

E- Learning for Autism Spectrum Disorder

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Abstract - Autism spectrum disorder (ASD) is a neurological and developmental disorder that manifests itself in early childhood and continues throughout a person's life. We must educate young children who have been diagnosed with ASD in their early infancy stages. These children do not respond naturally; they are always alone, so we must make them use the E-Learning program and make them inclusive in the classroom, assisting them in developing interests and interacting with everyone in social situations. As a result, we are developing an educational application that incorporates intra and interpersonal growth skills. We may keep track of their abilities and handle their uneven progress in specific areas this way. The proposed E-Learning application will assist parents and teachers in understanding the changes in an ASD child's behavior. Along with this, we will add Machine Learning methods (Categorization) such as Random ForestCART3 to simplify the E Learning application, and then we will visualize together on tableau and evaluate which child with ASD has higher grasping strength and sustainability to think. It is also changing in such a way that the complexity will increase as the ASD learner's knowledge of the cognitive process advances. This E-Learning program will play a significant role in transforming an ASD child's daily routine.

Key Words: ASD, Machine Learning Algorithms, Forest Cart3 Cognitive Process, Interpersonal Growth Skills.

1. INTRODUCTION

The most current global question in relation to the delivery of education to students with special learning needs was whether or not a full inclusion approach was effective. However, because it is already happening, that point is irrelevant, and the more pressing problem now is how educators, parents, and other professionals can coordinate to verify that it is conducted successfully. The full inclusion model assumes that all students are fully functioning and respected members of the school community, with the regular classroom teacher bearing main responsibility for education. This is a defensible worldview and a feasible model in most contexts. However, the barriers faced by students with Autism Spectrum Disorder necessitate an unprecedented level of assistance. When children with Autism Spectrum Disorder (ASD) ask for anything, they do

not answer and make no eye contact. They are self-absorbed and prefer to play alone rather than interact with other individuals who do not have ASD.

- Autism spectrum disorder. These youngsters do not battle with language; in fact, on cognitive measures, they tend to score in the average or above-average range. They do, however, have social problems and a restricted range of interests.

- Autistic Disorder. When most people hear the word "autism," they instantly think of this. It refers to issues with social connections, communication, and play among children under the age of three.

- A child's disorder. These children develop normally for at least two years before losing some or all of their speech and social skills.

- If a child exhibits certain autistic symptoms, such as impairments in social and communication skills, but does not fit into another category, your doctor may use this phrase.

Others investigated teachers' views on including pupils with special needs. What these studies seek to reveal is the same old NIMBY ism that was prominent in the early days of what was then dubbed "mainstreaming" or "integration." Another problem identified in that study is that teachers frequently report that they do not believe their principals provide them with appropriate assistance in making inclusion work.

The following are the key symptoms of Autism that have a negative impact on their life:

- Gesticulations
- Lack of Facial Expression
- Facial Manifestations
- Tone of Conversation
- Not going to look at or listening to other people
- Talking in a croon, bland, or artificial voice
- A small spectrum of interests or obsessive interest in certain issues

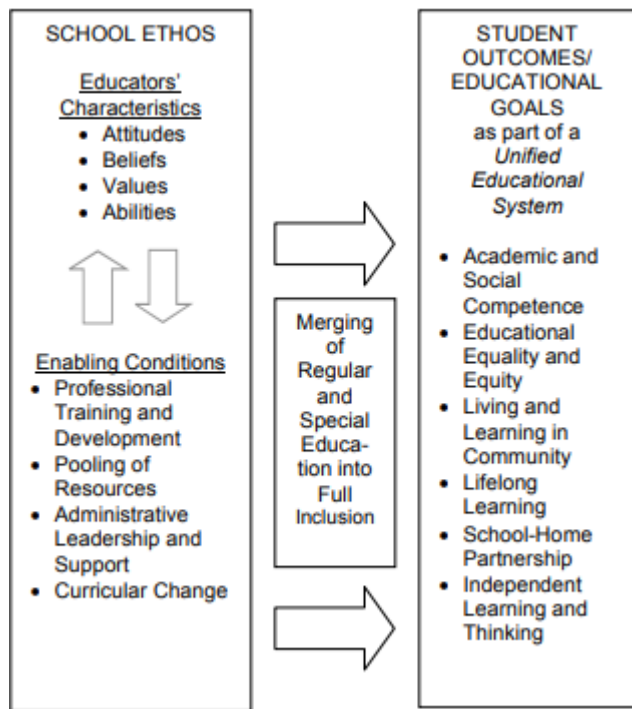
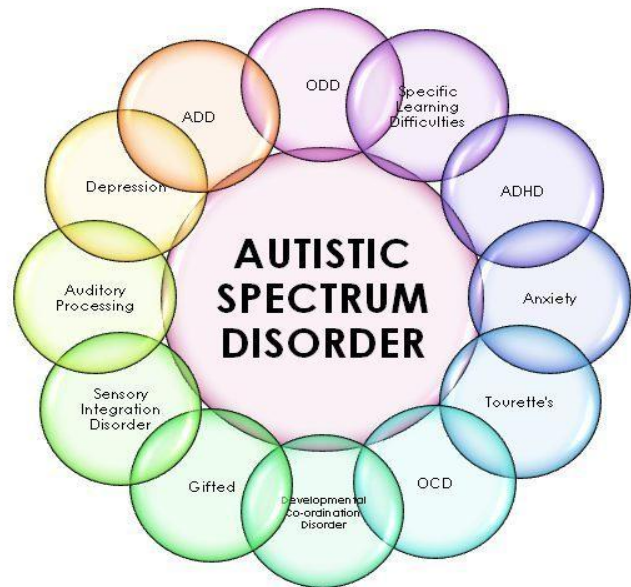


Figure 1 illustrates the factors that influence positive inclusive results.

Conventional guided e-learning systems follow a predictable curriculum with standard and uniform progressive levels of complexity. Because of the nature of the disease, this standard delivery method is inadequate for the early learner with ASD. As a necessary consequence, we propose a model that employs strategies, probabilistic analysis, machine learning, multidisciplinary knowledge representation, and other Artificial Intelligence techniques to provide the flexibility and complexity necessary to address all of the requirements and strengths of ASD learners.

1.1 Autism Epidemiology and Rate Statistical data:

- Autism Spectrum Disorder affects between 1 in 500 (2/1,000) and 1 in 166 (6/1,000) children (Centre for Disease Control). Prevalence rate: around 1 in 500, or 0.20 cent, or over 2,160,000 people in India.
- According to the disease control and prevention center, around 1 in 37 boys and 1 in 151 girls were diagnosed with Autism Spectrum Disorder in 2018.
- This data depicts that men are four times more likely than girls to be diagnosed with autism.
- Several toddlers are still diagnosed far beyond age of Four, regardless of the fact that autism can be reliably recognized as early as the age of two.



2. Methodology

It is evident that this degree of care is neither easy nor inexpensive to arrange, and in the few provinces where these services are financially supported by provincial or federal funding, the funding is usually cut off when the child reaches school age, as it is presumed that the public school system will provide these resources. In practice, the support provided by specialist's falls far short of what is recommended for a successful autism program, and teachers are still unable to meet the time commitments or provide the competence required to run these programs, forcing them to rely on minimally-trained special education assistants (SEAs) and parents to run and assist these initiatives.

2.1. Fundamental Prerequisites:

Data mining is a methodology for collecting insights from data that uses data analysis methodologies and algorithms.

Classification is a data mining approach in which data is clustered by different criteria and used to construct models for prediction. The model is trained and tested using training data, and then tested with unobserved testing data.

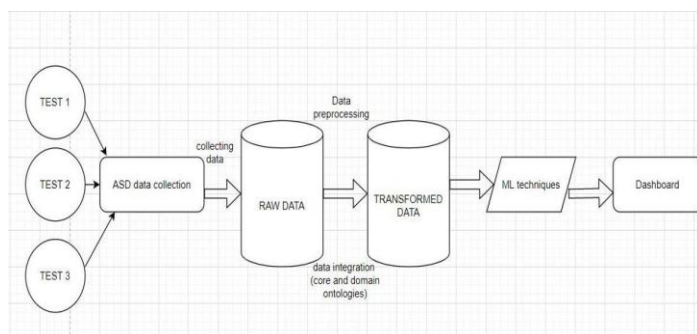
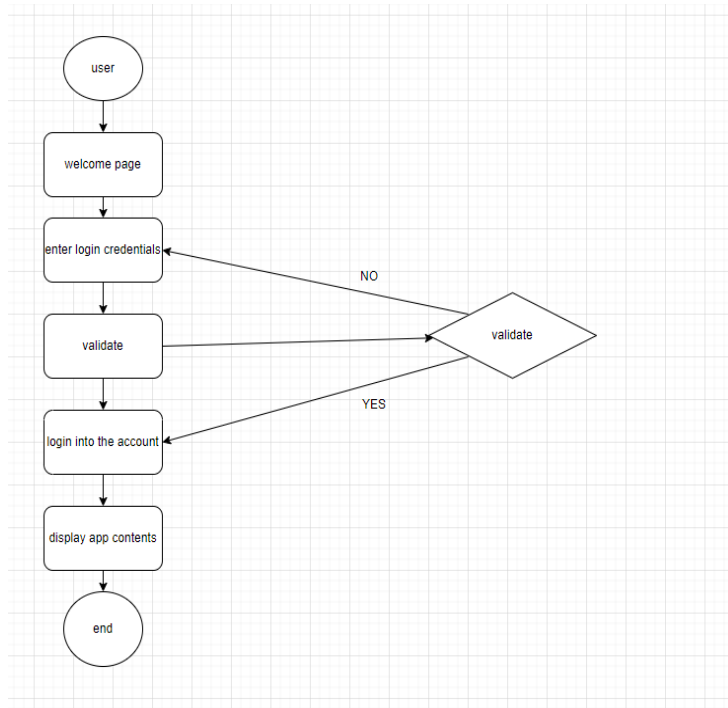
2.2. Data Synthetization:

First synthesize the information supplied by NGOs and institutions based on the children's learning and development and how the learner is functioning, and then we tested the data using machine learning algorithms and completed the entire synthetization fairly effortlessly.

2.3. Application:

Secondly, we developed a mobile application that is linked to the database and also has a login and registration dashboard, and also the activities of the Students with ASD and a planner in which we can schedule the activities, and this is how it will indeed be relevant to the ASD learners in the long run.

3. SYSEEM DIAGRAMS/FLOWCHARTS:



4. LIMITATIONS

The limitation would be that this app solely functions on Android devices; nevertheless, we are developing upon IOS devices and aim to offer it on the Playstore. Our future development for this application will include utilizing reinforcement learning and making the app more user-friendly for ASD individuals.

5. SUMMARY AND CONCLUSIONS

To this very day, it is undeniable that the conventional inclusive environment does not adequately meet the educational needs of students with ASD. In this research, we presented a new model for implementing an intelligent guided e-learning system within the education system, tailored specifically to cater the requirements of early learners with ASD as well as the needs of their support team. Educators, SEAs, interventionists, and guardians can use the system as a guidebook for one-on-one activities or as a self-directed personal teaching tool for the student. The abovementioned unique approach not only breaks new ground in educational discovery for ASD learners, but also does it in a way that makes sense to the child's learning and life. This erstwhile divide has historically impeded performance in 'inclusive' classrooms. It is argued that addressing the full kid within the model offered would advance learning for ASD children in more profound, resilient, and life-giving ways around the world.

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