Course: Human Computer Interaction
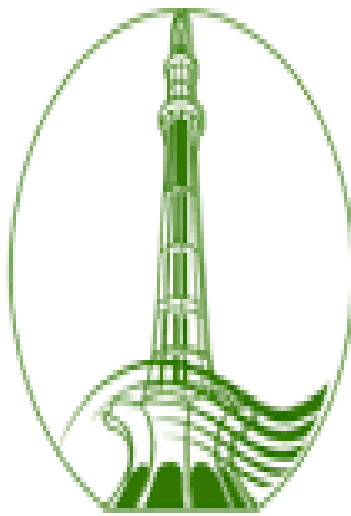
Project: Autism Spectral Disorder

Section: U

Semester: 5th

Hussnain Arshad (70110628)

Submitted To: Sir. MUJAHID RAFIQ

1.Introduction:

- o **Human Information (Your Project Human), Factors, Data**.

  Our Selected Human is **Autism** Patient.

  We all know that sharing your feelings and interests with others is a natural way of communicating. If someone doesn't do that, we call him anti-social. But this does not necessarily happen with every person. He may also have autism. Due to which he is having difficulty in communicating and maintaining relationships. In this we should not judge him by someone's style.

  Autism has remained a mystery for researchers, neurologists and psychiatrists for centuries. Although the cause of autism is still unknown, a number of strategies have been developed, that have saved so many lives all around the world. There are over 60 million people with autism across the world of which many Third World countries in Africa and Asia, including Pakistan, do not even have access to any public services. The situation is definitely alarming. In a country like Pakistan, where due to lack of financial resources, reasonable education remains a dream even for an average person, affording rehabilitation services to an autistic child is well nigh impossible.

  Age:

  We target the age starts from 7 years to 20 years

  Type:

  Autism is a neuro developmental disorder. And its broad terms are (**Autism Spectral Disorder**) ASD.

  When a complex genetic core and environmental changes start to alter brain development, it is called a neuro developmental disorder. It affects the normal functioning of the brain.

All these disorders come in neuro developmental disorders. And these are their names

- Attention deficit hyperactivity disorder
- Developmental coordination disorder
- Tic disorder
- Intellectual disorder
- Autism Spectrum disorder
- Specific learning disorder
- Child onset fluency disorder
- Speech sound disorder

In such a disease, the patient cannot speak properly and is very disturbed in social interaction. Restricted behavior is found in a person suffering from such a disease. There is nothing new in their interest. And some repetitive moves they keep doing over and over again. In the past, doctors diagnosed autism according to four different subtypes of the condition. However, healthcare professionals now classify autism spectrum disorder as one

broad category with three different levels to specify the degree of support an autistic person needs.

- Asperger's syndrome
- childhood disintegrative disorder
- pervasive developmental disorder-not otherwise specified

Symptoms With Reference

Social Communication and Interaction Skills	Restricted or Repetitive Behavior
➢ Avoids or does not keep eye contact ➢ Does not respond to name by 9 months of age ➢ Does not show facial expressions like happy, sad, angry, and surprised by 9 months of age ➢ Does not play simple interactive games like pat-a-cake by 12 months of age ➢ Uses few or no gestures by 12 months of age (for example, does not wave goodbye) ➢ Does not share interests with others by 15 months of age (for example, shows you an object that they like) ➢ Does not point to show you something interesting by 18 months of age ➢ Does not notice when others are hurt or upset by 24 months of age ➢ Does not notice other children and join them in play by 36 months of age ➢ Does not pretend to be something else, like a teacher or superhero, during play by 48 months of age ➢ Does not sing, dance, or act for you by 60 months of age ➢ Difficulty in building relationship with others ➢ Lack of sharing emotions and interest with others.	➢ Lines up toys or other objects and gets upset when order is changed ➢ Repeats words or phrases over and over (called echolalia) ➢ Plays with toys the same way every time ➢ Is focused on parts of objects (for example, wheels) ➢ Gets upset by minor changes ➢ Has obsessive interests ➢ Must follow certain routines ➢ Flaps hands, rocks body, or spins self in circles ➢ Has unusual reactions to the way things sound, smell, taste, look, or feel.

Others
➢ Delayed cognitive or learning skills
➢ Hyperactive, impulsive, and/or inattentive behavior
➢ Epilepsy or seizure disorder
➢ Unusual eating and sleeping habits
➢ Gastrointestinal issues (for example, constipation)
➢ Unusual mood or emotional reactions
➢ Anxiety, stress, or excessive worry
➢ Lack of fear or more fear than expected
➢ If the surrounding environment changes, then one has to face a lot of difficulty
➢ Difficulty in sleeping
➢ Delayed language skills
➢ Delayed movement skills

Overall Population in World

Approximately 1 in 59 youth are currently diagnosed with autism spectrum disorder (ASD), a neuro developmental disorder.

This disease is found all over the world. And its ratio is 4:1 which means 4 boys and 1 girl out of every 100 suffer from this disease.

Overall Population in Pakistan

Autism Spectrum Disorder: 1:120 kids

However, according to the estimates of the Pakistan Autism Society, about 350,000 children are suffering from ASD in Pakistan.

Computer Information

- **Computing Device**

Our computing device is smart mobile phone .

- **Reason**

We want to make a mobile application because in this era of technology everybody has smart phone. Via smart phone it is easy to learn because in the today world the manual treatment of autism is too expensive. It's harder to afford this treatment for every one.

- **Factors**

Your Problem

We want to treat autism disease children. Who can not talk and write the thing correctly due to mental disorder. They can't perceives the things right.

Proposed Solution

Our propose solution help autism patient to learn different learning exercise like writing ,reading ,color selection and traveling .

Benefits of your application

This is beneficial for autism person to learn many thing that use in daily lift like color selection, travelling subjects,

1.Project Research

App Surveys
Working: Ali Aftab

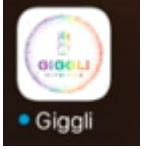| Name of Application	Rating	Downloads	Review	Platform	Cost	Features	Icon
Speech Blubs: Language Therapy	3+	1M+	7K	Android	Free	Speech Therapy for Kids!	
Otsimo	3+	100K+	No review yet!	Android	Free	1. Certified Educational Games for Learning Disabilities, Autism and Down Syndrome. 2. Otsimo Special Education enables the individuals to engage their motor and cognitive skills through assistive matching, drawing, choosing, ordering and sound games	
Autism ABC App- Special Educa	3+	10K+	No review yet!	Android	Free	Results: Our App is able to make your child achieve results, thanks to games and activities designed for this purpose. 1: Simplicity 2: Flexibility	
AutiSpark: Kids Autism Games	3+	100K+	570	Android	Free	AutiSpark is a one-of-a-kind educational app for children with Autism Spectrum Disorder with specially designed learning games and approved by experts. If you are struggling to teach basic concepts to your child, AutiSpark is a must-try for you.	

App	Age	Downloads	Reviews	Platform	Price	Description
Avaz AAC India	3+	50K+	122	Android	Free	1: A customised home screen where you can breeze through accessing favourite features. 2: Exciting Dark mode, best equipped for readability and visual comfort. 3: High quality and stable premier ReadSpeaker voice. 4: Personalised vocabulary with engaging word morphologies. 5: Overall ease in navigation, user-friendly editing options, and much more.
Preschool learning games 2+	3+	5M+	19K	Android	Free	Children and adults will experience an exciting adventure, solving puzzle games with colors and geometric shapes, running, counting, flying, learning, jumping and doing magic to unblock all the dino-characters and all game modes.
SocialSkills for Autism Kloog2	3+	10K+	No review yet!	Android	Free	1: This app contains lessons which teach life and safety skills suitable for all children. 2: Developing friendships and how to recognise and respond to bullying. 3: This app introduces the user to a range of wonderful and interesting new characters, the planets where they live and the story of how they must learn to form friendships and work together.

Autism-Behavioral Treatments	3+	5k+	No review yet!	Android	Free	1: how to heal older, self-injurious and/or aggressive children; 2: GcMAF and its role in healing autism; 3: gluten's role in molecular mimicry and autoimmunity; 4: a new method of CD preparation; an improved and easier to follow parasite protocol; along with 5: a special calendar so you know what to do when; 6: many new testimonials from parents sharing their real-life experiences using this protocol	
CommBoards Lite AAC Assistant	3+	10K+	No review yet!	Android	Free	1: High-quality imagery 2: Unlimited creation of new categories with custom images and sounds 3: Select images from our rich image bank 4: Natural pronunciation of sounds and easy to understand images 5: Associate photos to cells using the camera or use images from your gallery 6: Record sounds using the microphone and associate it with any cell 7: Pre-configured for kids with autism spectrum disorder (ASD)	

Working: Hussnain Arshad

Name of Application	Rating & Reviews	No. Downloads	Platform	Cost	Features	Your Remarks	Icon
Language Therapy for Children	4.7 Stars & 3K	500K+	Android	Free	Ø Language & Cognitive Therapy Ø Improve Reasoning Ability Ø Validated By Research Ø Match Size Color and shape Activates Ø Matching by Size & color Activates Ø Matching Size Activates Ø Matching Color Activates	This app has Fantastic reviews. Almost all users are happy from this app the main problem is observe after reading the reviews is that the user is not satisfied from to much exercise in daily plan. Maximum user say to reduce the daily exercise plan.	MITA
Autism : Assisted	4.9	5K+	Android	Free	➢ Details about Autism And its types ➢ Sign of Autism ➢ Testing Autism via Screening and Formal Evaluation ➢ Treating Autism ➢ Different session of different Exercise in this app	This is the Pakistani App for Autism .LUMS university HCI Lab (CHISEL @ LUMS) Research and all the history and Built this app. After Reading the Reviews I observe that this is amazing app. In this app autism explained in the simplest yet best way possible. Requires a	AutismA...

						small space of mobile memory	
Autism & Sensory Play Fidgets (The Anti Stress Game)	5.0	100K	Android	Free	➢ Soft button Game ➢ Sensory Rotation ➢ Push POP ➢ Squish ➢ Sensory Ball ➢ Fidget Cube ➢ Pop it ➢ Asmr Music	After Reviewing the review is observe that this has to be the most STRESSFULL anti-Stress game. The Sensory music toy played discordant sounds that grated patient nerves. It has many different types of game that make patient mind sharp.	
Autism Read & Write	3.7	10K+	Android	Free	➢ Write and Talk ➢ Writing lessons ➢ Reading lessons ➢ Configure	This App intended to help ASD children to learn the basic of reading and writing. This app helps ASD children to identify the different words. It also gives different writing and reading skills.	
ABA Autism Therapy	4.1	1K+	Android	Free	➢ Different physical exercise ➢ Give gift after fulfill the exercise ➢ After gift there is a Fill in the	My remarks about this app is that is app gives different exercise and give reward after these app. Rewards like	

					blank session about the gift	candy or lollipop etc. The reward create a passion to fulfill the exercise for giving the reward.	
Giggli Spectrum Autism	3+	10k+	Android	Free	➢ Learn daily life activates ➢ Wake up and what to do wake up ➢ How to brush ➢ How to use toilet ➢ How to eat food ➢ How to fulfill our daily life work	This App helps patient to schedule daily routine works.	
Card Talk	4.6 & 1K	100K+	Android	Free	➢ Indicating Your emotion with cards ➢ You can also learn Language ➢ Learn different Gestures ➢ Leans name of things like jacket , shoes, wear etc	After reading comments I observe that this app is very useful for autism non-verbal kids also for languages improvement best part is you can create your own cards with sound .	
PictoBoard : Help talk, Autism	3+	10K	Android	Free	➢ Categorized by tabs ➢ Listen and Repeat ➢ Celebration Animations ➢ Search by voice	I review this app then I observe that this app has categorized by into different tabs. It helps the patient to improve listening skills	

App	Rating & Reviews	Downloads	Platform	Price	Features	Remarks	Icon
					➢ Customizable celebration Audios ➢ Customizable animation and audios ➢ Export and import ➢ Configurable words to be more comprehensive	and then repeat these skills also enjoy animations etc. This app might be helpful for increasing brain activities also improving learning skills.	
Daylio Journal Mood Tracker	4.4 & 339K	10M+	Android & iOS	Free	➢ Make reflection a daily habit ➢ Discover what makes you happy ➢ Customize color themes ➢ Enjoy nights with dark mode ➢ Build habits and collect achievements ➢ Share statistics with your friends	After review the reviews and visiting the app my remarks are this app is amazing for mood tracking. With the help of this app parents can check the improvement of the child.	
Better Sleep : sleep tracker	4.4	10M+	Android & iOS	Free	➢ Sleep Sounds ➢ Sleep Recorder ➢ Guided Meditations ➢ Brain Waves ➢ Bed time Stories	After reading review and visiting the app my reviews is that this app is help full to Autism patient to sleep and also record the sleeping time . The parents can measure the sleeping time of the children then treatment	

					according to that sleeping time.	

App survey findings

we finds different ideas by surveying different application .

Requirements gathering

- o User shall be write alphabets
- o User shall be hear the sound of writing alphabets .
- o User shall be guess different shapes via name.
- o User shall be write the name of the thing after looking the thing.
- o User shall be check your permanence

Initial Prototype:

Prototype:

1. **Login page:**

2 . **Cognitive**

   i)

ii)

Has Your Child ever been evaluated by a therapist

Yes   No

iii)

Does your Child point to one body part when you ask?

Yes   No

iv)

Has Your Child ever been evaluated by a therapist

Yes   No

v)

Does Your Child imitate gestures?

Yes   No

1. Let's Start

Dashboard /Home Page

Start your Child Development Test

Ok, Let's Start →

More Info

Start

Settings

Restore Default

Help

Pro Version

Apps for Autism
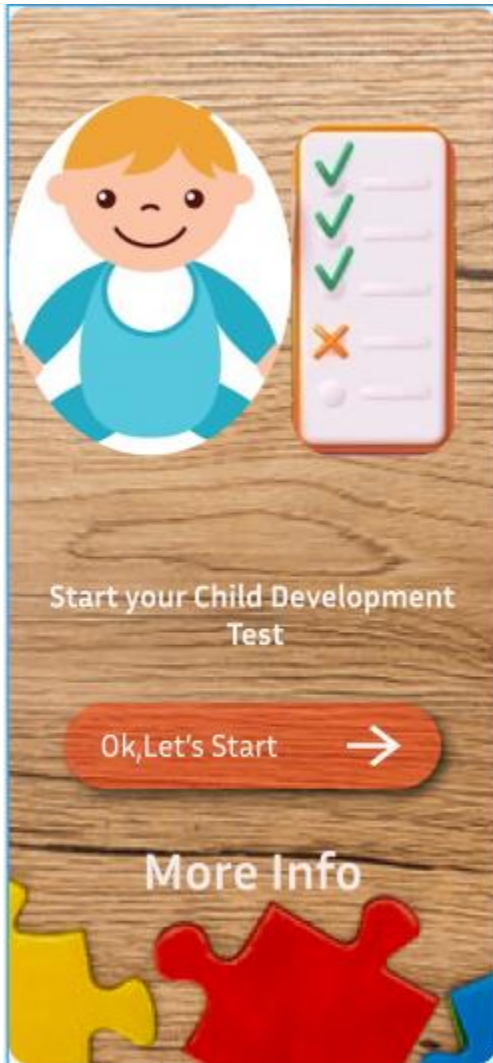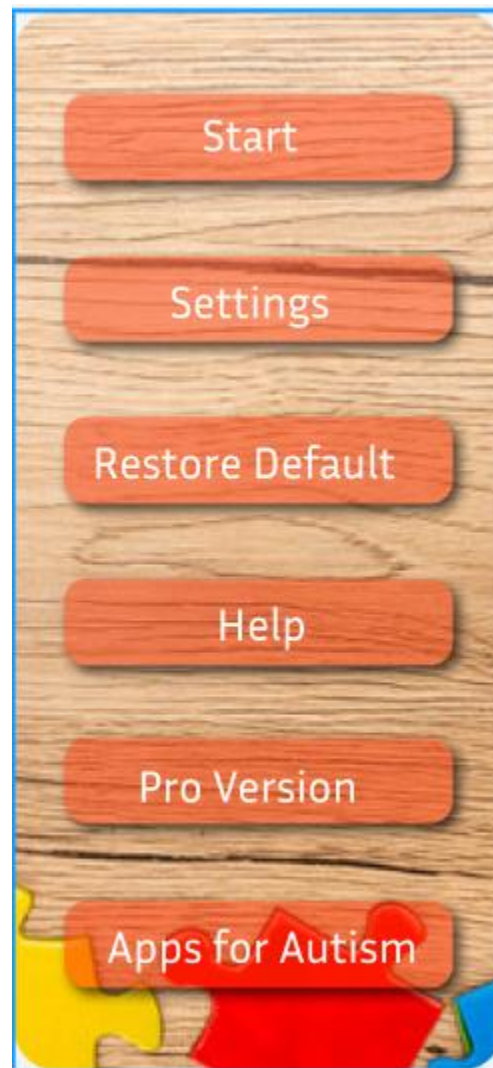
2. Type of Activates   **3 Write And Talk Activity**

Writing Lessons
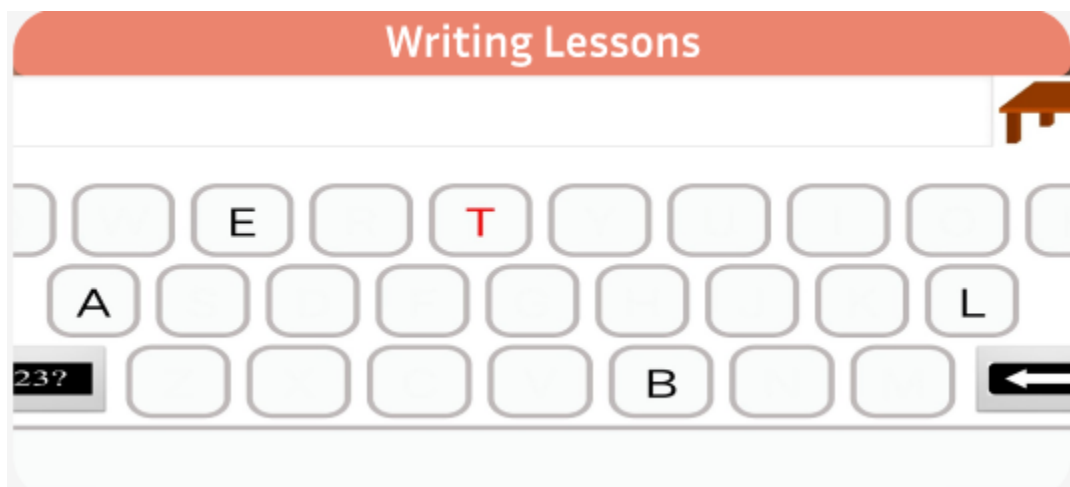
3. **Reading Lessons**

Writing Lessons
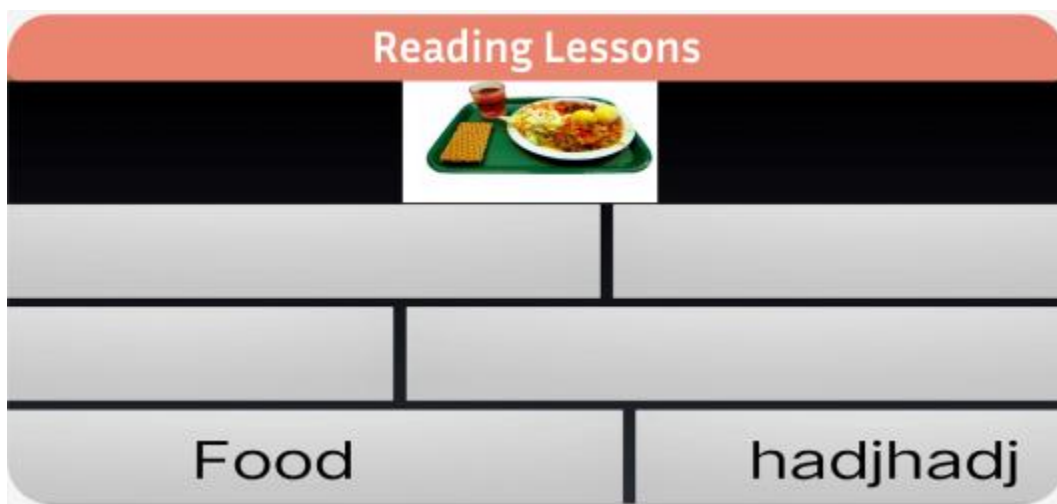
Tool used, reasons for using the tool

We use figma tool to make these prototypes because figma is much easy and free of cost. We make interactive prototyes use figma according to our skills. Figma is recoverable if you make some prototypes due to some mishap your computer shut down are sometime else. In figme you can recover your prototypes at any time.

You can share link with our project partner and the same screen show on both sides. Both can edit these prototype according to our thinking.

Final Prototypes

All prototypes paste in sequence

2. **Login page:**

2 . **Cognitive**

`   **ii)**   **iii)**

iv)

v)

4. Dashboard   **Type of Activates**

Dashboard	Type of Activates
Start	Write And Talk
Settings	Writing Lessons
Restore Default	Reading Lessons
Help	Configure Lessons
Pro Version	
Apps for Autism	

6. Write And Talk Activities **7.Writing activies**

Writing Lessons
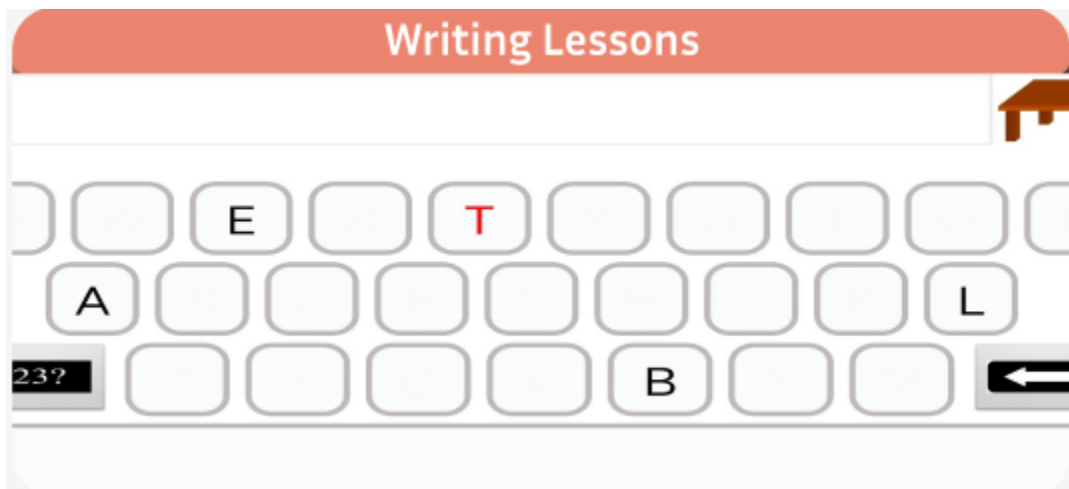
5. **Reading Lessons**

Reading Lessons
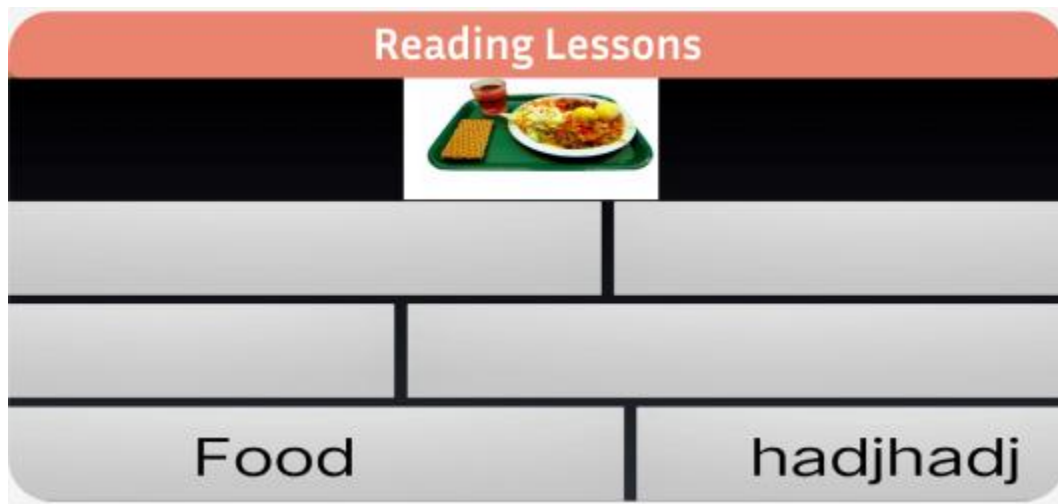
Setting

3. **Evaluation:**
    - **Survey**
      This is google drive link in this link includes
      - **Survey form**
      - **Responses in PDF format**
      - **Responses in .csv format**
      **https://drive.google.com/drive/folders/1xexSl75_vaLjmDHoOFyTXT
      AJ4oPOQQeF?usp=sharing**

Responses Screenshots including Survey question

What are your child's areas of strength?

13 responses

Intelligence quotient is very good

IQ level high

Perceiving things early

Memory

Calligraphy

Perception

My child never lies …and always gives her best.

Almost 100 plus

School

What types of things work best for your child in terms of rewards and motivation?

13 responses

Favorite food plus toys

Special foods

chocolates and candies

Travelling
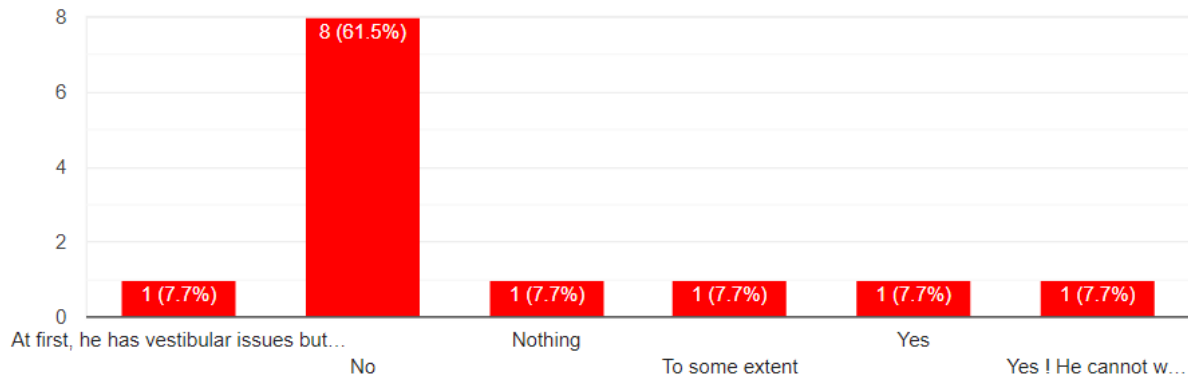
Appreciation and Love

Love

Surprise gifts

No

Chocolate

Does your child have any balance, coordination, or physical challenges that impede his or her ability to participate in gym class? If so, please describe:
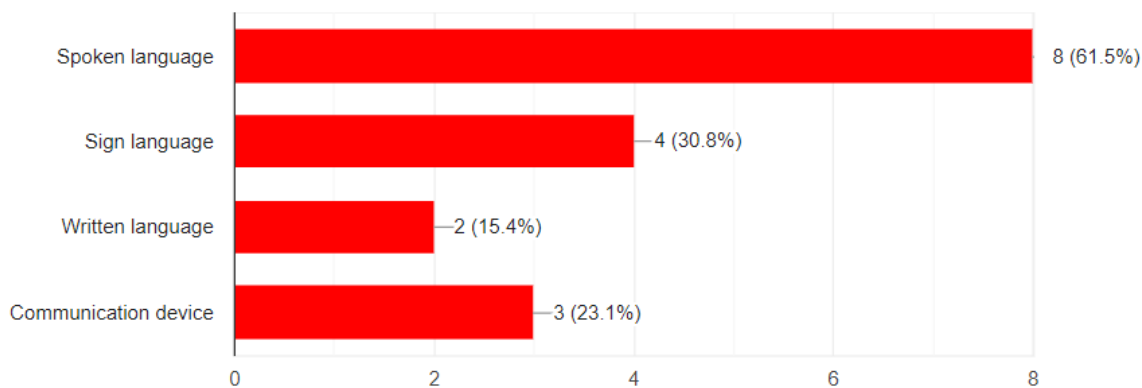

Copy

13 responses

	Count
At first, he has vestibular issues but…	1 (7.7%)
No	8 (61.5%)
Nothing	1 (7.7%)
To some extent	1 (7.7%)
Yes	1 (7.7%)
Yes ! He cannot w…	1 (7.7%)

How does your child best communicate with others?

Copy

13 responses

	Count
Spoken language	8 (61.5%)
Sign language	4 (30.8%)
Written language	2 (15.4%)
Communication device	3 (23.1%)

Does your child use echolalia (repeating words without regard for meaning)?

Copy

13 responses

- Never — 53.8%
- Sometimes — 30.8%
- Frequently — 15.4%
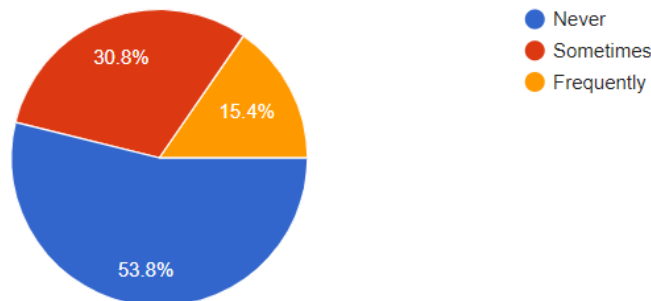
Do changes in routine or transitions to new activities affect your child's behavior?

13 responses

- Never
- Sometimes
- Frequently

23.1%
61.5%
15.4%
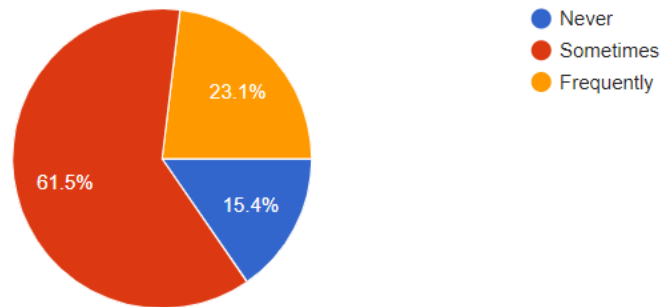
Does your child have any sensory needs that I should be aware of?

13 responses

- Yes
- No

46.2%
53.8%
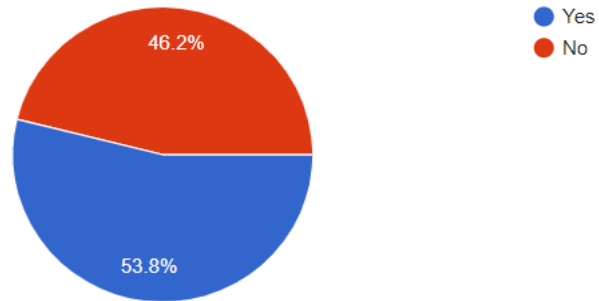
(From above question)If yes, what type of sensitivity does the student have?   [⧉ Copy]

11 responses

Visual	5 (45.5%)
Auditory	5 (45.5%)
Smells	1 (9.1%)
Touch	2 (18.2%)
Taste	1 (9.1%)
Nothimg	1 (9.1%)
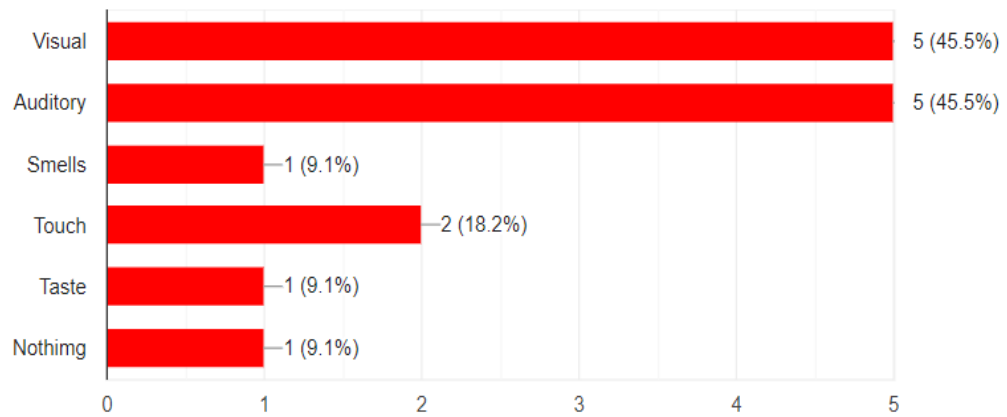
What kinds of adaptations have helped with these sensitivities in the past?

12 responses

No

Playing old games

Touch

Guidance

Nil

Nill

No

Better food selection

Excessive hand movements

What behaviors related to autism spectrum disorder am I most likely to see at school?
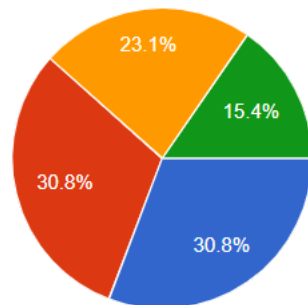
13 responses

Not social at all and have jo friends

High IQ

I see only few autism patients

Social disturbed

Confused behaviour

Nil

Nill

Ni

Vomiting

Are there triggers for these behaviors?   Copy

13 responses

- Sensory sensitivity
- Change in schedule or routine
- Social attention
- Escape a boring task

23.1%
15.4%
30.8%
30.8%

In your experience, what are the best ways to cope with these challenges and get your child back on task?
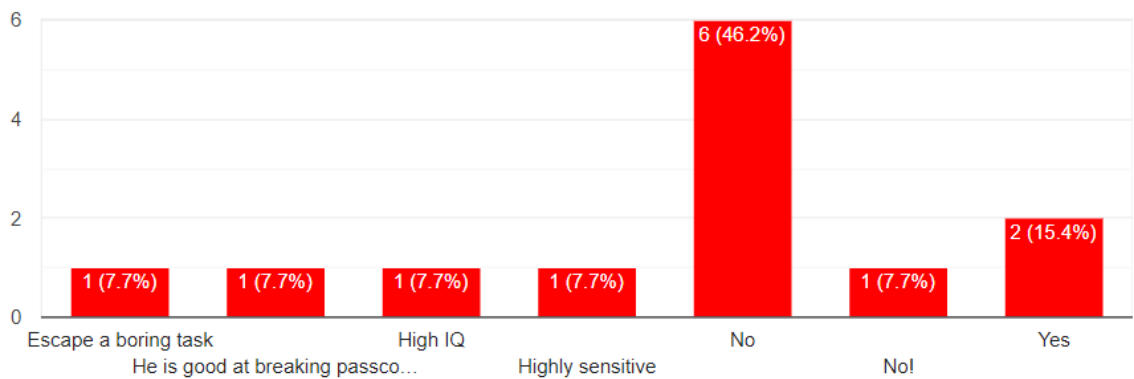
13 responses

Just to give him some time to hold himself

Special care

By giving rewards and give motivation

Fulfil their requirments

Teaching with love

Social attention

She is aware of her responsibilities and she work according yo need

No

Escaping boring task

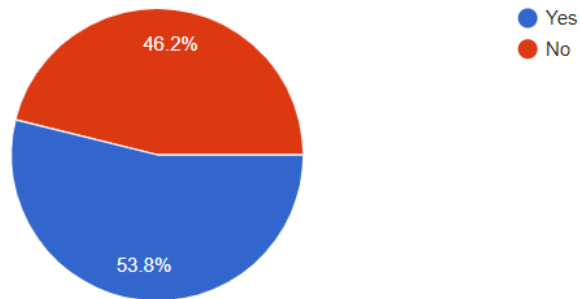Is there anything else you think I should know about your child?

13 responses

Copy

Does s/he join in playing games with other children easily?
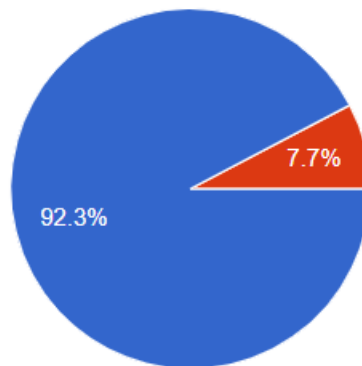
13 responses

- Yes
- No

46.2%

53.8%

Does s/he enjoy sports?

13 responses

- Yes
- No

7.7%

92.3%

Can s/he keep a two-way conversation going?

13 responses

- Yes
- No

53.8%

46.2%
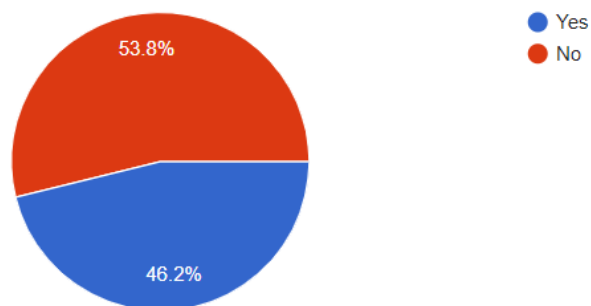
Does s/he mostly have the same interests as his/her peers?

13 responses

- Yes
- No

69.2%

30.8%
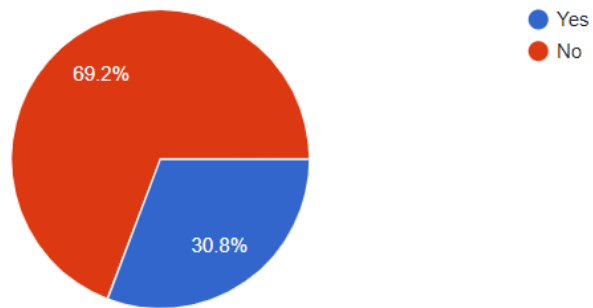
Does s/he have an interest which takes up so much time that s/he does little else?

13 responses

- Yes
- No

38.5%

61.5%
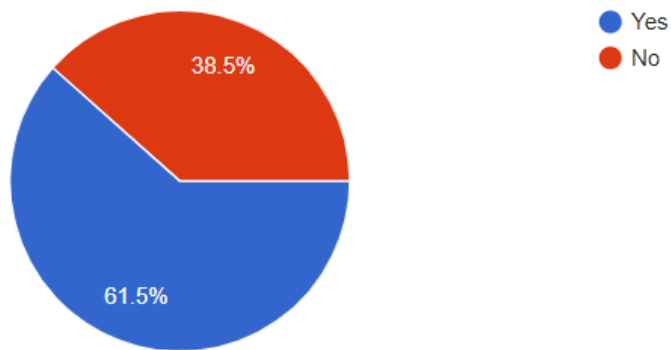
Does s/he often bring you things s/he is interested in to show you?

13 responses

- Yes
- No

23.1%

76.9%
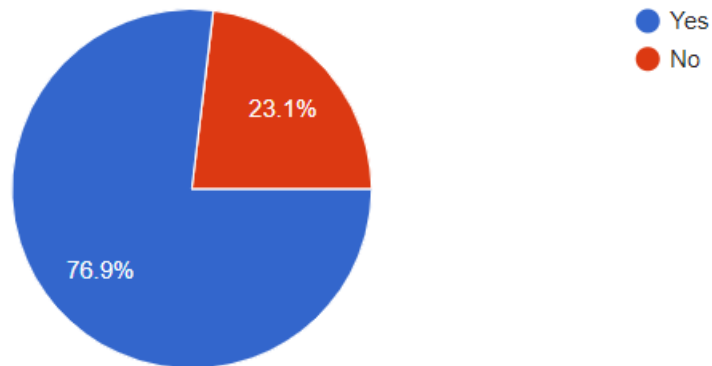
Does s/he have difficulty understanding the rules for polite behavior?

13 responses

- Yes
- No

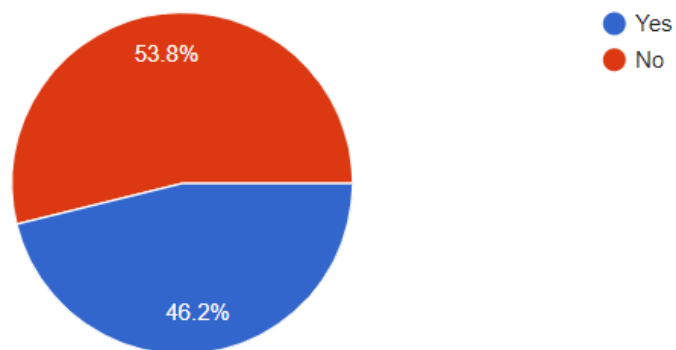61.5%

38.5%
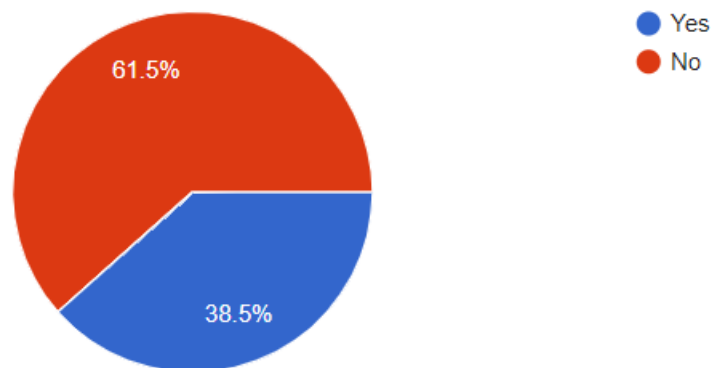
Does s/he appear to have an unusual memory for details?
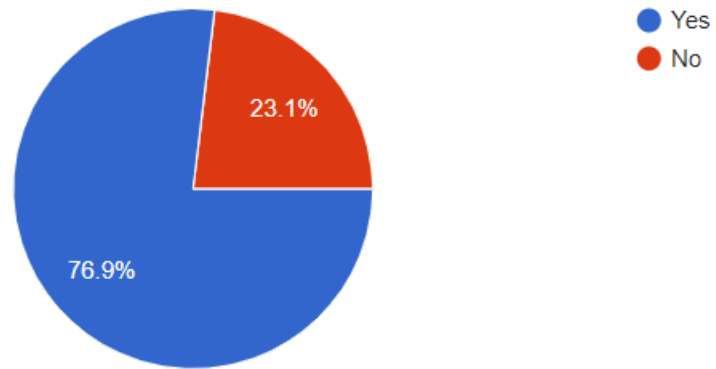
13 responses

Yes
No

30.8%

69.2%
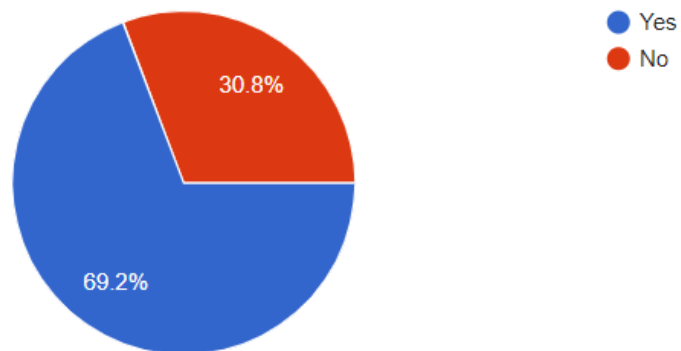
Is his/her voice unusual (e.g., overly adult, flat, or very monotonous)?
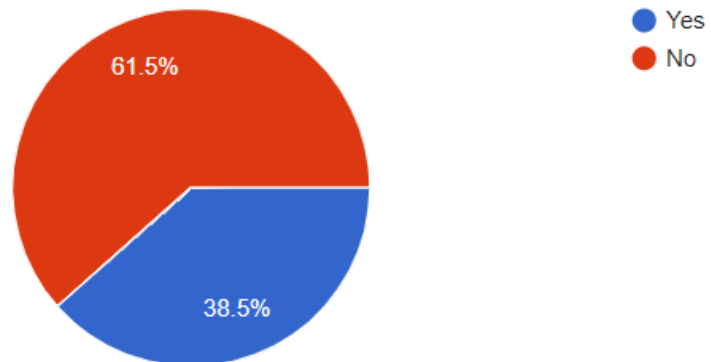
13 responses

Yes
No

53.8%

46.2%

Are people important to him/her?

13 responses

- ● Yes
- ● No

23.1%

76.9%

Is s/he good at turn-taking in conversation?

13 responses

- ● Yes
- ● No

61.5%

38.5%

Does s/he have any unusual and repetitive movements?

13 responses

- Yes
- No

No
5 (38.5%)

61.5%
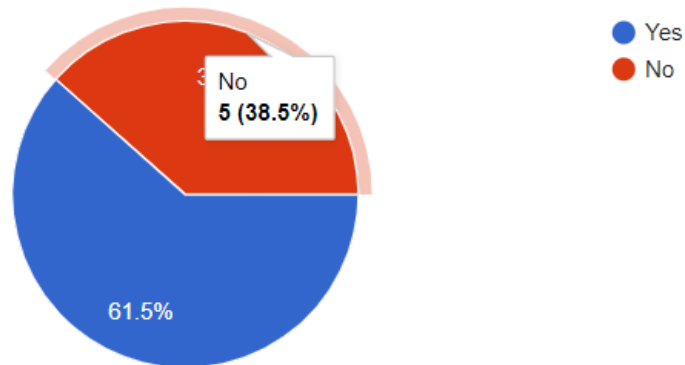
Does s/he care how s/he is perceived by the rest of the group?

13 responses

- Yes
- No

46.2%

Yes
7 (53.8%)
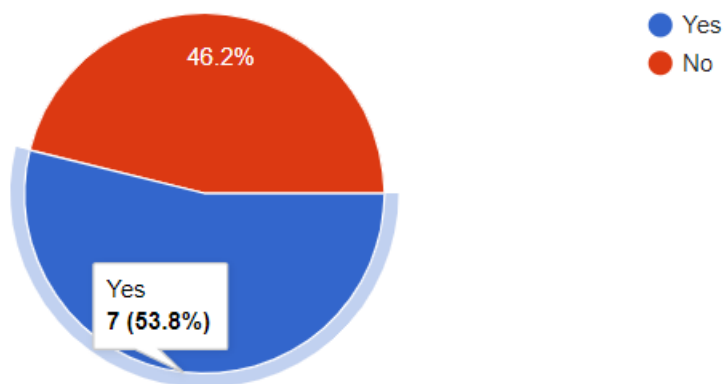
Results & Discussions:

- **Any Improvements in Final prototype.**

    Yes ! we improve our prototypes in the previous version we can't add the navigation bar in some screen and some color is not attractive.

    Now we improve our prototypes change background color of sign up page

    General Discussion or Summary
    Our Selected Human is **Autism** Patient.

We all know that sharing your feelings and interests with others is a natural way of communicating. If someone doesn't do that, we call him anti-social. But this does not necessarily happen with every person. He may also have autism. Due to which he is having difficulty in communicating and maintaining relationships. In this we should not judge him by someone's style.

Autism has remained a mystery for researchers, neurologists and psychiatrists for centuries. Although the cause of autism is still unknown, a number of strategies have been developed, that have saved so many lives all around the world. There are over 60 million people with autism across the world of which many Third World countries in Africa and Asia, including Pakistan, do not even have access to any public services. The situation is definitely alarming. In a country like Pakistan, where due to lack of financial resources, reasonable education remains a dream even for an average person, affording rehabilitation services to an autistic child is well nigh impossible.

Autism is a neuro developmental disorder. And its broad terms are (**Autism Spectral Disorder**) ASD.

When a complex genetic core and environmental changes start to alter brain development, it is called a neuro developmental disorder. It affects the normal functioning of the brain.

All these disorders come in neuro developmental disorders. And these are their names

- Attention deficit hyperactivity disorder
- Developmental coordination disorder
- Tic disorder
- Intellectual disorder
- Autism Spectrum disorder
- Specific learning disorder
- Child onset fluency disorder
- Speech sound disorder

In such a disease, the patient cannot speak properly and is very disturbed in social interaction. Restricted behavior is found in a person suffering from such a disease. There is nothing new in their interest. And some repetitive moves they keep doing over and over again. In the past, doctors diagnosed autism according to four different subtypes of the condition. However, healthcare professionals now classify autism spectrum disorder as one broad category with three different levels to specify the degree of support an autistic person needs.

- Asperger's syndrome
- childhood disintegrative disorder
- pervasive developmental disorder-not otherwise specified

Future Work related to your app
- o In future we add augmented reality related 360* videos.

- In future we introduce different physical exercises
- In future we add virtual reality based exercises. Because VR is the upgrowing technology in the coming world.

Limitations of your project.

- Our application don't have physical exercise.
- With out sign in user can't use the application.