

## Learning Aid for Autistic Students

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**Abstract**—Autism and Autism spectrum disorders are terms which are commonly related to the disorders of the neurological development of the brain. The general characteristics of the people facing this disorder are difficulties in social interaction, verbal and non verbal communication, repetitive behaviors, lack of concentration, less attention span, decreased visual perception and hyperactivity. No two autistic children can be same. Each autistic patient has different characteristics. There is no specific cure for autism but there are measures which can help them to improve their way of living, such measures include certain therapies and medical interventions. But along with these, the autistic children are found to have a high aptitude and reception towards technology which include computers and computer related devices. So there is a need for such technology which can be useful for teaching these children certain things which they can learn while enjoying at the same time. This technology can be extremely useful in the treatment of autistic patients. So the basic idea of this project is to provide an integrated solution in the form of a software application which would act as a learning aid for the autistic students. The project would consist of several modules which would try to improvise on the several difficulties faced by the students. The project would be developed keeping in mind their temperament and their capabilities. It would be developed specifically for the children having autism and similar learning disorders and would focus on improving their social skills, special education, memory and cognition through several interactive sessions and games.

**Keywords**- Autism; Autism Spectrum Disorder; Learning Disability; Learning Aid; Software..

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### I. INTRODUCTION

Every person having autism is unique. Some of the individuals on the autism spectrum have extraordinary skills in visual abilities, music and academics. Many individuals pride themselves about viewing the world in their own fascinating ways. But there are some who have severe disability and cannot live independently. Almost 25 percent of the people having Autism spectrum disorder are verbally weak but are able to learn to communicate using other ways. The motto of this project is to improve the lives of those having Autism spectrum disorder. It is meant to address the considerable challenges in communication, education and cognition.

But before developing a solution for their problems it is first important to know their problems in detail. So some of the issues and challenges faced by the autistic individuals are as follows :

- Some of the problems are faced by them on a daily basis like difficulty in communication and socializing with other people.
- They may also feel frustrated due to the ignorance by other people and their prejudice against autism.
- They also show restricted and repetitive patterns of behaviors and interests.
- They also show some differences in specific cognitive skills like attention and concentration, Central Coherence, Intellectual Ability, Abstract Thinking and Memory.

So it is important that they be provided with interventions that can help them. These problems can be worked on and their impact can be reduced significantly.

Therefore, the proposed application includes modules that will help in improving all the problems faced by them described above. This paper is sectioned into four chapters.

The first being the introduction itself. The second chapter explains the related work. The third chapter explains the proposed system for the learning aid. The fourth chapter being the last chapter of this paper concludes the topic along with the references.

### II. RELATED WORK

There are several systems available which serve a similar purpose as the proposed project. But there are certain drawbacks each of them face. The existing systems are :

\*Educational Games for Kids :

It is an android based application which offers several games for teaching the kids things like alphabets, numbers, relationships, colours etc. The disadvantage of this system is that it may work fine for other kids but autistic students may find it a little difficult to cope up with.

\*Animal Memory :

It is a classical tile game which helps in improvising the memory of the kids. It uses cute and vibrant images of animals and also helps in recognition and matching for the kids.

\*Autism iHelp :

It is a teaching aid which proves helpful in vocabulary teaching and speech therapy. It is developed due to the need for specific language intervention tools for children with Autism Spectrum Disorder.

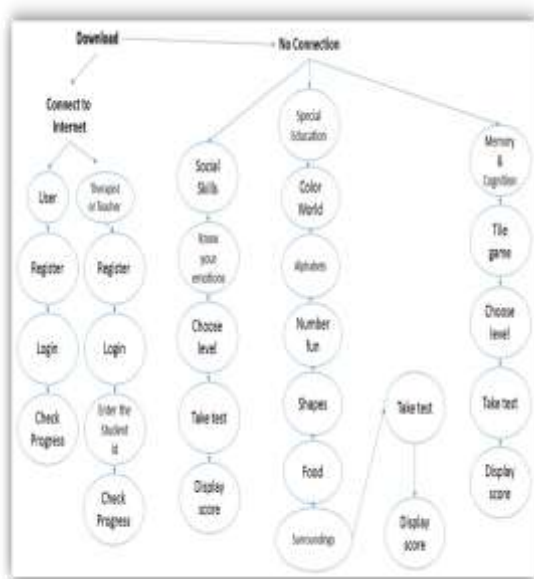
\*Touch Emotions :

It is an application which focuses on teaching about different kinds of human emotions through images and a voice over. The disadvantage of this system is that the voice over does not depict the emotion represented through the images accurately.

### III. PROPOSED SYSTEM

Learning Aid for Autistic Students is a software application that will make learning easy and fun for the kids. It is designed specifically for the autistic students, keeping in mind their requirements and needs. It is an integrated solution which would developed using java and mysql so it would be easy to use on any system. There will be three modules. The first module would concentrate on improving the social skills of the kids. This would include certain games that will help them recognize human emotions and thus clearing their confusion regarding human emotions which is a big hurdle in their communication mechanism. The second module would focus on improving their special education which would involve games that would teach them basics like alphabets, numbers, colors, fruits, vegetables, transport, etc. The third module would specially prioritize on improving their memory and cognition through various tile games. Also the user will have the facility to choose the lessons he wishes to take first and also to select the levels of difficulties for the tests which would be available for each module. There would also be provisions that would help the parents and teachers to tack the progress of their wards.

The flow of the system would be as shown in the fig(1) and the use case diagram as shown in the fig(2).



Fig(1) : Flow of System

The proposed system would try to overcome all the disadvantages and the limitations of the existing systems specified above. Thus it may be suitable for use by parents at home and also by the doctors and therapies in the treatments.

### IV. CONCLUSION

The project aims to develop most of the attributes of autistic children like speaking, reading, attention, listening, understanding and comprehension through various interactive modules. This project would prove useful for many autistic children making learning a fun activity for



Fig(2) : Use case diagram of Learning aid for Autistic students

them. Also it would help the teachers, therapists and the parents to keep a track of the child's progress in various fields through the integrated system. The system being a software application would easy to use and manage. Also it would not require any sort of external support and the use of internet would also not be compulsory for use of the system. Thus making it useful even for the people who have no access to the internet.

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### REFERENCES

- [1] Moutaz S. Saleh, Jihad M. Aljaam "Learning Games for Children with Intellectual Challenges", Qatar University Doha, Qatar, 2012.
- [2] Alja'am J., Jaoua A., Alhazbi S., Hassan M., and Elsaddik A.: "An Assistive Computerized System for Children with Moderate Intellectual and Learning Disabilities". In The IEEE Global Engineering Education Conference (EDUCON-2011) – "Learning Environments and Ecosystems in Engineering Education", Jordan, 2011.
- [3] Karime A., Hossain M., Rahman A., Alja'am J., Gueaieb W. and Elsaddik A.: "RFID-Based Interactive Multimedia System for the Children", In International Journal of Multimedia Tools and Applications, SPRINGER, (ISSN: 1380-7501, Print Version, Journal no.11042, DOI: 10.1007/s11042-011-0768-3), March , 2011.
- [4] Moutaz S. Saleh, Jihad M. Aljaam, "An Integrated e-Learning System for MID and MLD Children in Qatar", Doha, Qatar.
- [5] EGENFELDT-NIELSEN: Third Generation Educational Use of Computer Games. JI. of Educational Multimedia and Hypermedia, 16(3), pp. 263-281. 2007.
- [6] Baytak A. and Land S.: "A case study of educational game design by kids and for kids". Procedia Social and Behavioral Sciences 2 (5242-5246). 2010.