



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

## **SECP1513: TECHNOLOGY AND INFORMATION SYSTEM (SECTION 05)**

**DESIGN THINKING:  
DIGITAL SOLUTION FOR ADHD AND ASD COMMUNITY**

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Link video: <https://www.youtube.com/watch?v=MCw0H1BEBWI>

### **GROUP 7**

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## **1. INTRODUCTION**

Autism Spectrum Disorder (ASD) is a neuro related developmental disability due to differences in the brain. Autistic individuals often face challenges with social interaction and communication as well as restricted and repetitive behaviours of interest. Therapy services are sometimes too far away, too expensive, long waiting list and take too much time to access. Online platforms help narrow down the gap between autism therapists and parents. However, common video conference tools rely on single camera view, which limits the therapist observation. This project aims to provide an online consultation specialized for autism therapy, integrated by multi-camera setup to improve quality of online sessions.

## **2. DESIGN THINKING PROCESS**

This project obeys the five rules of design thinking approach which are empathy, define, ideate, prototyping, and test.

### **2.1 Empathy Phase**

This phase is focused to understand problems faced by parents. They experience challenges in attending face to face session mostly because of high cost, limited time, and long travel distance.

#### **Step 1: Identify target user**

- Parents of autistic child

#### **Step 2: Gathering information**

- Find information from articles or case studies about parent with ASD children.

#### **Step 3: Conclude user problem and needs**

- Parents of autistic child experience expensive therapy, long-distance travel to therapy centres, and time-consuming sessions.

## **2.2 Define Phase**

Based on the inputs retrieved, the team had managed to identify several key problems. Face-to-face therapy is too far, time consuming, and costly.

### **Step 1: Identify problems to focus on**

- Expensive therapy, long-distance locations, lack of knowledge about ASD people and time consuming.

### **Step 2: Analyse the problems**

- Parents face financial problem due to high cost of therapy and long-distance location making it hard to attend physical session.
- Parents need accessible professional help

### **Step 3: Design focus**

- Solution must reduce the therapy cost and travel to long-distance location
- Using flexible and affordable solution therapy delivery

## **2.3 Ideate Phase**

In this phase, the team brainstormed several solution ideas, including standard video calls, recorded behaviour videos, and observation checklists. After thorough discussion, a guided multi-camera video consultation platform was selected due to its practicality and effectiveness.

### **Step 1: Brainstorm ideas**

- Make an online consultation platform like video conference, recorded video, observant checklist, home-visit therapy and booking system.

### **Step 2: Selecting ideas**

- An online video conference consultation platform using multi-camera to get better angle for therapists to observe.

### **Step 3: Refine ideas**

- Guided multi-device setup for parents
- Therapist can observe children from different view

## **2.4 Prototyping**

Through retrieved inputs, the team transformed the ideas into a prototype. It was created to visualize the flow of our team's ideas and to illustrate the consultation interface, camera setup guide, and multi-view observation panels.

### **Step 1: Parent features**

- Parent account registration
- Device setup guidance
- Access online consultation
- Session summary and feedback

### **Step 2: User flow**

- Parents sign up to website
- Parents follow instruction to set up camera
- Parents join online consultation through the website
- Parent will receive feedback from therapist

### **Step 3: Create prototype**

- Parent dashboard
- Camera instruction page
- Online consultation interface
- Feedback page from therapist

## **2.5 Test**

After completing the prototype, a concept test was conducted using Google Form to gather feedback. The form presented a description of the platform interface and features, along with instructions for setting up devices for online consultation.

- Respondents rated how easy it would be for parents to navigate the platform for the first time.
- They indicated whether the platform could be understood without technical guidance.
- Feedback assessed the perceived usefulness of features, including multi-device observation and online consultation.
- Respondents noted potential concerns, including privacy, technology reliability, quality of consultation, and child cooperation.

### **3. PROJECT DESCRIPTION**

#### **3.1. Problem Statement**

Parents of autistic child often face challenges attending face-to face therapy due to limited time and high cost. Online consultations help by reducing both time and financial burdens. However, autism therapy depends heavily on observation and single-camera video conferences limit therapists' ability to observe patients effectively.

#### **3.2. Solution**

The proposed solution is to build an online video consultation platform enhanced with multi-camera observation system. The platform allows therapists to conduct online consultations while observing the child through various camera angles. Upon every session, parents will be guided to set up multiple devices, like smartphones or tablets to record the child from different views. Therapists will have the ability to observe the child through different views to gain better insights. The platform enhances observation quality while maintaining the convenience of online consultation. It provides a convenient solution for parental guidance, follow up sessions, and scenarios where physical therapy is non-available. After every session, user will be provided with summary from therapists containing valuable information regarding the session.

#### **3.3. Team Working**

This project tested the team's strong chemistry and collaborative skills to create a platform that could accommodate concerns of parents with autistic children. The project was broken down into several sections, including collecting and processing relevant information related to the issue, designing an interface that could demonstrate the flow to produce the final output expected by parents, and creating a project report based on the research results and conclusions drawn.

## **4. ASSESSMENT POINT**

### **4.1 End of Project Demonstration**

Assessment happens on the final project demonstration, when the team presents the prototype, explains the problems, and demonstrates the user flow. The focus is towards demonstration, description, and relevance.

- **Demonstration:** Present clear functional user flow that provides a practical solution to the problem identified in problem statement.
- **Description:** Clearly describe each feature of the prototype is derived from the challenges during the Empathy and Define phases.
- **Relevance:** The prototype's design decisions are based on the challenges faced by parents, as identified through a review of relevant research articles.

### **4.2 Transition Between Design Thinking Phases**

Assessment also occurs during transition between phases, like refining the problem after empathy findings and elevating the functionality of the project after receiving feedback. This simulates reflective thinking and iterative improvement.

<b>Transition phase</b>	<b>outcomes</b>
Empathy - Define	<ul style="list-style-type: none"><li>• Search online articles about parents with autism child challenges</li><li>• Make a problem statement from the finding articles</li></ul>
Define - Ideate	<ul style="list-style-type: none"><li>• Select main problem to focus on</li><li>• Brainstorm a few ideas for the problem</li><li>• Choose the best solution (using multi-device for online consultation)</li></ul>
Ideate - Prototype	<ul style="list-style-type: none"><li>• Create a prototype based on the chosen solution</li><li>• Include some features such as guidance for set up device, feedback from therapist</li></ul>
Prototype - Test	<ul style="list-style-type: none"><li>• Ask user to make a simple test on our prototype to get some view and improvement</li></ul>

## **5. DESIGN THINKING EVIDENCE**

### **5.1 Sample of student work**

#### **Record for each phase**

##### **i. Empathy**

Composite Persona:

- **Name:** Nasser Ansari
- **Age:** 45
- **Background:** Working father of an autistic child
- **Needs:** Accessible therapy support regardless of time and location
- **Challenges:** Time constraints and limited observation

##### ***Theme 1: Lack of knowledge about ASD***

The majority of the participants (6 of the 8) revealed that they did not understand what exactly ASD is, but they could describe symptoms of ASD based on their child's characteristics. Almost all parents had been feeling confused at the very beginning, right after diagnosis, when they could neither identify nor handle their child's unique behaviours and expressions. All of them reported that this was their first child with ASD and that they had no prior experience with ASD. They only became knowledgeable about ASD after their child had been diagnosed by a professional. For example,

There were many obstacles and challenges in seeking speech therapy services for all of the participants. Our participants revealed different opinions and experiences, including difficulties in obtaining additional information about ASD, long wait times for assessment and intervention, and the expensive costs of intervention charges. Participants P4 and P7 discussed some difficulties that they faced when searching for intervention for their children. For example, P4 related that,

When he was 3, he is still cannot speak and that time my third child can talk normally. I know already that he does not talk when he was 3 years old. Only one word...We don't know where we should go and whom should we ask. When the doctor said go to here and go to there when they have largest population and try for look there. We still not sure where should we seek for help.

Parents who went to government-sponsored (i.e., public) hospitals to seek help for their children faced a different challenge in the lengthy waiting periods for intervention. P5 had to wait for a year to receive interventions for his child, who was diagnosed with ASD at three years of age. P5 stated, 'The waiting period is really long due to the long queue. It took one year for us to wait for a first therapy. During that one year, we were struggling.' This appeared to be a common issue with speech therapy services in the government hospitals.

Meanwhile, five parents faced financial difficulties to meet the costs of private speech therapy centres, with speech-language therapy becoming inaccessible since it was cost prohibitive to them. The comments

##### **ii. Define**

Both parents and therapists require an online consultation platform that allows effective observation of an autistic child.

##### **Setting and Materials**

For all telehealth direct therapy, a HIPAA-compliant platform (Zoom) was used (Zoom Video Communications Inc., 2016). BTs connected with the participant and their caregiver synchronously. Sessions ranged in duration from 1 to 3 hr. Lesson stimuli were either provided over the videoconferencing setting by the BT (e.g., electronically via screen share, physical stimuli held up to the camera) or present in the family's home and provided by the caregiver (i.e., in the case of caregiver-implemented telehealth direct therapy.)

##### **Data Collection and Interobserver Agreement**

To ensure the data were recorded with accuracy, the participant or caregiver were asked to angle the camera towards the participant, so the response could be observed. If the response was missed due to a frozen screen, unclear audio, or the response occurred outside of the screen view, the participant was asked to repeat themselves (for technician-delivered telehealth direct therapy) or the caregiver was consulted as to the correctness of the response (for caregiver-assisted or caregiver-implemented telehealth direct therapy). Data were collected either electronically or, if the data collection device was used to place the zoom call, via pencil and paper and subsequently transferred to the electronic data collection system.

### iii. Ideate

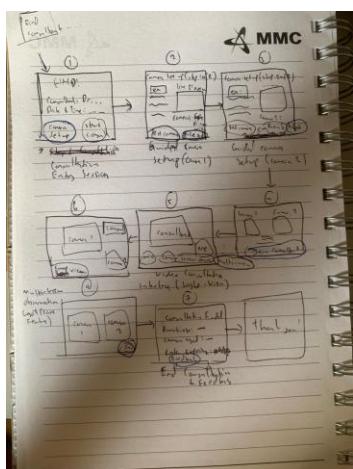
The team discussed various digital solutions and evaluated them through its usability and impact. An online consultation platform with guided multi-camera setup was selected due to its direct benefit and practicality.



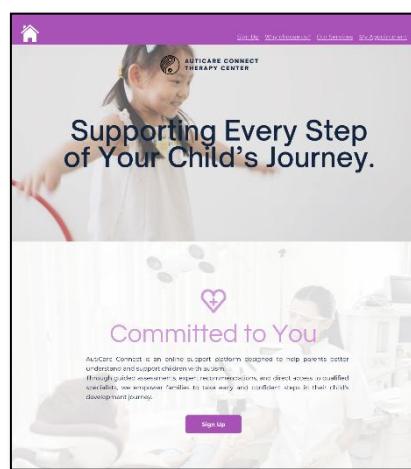
Image of team brainstorming session and discussion

### iv. Prototype

Sketched Prototype



Main page



## Login panel

Sign Up Here!

Name  
First Name \_\_\_\_\_ Last Name \_\_\_\_\_

Email  
example@example.com

Phone Number  
\_\_\_\_\_

Please enter a valid phone number.

Submit

## Consultation list panel

You have an upcoming appointment

**THERAPIST NAME :** Dr. Sarah Lim

**SPECIALIZATION :** Behavior Analysis (ABA)

**BACKGROUND :** Dr. Sarah holds a Bachelor's degree in Psychology and professional training in Behavior Therapy and Autism Intervention. Her approach is compassionate, structured, and focused on helping each child reach their fullest potential at their own pace.

**DATE & TIME :** 11:00 a.m., 14 January 2025

Camera Setup (recommended before joining)

Start Consultation

\*You should setup your camera first!

## Multi-camera setup panel

Camera Setup (step 1 of 3)

Example of camera set up.

This consultation supports multiple camera views. Please set up your cameras as example above.

Camera 1: Face / Primary View

Test Camera

Camera Setup (step 2 of 3)

Example of cameras set up.

This consultation supports multiple camera views. Please set up your cameras as example above.

Camera 2: View from behind

Test Camera

Camera Setup (step 3 of 3)

Example of cameras set up.

This consultation supports multiple camera views. Please set up your cameras as example above.

Camera 3: View from above

Test Camera

Preview of All Camera

Camera 1: Face / Primary View

Camera 2: View from behind

Camera 3: View from above

If you are satisfied with the position of cameras, you may start the consultation.

Back

Join Consultation

## Video conference panel

Zoom Meeting

Live Chat

Multi-View

Zoom Meeting

Live Chat

Multi-View

Chat messages:

- Gary, can you see me? I am in the office now.
- Gary, can you hear me?
- Yes, I can hear you. Please go ahead.
- Thank you! And happy New Year!

## Summary panel

Subject: Follow-up from Today's Online Consultation - [Child's Name]

Dear Zendaya Dalitso,

Thank you for joining today's session. During today's session, we observed [Child's Name]'s behaviors, particularly around routines, transitions, and communication. [Child's Name] responded well to structured activities but showed some frustration during changes in routine.

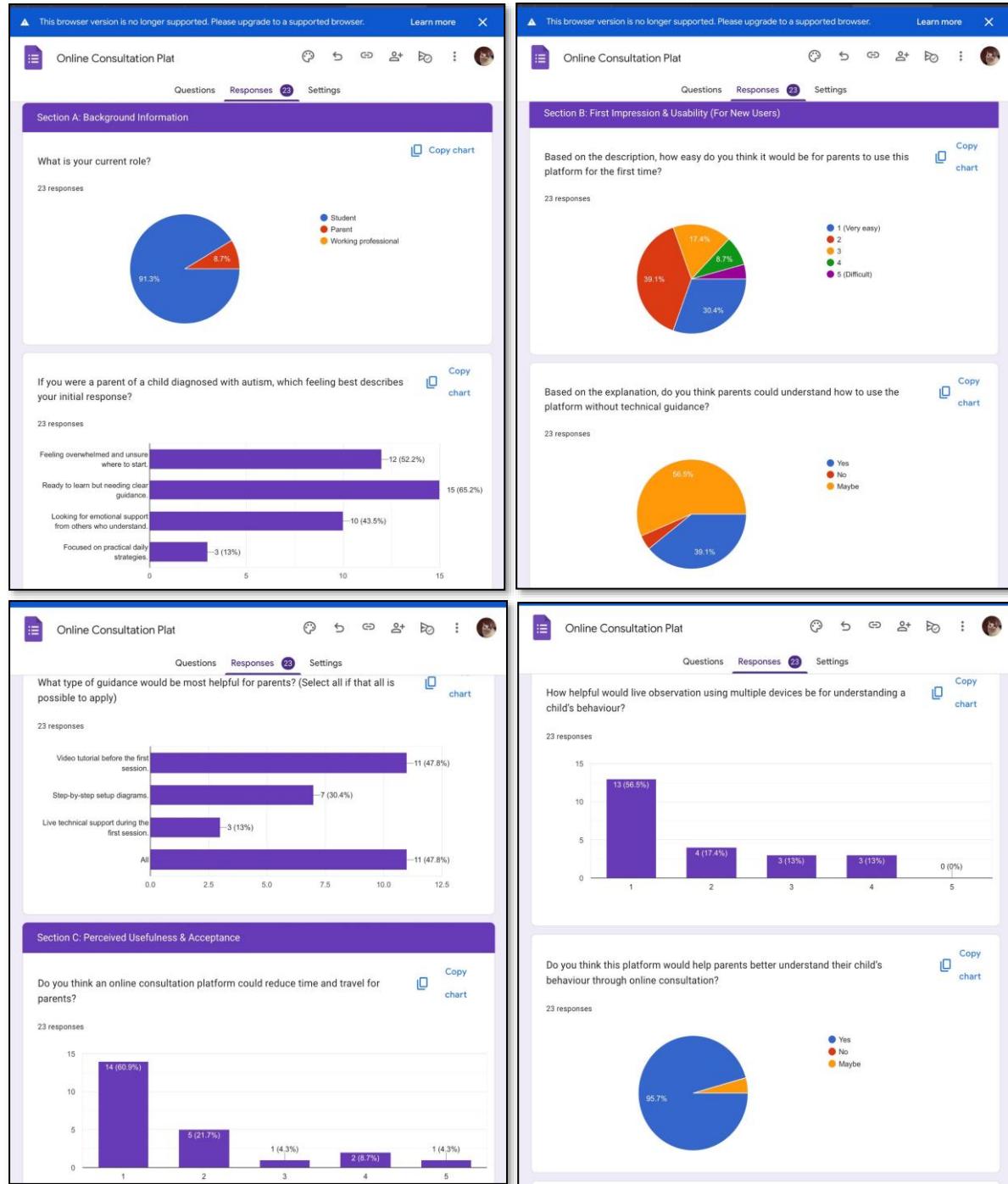
To support [Child's Name] further, try:

- If your child has a meltdown, the most important thing is to try to stay calm and keep them safe. You can try to letting your child wear headphones to listen to calming music.
- Focus on what your child wants to do and what you want them to STOP doing.
- Use simple gestures, eye contact and pictures or drawings to support what you're saying and keep language simple and clear.
- Praising or rewarding small successes immediately.

With consistent support and reinforcement, we expect [Child's Name] to continue improving in managing frustration, following routines, and communicating effectively.

Warm regards,  
Dr. Sarah Lim  
AutiCare Connect

Done





## **6. REFLECTION**

### **KHAIRULNAIM ZAQUAN**

My goal is to pursue a career related to computer networks and security as well as to develop a digital solution to improve one's life. Design thinking has helped me realize the value of both empathy and user-centric issues. This has impacted my way of designing solutions, where I no longer rely on assumptions linked to users. To enhance my potential in industry, I plan to strengthen my communication skills and leadership attributes as well as to keep up with the latest technology trends.

### **NAQIBAH DINIYAH AHMAD**

My goal regarding my course is to make it easier for individuals to take the first step in solving problems they face by providing a platform that they can utilize, in line with my major which is being able to create an interface that can be used by many people. This design thinking indirectly fosters a sense of empathy towards fellow humans, which makes me determined to be able to develop the interface that I have created and make it easily accessible to those who need it. It required a high critical thinking to design and create an interface and that will be impacted for everyone who uses it.

### **NUR FATIN NADHIRAH**

My goal in pursuing Computer Network and Security is to build a stable career in the future after graduation. In today's world, the development of technology has rapidly increased the need for security services. Therefore, I chose this program because I believe many organizations require professionals in the security field. Design thinking has a positive impact on me as it helps me identify problems and generate ideas to solve them effectively. This assignment encouraged us to find innovative solutions that are needed in the real world. One of the improvements I need to focus on is developing my soft skills, as they are very important for working effectively in the industry.

## **Task Assignment**

No	Name	Task
1.	KHAIRULNAIM ZAQUAN BIN KAIRULZAKI (A25CS0240)	<ul style="list-style-type: none"><li>• Report Writing (Design Thinking Phases)</li><li>• Report Writing (Project Description)</li><li>• Report Writing (Assessment Point)</li><li>• Video Editing (Design Thinking Video)</li></ul>
2.	NAQIBAH DINIYAH AHMAD (A25CS4018)	<ul style="list-style-type: none"><li>• Making an interface for prototype</li><li>• Gathering the source of information</li><li>• Slide Presentation</li></ul>
3.	NUR FATIN NADHIRAH BINTI BADLI AIZI (A25CS0312)	<ul style="list-style-type: none"><li>• Report Writing (Introduction)</li><li>• Report Writing (Detail Step)</li><li>• Report Writing (Assessment Point)</li><li>• Report Writing (Evidence)</li><li>• Data Collection</li></ul>

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