، أرجو ألا تترددوا فى إضافة أى ملاحظة ترونها ضرورية فى نهاية الإستهبان.

مع جزيل الشكر ،

(١) هل لديكم أى علاقة بالأطفال المصابين بالتوحد؟

- أ. نعم  
ب. لا (رجاء إنهاء الإستهبان)

(٢) ما هى علاقتك بالأطفال المصابين بالتوحد؟

- أ. أبوية  
ب. مهنية

(٣) ما هى مدة استمرار هذه العلاقة ؟

- أ. أقل من ١٠ سنوات  
ب. أكثر من ١٠ سنوات و لكن أقل من ٢٠ سنة  
ج. أكثر من ٢٠ سنة

(٤) ما هو عمر الطفل؟ .....

٥) هل يذهب الطفل عادة لزيارات الاسرة أو الأصدقاء ؟

أوافق بشدة	أوافق	محايد	أعارض	أعارض بشدة	نوع التجمعات
					تجمع اسري أو عيد ميلاد عائلي
					زيارات أو نزوات مع اصدقاء وأطفال
					نزوات مع أصدقاء الإخوة / الأخوات
					تجمعات معاقين

٦) يرجى إبداء سبب لإجابتك علي السؤال الخامس .

.....

.....

.....

.....

٧) هل يستخدم الطفل المصاب بالتوحد الذي تعرفونه أي جهاز من تكنولوجيا المعلومات والاتصالات (ICT) ؟

- ا. نعم (يرجى الانتقال إلى السؤال ٨ )  
ب. لا (يرجى الانتقال إلى السؤال ٩ )

٨) لا يستخدم الطفل تكنولوجيا المعلومات والاتصالات، للأسباب التالية:

- ا. قدراته العقلية لا تستوعب إستخدام هذه الأجهزة.  
ب. لم تفكر في مجرد المحاولة.  
ج. ظروف مادية.  
د. أسباب اخري : برجاا التحديد .....

١١) ما نوع الجهاز الذي يستخدمه الطفل ؟ (يرجى إختيار الجهاز / الأجهزة المستخدمة)

- أ. السبورة البيضاء التفاعلية  
ب. الحاسوب الشخصي  
ج. لاب توب  
د. التابلت  
هـ. الهاتف الذكي  
و. لعبة تمهيدية تفاعلية

١٠) أين يقوم الطفل باستخدام الجهاز ؟

الجهاز	المدرسة	المنزل	اماكن اخري (رجاء التحديد)
السيبورة البيضاء التفاعلية			
الحاسوب الشخصي			
لاب توب			
تابليت			
الهاتف الذكي			
لعبة تمهيدية تفاعلية			

١١) الزمن الذي استخدم خلاله الطفل الجهاز / الأجهزة؟ (إختيارات متعددة)

الجهاز	اقل من ٥ سنوات	اقل من ١٠ سنوات	اكثر من ١٠ سنوات و لكن اقل من ٢٠ سنة	اكثر من ٢٠ سنة
السيبورة البيضاء التفاعلية				
الحاسوب الشخصي				
لاب توب				
تابليت				
الهاتف الذكي				
لعبة تمهيدية تفاعلية				

١٢) الوقت الذي يستخدم فيه الجهاز يوميا ؟

الجهاز	اقل من ساعة	ساعة	ساعتين	يتركه مفتوح بدون تركيز
السيبورة البيضاء التفاعلية				
الحاسوب الشخصي				
لاب توب				
تابليت				
الهاتف الذكي				
لعبة تمهيدية تفاعلية				



١٣) استخدامات الطفل للتابلت تتسم بكونها : (إختيارات متعددة)

- أ. تطبيقات تعليمية ذات صلة بالتوحد
- ب. تطبيقات تعليمية عامة
- ج. ألعاب
- د. وسائل التواصل الاجتماعي

١٤) استخدامات الطفل للتابلت هي باللغة :

- أ. العربية
- ب. الإنجليزية
- ج. الفرنسية
- د. لا يوجد فارق
- هـ. يفضل صامت

١٥) هل استخدم طفلك أي من التطبيقات التالية من قبل؟

التطبيق	كثيراً جداً	كثيراً	لا أعرفه	نادراً
iAutism				
كلامي				
فيس بوك Facebook				
توكنج توم Talking Tom				
تناقضات Opposites				

١٦) برجاء تقييم التطبيقات التي ساعدت من وجهة نظرك علي تسهيل اندماج طفلك في المجتمع؟

نوع التطبيق	مؤثر جداً	مؤثر	محايد	غير مؤثر	تأثير سلبي
iAutism					
كلامي					
فيس بوك Facebook					
توم المتحدث Talking Tom					
تناقضات Opposites					

(١٧) أنت:

- أ. انثى
- ب. ذكر

(١٨) ما هي منطقة سكنك؟

- أ. مصر الجديدة
- ب. المعادي
- ج. المهندسين
- د. مدينة نصر
- هـ. القاهرة الجديدة
- و. الزمالك
- ز. اخر، يرجى التحديد:

(١٩) سنك؟

- أ. ٢١ - ٢٩
- ب. ٣٠ - ٤٠
- ج. ٤١ - ٥٠
- د. ٥١ - ٦٥
- هـ. فوق الـ ٦٥

(٢٠) مستواك التعليمي؟

- أ. حاصل علي درجة البكالوريوس / ليسانس
- ب. طالب دراسات عليا
- ج. حاصل على درجة الماجستير
- د. حاصل علي درجة الدكتوراه
- هـ. أخرى، يرجى تحديد

(٢١) للآباء فقط: اذكر ما هو اقرب الي دخلك الشهري؟

- أ. اقل من ١٠٠٠ جنيه مصري
- ب. اقل من ٥٠٠٠ جنيه مصري
- ج. اقل من ٩٠٠٠ جنيه مصري
- د. ٩٠٠٠ جنيه مصري وما فوق.

وشكرا جزيلا لمساهمتمكم القيمة.

## **APPENDIX C: Interview guiding Questions**

### **Interview Guiding questions**

1. How are you related to Children with Autism?
2. How would you consider ICT tools helpful with children with autism?
3. Any recommendations for further integration of those children within the Egyptian Society?



To: Aline Bahari  
Cc: Nesrine Azmy  
From: Atta Gebril, Chair of the IRB  
Date: May 31 ,2015  
Re: Approval of study

---

This is to inform you that I reviewed your revised research proposal entitled "The use of Computer Tablets for Integration of Autistic Children in the Society" and determined that it required consultation with the IRB under the "full board review" heading. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Amr Salama. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

A handwritten signature in black ink that reads "Atta Gebril".

Dr. Atta Gebril  
IRB chair, The American University in Cairo  
2046 HUSS Building  
T: 02-26151919  
Email: [agebril@aucegypt.edu](mailto:agebril@aucegypt.edu)

A decorative horizontal bar at the bottom right of the page, consisting of a yellow square on the left and a dark blue rectangle on the right.

Institutional Review Board  
The American University in Cairo  
AUC Avenue, P.O. Box 74  
New Cairo 11835, Egypt.  
tel 20.2.2615.1000  
fax 20.2.27957565  
Email: [aucirb@aucegypt.edu](mailto:aucirb@aucegypt.edu)

## APPENDIX E: CAPMASS Approval

جمهورية مصر العربية



الجهاز المركزي للتعبئة العامة والإحصاء

قرار رئيس الجهاز المركزي للتعبئة العامة والإحصاء

بالتفويض

رقم (٢١١٩) لسنة ٢٠١٦

في شأن قيام الباحثة / أليين سمير مورييس بحرى - المسجلة لدرجة الماجستير بكلية الصحافة والإعلام الجامعة الأمريكية بالقاهرة/ بإجراء دراسة ميدانية بعنوان: (دمج الطفل التوحدي عن طريق استخدامه للتكنولوجيا).

رئيس الجهاز

- بعد الإطلاع على القرار الجمهوري رقم (٢٩١٥) لسنة ١٩٦٤ بشأن إنشاء وتنظيم الجهاز المركزي للتعبئة العامة والإحصاء.
- وعلى قرار رئيس الجهاز رقم (٢٣١) لسنة ١٩٦٨ في شأن إجراء الإحصاءات والتعدادات والاستفتاءات والاستقصاءات.
- وعلى قرار رئيس الجهاز رقم (١٣١٤) لسنة ٢٠٠٧ بشأن التفويض في بعض الاختصاصات.
- وعلى قرار رئيس الجهاز رقم (٨٠١) لسنة ٢٠١٥.
- وعلى كتاب الجامعة الأمريكية بالقاهرة الوارد للجهاز في ٢٠١٦/١/١٧.

قرر

مادة ١: تقوم الباحثة/ أليين سمير مورييس بحرى - المسجلة لدرجة الماجستير بكلية الصحافة والإعلام/ الجامعة الأمريكية بالقاهرة / بإجراء الدراسة الميدانية المشار إليها عالية.

مادة ٢: تجري الدراسة علي عينة حجمها (٢٠) عشرون مفردة من الاطفال المصابين بالتوحد بمراكز التأهيل والجمعيات الخاصة بالتوحد من خلال (أولياء أمورهم وعوائلهم ومعلميهم) وذلك بمحافظات "القاهرة والجيزة والقليوبية ودمياط".

مادة ٣: تجمع البيانات اللازمة لهذه الدراسة بموجب الإستمارة المعدة لذلك وعدد صفحاتها صفحة واحدة مترجمة للغة الانجليزية ومُعتمدة بخاتم الجهاز المركزي للتعبئة العامة والإحصاء.

مادة ٤: تقوم وزارة التضامن الإجتماعي - وتحت إشراف إدارة الأمن بها- بتيسير إجراء هذه الدراسة الميدانية - على ان تقوم الوزارة بتحديد الجمعيات ومراكز التأهيل المستهدفة - مع مراعاة الضوابط الخاصة بتقييم درجة سرية البيانات والمعلومات المتداولة مسبقا بمعرفة كل جهة طبقا لما جاء بخطة الأمن بها.

مادة ٥: يراعى موافقة مفردات العينة - مع مراعاة سرية البيانات الفردية طبقا لأحكام القانون رقم (٣٥) لسنة ١٩٦٠ والمعدل بالقانون رقم (٢٨) لسنة ١٩٨٢ وعدم استخدام البيانات التي يتم جمعها لأغراض أخرى غير أغراض هذه الدراسة.

مادة ٦: يجري العمل الميداني خلال ثمانية أشهر من تاريخ صدور هذا القرار.

مادة ٧: يوافق الجهاز المركزي للتعبئة العامة والإحصاء بنسخة من النتائج النهائية لهذه الدراسة.

مادة ٨: ينفذ هذا القرار من تاريخ صدوره.

صدر في: ٢٠١٦ / ١ / ١٩.

محمد ممدوح محمد  
مدير عام الإدارة العامة للأمن





قرار رئيس الجهاز المركزي للتعبئة العامة والإحصاء  
بالتفويض  
رقم ( ٨٠١ ) لسنة ٢٠١٥

في شأن قيام الباحثة / آلين سمير موريس بحرى - المسجلة لدرجة الماجستير بكلية الصحافة والإعلام - الجامعة الأمريكية بالقاهرة - بإجراء دراسة ميدانية بعنوان : (دمج الطفل التوحدي عن طريق استخدامه للتكنولوجيا).

رئيس الجهاز

- بعد الإطلاع على القرار الجمهوري رقم (٢٩١٥) لسنة ١٩٦٤ بشأن إنشاء وتنظيم الجهاز المركزي للتعبئة العامة والإحصاء مادة (١٠).
- وعلى قرار رئيس الجهاز رقم (٢٣١) لسنة ١٩٦٨ في شأن إجراء الإحصاءات والتعدادات والاستفتاءات والاستقصاءات مادة (٢).
- وعلى قرار رئيس الجهاز رقم (١٣١٤) لسنة ٢٠٠٧ بشأن التفويض في بعض الاختصاصات.
- وبعد الإطلاع على مذكرة العرض على رئيس الجهاز وموافقة سيادته علي ما ورد بها.
- وعلى كتاب الجامعة الأمريكية بالقاهرة الوارد للجهاز في ٢٠١٥/٥/١٠.

قرر

مادة ١: تقوم الباحثة / آلين سمير موريس بحرى - المسجلة لدرجة الماجستير بكلية الصحافة والإعلام - الجامعة الأمريكية بالقاهرة - بإجراء الدراسة الميدانية المشار إليها عالية.

مادة ٢: تجري الدراسة على عينة حجمها (٢٠) مفردة من الأطفال المصابين بالتوحد بمراكز التأهيل والجمعيات الخاصة بالتوحد من خلال (أولياء أمورهم وعوائلهم ومعلميهم) وذلك بمحافظات "القاهرة والجيزة والقليوبية ودمياط".

مادة ٣: تجمع البيانات اللازمة لهذه الدراسة طبقا للاستمارة المعدة لهذا الغرض والمعتمدة من الجهاز المركزي للتعبئة العامة والإحصاء وعدد صفحاتها صفحة واحدة وترجمتها للغة الإنجليزية.

مادة ٤: تقوم وزارة التضامن الإجتماعي وتحت اشراف ادارة الامن بها- بتيسير إجراء الدراسة الميدانية - على أن تقوم الوزارة بتحديد الجمعيات ومراكز التأهيل محل الدراسة - مع مراعاة الضوابط الخاصة بتقييم درجة سرية البيانات والمعلومات المتداولة مسبقا بمعرفة كل جهة طبقا لما جاء بخطة الأمن بها.

مادة ٥: يراعى موافقة مفردات العينة - مع مراعاة سرية البيانات الفردية طبقا لإحكام القانون رقم (٣٥) لسنة ١٩٦٠ والمعدل بالقانون رقم ٢٨ لسنة ١٩٨٢ وعدم استخدام البيانات التي يتم جمعها لأغراض أخرى غير أغراض هذه الدراسة.

مادة ٦: يجري العمل الميداني خلال خمسة أشهر من تاريخ صدور هذا القرار.

مادة ٧: يوافي الجهاز المركزي للتعبئة العامة والإحصاء بنسخة من النتائج النهائية لهذه الدراسة.

مادة ٨: ينفذ هذا القرار من تاريخ صدوره.

صدر في: ٢٠١٥/٥/١٢.

أحمد عطية محمد  
مدير عام الإدارة العامة للأمن





# CONVENTION on the RIGHTS of PERSONS with DISABILITIES

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## Convention on the Rights of Persons with Disabilities

### Preamble

The States Parties to the present Convention,

- a. Recalling the principles proclaimed in the Charter of the United Nations which recognize the inherent dignity and worth and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world,
- b. Recognizing that the United Nations, in the Universal Declaration of Human Rights and in the International Covenants on Human Rights, has proclaimed and agreed that everyone is entitled to all the rights and freedoms set forth therein, without distinction of any kind,
- c. Reaffirming the universality, indivisibility, interdependence and interrelatedness of all human rights and fundamental freedoms and the need for persons with disabilities to be guaranteed their full enjoyment without discrimination,
- d. Recalling the International Covenant on Economic, Social and Cultural Rights, the International Covenant on Civil and Political Rights, the International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Elimination of All Forms of Discrimination against Women, the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, the Convention on the Rights of the Child, and the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families,
- e. Recognizing that disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others,
- f. Recognizing the importance of the principles and policy guidelines contained in the World Programme of Action concerning Disabled Persons and in the Standard Rules on the Equalization of Opportunities for Persons with Disabilities in influencing the promotion, formulation and evaluation of the policies, plans, programmes and actions at the national, regional and international levels to further equalize opportunities for persons with disabilities,
- g. Emphasizing the importance of mainstreaming disability issues as an integral part of relevant strategies of sustainable development,
- h. Recognizing also that discrimination against any person on the basis of disability is a violation of the inherent dignity and worth of the human person,
- i. Recognizing further the diversity of persons with disabilities,
- j. Recognizing the need to promote and protect the human rights of all persons with disabilities, including those who require more intensive support,
- k. Concerned that, despite these various instruments and undertakings, persons with disabilities continue to face barriers in their participation as

- equal members of society and violations of their human rights in all parts of the world,
- I. Recognizing the importance of international cooperation for improving the living conditions of persons with disabilities in every country, particularly in developing countries,
  - m. Recognizing the valued existing and potential contributions made by persons with disabilities to the overall well-being and diversity of their communities, and that the promotion of the full enjoyment by persons with disabilities of their human rights and fundamental freedoms and of full participation by persons with disabilities will result in their enhanced sense of belonging and in significant advances in the human, social and economic development of society and the eradication of poverty,
  - n. Recognizing the importance for persons with disabilities of their individual autonomy and independence, including the freedom to make their own choices,
  - o. Considering that persons with disabilities should have the opportunity to be actively involved in decision-making processes about policies and programmes, including those directly concerning them,
  - p. Concerned about the difficult conditions faced by persons with disabilities who are subject to multiple or aggravated forms of discrimination on the basis of race, colour, sex, language, religion, political or other opinion, national, ethnic, indigenous or social origin, property, birth, age or other status,
  - q. Recognizing that women and girls with disabilities are often at greater risk, both within and outside the home of violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation,
  - r. Recognizing that children with disabilities should have full enjoyment of all human rights and fundamental freedoms on an equal basis with other children, and recalling obligations to that end undertaken by States Parties to the Convention on the Rights of the Child,
  - s. Emphasizing the need to incorporate a gender perspective in all efforts to promote the full enjoyment of human rights and fundamental freedoms by persons with disabilities,
  - t. Highlighting the fact that the majority of persons with disabilities live in conditions of poverty, and in this regard recognizing the critical need to address the negative impact of poverty on persons with disabilities,
  - u. Bearing in mind that conditions of peace and security based on full respect for the purposes and principles contained in the Charter of the United Nations and observance of applicable human rights instruments are indispensable for the full protection of persons with disabilities, in particular during armed conflicts and foreign occupation,
  - v. Recognizing the importance of accessibility to the physical, social, economic and cultural environment, to health and education and to information and communication, in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms,
  - w. Realizing that the individual, having duties to other individuals and to the community to which he or she belongs, is under a responsibility to strive for the promotion and observance of the rights recognized in the International Bill of Human Rights,
  - x. Convinced that the family is the natural and fundamental group unit of society and is entitled to protection by society and the State, and that persons with disabilities and their family members should receive the necessary protection and assistance to enable families to contribute towards the full and equal enjoyment of the rights of persons with disabilities,
  - y. Convinced that a comprehensive and integral international convention to promote and protect the rights and dignity of persons with disabilities will make a significant contribution to redressing the profound social disadvantage of persons with disabilities and promote their participation in the civil, political, economic, social and cultural spheres with equal opportunities, in both developing and developed countries,



Have agreed as follows:


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## Article 1 - Purpose

The purpose of the present Convention is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity.

Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.

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## Article 2 - Definitions

For the purposes of the present Convention:

- "Communication" includes languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communication technology;
- "Language" includes spoken and signed languages and other forms of non spoken languages;
- "Discrimination on the basis of disability" means any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation;
- "Reasonable accommodation" means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms;
- "Universal design" means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

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## Article 3 - General principles

The principles of the present Convention shall be:

- a. Respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons;
- b. Non-discrimination;
- c. Full and effective participation and inclusion in society;
- d. Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity;
- e. Equality of opportunity;
- f. Accessibility;
- g. Equality between men and women;
- h. Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities.

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## Article 4 - General obligations

1. States Parties undertake to ensure and promote the full realization of all human rights and fundamental freedoms for all persons with disabilities without discrimination of any kind on the basis of disability. To this end, States Parties undertake:

- a. To adopt all appropriate legislative, administrative and other measures for the implementation of the rights recognized in the present Convention;
- b. To take all appropriate measures, including legislation, to modify or abolish existing laws, regulations, customs and practices that constitute discrimination against persons with disabilities;
- c. To take into account the protection and promotion of the human rights of persons with disabilities in all policies and programmes;
- d. To refrain from engaging in any act or practice that is inconsistent with the present Convention and to ensure that public authorities and institutions act in conformity with the present Convention;
- e. To take all appropriate measures to eliminate discrimination on the basis of disability by any person, organization or private enterprise;
- f. To undertake or promote research and development of universally designed goods, services, equipment and facilities, as defined in article 2 of the present Convention, which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities, to promote their availability and use, and to promote universal design in the development of standards and guidelines;
- g. To undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost;
- h. To provide accessible information to persons with disabilities about mobility aids, devices and assistive technologies, including new technologies, as well as other forms of assistance, support services and facilities;
- i. To promote the training of professionals and staff working with persons with disabilities in the rights recognized in this Convention so as to better provide the assistance and services guaranteed by those rights.

2. With regard to economic, social and cultural rights, each State Party undertakes to take measures to the maximum of its available resources and, where needed, within the framework of international cooperation, with a view to achieving progressively the full realization of these rights, without prejudice to those obligations contained in the present Convention that are

immediately applicable according to international law.

3. In the development and implementation of legislation and policies to implement the present Convention, and in other decision-making processes concerning issues relating to persons with disabilities, States Parties shall closely consult with and actively involve persons with disabilities, including children with disabilities, through their representative organizations.

4. Nothing in the present Convention shall affect any provisions which are more conducive to the realization of the rights of persons with disabilities and which may be contained in the law of a State Party or international law in force for that State. There shall be no restriction upon or derogation from any of the human rights and fundamental freedoms recognized or existing in any State Party to the present Convention pursuant to law, conventions, regulation or custom on the pretext that the present Convention does not recognize such rights or freedoms or that it recognizes them to a lesser extent.

5. The provisions of the present Convention shall extend to all parts of federal states without any limitations or exceptions.

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## **Article 5 - Equality and non-discrimination**

1. States Parties recognize that all persons are equal before and under the law and are entitled without any discrimination to the equal protection and equal benefit of the law.

2. States Parties shall prohibit all discrimination on the basis of disability and guarantee to persons with disabilities equal and effective legal protection against discrimination on all grounds.

3. In order to promote equality and eliminate discrimination, States Parties shall take all appropriate steps to ensure that reasonable accommodation is provided.

4. Specific measures which are necessary to accelerate or achieve de facto equality of persons with disabilities shall not be considered discrimination under the terms of the present Convention.

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## **Article 6 - Women with disabilities**

1. States Parties recognize that women and girls with disabilities are subject to multiple discrimination, and in this regard shall take measures to ensure the full and equal enjoyment by them of all human rights and fundamental freedoms.

2. States Parties shall take all appropriate measures to ensure the full development, advancement and empowerment of women, for the purpose of guaranteeing them the exercise and enjoyment of the human rights and fundamental freedoms set out in the present Convention.

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## Article 7 - Children with disabilities

1. States Parties shall take all necessary measures to ensure the full enjoyment by children with disabilities of all human rights and fundamental freedoms on an equal basis with other children.
2. In all actions concerning children with disabilities, the best interests of the child shall be a primary consideration.
3. States Parties shall ensure that children with disabilities have the right to express their views freely on all matters affecting them, their views being given due weight in accordance with their age and maturity, on an equal basis with other children, and to be provided with disability and age-appropriate assistance to realize that right.

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## Article 8 - Awareness-raising

1. States Parties undertake to adopt immediate, effective and appropriate measures:
  - a. To raise awareness throughout society, including at the family level, regarding persons with disabilities, and to foster respect for the rights and dignity of persons with disabilities;
  - b. To combat stereotypes, prejudices and harmful practices relating to persons with disabilities, including those based on sex and age, in all areas of life;
  - c. To promote awareness of the capabilities and contributions of persons with disabilities.

Measures to this end include:

- a. Initiating and maintaining effective public awareness campaigns designed:
  - i. To nurture receptiveness to the rights of persons with disabilities;
  - ii. To promote positive perceptions and greater social awareness towards persons with disabilities;
  - iii. To promote recognition of the skills, merits and abilities of persons with disabilities, and of their contributions to the workplace and the labour market;
- b. Fostering at all levels of the education system, including in all children from an early age, an attitude of respect for the rights of persons with disabilities;
- c. Encouraging all organs of the media to portray persons with disabilities in a manner consistent with the purpose of the present Convention;
- d. Promoting awareness-training programmes regarding persons with disabilities and the rights of persons with disabilities.

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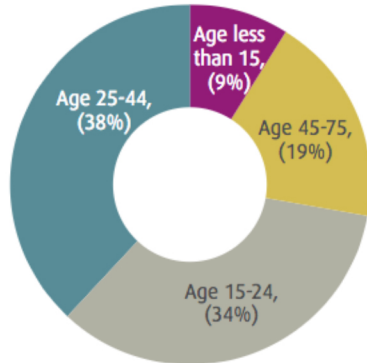
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## Article 9 - Accessibility

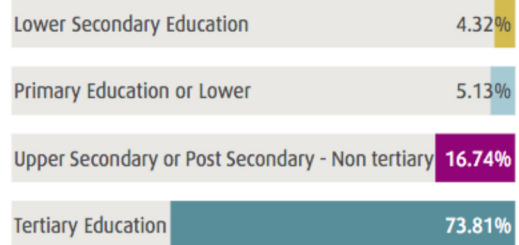
1. To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to

## Internet Users' Demographics

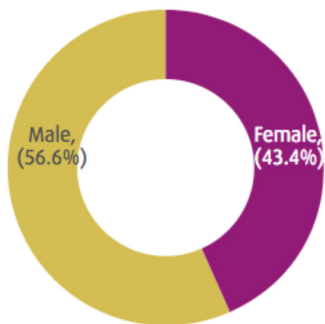
**Figure 2.1.5**  
Internet Users by Age Group (2013)



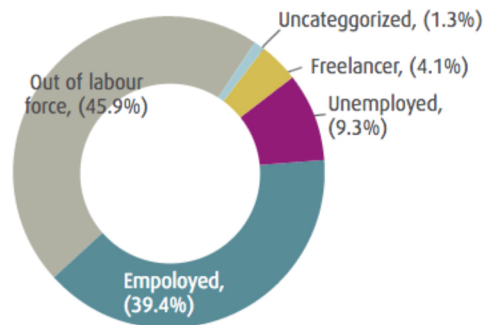
**Figure 2.1.6**  
Internet Users by Education Level (2013)



**Figure 2.1.7**  
Internet Users by Gender (2013)



**Figure 2.1.8**  
Internet Users by Employment Status (2013)



### Internet Users Demographic Profile (2013):

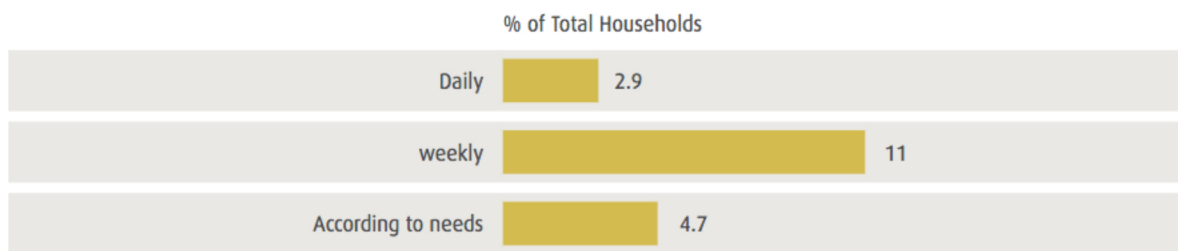
- 56.6% of the internet users are males
- 38% of the users are between 25 and 44 years old
- More than 73% of the internet users are tertiary students, which include university students and post graduate students
- 45.9% of Internet users are out of labor force, as they include students, housewives, retired and military servants, while the employed users represent 39.4% of the total internet users.

## 4.2 Social Media

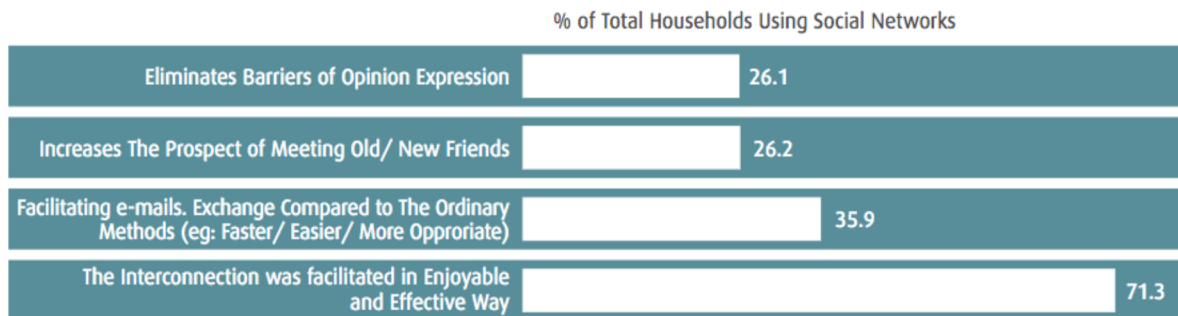
In 2013, 11% of the total Egyptian households used Social Networks (such as facebook, twitter, link...) on weekly bases, while almost 3% of them used it on daily bases.



**Figure 4.2.1**  
Frequency of Households Using Social Networks (2013)

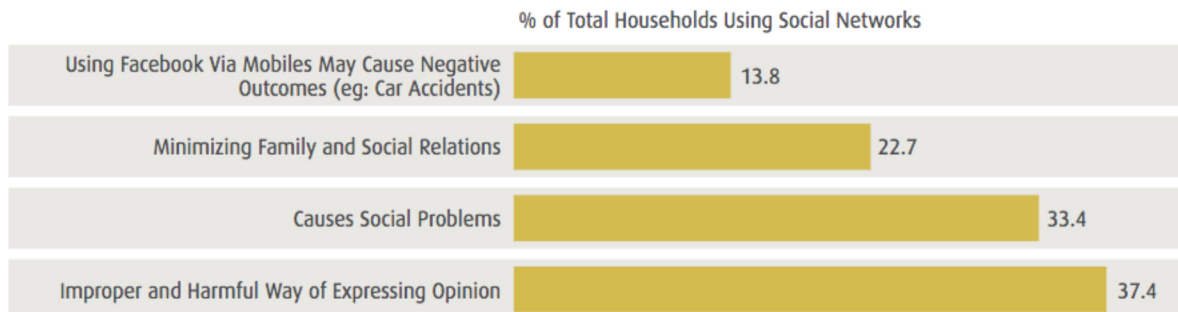


**Figure 4.2.2**  
Positive Impacts of using Social Networks (2013)



\*Multiple answers are allowed

**Figure 4.2.3**  
Negative Impacts of using Social Networks (2013)



\*Multiple answers are allowed

Using Social Network arouses great debate about its impact on people whether positive or negative. In 2013, 71.3% of the households using social networks claimed that social network has a positive impact on their lives through facilitating interconnection in an enjoyable and effective way. On the other hand, 37.4% of the households using social network claimed that social network affected their lives negatively due to the improper and harmful way of expressing opinion.

APPENDIX I: A list of Available organizations and NGOs in Egypt

قاعدة بيانات

القاهرة: جمعيات ومراكز

م	اسم الجمعية	العنوان	التليفون	الفاكس
٠١	المركز النموذجي لرعاية وتوجيه المكفوفين	١٨٤ ش جسر السويس	٢٦٩٩٤٠٩٧ ٢٦٣٣٢٣٢١	٢٦٣٣٥٧١٨
٠٢	مؤسسة الطيبى لذوى الاحتياجات الخاصة (المنى سابقا)	فيلا ٤ ش صبرى شريف - بجوار جامع بلال جسر السويس	٠١٠١٩١٤٨٠٨	٢٤٩٥٣٠٦٧
٠٣	مؤسسة التنقيف الفكرى	٢٦ ش نجيب شكور - بجوار أستوديو جلال - مصر والسودان - حدائق القبة	٢٤٨٢٠٨٠٣	
٠٤	مركز دار الهناء للفئات الخاصة - بطيء التعلم	١٣٠ ش مصر والسودان - محطة الجراج - حدائق القبة	٢٦٨٥٩٠١٤ ٢٦٨٣٣٢٦٨ ٠١٠١٣٤٣٨٨٣	٢٤٠٣٦٦٣٥
٠٥	مؤسسة بسمة الحياة	٩ ش الأجهوري - مصر والسودان - محطة التعاون - حدائق القبة	٢٤٨٦٣٩٦٧ ٠١٢٢٧٤٤٣٩٧	
٠٦	مركز النور للعلاج الطبيعى	٧٩ ش مصر والسودان - حدائق القبة	٢٤٨٣٥٤٩٦	
٠٧	مؤسسة التنقيف الفكرى للفتيات	المساكن الاقتصادية - مبنى الشئون الاجتماعية أمام بلوك - ١٢ حلوان	٢٥٥٦٠٤٠٨	
٠٨	جمعية الرعاية المتكاملة	بلوك - ٤٥ مدخل ١ مساكن عين حلوان - بجوار جامعة حلوان	٢٥٥٤٧٦١٥ ٢٤١٧٢٠٨٤ ٠١٢٣٨٠٢٢٠٩	٢٤١٧١٧٨٧
٠٩	جمعية تنمية المجتمع المحلى	مساكن غرب حلوان - مجمع الخدمات - خلف مبنى الإسعاف - حلوان	٢٥٥٨٢١٥٧	
٠١٠	جمعية المبرات الإسلامية	١٧ ش شريف أمام محكمة حلوان الابتدائية حلوان	٢٥٥٦٢٢٨٨	٢٥٥٥٠٧٥٥
٠١١	جمعية المعصرة البحرية لتنمية المجتمعات	٥٩ ش عبد العزيز الحكيم - مسجد حراس - المعصرة حلوان	٢٣٦٩٨٢٦٣	
٠١٢	جمعية الرعاية الصحية والاجتماعية	٥٠ ش المراغى - بجوار جامع المراغى حلوان	٢٥٥٦١٥١٩	
٠١٣	مركز التدخل المبكر بحلوان	٦ شارع ١٨ متفرع من ش عبد الرحمن - مدينة الموظفين أمام صهريج المياه	٢٧٦٤٤٠٠١ ٢٧٦٤٤٠٠٢	٢٥٥٨١٤١٨ ٢٥٥٨١٤٣٧

	٢٥٥٨١٤١٨	- حلوان		
٢٥٥٥٢٢.٣	٢٥٥٥٩٦.٢ ٢٥٥٥٧٨٩٤ ٢٥٥٥٢٥٨٤	١٦ ش عبد الرحمن متفرع من ش يوسف حلوان	دار الطفولة بحلوان	.١٤
٢٣٧٣٧٥٢٢	٢٣٧٣٧٥٢٢ ٠١٠١٧٧٦٨٤٦	ش ترعة الخشاب- محطة المعصرة حلوان	أسرة البركة (دير الأنبا برسوم العريان)	.١٥
	٢٥٧٥.٣.٢	٣٢ ش رمسيس - الجلاء - أمام محطة أحمد عرابي - رمسيس	جمعية رعاية الأمهات والأطفال	.١٦
	٢٦٣٧٥٧٦٩ ٠١٠١٥٢٤٧٤٧	١٤ ش لطفي السيد - غمرة - رمسيس	جمعية نور الشمس	.١٧
	٢٤٢٤٤٤٣٠	داير الناحية - الزاوية الحمراء	مشروع التأهيل المرتكز على المجتمع بالزاوية الحمراء	.١٨
	٤٢٧٢٧٦٦ ٠١٠١٨٥٩٨٤٨ ٠١٠١٥٤٩٩٢٢	١ ش محمد خالد - محطة الحزب الوطني - الزاوية الحمراء	جمعية وحدة الزاوية الحمراء السكنية	.١٩
٢٦٣٧٠.٠٦٢	٢٦٣٤١١.٢	٣ش متحف المطرية - مساكن حلمية الزيتون	جمعية التنمية الفكرية	.٢٠
	٢٤٥٤٧٨٦٢	١٧ش العزيز بالله- أمام مسجد العزيز بالله - الزيتون	جمعية زهرة المدائن الخيرية	.٢١
	٢٦٣٤٩١٥١ ٠١٢٣٨٣٥.٩٩	٣ش أبو السنون متفرع من طومان باي - الزيتون	مركز بسملة البدر	.٢٢
٢٤٥٣٤٦.٢	٢٤٥٠.٨٢٧٤ ٢٤٥٣٤٦.٢	٥ ش توفيق خليل متفرع من ش سنان - الزيتون	مركز رعاية الأطفال ذوى الاحتياجات الخاصة	.٢٣
٢٢٥٦٥٣١٢ ٢٣٦٥.٤٢٩	٢٢٥٦٥٦١٣ ٢٢٥٧٤٦٥٣ ٢٣٦٤٢٨٣٠ ٢٣٦٤٣١٦١	٣ ش أبو الريش - مساكن أبو الريش - السيدة زينب	مؤسسة يوم المستشفيات - جمعية الفن الخاص (AHED)	.٢٤
٢٥٢٦٦٦٣١	٠١٢٥٤٤٨٣.٢		المجلس القومي للطفولة والأمومة / أسامة حسين	.٢٥
	٢٢٣٦٩٢٧٩	ش أحمد حلمي خلف مدرسة محمد فريد شبرا	مكتب التأهيل الاجتماعي بالساحل	.٢٦
	٢٥٧٤٦٨٥.٠	٢٣ش البعثة مدرسة سان بول - شبرا	جمعية الأمل المشرق	.٢٧



٢٢٠٥٥٧٤١	٢٠ ش المتنزّه رقم ٢- خلف محطة مترو سانت تريز - شبرا	مؤسسة الصرخة للصم والبكم وضعاف السمع وذوى الاحتياجات الخاصة	٢٨.	
٢٥٧٧٠٦٣٥	ش علي أمين عبده (فؤاد سابقاً) شبرا	جمعية التقوى الخيرية	٢٩.	
٢٤٥٩٥٤٧١	١٢٥ ش أبو الفرج من ش روض الفرج - شبرا	جمعية منبر الإسلام	٣٠.	
٢٢٠٢١٥٨٨	ش البراد بجوار مسجد الخازندارة - شبرا	جمعية النشاط النسائي	٣١.	
٢٥٧٤٦٨٥٠	٢٣ ش البعثة متفرع من ش شبرا	مركز التأهيل المهني سيتي شبرا	٣٢.	
٢٢٣١٩٥٣٣	٢٨ ش قبة الهواء متفرع من ش شيكلاني - شبرا	مركز القديس لوقا الطبي	٣٣.	
٢٤٥٩٠٧٢٣	٥ ش رفعت متفرع من ش بديع روض الفرج - شبرا	مركز سمعان للعلاج الطبيعي	٣٤.	
٢٤٥٩٥٦٣٦	٢٣ ش كنيسة العذراء متفرع من الكركي - روض الفرج شبرا	مركز التخاطب وعلاج الكلام وعيوب النطق	٣٥.	
٢٤٣١٠٩٩٢ ٠١٢٧٨٨٤٦٩٢	٢٠ ش نجيب المهندس - الحافظية - شبرا	مركز بستان الملائكة (كنيسة نهضة القداية)	٣٦.	
٢٣٥٤٨٩٠	ش مهمشة - الشرايبة	مركز أم النور لذوى الاحتياجات الخاصة	٣٧.	
٢٥٩٠١٥٨٣	٧ ش القبيسي خلف مستشفى القبطي الظاهر	نادى الجزويت للمعاقين عقلياً	٣٨.	
٢٥٩٠٣١٣٨	٢٥٩٠٥١٤٨ ٢٥٩٠٨٣٩١	ش السبع - داخل مدرسة دي لاسال الفريز - الظاهر	كاريتاس "مركز سيتي" للتدريس والدراسات فى الإعاقة	٣٩.
	فيلا ٣٨ ، بالقرب من المستشفى التخصصي - المجاورة رقم ٥ - العاشر من رمضان	مؤسسة الوليد لذوى الاحتياجات الخاصة / أحمد إبراهيم	٤٠.	
٠١٥٣٦٤٤٥٣ ٠١٥٣٦٧٩٦٥	المنطقة الصناعية - أمام النساجون الشرقيون - العاشر من رمضان	مركز ماضي أبو العزائم للحالات الخاصة	٤١.	
٢٤٨٢٣٨٢٧	٣٦٥ ش رمسيس بجوار كلية التربية النوعية - أمام مستشفى الدمرداش - العباسية	جمعية آباء وأبناء رئيس مجلس الإدارة د/ حسن عباس ذكى	٤٢.	
	داخل مستشفى الصحة النفسية بالعباسية - طريق صلاح سالم - بجوار سوق القاهرة الدولي - العباسية	جمعية أصدقاء مرضى الصرع	٤٣.	

٢٤٩٨٦٢٨١	٢٤٩١١٤٣٠	١١٢ ش عين شمس ، أمام مساكن عثمان - عزبة النخل	جمعية حبات القلوب	.٤٤
	٢٤٤٠٤٥٥٣	كنيسة السيدة العذراء بزرابب عزبة النخل	مركز البابا كيرلس لذوى الاحتياجات الخاصة	.٤٥
٢٤٤٠١٨٩٣	٢٤٤٠١٧٩٩ ٢٤٤٠١٣٠٨	ش البترول بعد حلواني سفير عزبة النخل	مركز بذور الأمل	.٤٦
	٧٩٥٥٢٣٤ ٧٩٥١١٧٣	٤٤ش القصر العيني بجوار دار الحكمة - القصر العيني	مركز شعلان للطب النفسي والعلاقات الإنسانية	.٤٧
	٥١٠٣٦٧٨ ٥٠٦٩١٩٠	١ ميدان صلاح الدين القلعة	جمعية مبرة مصطفى كامل	.٤٨
٣٩٥٨٣٥٦	٣٩٦٢١٨٩ ٢٩٥٨٣٥٦	٣٥ش محمد كريم - الحلمية الجديدة - القلعة	جمعية بسمة أمل لرعاية ذوى الاحتياجات الخاصة	.٤٩
	٢٥٥٢١١٣٧	مجاورة ١٥ بجوار السوق التجاري ١٥ مايو	جمعية التأهيل الاجتماعي بمدينة ١٥ مايو	.٥٠
	٢٨٧٧٥٦٢	٣ ش ياسين راغب - المنطقة الثامنة مدينة نصر	تيتا توتة (برايت فيوتشر سابقاً)	.٥١
٢٢٦٠١١٣٦	٢٢٧٤٨٣٧٢	١٥ ش مصطفى النحاس - مدينة نصر	دار الفردوس للأطفال المعاقين	.٥٢
	٢٢٦٢٠٤٢٨٤ ٠١٢٤٧١٣٢٤٣	٨ش هيئة الميناء - عمارات مصر للطيران - النهضة الجديدة مدينة نصر	مؤسسة الإرادة والإيمان لرعاية الفئات الخاصة	.٥٣
٢٢٧٤٦٩٠٩	٢٢٧٤٧٦٤٨ ٢٢٧٤٦٨٣٩ ٢٢٧٤٦٧٥٧	ش أحمد الزمر امتداد شارع ذاكر حسين - مدينة نصر	جمعية الوفاء والأمل	.٥٤
٢٢٧٣٧٨٥١	٠١٠١٠٣٠٧٦٩ ٠١٠٥٠٩٠٧٠٨	١٢ ش محمود غنيم متفرع من مكرم عبيد - المنطقة الثامنة - مدينة نصر	جمعية الأمل البراق لذوى الاحتياجات الخاصة (برايت هوب)	.٥٥
	٢٢٤٠١٧٨٩ ٢٦٧٠٢٥٦٢ ٠١٠١٥٨٩٠٤١	٣٥ ش محمد كريم أمام النادي الأهلي الحي الثامن مدينة نصر	مؤسسة آل عامر للتربية	.٥٦
٢٣٤٢١١٦١	- ٢٣٤٢٠٣٤٩ ٢٣٤٢١١٦١	٢٩ ش عمارات ايديال أمام نادى المقاولون العرب - مدينة نصر	جمعية ريجنسي لذوى الاحتياجات الخاصة	.٥٧
٢٦٧٠٩٤٥٧ ٢٦٧٠٩٤٥٦	٢٢٦٢٨٦٢٨	٤٥ ش الجاحظ خلف الحديقة الدولية الطيران - مدينة نصر	جمعية بر الأمان للإعاقة الذهنية	.٥٨

	٢٤٨٥٢٠٤٥ ٢٢٧١٨٩٩٨ ٠١٢٢١٣٣٥١٥	١٢ مشروع ٢٩ عمارة - حسن المأمون - مدينة نصر	ماريا هوم للاحتياجات الخاصة	.٥٩
	٠١٠٥٨٣١٣٩٤	٦٩ش مساكن الشروق بجوار نادى المهن الطبية خلف النادي الأهلي مدينة نصر	مركز قطرات الندى للفئات الخاصة	.٦٠
	٢٦١٧٠٧٩٨ ٢٦١٧٠٧٨٨ ٠١٢٣١١٠٣٦٨	ش طه حسين - الحى الرابع بجوار نقطة الشرطة الجديدة التجمع الخامس - مدينة نصر	الرعاية الدائمة (Ever Care)	.٦١
	٢٤٠٣٩٤٧٦	١٩ عمارات الياسمين خلف عمارات العبور خلف دار المشاة مدينة نصر	مركز معوقات الطفولة	.٦٢
٢٢٨١٢٠٦٠	٢٢٨١٢٠٧٥ ٢٢٨١٢٠١٢	أول طريق القاهرة بلبيس الصحراوي بجانب مدرسة الـ bbc - مدينة السلام	جمعية أصدقاء الغد المشرق	.٦٣
	٢٦٩٠١٦٥٨	٩ش أحمد فهيم بيومي (أمام مسرح التلفزيون) الكلية الحربية - مصر الجديدة	الجمعية التعاونية للخدمات الاجتماعية لذوى الاحتياجات الخاصة (مؤسسة بيتي)	.٦٤
	٢٦٤٢٢٤٩٩ ٢٦٣٦٠٧٧٧	٦ش عبد الرحمن رشدي متفرع من عبد العزيز فهمي سانت فاتيما - مصر الجديدة	جمعية دار الرعاية والتأهيل	.٦٥
٢٢٦٧١٧٢٩	٢٢٦٧١٧٢٩ ٢٢٦٦١٢٧١	٢٦١ش الحق فى الحياة - مساكن شيراتون النزهة الجديدة خلف سنترال شيراتون - مصر الجديدة	جمعية الحق فى الحياة للمعاقين ذهنيا رئيس مجلس الإدارة مدام / نانى إسماعيل صالح أ/ نادية العربي ٠١٠٥٧٠٩٠٨٥	.٦٦
٢٢٥٧٧٢٧٢	٢٢٥٧٧٢٧٢	١ ش حلب أمام الميريلاند - مصر الجديدة	جمعية أحباب الله	.٦٧
		١ش خليفة منصور - ميدان سفير - مصر الجديدة	جمعية الرعاية المبكرة للطفولة	.٦٨
	٢٤١٩٣٨٠٩	٨ ش الشهيد أحمد وصفى - ألماتة - مصر الجديدة	جمعية معاً للأبد	.٦٩
٢٦٢٢١٤٢٨ ٢٦٢٢١٤٣٤	٢٦٢٢١٤٢٧ ٢٦٢٢١٤٢٦ ٢٦٢٢١٤٢٥	مربع ١٣٣١ش د. أحمد زكي النزهة الجديدة - مصر الجديدة	الهيئة القبطية الإنجيلية للخدمات الاجتماعية CEOSS	.٧٠
	٢٢٦٦٤٧٩٢	١١ش مساكن الإسكان والتعمير منطقة	مركز الولاء والوفاء	.٧١

	٠١٠٥٨٣٩٩٤٧	٢ الشيراتون مصر الجديدة		
٢٢٦٨٣٧٠٨	٢٤١٤١٠١٢ ٢٢٦٨٣٧٠٨ ٠١٢٢١٤٦٠٣٦	٢٢ ش عمارات مصر للتعمير - المنطقة الأولى - مساكن شيراتون - مصر الجديدة	مركز المستقبل السعيد	.٧٢
	٢٦٢٢٤٧٧٦ ٠١٢٢٧٧٣٥٩٥	٨ امتداد ش د. أحمد مصطفى - مصر الجديدة	مركز القلب الفرحان	.٧٣
	٢٦٢٢٦٤٦٧	٣ ش إسماعيل غانم - محمد رفعت - النزهة الجديدة	مركز هاند إن هاند	.٧٤
٢٦٣٥٠٢٣٥	٢٦٣٥٧٩٩٨ ٢٢٤٠٣٦٠١	٣ش السيد محمد عيسى - بيومي نصار - مصر الجديدة	مازن لتنمية الفئات الخاصة	.٧٥
٢٦٤٤٧٣١٧	٢٦٤٤٧٣٠٤ ٢٦٤٤٧٣١٧	٤ ش النجمة - الشيخ علي محمود هيلوبوليس - مصر الجديدة	مركز تعليم وتنمية الطفل مؤسسة أبني ( CLD ) رئيس مجلس	.٧٦
	٠١٠٦٧١٦١٥٩	أ٣ ش عبد الرحمن رجب - ألف مسكن - ميدان الحجاز مصر الجديدة	مركز شروق الشمس	.٧٧
	٢٦٢٠٢٠٦٦ ٠١٠١٥١٤٢٢٥٥	٧ش مسجد الرحمن الرحيم - دخول من ش المدينة المنورة بعد شركة بتروجيت مصر الجديدة	مؤسسة أبارار مصر	.٧٨
	٢٣١٧٨٧٥٢ ٢٣٢١٨٠٦٠	٢ش الشارع الجديد البساتين مصر القديمة	جمعية مدينة الوحدة	.٧٩
	٢٧١٦٣٧٥١ ٢٧١٦٨٢٥٩	٨ حارة محمود أبو النجا الأسيوطي متفرعة من ش النجاج هضبة الزهراء مصر القديمة	جمعية هضبة الزهراء	.٨٠
٢٣١٧١٨٤٣	٢٣١٧٠٤٢٠	٦ش مؤسسة الطفل حي الشيخ مبارك أمام مدرسة التربية الفكرية مصر القديمة	المركز النموذجي لرعاية الفتيات ذوى الاحتياجات الخاصة	.٨١
٢٣٥٨٣٦٨٧	٢٣٨٠١٣٢٦ ٢٣٥٨٣٦٨٧ ٠١٢٢٣٠٤٦٩٥	٩٤ ش ١٠ المعادى القديمة	مؤسسة أنس الوجود	.٨٢
	٢٥١٩٩٢٦٢ ٢٣٥٢٦٤٠٢	٣٤ ب - نيركو الجديدة بجوار مدرسة الأورمان - المعادى	مركز أغصان الكرمة	.٨٣
٢٣٥٨٢٥٣٨	٢٣٥٩٦٨٢٢	٧٠ ش - ١٠ المعادى	دار القدس (تبع جامع الفتح)	.٨٤

	٦٣٤١١٠٢ ٦٣١١٤٠٢	٣٠ ش متحف المطرية - المطرية	مركز تدريب التنمية الفكرية بالمطرية	.٨٥
٢٥١٩٨٦٦٣	٢٥١٦٤٧٩٤ ٠١٢٤٧٨٥٤٩٢	شارع ٢٠٢ دجلة المعادي	جمعية تنمية المجتمع المحلي	.٨٦
	٢٧٠٠٦٤٤٦	كورنيش النيل - داخل كنيسة مارجرس بكتسكا - المعادي	مركز أغصان الكرمه للتأهيل المهني	.٨٧
	٢٥٠٨١٤٨٦	خلف مدرسة الشيخ جابر الصباح - الهضبة العليا - المقطم	دار أمنين	.٨٨
٢٣٦٨٩٠٤٢	٢٣٦٤٧٣١١ ٢٣٦٤٧٨٣٩	١٠/٨ متحف المنيل - الملك الصالح - المنيل	بلان انترناشيونال ايجيبت	.٨٩
٢٥٩١٣٤٦٦	٢٥٩١٦٩٣٣ ٢٥١٩٦٩٣٢	١١ش عماد الدين - وسط القاهرة	مركز الرجاء	.٩٠
	٣٧١٢٦٠٢٦	مركز طبى البوهى العام - المنيرة إمبابة	جمعية رعاية حقوق المعاقين	.٩١
	٣٣١١٨٣٧٨	١ش الطيار فكري زاهر - داخل معهد شلل الأطفال - إمبابة	جمعية رعاية مرضى شلل الأطفال والمعوقين حركياً	.٩٢
	٣٨٩١٠٥٧٤	٥ش المنيل أمام محطة كهرياء غرب القاهرة - إمبابة	جمعية أنقياء القلب	.٩٣
	٣٣١٠٨٣٧٨ ٣٣١١١٠٦١	٢٥ش ٢٥ متفرع من ش الوحدة - مدينة التحرير - إمبابة	جمعية حنين لتنمية المجتمع	.٩٤
	٣٧٦٠٨٤٠٧	١٨ش حسين كمال - الدقي	الجمعية العامة لأصدقاء الأيتام والمعاقين	.٩٥
	٣٧٦١٣٠٢٠ ٣٣٣٦٣٤٥٩	٨ش ينبع - الأنصار من مصدق - الدقي	الجمعية التعاونية لرعاية ذوى الاحتياجات الخاصة	.٩٦
٣٧٤٩٩٧٧٣	٣٣٣٧٢٩٩٥	١٧ش منى متفرع من ش الأنصار ش مصدق - الدقي	مركز الابن الخاص (جينيور) عزة ٠١٢٣٦٤٨٤٣٤	.٩٧
	٣٣٣٧٢٠٤٤ ٠١٠٥٢٨٩٢٢٦	٣ش الحسين من ش عمان - من محي الدين أبو العز - الدقي	مركز وندر لاند	.٩٨
	٣٧٦٠٠٩٣٨	٢٤ش عامر - الدقي	مركز الياسمين	.٩٩
٠١٢٣٠٤٣٤٦١ ٣٣٤٦١٧٨١	٣٣٤٦١٧٨١	١٠ش د. حجازي من ش الرشيد - أحمد عرابي - الصحفيين	مركز ستيب باى ستيب (براعم التحدي)	.١٠٠
٣٣٠٢٧٤٠٧	٣٣٠٣٢٦٨٢	٤ش ميدان الملكة زبيدة - أحمد عرابي	مركز تنمية الطفل (د. منى سند)	.١٠١

	٣٣٤٦٨٥٩٠	- الصحفيين		
٣٣٤٧١٣٥٣ ٣٣٠٣٦١٨٤	٣٣٤٦٧٨٩٠ ٣٣٤٦٧٩٥٩	الفالوجا - خلف مستشفى العجوزة	مركز الطب الطبيعي وعلاج الروماتيزم (وحدة الأطفال ذوى الاحتياجات الخاصة) القوات المسلحة	١٠٢
	٣٥٤٧٢٣٩٩ ٠١٢٣٣٥٨٩٣٧ ٠١٢٤٥٧٧٠٣٠	١٠ حارة ناصر من ش العهد الجديد - ش مستشفى الصدر - العمرانية	جمعية الأنبا أنطونيوس للخدمات الاجتماعية	١٠٣
	٥٦٣٥٠٩٠	ش كمال هويدى - خاتم المرسلين - العمرانية الغربية	الجمعية القبطية لذوى الاحتياجات الخاصة	١٠٤
	٧٢٠٩١٦٥	طريق كفر طهرمس - من ش فيصل أمام مستشفى روزاليوسف	جمعية شروق لذوى الاحتياجات الخاصة	١٠٥
٥٧١٠١٠٩	٥٧١٠١٠٩	١٢ش كمال حبشي متفرع من ش محمد موسى - فيصل	جمعية شمس البر	١٠٦
	٣٣٨٦٣٥٨٨	٢٢ش الملك فيصل - برج النور - محطة التعاون	جمعية أصدقاء التربية الخاصة	١٠٧
٣٧٨٣١٦٠٧	٣٧٨٣١٦٠٣ ٣٧٨٣١٦٠٢	ش الملك فيصل - الطالبة - بجوار مدارس الملكة للغات	مركز الأميرة الجميلة لرعاية الأطفال ذوى الاحتياجات الخاصة	١٠٨
٣٣٠٣١٨٠٦ ٣٣٨٣١١٨٥	٣٣٤٥٠٥٧١ ٣٣٤٥٠٥٧٢	١ش د. المحروقى من ش البطل أحمد عبد العزيز - المهندسين	دار الأورمان للأيتام والمعاقين	١٠٩
	٠١٠١١٦٠٠٤٣	٨ عمارات الفراغة متفرع نم ش الجزر نزلة البطران - الهرم بعد فندق سياج ٥٠٠ متر	الشمس المشرقة	١١٠
٧٤١٩٨٤٢	٧٤٢٠٣٦١	أول طريق الفيوم داخل مدارس مصر للغات - الهرم	جمعية الأسر المتألفة لرعاية المعاقين ذهنياً	١١١
	٥٨٦٥٥٦٨	٣٣٨ش الهرم - المقر الرئيسي أمام أخناتون مول - الهرم	دار الأورمان	١١٢
	٣٥٨٥٦٣٤٤ ٠١٢٢٨٢٢٢٣٥	٢ش مدرسة أم الأبطال الثانوية بنات بالطالبة - الهرم	مؤسسة متعددي الإعاقات (العاهات)	١١٣
	٠١٢٤٧٨٥٤٩٢	أول كوبرى صفت اللبن (الطريق الزراعي) الهرم	جمعية الزهراء النسائية	١١٤
	٣٧٤٠٠٨٢٦	١٣٥ج شارع - ٣ حدائق الأهرام -	مركز فال للعلاج الطبيعي ورعاية الأطفال	١١٥

	٣٧٤٠٠٨٦٧	الهرم	ذوى الاحتياجات الخاصة	
٢٣٣٠٢٦٣٣	٢٣٣٠٢٦٣٣	ش على سلام متفرع من ش الجمعية - أبو قتاتة - بولاق الدكرور	مؤسسة التنقيف الفكري والأحداث الضالين بالحيزة	.١١٦
	٥٤٠٣٠٥٤	٨ش الشهيد فكري متفرع من ترعة السواحل - وراق الحضر	مركز الرحمة لذوى الاحتياجات الخاصة	.١١٧
	٠١٢٧١٠٤٣١٩	الإسكان الصناعي بنويار - بجوار بنزيون - شبرا الخيمة	مركز التأهيل الشامل للمعوقين بشبرا الخيمة	.١١٨
	٤٣٢٧٠٥٧	السيد البابلي - طريق القناطر - عزبة رستم - باسوس - شبين القناطر	جمعية البركة للمعاقين ذهنياً	.١١٩
٢٧٩٢١٠٦٦	٢٧٩٢١٠٧٤ ٢٧٩٢١٠٦٢	٣ش مجلس الشعب - القصر العيني	إدارة الروماتيزم والتأهيل (وزارة الصحة)	.١٢٠
٢٤٠٢٣٦٣٦	٢٢٦٢٦٩٣٠	٣٠ شارع عمر زعفان - مدينة نصر - القاهرة	جمعية نداء	.١٢١
٢٤٩٣٥٠٦٧	٠١٠١٩١٤٨٠٨	فيلا ٤ ش صبرى شريف - بجوار جامع بلال - جسر السويس	مؤسسة الطبيي	.١٢٢
٢٦٨٢٧٢٠٢	٤٨٣٠٤١٩ ٤٨٢١٩٧٠	١٣ ش حنفي ناصف - حدائق القبة	السنابل للخدمات الاجتماعية	.١٢٣
٢٥٥٤٧٦١٥	٢٥٥٤٧٦١٥ ٠١٢٣٨٠٢٢٠٩	بلوك - ٤٥ مدخل ١ مساكن عين حلوان - بجوار جامعة حلوان	جمعية الرعاية المتكاملة	.١٢٤
	٢٥٢١٢٣٢١	٢٣ ش ٢٣٢ - دجلة - المعادى	مركز موف للشلل الدماغى	.١٢٥
٢٢٦٠١١٣٦	٢٢٦٠٣٥٥٤ ٢٢٦٠١١٣٦	٢٤ ش الخليفة الأمر - خلف الحديقة الدولية - مدينة نصر	مؤسسة السندس للأيتام ذوى الاحتياجات الخاصة	.١٢٦
	٢٢٦٣٠٧٩٣	٨ ش صلاح مجدي - أرض الجولف - مصر الجديدة	جمعية وادى النور	.١٢٧
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٢.	جمعية الرجاء	طنطا	٠٤٠٢٦٦٤٧٩٢	٠٤٠٣٣٠٣١٧٧
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#### الشرقية :

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**Chapter X**  
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