

## 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, Social Cause

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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 application includes modules that will help in improving all the problems faced by them described above. This paper is sectioned into five chapters. The first being the introduction itself. The second chapter explains the related work. The third chapter explains the methodology of the system for the learning aid while the fourth chapter explains its implementation. The fifth chapter being the last chapter of this paper concludes the topic along with the references.

### II. Related Work

There are very few integrated systems which specifically cater to the needs of autistic students. However there are some systems available which serve a similar purpose for other kids. 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.

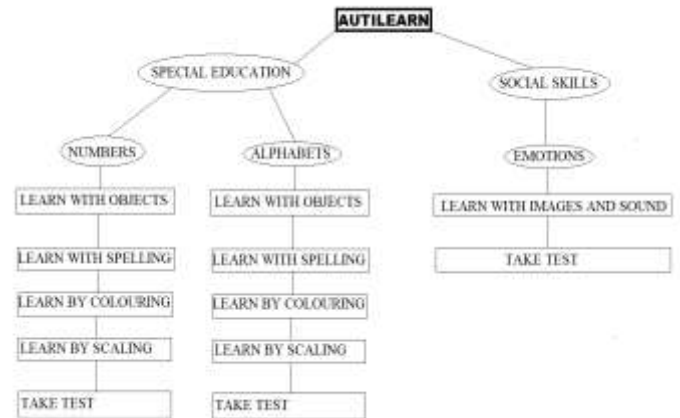
\*Touch Emotions : It is an application which focuses on teaching about different kinds of human emotions through images and a voice over. The disadvantage of this system is that the voice over does not depict the emotion represented through the images accurately.

### III. METHODOLOGY

AUTILEARN – A 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 is developed using java and so it would be easy to use on any system.

There are two modules. The first module concentrates on improving the social skills of the kids. This includes images and related audio that helps them recognize human emotions and thus clearing their confusion regarding human emotions which is a big hurdle in their communication mechanism. The second module focuses on improving their special education which would involve teaching them basics like alphabets and numbers. Also the user will have the facility to choose the lessons he wishes to take first and also to take tests are available for each module. There are special features include like teaching by scaling and colouring. These two activities are found to improve concentration and memory of the students.

Also the basic ideology used in the project is to make use of a clear background so that students don't get confused along with proper audios where needed and also to use objects which are used by them in their daily life so that they can easily relate to them. The flow of the system is as shown in the fig(1).



fig(1) : Flow of system

### IV. IMPLEMENTATION

The project is developed using java. Also use of colourful and attractive images is made. The implementation of the system is as shown in the figs(2) to (6)



fig(2) : Homescreen



fig(3) : Teaching Numbers



fig(4) : Teaching Alphabets



fig(5) : Teaching with Spelling



fig(6) : Test

In this system we have tried to overcome all the disadvantages and the limitations of the existing systems specified above. Also regular feedback was taken from the hospital for which the system was being designed. Thus it may be suitable for use by parents at home and also for the doctors and therapists in the treatments.

## V. 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 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 be 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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