



FACULTY OF COMPUTING

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SECP1513 - TECHNOLOGY & INFORMATION SYSTEM

SECTION 01

PROJECT DESIGN THINKING - SoftSkills Buddy App

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INTRODUCTION

In the landscape of neurodevelopment support, a significant challenge exists regarding the subjective and inconsistent manual soft skill assessments, which often rely on the fragmented observations of parents and educators who may often struggle to identify the subtle behavior in high stimulation environments. As digital innovation continues to transform the field of special education, research has increasingly demonstrated that mobile applications and game based learning are highly effective tools for detecting emotional improvements and increasing motivation in children with autism spectrum disorder (ASD) challenges. Our project, SoftSkills Buddy , integrates these research findings with design thinking steps to create a non-functional computerized prototype that functions as an interactive assessment platform for detecting soft skill gaps in children with autism. By utilizing game-based interventions , we aim to move beyond traditional passive observation and instead provide a gamified, engaging environment where social interactions can be tracked objectively to foster greater social inclusion and peer-to-peer confidence.

The primary problem that we identified is that current assessment methods for soft skills are largely subjective, time consuming and inconsistent as they rely heavily on the manual observations of parents and educators which may cause them to overlook small behavioral indicators in high-stimulation settings. Given that early intervention is the most important factor enhancing long term social outcomes and can lower overall parenting stress. This inconsistency frequently results in a large delay in recognizing specific developmental requirements. Furthermore, when these soft skill gaps go undetected, children face increased risk of social isolation and difficulties in peer-to-peer learning which can make it more difficult for them to fully engage in inclusive social and educational environments.

To bridge this gap, we propose SoftSkills Buddy , a non functional computerized prototype that utilizes Game-Based Learning (GBL) to assess and track soft skills in a child friendly and interactive environment. The primary objective of the apps is to develop an objective detection system that replaces subjective and inconsistent manual observation methods with a reliable, digital platform that is capable of using interactive scenarios to monitor soft skills development in real time. Furthermore, this game based learning app will automatically increase a child's motivation and provide a more accurate reflection of their social capabilities and high pressure environment.

The decision to focus our project on the identification of soft skills is rooted in the understanding that these competencies are the fundamental building blocks for a child's long-term independence and social integration. It is vital to identify and track soft skills like managing emotions and interacting with others because these are the building blocks for child's independence. Children

with autism often see and feel the world differently, which makes it hard for them to understand social rules. If their struggles cannot be identified, the child may be frustrated and lonely. By identifying these gaps now, we can help them learn how to connect with others and feel more confident in social situations. Identifying these specific skill gaps during early stages of development also can help them to have many opportunities for early support, which can increase their confidence in the school environment.

DESIGN THINKING STEPS

1.0 Empathy

To understand the real-world challenges faced by the autism community in Malaysia, our team conducted a quantitative and qualitative survey using Google Forms. The survey was distributed through our relatives and closest friends who have or is experiencing the daily challenges faced by autism communities.

Due to logical constraints, we received only a few numbers of responses. We asked the respondents for their kids names, ages, their roles for the children, education level, whether they know the child's autism level, and whether they understand the child's specific needs related to autism.

Based on the responses, the results highlight several insights regarding challenges the parents/caregivers face. First, about 2 parents find it very difficult to identify their child's needs and hidden talents, which indicates a lack of effective discovery tools. Second, a parent felt that school focus disproportionately on academic reading and writing while neglecting soft skills. Last, majority of respondents agreed that it would be greatly beneficial for them if there's a tool that can help the parents identify their children's hidden talents while developing their soft skills.

Based on these responses, we constructed a representative user profile:

Name: Puan Siti (Based on respondent profile).

Role: Mother and primary caregiver.

Frustration: She knows her child has potential but finds it "very difficult" to pinpoint exactly what those talents are.

Goal: She wants a tool that balances the school's academic focus by helping her develop her child's soft skills at home.

2.0 Define

Based on the survey analysis, the team synthesized the findings to define the core challenge. Caregivers of children with autism face significant hurdles in identifying their child's specific needs and hidden talents due to a lack of accessible discovery tools. This issue is compounded by a formal education system that disproportionately prioritizes academic achievement over soft skill development, leaving parents without a structured way to support their child's holistic growth.

Consequently, identified user needs focus on two main areas: the necessity for a guided method to uncover "hidden talents" that are currently difficult to observe, and the demand for a supplementary tool to teach emotional regulation at home. To address this, our team formulated the following guiding question: "How might we create a tool that helps parents easily identify their child's hidden talents and soft skills, bridging the gap left by an academically focused school system?" Ultimately, this solution aims to fulfill the parents' emotional need for competence, empowering them with the data required to advocate for their child's future independence.

3.0 Ideate

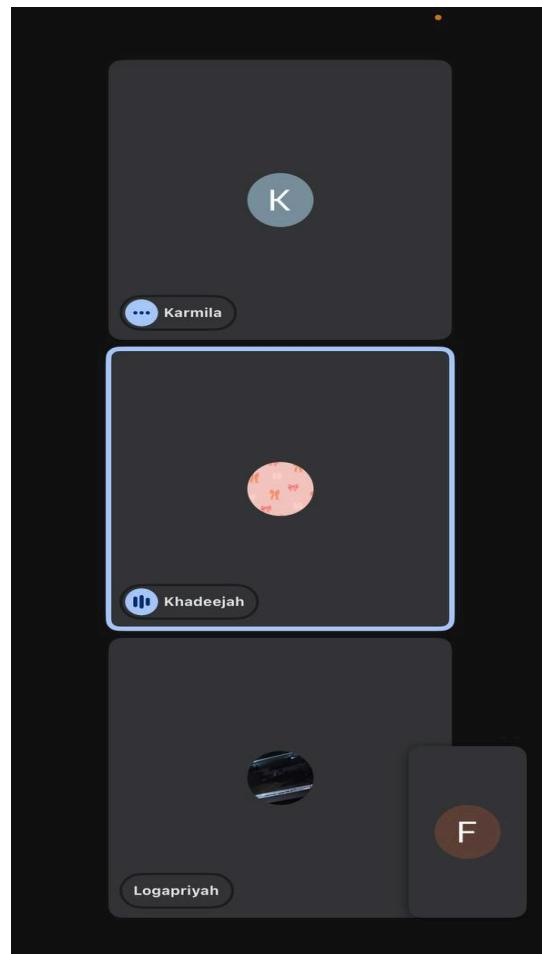
During ideation phase of our design thinking project, our team engaged in a analytical discussion regarding the primary function objective of SoftSkills Buddy system. The main point of the debation between our group members is whether the platform should prioritize direct education which is activate teaching or early detection and assessment which focus on identifying existing skills gaps through interactive play.

Initially, several of my team members argued that a teaching centric model would provide immediate value to the child. However, as we synthesized our findings from Empathy phase and analyzed the research regarding parenting stress,we discovered that academic literature is the most significant source of stress for caregiver and educator is not the lack of teaching tools but it is involved in tracking a child's progress.

Consequently, our team reached a decision to prioritize detection and assessment as core pillar of SoftSkills Buddy. We conclude that before a child can be effectively taught, their specific challenges must first be objectively identified and documented. By focusing on detection, our prototype will serves as diagnostic tools that converts subtle social behavior into clear, digital data. We shifted our focus to detection because research shows that game-based environments allow children to respond naturally without the pressure of a traditional clinical setting. This decision transformed our project from a simple game into a sophisticated system designed to

provide more accurate assessments, ultimately reducing the diagnostic burden on families and improving the precision of early intervention.

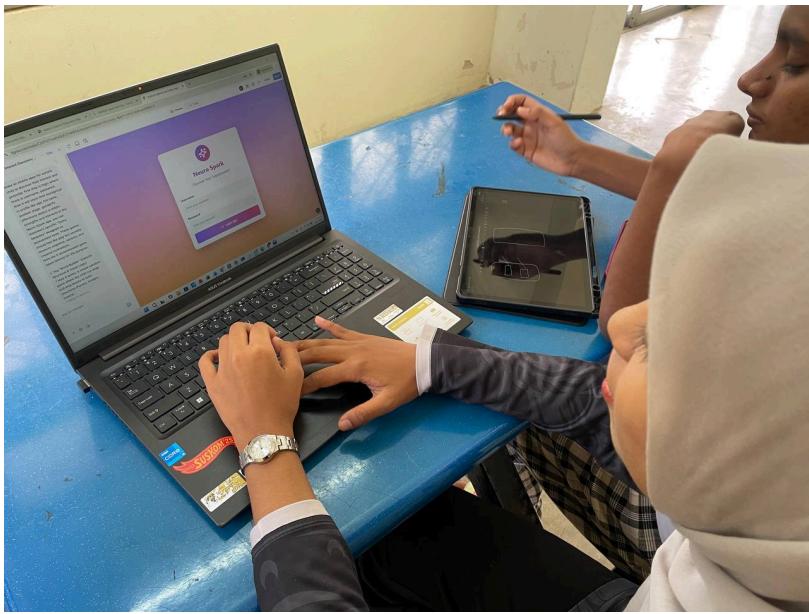
3.1 PROJECT'S EVIDENCE :



The provided picture is our second meeting that is conducted via Google Meet to discuss about ideation and definition phase of design thinking process. This meeting was strategically focused on synthesizing our research findings from various academic sources to narrow down the scope of our project. During this session, the team engaged in debate concerning the most effective way to support the Autism Spectrum Order (ASD) children, leading to the concept of SoftSkills Buddy as computerized diagnostic tool.

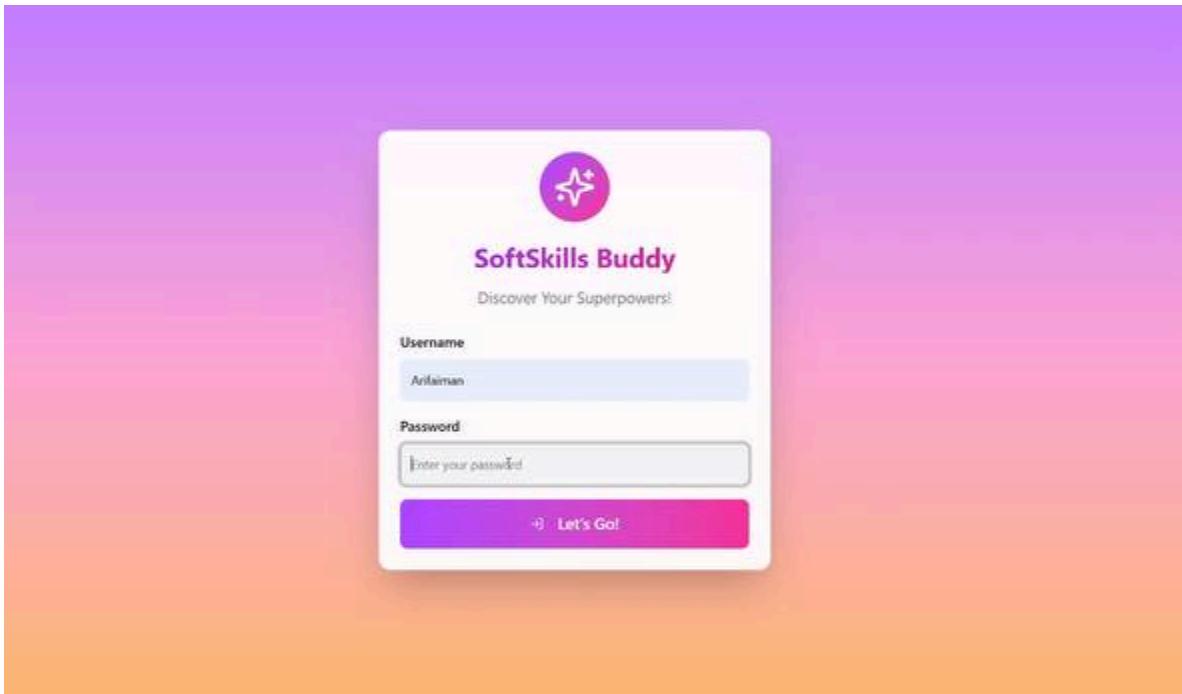


The provided picture was our meeting that conducted for task distribution, where we assigned specific responsibilities for the prototyping and report writing phases to ensured balance workload. This meeting highlights how our team moved from broad ideas to a focused ensuring that the development of SoftSkills Buddy was a result of critical thinking.

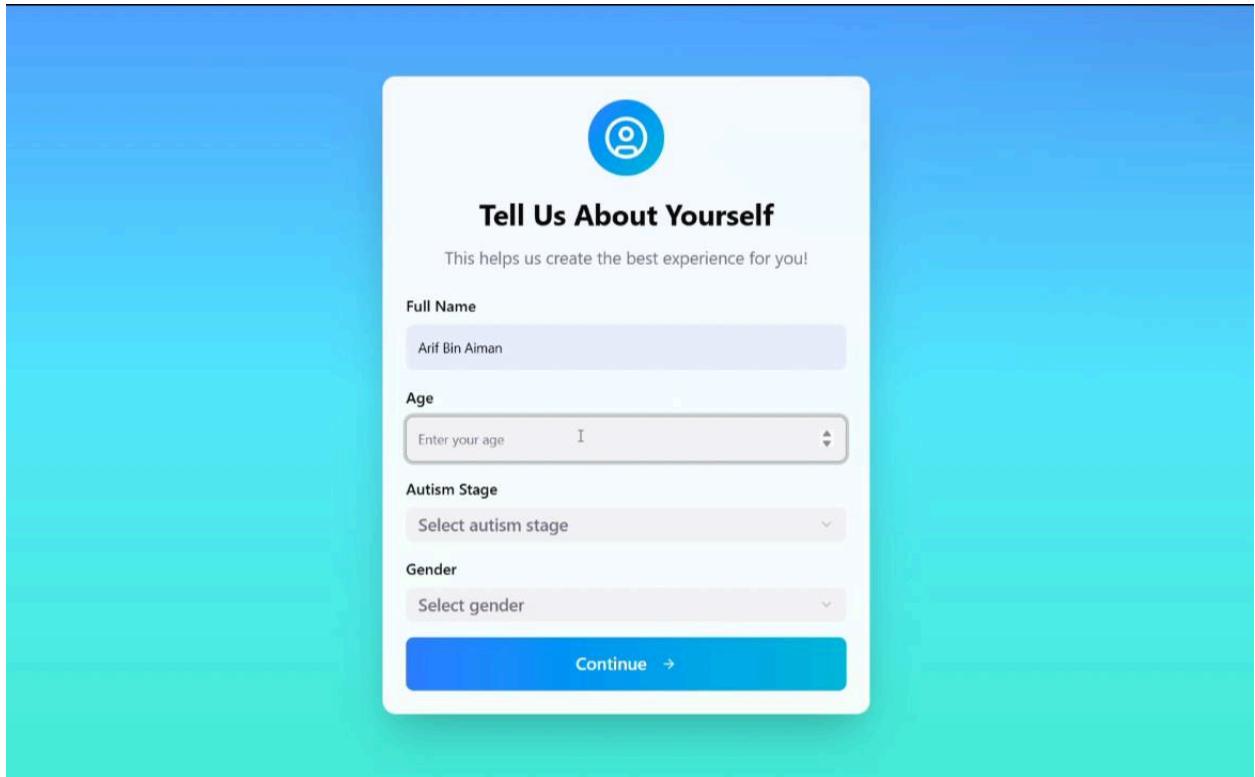


The provided picture shows our team's brainstorming process on how we want to develop our app. It shows the moment our team turned our research into actual design ideas for SoftSkills Buddy. This section documents the transition from our initial ideas into a non functional prototype of the SoftSkills Buddy app. This stage was critical because it allowed us to visualize the user interface and ensure the layout was sensory-friendly for children with autism.

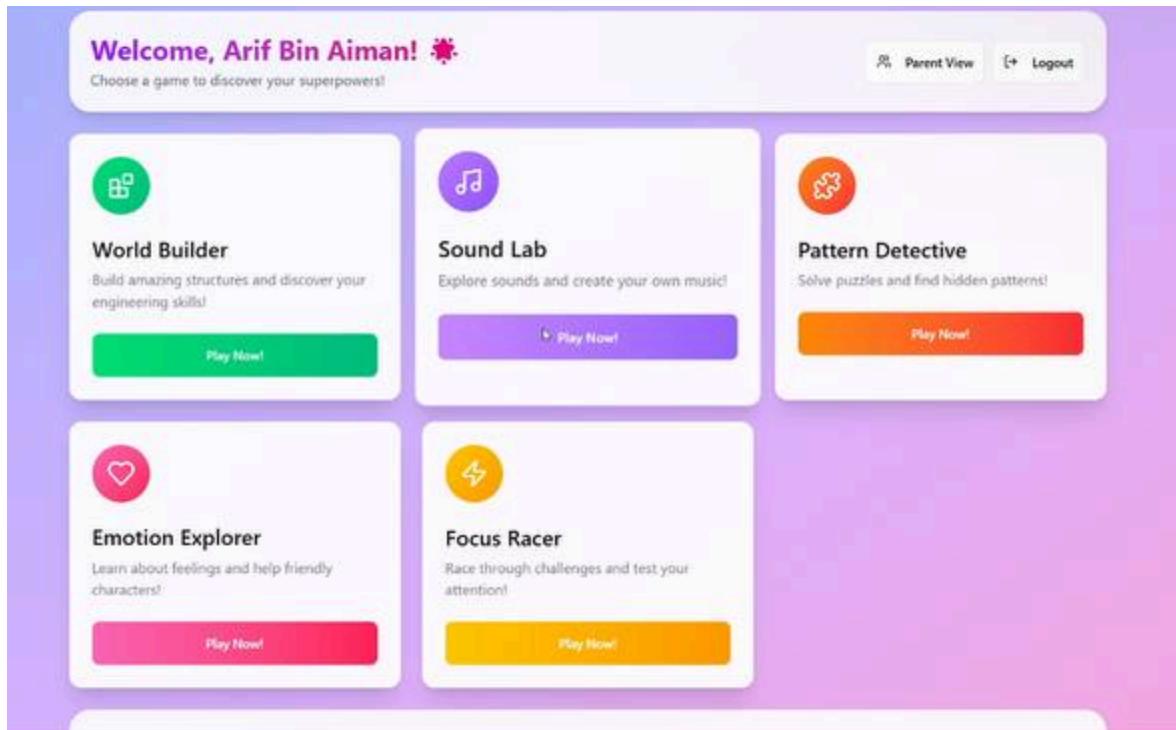
4.0 Prototyping



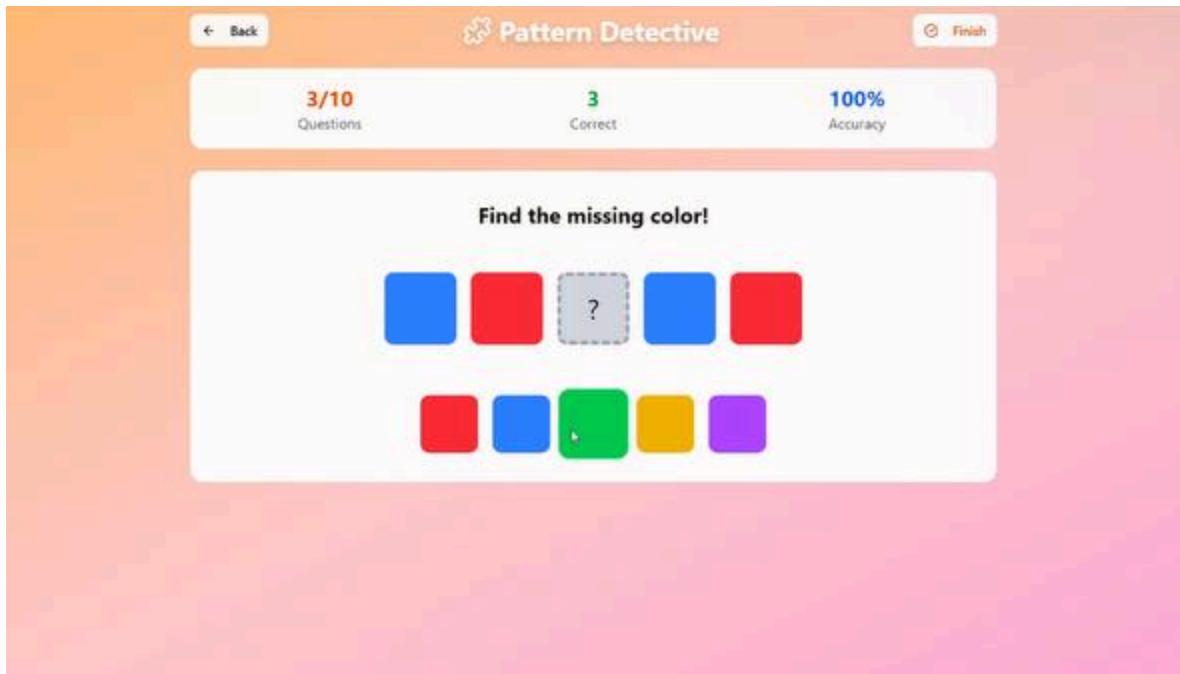
1 - This is the main Login page of SoftSkills Buddy prototype, which serves as primary entry point for the user. We intentionally designed it to be clean as research indicates that minimizing sensory overload is essential for children with Autism Spectrum Disorder (ASD). By requiring a login that entered by user, the system ensures that all "detected" soft skill data and game progress are assigned to the correct individual profile, allowing for accurate tracking.



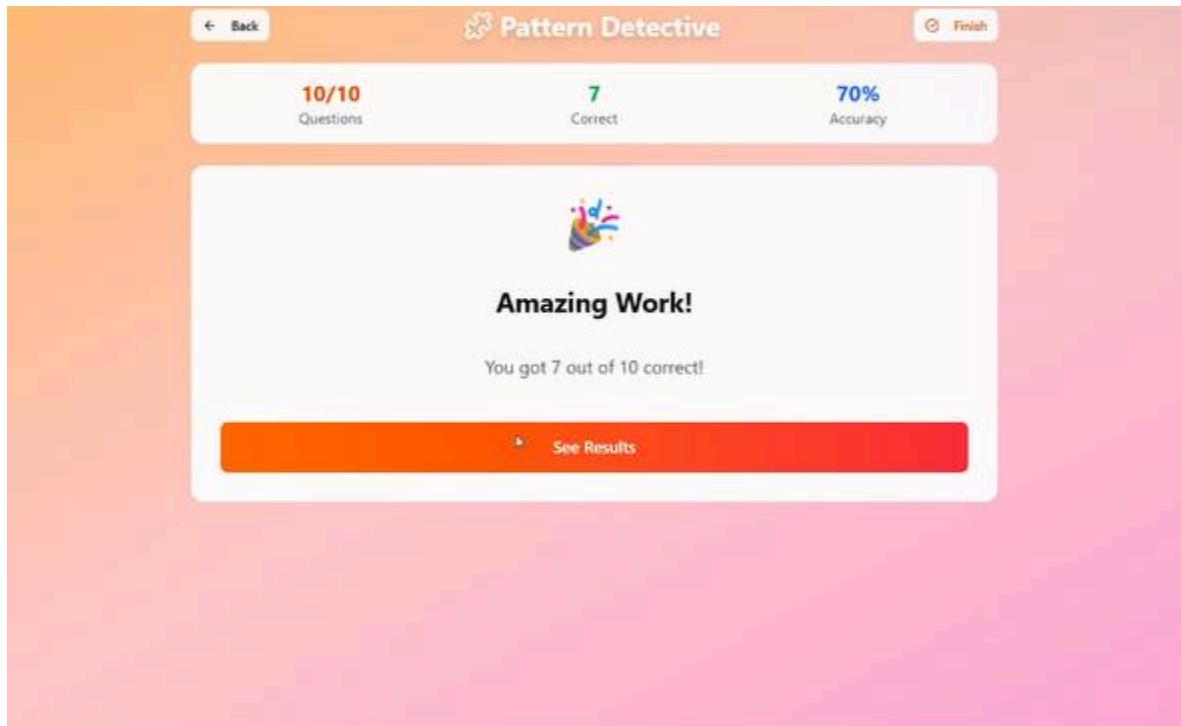
2 - This screen allows the app to gather essential details. Collecting this information allows the system to personalize the experience for each user. For example, knowing the child's "autism stage" helps the app adjust the difficulty of the social games to match their specific needs. This ensures that the detection process is accurate and that the child receives a customized report that truly reflects their developmental progress.



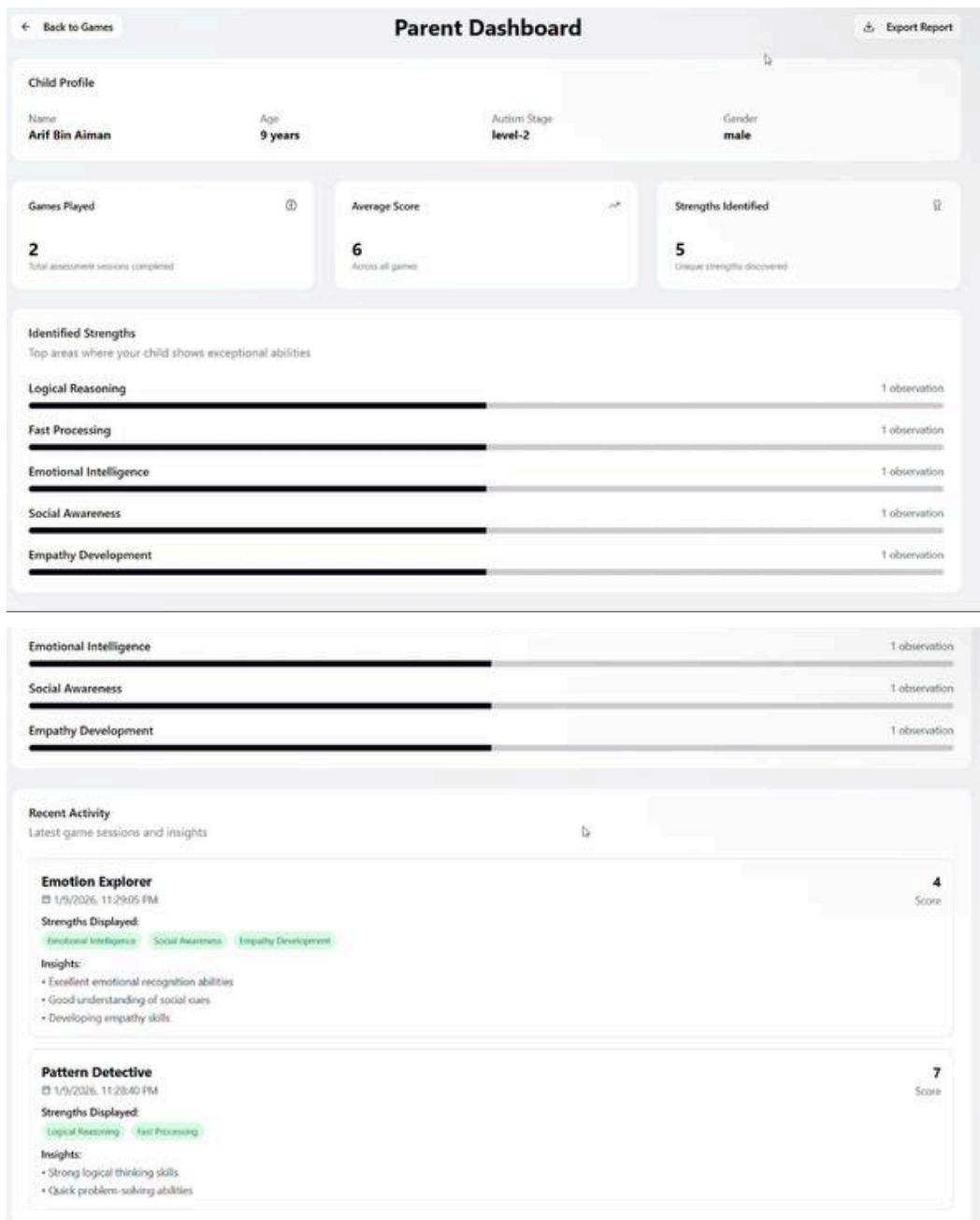
3 - This interface is about game selection hub which is central dashboard that can choose various interactive activities. This page allows user to explore at their own pace, which reduces anxiety and helps us detect their soft skills naturally through play.



4 - This game is designed to assess a child's logical reasoning and attention to detail by challenging them to solve puzzles and identify hidden sequences. For children with Autism Spectrum Disorder (ASD), recognizing patterns can be a significant strength, and this game leverages that natural ability to build confidence while simultaneously monitoring their focus levels and problem-solving persistence.



5 - This interface provides immediate positive reinforcement after a child completes a game session.



6 - Last page is about parents dashboard. It is designed to transform the raw data collected during gameplay into meaningful insights for caregivers. By presenting theses scores, it can provides an objective way to see where a child thriving or where they may need extra support.

5.0 Testing

After developing the high-fidelity prototype in Figma, we conducted a user experience interview but due to logistical constraints, we selected a focus group of 4 participants which are 2 parents from the initial survey and 2 university peers acting as "naive users" to interact with the Neuro Spark prototype.

1. Testing Methodology

We narrowed the scope to three different testing. Firstly, users were given specific tasks to fulfill. Next, users were asked to vocalise their thoughts while navigating the app and lastly, users rates the "ease of use" and "visual comfort" on a scale from 1-10.

2. User Feedback

Strengths :

The navigation went smoothly, the users' trust in the interface was spurred by the 'Home' button being consistently where it was expected, so they were certain of not being lost. The addition of the animated dog mascot proved to be a brilliant idea as well since the users found the character friendly and nice.

Weaknesses :

On the other hand, the testing uncovered few usability issues. Some users were puzzled by the "Brain" icon as two of them did not connect it with "Memory Games" and hence, did not use the module. Also, the font size was a concern as one parent found the font in the "Teacher Report" was too tiny to read comfortably on a mobile screen. Lastly, the navigation sequence was problematic since the users were not able to find the "Exit" button easily after they had gone into a minigame.

3. Improvements suggestions

Based on this direct feedback, we planned to implement specific iterations to enhance the prototype. To address the confusion around icons, we replaced the abstract "Brain" symbol with a more literal "Picture Card" icon, which clearly represents memory-based tasks. We also updated the typography by increasing the global font size from 14px to 18px. Lastly, to solve the navigation issue, we suggested adding a permanent, semi-transparent "Back" arrow in the top-left corner of every game screen, ensuring a clear and accessible exit route at all times.

TASK DISTRIBUTION

To ensure the success of SoftSkills Buddy app, our group divided responsibilities based on individual strengths.

TASK	DESCRIPTION	PERSON IN CHARGE
Documentation	<ul style="list-style-type: none"> - Responsible to compile the evidence section - Ensured the report met all the grading criteria and word counts 	<ul style="list-style-type: none"> - Nur Fatin Nabila
Problem description and solution	<ul style="list-style-type: none"> - Responsible to provide detailed description of the problem met by our target user - Elaborate how the group came out with the solution 	<ul style="list-style-type: none"> - Nurkarmila
System architect / creative designer	<ul style="list-style-type: none"> - Responsible to designed visual interface of non functional prototype screens - Created the user flow diagram (how user moves through app) 	<ul style="list-style-type: none"> - Khadeejah Zhafeerah
Content creator / editor of the video	<ul style="list-style-type: none"> - Responsible to lead the video documentation for this report 	<ul style="list-style-type: none"> - Khadeejah Zhafeerah
Empathy phase lead	<ul style="list-style-type: none"> - Provide google form to survey about the apps we want to develop - Formulated the survey questions to understand user needs 	<ul style="list-style-type: none"> - Logapriyah Sivakumar

Students Reflection	<ul style="list-style-type: none"> - Provide motivation that drove us to complete this project - Provide the lesson learned through this project 	<ul style="list-style-type: none"> - Nur Fatin Nabila - Khadeejah Zafeerah - Nurkarmila - Logapriyah
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CONCLUSION

In summary, the development of the Softskills Buddy prototype represents a significant step for digital innovation to develop the needs of children with Autism Spectrum Disorder (ASD). Throughout this project, the application of design thinking steps allowed our team to focus on lived experiences of autism communities. It was through the human, centered Design Thinking process that we were able to focus on the voices of the community and thus ensure that our solution really attends to the sensory and emotional needs of the children instead of simply providing content.

Most importantly, the research shows that starting to identify soft skills at the early stage is a key factor for the child's success in living independently later on. By combining the major tracks of Bioinformatics with the design that considers user's emotions, our "stealth assessment" model cleverly gathers data on these essential skills being developed without interrupting the natural flow of the game. The research analyzed during this project confirms that identifying and assessing soft skills early is an absolute necessity for fostering long-term independence and social inclusion.

Ultimately, the process of building this prototype has transformed our team's perspective on the intersection of healthcare and digital innovation. We have learned that the most effective tools are those who created through a numerous of research and genuine community engagement. As we move forward into our careers, the lessons learned from this design thinking project will remain at core of our professional values. SoftSkills buddy is more than just an app, it is our dedication to ensuring that every child is empowered to unlock their hidden strength and skills.

REFLECTION

KHADEEJAH ZAFEERAH :

1. What is your goal/dream with regard to your course/program?

My main goal in pursuing Bachelor Of Science Computer in Bioinformatics is to become a data analyst in the future. I am deeply interested in how data can be used to understand people, systems, and real-world problems. In today's digital world, almost everything generates data, from education platforms to healthcare systems, and I believe that data analysts play an important role in transforming this information into meaningful insights. Through my studies, I hope to develop strong skills in data analysis, programming, critical thinking, and problem solving so that I can contribute to organizations that aim to make positive changes in society. My long-term dream is not only to succeed in my career, but also to use my skills to help communities, especially in areas such as education and child development.

2. How does this design thinking impact your goal/dream with regard to your program?

The design thinking project has greatly influenced how I see my future goal. This project taught me to focus on real users and their needs before creating a solution. Instead of just thinking about technology, I learned to think about people, their challenges, and how a digital product can truly support them. Through this project, I hope that our application can become a real system one day, especially to help parents of children with autism. Many parents struggle to identify their child's interests, abilities, and learning progress. With this application, parents can see their child's development over time and better understand their strengths and areas that need support. This will allow them to make better decisions and plan their child's future more effectively, even if their child has autism. This project is closely connected to my dream of becoming a data analyst because the application will collect valuable data about a child's learning, progress, and interests. By analyzing this data, useful insights can be generated to help parents, teachers, and therapists provide better support for the child. For example, data can show which activities a child enjoys most, which skills are improving, and which areas need more attention. This shows me how data analysis can be used not just for business, but also to improve people's lives in meaningful ways. The project has helped me realize that data is not just numbers but it represents real people and real stories.

3. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To improve my potential and be ready to serve the industry, I know that I need to continue learning and developing my skills. One of my main plans is to join more coding and technology programs so that I can become more confident in programming, data handling, and software development. I also want to learn more about how data is used in real organizations, such as how data is collected, stored and presented. This will help me understand how the industry actually works and prepare me for professional work environments. In addition, I also plan to strengthen my skills in using tools such as VS Code, GitHub, and Slack so that I can collaborate efficiently, manage projects effectively, and communicate my findings clearly in a professional environment.

NUR FATIN NABILA :

1. What is your goal/dream with regard to your course/program?

My dream/ goal pursuing this course is to become a bioinformatics specialist who can contribute to medical research, especially in disease detection and genetic analysis. I wanted to try to develop an efficient software that helps people in need. In the future, i hope to work in biotechnologies companies where i can support in improving human health and make them easier in their daily life. I hope to contribute to a meaningful solutions that benefit society through innovation and research.

2. How does this design thinking impact your goal/dream with regard to your program?

It has strong impact on my goal because it trains me to solve a real problem by focusing on human needs. Through this project, I learned that technology should not only be advanced but it is also have to be meaningful and user-centered. This experience aligns with my dream which is to improve healthcare and quality of life. Design thinking encourages empathy, allowing me to better understand the challenges faced by children with disorders, their parents, and educators.

3. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To improve my potential in the industry, I need to consistently improve my skills and gain more knowledge on professional skills. I plan to improve my biological knowledge and programming skills which widely used in healthcare-related applications. I aim to deepen my knowledge in machine learning and biological databases. Lastly, I will also improve my communication skills and stay updated with the industry trends.

LOGAPRIYAH SIVAKUMAR :

1. What is your goal/dream with regard to your course/program?

My goal in this course is to use what I learn to create something meaningful that can help people in real life. I am especially interested in using technology and design to support children with needs, such as autistic children. Through my studies, I hope to gain the skills needed to design applications that are simple, friendly and useful not just technically correct but also emotionally considerate.

2. How does this design thinking impact your goal/dream with regard to your program?

Design thinking has helped me understand that a good solution does not start with technology, but with people. While working on the Neuro Spark app, I learned how important empathy is in the design process. By thinking from the perspective of autistic children and their parents, I was able to design an app that focuses on comfort, play, and understanding rather than pressure or testing. This experience showed me how design thinking can turn ideas into solutions that genuinely make a difference, which strongly supports my personal goal.

3. What is the action/improvement/plan necessary for you to improve your potential in the industry?

To improve myself for the industry, I need to continue strengthening both my technical skills and my understanding of users. I plan to improve my coding and design skills while also learning more about inclusive and user-centred design. At the same time, I want to gain more knowledge about autism and special needs so that my future projects are more sensitive and realistic. By working on more projects, accepting feedback, and learning from real-world experiences, I believe I can grow into someone who creates technology with purpose.

NURKARMILA :

1. What is your goal/dream with regard to your course/program?

From this course, I hope to implement the lessons I've learnt into something that can greatly benefit our society. I've dreamt of contributing my life's work and energy to create solutions that inspire generations. Specifically, as a student in this program, my dream is to link the gap between complex biological information and human accessibility to help produce more solutions like this - practical, user-friendly ASD detection system that helps deserving families and undersupported communities in Malaysia have access to educational support.

2. How does this design thinking impact your goal/dream with regard to your program?

This project helps me understand that in order to create lasting solutions, we need to think at a different angle and put ourselves into the shoes of whoever is going to benefit from them. As a Bioinformatics student, it is easy to get lost in the sea of algorithms, code and raw data. However, this design thinking taught me that research, predictions, and accurate data are not enough if the user experience is flawed. ASD is a continuous spectrum that manifests differently in different individuals, so it is crucial that the system can adapt to the user's need, avoid causing overstimulation, and affect the user's experience, which would contradict the purpose of the system. Therefore, it is an important reminder that not only do I have to think logically, I must also be an empathetic problem solver.

3. What is the action/improvement/plan necessary for you to improve your potential in the industry?

In order to improve myself, I plan on taking more off-academy classes offered online or physically related to coding or my course in order to gain more understanding in my field. Other than that, it is important that I also take part in programs that teach leadership, develop soft skills and promote collaboration so I have a chance to stand out more. Next, I will also seek opportunities to collaborate with experts outside of my field like biology scientists to ensure that my technical solutions are medically accurate.

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