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By

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Initial Project Proposal

Autism and Assistive Technologies

## Introduction

What is Autism Spectrum Disorder (ASD)?

ASD is a developmental disability, which interference with person’s skills in communication and interaction with others.  Autism can diminish person’s ability to learn and process the information.  Symptoms of autism can be seen from an early childhood but varies greatly from person to person. I have two friends with autistic child. Both vary in age and symptoms. One child is 14 years old and has severe autism since the birth. It is not hard to notice that the child has certain developmental issues just by looking at him. Other child is five years old and looks normal. His symptoms are very subtle and unless you spend quality time with him you will not notice his symptoms. Autism symptoms are behavioral like ignoring people, avoiding eye contact, getting agitated when routine is changed, or when physically touched. The list can go on and on for different categories of ASD.

There are many different treatments available to help autistic children with their behavioral and developmental issues. For this paper we are focusing on assistive technologies used for the treatment. It has been proved that using computer-assisted technology helps enhance children’s social skills, creativity and understanding of emotions. Our target is to explore state-of-the art assistive technologies to support autistic children and see how effective they are. We are also going to find out if these technologies differ with children with different levels of symptoms.

We are planning to create a questionnaire for both parents and teachers and include questions like: On the scale of one to five

·      while using the application does the child interact more?

·      how does his behavior look like while using the application?

·      is it different than what he/she would normally act like?

·      Do you see difference in children after starting using the application?

·      how satisfied are you with current applications used for children?

We will work on questions and narrow them down to get the helpful data set that we can analyze. In an interview we also wish to ask questions like “Is there a way to make lives better? How existing technology can be augmented to better support?” We will work on adding more questions.

We intend to perform an in-depth research on a representative population and analyze quantitatively and qualitatively. Currently our target population is students in one particular school, which is not enough. We will try and reach larger communities once we get in touch with local school. Our idea is to at least send questionnaire to more than one school and try to collect the data on the satisfaction rating for the technologies used.

## Research Methods

We are planning to explore existing technologies and their effect on children by visiting a local school for autistic children. We will prepare questionnaire for both therapists and parents and see how satisfied they are with the current technology and if they have any suggestions for the developers which they think can really make a difference. We also wish to perform semi-structured interviews with school authorities, therapists, doctors and if permitted with students too.

## Participant Recruitment

We are planning to take the data sample from a local school and we may select a random number of students each time. This will ensure the data is normally distributed and randomness is there. Also we plan to pick a sufficiently large sample to represent the whole population. We will try to collect the data from the institute about the progress of the students after they started using assistive technologies. We will not know the extent of our data collection unless we go and meet the school. We will start doing that in next few weeks and will be able to provide a better idea about our data set.

## Research Instruments

In our research we are planning to conduct a survey on students and parents with the same set of questions. We plan to do this so that it remains consistent and we can do further analysis on these responses. Initially we want to provide them with Likert scale questions and record their response. One sample survey might be of the form: <https://www.surveymonkey.com/create/survey/preview?sm=BtM05bme4MZa69wHFXp5yCc9OvDhb56ff7lpjLzcKVg_3D>.

This Likert scale survey has five scales and associated weights. Students, teachers and parents will take part in this survey.

In order to better understand the loopholes of existing system and required updates, we plan to conduct a comprehensive interview with parents, teachers and students. This interview will be face-to-face, semi-structured and will focus on how good the assistive technologies are according to them and how new ideas can be incorporated. We might divide the study phase into pre-use and post-use parts. During these parts of study the interviews will be held. We plan to divide the students into smaller chunks to make this easy. Also there will be group interviews to get a broader perspective. The interview questions are not determined yet.

## Data Analysis Plan

We plan to perform t-test, ANOVA analysis on the data. T-test will determine how much the data responses differ. But these tests are subject to adequate availability of data. If we can gather sufficient sample response data, which will represent the population, we can go ahead and use such statistical methods. We plan to code behavior of students to better understand the effect of the existing technology. The coding scheme is yet to be decided. If, in case, the analysis prove that the existing technology is not sufficient we can propose a better way to approach the issue. This involves a complete new design from the scratch or augmenting existing one.