

## Autism Learning Mobile Application

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### Abstract

The Autism Learning Mobile Application is designed for students aged 4 to 12 with autism. Developed using an agile methodology and an object-oriented approach, it aims to minimize risk through iterative improvements, allowing regular upgrades and continuous enhancements. Built with Flutter on Visual Studio Code and utilizing a NoSQL database, the app aims to improve daily skills, social skills, and overall quality of life for autistic children. Personalized materials tailored to each student's needs enhance its effectiveness, helping students develop language skills and improve social interactions. Key features include training videos, assessments, and a game hub, facilitating convenience, supervision, and collaboration between teachers and parents. This provides educational content and learning opportunities, especially for those unable to attend traditional school or needing extra support. The app reduces stress and anxiety by offering a safe environment where children can learn at their own pace, boosting self-esteem and confidence. Overall, the Autism Learning Mobile Application significantly enhances the quality of life for autistic children, helping them learn, grow, and develop in ways that may not be possible otherwise.

## 1. Introduction

The medical symptoms of developmental disorders are varied in nature as well as in restricted particular areas of action. Children with development disorders are usually affected by other causes of disease or illness such as mental health issues or trauma since that is the nature and severity of a brain impairment. In the rising occurrence of abuse among this group, lack of schooling, lack of self-esteem and self-advocacy skills, lack of awareness of social expectations and proper behaviour and communication problems are strong contributing factors (Zablotsky et al., 2019). People who are autistic may struggle with boredom, social contact, and enjoyable distractions. Individuals on the autism spectrum may struggle to pay attention in class or obey instructions.

These characteristics might make daily chores challenging. It is important to note that some individuals may have comparable symptoms even in the absence of autism spectrum condition.

The social skills and engagement that they often practice in their daily lives are refuses to make eye contact, is unable to recognize their name by the age of nine months, is unable to express emotions through expressions by the age of nine months, such as happiness or sadness, and by the age of twelve months, hardly ever makes gestures, such as waving goodbye, and is unable to play well with others by the age of fifteen months. exhibits no indications of being sensitive to other people's emotions at 24 months old.

Before the age of 36 months, does not engage in play or socialization with other kids. Not capable to performing in sixty months (Jyotismita, et.al., 2023).

The results show that, on all component abilities of a non-word repetition task employing simple stimuli, children with ASD perform comparably to typically developing children matched for language ability. In fact, they even show higher repetition accuracy on the longest test stimuli. Additionally, children with ASD appeared to do better on the task's auditory memory component. This finding has to be confirmed in a larger sample and—crucially—in an age-matched, normally developing comparison group with similarly developed short-term memory.

## 1.1 Background Research

Autism spectrum disorder (ASD) is characterized by social communication and interaction difficulties and restricted and repetitive behaviors and interests. Individuals with ASD usually display repetitive language, poor nonverbal conversation abilities, and uneven speech and language development. About 25–30% of individuals with ASD do not develop functional language throughout their lives, leading to isolation. ASD can affect anyone, regardless of sociocultural or economic background, and while it cannot be cured, early diagnosis and intervention can improve outcomes. Many students with ASD are now learning in mainstream schools, but they often require high levels of support, and teachers often lack specialized training. Targeted resources are needed to bridge the gap between research and practice in education for these students. Mobile devices and technology-based treatments, which are often preferred by children with ASD, can extend learning experiences and support their education effectively.

## 1.2 Problem Statement

Autism is a subclass of Autism Spectrum Disorder (ASD), identified by a lack of mutual social contact, social expression, and social creativity (Sofian et al., 2018). Children with autism face daily complexities and depend on their parents and teachers for daily routines (Azahari et al., 2017). Learning self-care skills is crucial for independence, but children with autism often struggle with verbal and nonverbal communication, social interactions, and repetitive behaviors (American Psychiatric Association, 2013; Howlin & Magiati, 2017). They also have sensory sensitivities and are more likely to experience anxiety and depression (Stahmer & Schreibman, 2007).

Families with autistic children often face major restrictions in their daily activities due to the need for strict behavior schedules (Ricon et al., 2017). The loss of self-care skills is linked with an increased risk of harassment, pressure on caregivers, and higher life-care costs (Donelly & Karsten, 2017).

Traditional teaching methods using pictures are less effective than videos for educating self-care skills (Kellems et al., 2017). Findings show that video prompting is more efficient in teaching daily living skills. A mobile application is proposed to improve the learning experience for children with autism by providing more effective educational tools.

## 1.3 Objective

To design and develop an autism learning mobile application using the agile method approach on the Android system, and to conduct functionality testing of the application.

## 2. Related Work

A literature review conducted for the application and the current management utilized by sekolah kebangsaan pendidikan khas will be covered in this chapter. It includes explaining the technology used in the mobile application and discussing and comparing three types of existing related mobile applications.

### 2.1 Mobile Application Technology

The Autism Learning Mobile Application for students is being developed using Android, a popular and widely used mobile operating system. Android's open-source architecture allows for flexibility and customization, making it suitable for addressing the specific needs of users with autism. Additionally, the widespread use of Android smartphones ensures that the Autism Learning Mobile Application for students can reach a broad audience. The Android development ecosystem, including tools like Android Studio, enhances the development process by making it more effective, streamlined, and efficient. Thus, Android's accessibility and comprehensive development ecosystem were the primary reasons for selecting it to build the Autism Learning Mobile Application for students.

## 2.2 Case Study: Sekolah Kebangsaan Pendidikan Khas Batu Pahat

The symptoms of developmental disorders are diverse, affecting specific areas of functioning. Children with these disorders often experience additional health challenges such as mental health issues or trauma, exacerbated by instances of abuse. Contributing factors include lack of schooling, low self-esteem, social unawareness, and communication difficulties (Zablotsky et al., 2019).

Autistic individuals may struggle with boredom, social interaction, and following instructions, impacting daily activities. Some may exhibit similar symptoms even without an autism diagnosis, such as difficulties with eye contact, recognizing names, expressing emotions, making gestures, and engaging in social play. Research indicates that children with Autism Spectrum Disorder (ASD) perform comparably to typically developing children on linguistic tasks, albeit at a delayed pace, suggesting a correlation between language proficiency and the ability to repeat novel phonological forms in individuals with ASD. Various types of developmental disabilities exist, including ADHD, Cerebral Palsy, and others, with ASD characterized by difficulties in social interaction and repetitive sensory-motor behaviors, independent of cultural or socioeconomic factors (Lord et al., 2018).

## 2.3 Study of Existing Related Application

A team of psychologists, speech therapists, occupational therapists, and behavioral therapists created Autism BASICS to empower parents of children with autism and special needs. The app offers Daily Activities, an Activity Library, and a Parent Corner for direct interaction with children, with activities assigned by parents or therapists. Thousands of engaging activities cater to various developmental areas like behavior, intellect, communication, and social skills.

AutiSpark is specialized educational software for children with Autism Spectrum Disorder (ASD), featuring professionally created games tailored to their needs. These games, including visual association and emotional comprehension activities, provide positive reinforcement and teach fundamental skills essential for daily life.

Otsimo, developed under the guidance of psychologists, parents, and special education teachers, offers assistive games for cognitive, communicative, and motor skill improvement. With various categories like social stories and vocabulary, Otsimo allows users to customize settings and adjust difficulty levels, providing a tailored curriculum for each individual's learning progress. Additionally, the app prohibits advertising and offers comprehensive progress reports for users.

## 2.4 Comparison with the Existing Application

This section describes the use of three currently available autism learning application which is Otsimo, AutiSpark, and Autism BASICS to improve the functionality of the suggested mobile application for school-age children with autism. The comparison of the three accepted applications is shown in Table 1. Table shows that comparison between the three established applications and the proposed applications. Basically the sign up/log and database in features is got in all the compared applications. For the report generation Autism Basics don't have but we have in autism learning mobile application. Furthermore, for assessment result two application did not provide which is Autism BASICS and AutiSpark. Moreover, Learning material management, game hub for kids and training for kids don't have in Otsimo application. Finally, in autism learning mobile application got all the scopes that proposed. The Table 1 shows the comparison between existing applications and the Autism Learning Mobile Application.

**Table 1** Comparison with the existing application

Application features	Otsimo	Autism Basics	AutiSpark	Autism Learning Mobile Application
Sign Up/ Login	√	√	√	√
Database	√	√	√	√
Report Generation	√	x	√	√
Assessment Result	√	x	x	√
Learning Material Management	x	√	x	√
Game Hub for kids	x	√	√	√
Training for kids	x	x	√	√

### 3. Methodology/Framework

This chapter explain of a mobile application development project typically describes the methodology that will be used to develop, deliver, and maintain the application. The methodology should be chosen based on the specific needs of the project, such as the size and complexity of the application, the budget and timeline, and the expertise of the development team. Agile methodology will be used for this project's effective development, delivery, and brief explanation of each stage. Agile technique was used to create the mobile application. Agile is an iterative, sequential approach to software development. Agile application development facilitates the organization of development, planning, and testing procedures across the software life cycle. Because agile application development methodologies may be updated and continually enhanced, their quality can be steadily improved, adopting an agile strategy lowers risk. The last build will include all the functionality the client demands, with each release adding features alliteratively

**Table 2** Development task and output

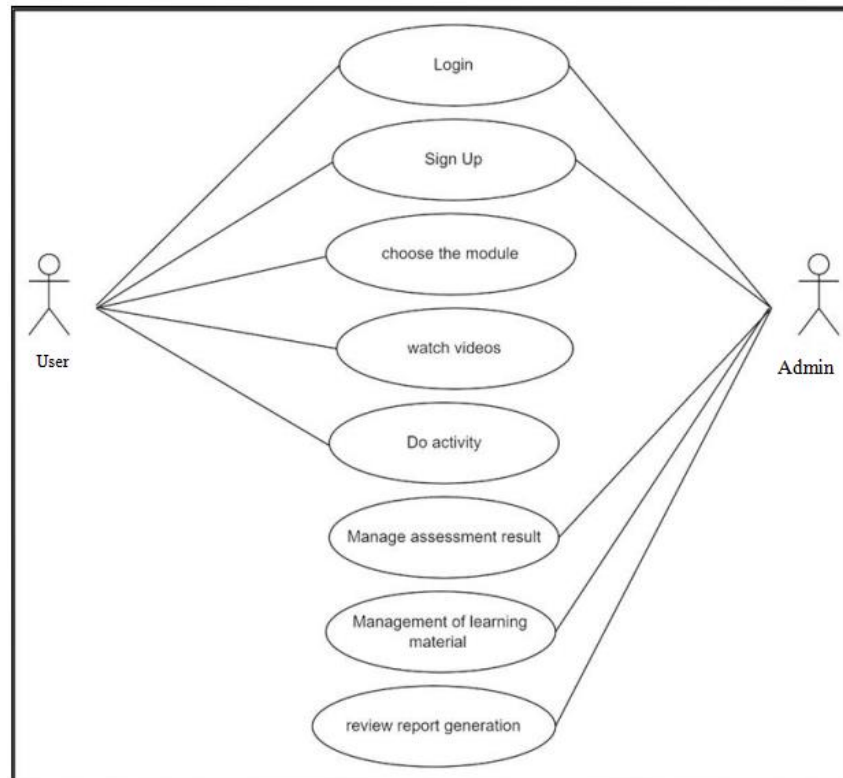
Phase	Task	Output
Requirement	<ul style="list-style-type: none"> <li>Identify the background, problem statement, objectives, requirements and scope of the project.</li> <li>Identify the functional, non-functional, user, hardware and software requirements.</li> <li>Visual the application.</li> </ul>	<ul style="list-style-type: none"> <li>Determine the scope</li> <li>Determine the goals</li> <li>UML</li> <li>ERD</li> <li>Flowchart</li> </ul>
Planning	<ul style="list-style-type: none"> <li>Proposed the project</li> <li>Determine the project schedule, activities and output.</li> </ul>	<ul style="list-style-type: none"> <li>Project Proposal</li> <li>Develop Gantt Chart</li> </ul>
Design	<ul style="list-style-type: none"> <li>Build and organize the application</li> <li>Database schema and data dictionaries</li> <li>User Interface</li> </ul>	<ul style="list-style-type: none"> <li>Designed User interface</li> </ul>
Develop	<ul style="list-style-type: none"> <li>Front-end Development</li> <li>Back-end Development</li> <li>Database</li> </ul>	<ul style="list-style-type: none"> <li>For users easy to use the mobile application</li> <li>Connected Database</li> </ul>
Testing	<ul style="list-style-type: none"> <li>Testing Mobile Application</li> <li>Fixed Bug</li> </ul>	<ul style="list-style-type: none"> <li>The developer tested and ensured the functionality of the</li> </ul>
Deploy	<ul style="list-style-type: none"> <li>Deploy app on the application store</li> </ul>	<ul style="list-style-type: none"> <li>Mobile applications fulfil the requirements of both developers and users.</li> <li>User Guide</li> </ul>
Review and Maintenance	<ul style="list-style-type: none"> <li>Questionnaire feedback</li> <li>Provide Maintenance</li> <li>Submit all report of FYP</li> </ul>	<ul style="list-style-type: none"> <li>Feedback from Sekolah kebangsaan pendidikan khas.</li> <li>Provide Maintenance if needed</li> <li>Project submitted</li> </ul>

### 4. Analysis and Design

This will explain about the application's analytical and design needs, including system architecture, database, and user interface wireframes. The functional requirements, non-functional requirements, and user requirements are all shown in Chapter 4.1. This chapter also covers the Unified Modelling Language (UML), the Entity Relationship Diagram (ERD), and the flow chart. The results of this application's analysis and design is vital to meet the demand of stakeholders to may ensure that its functional process understood better.

## 4.1 Use Case Diagram

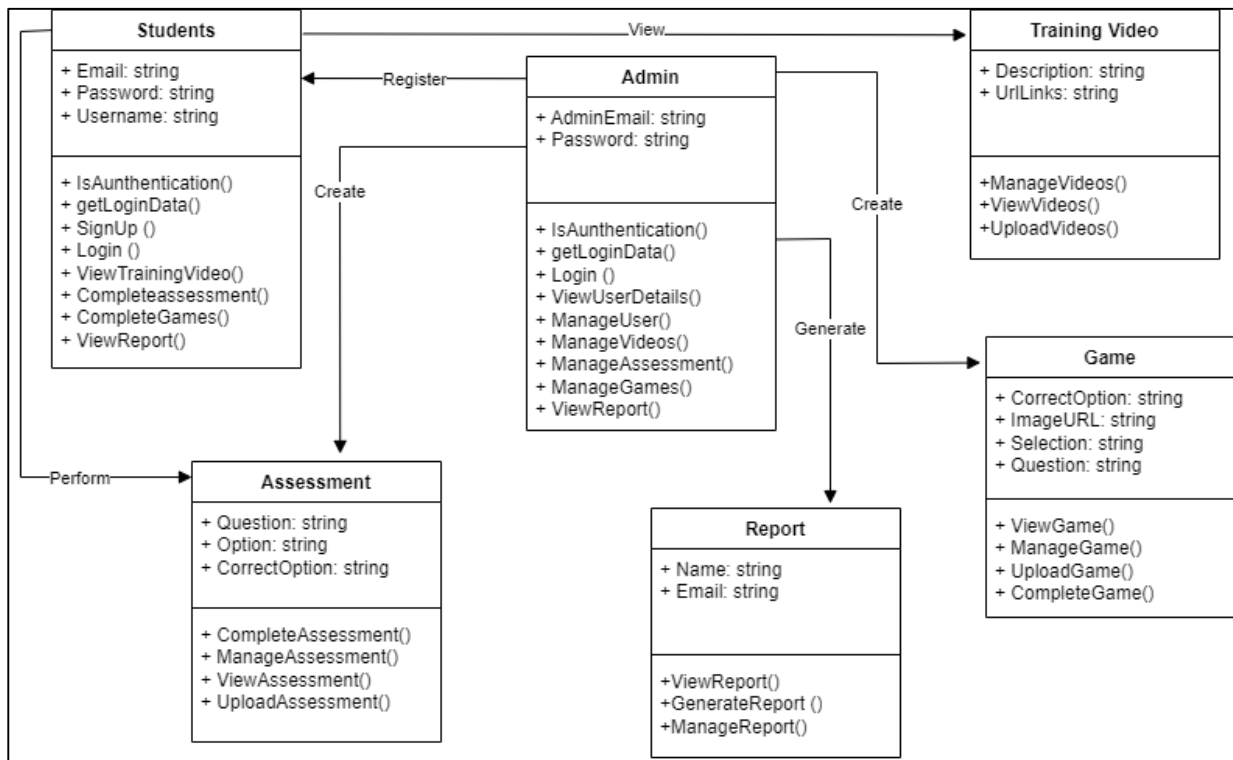
As part of the analysis, a use case diagram was created to illustrate the overall functionality and components of the application. The description or module implemented in the suggested system will explain the use case diagram. Figure 1 shows the use case diagram of the proposed system. Furthermore, in the Autism Learning Mobile Application, the actors identified for this system are users and admin.



**Fig 1** Use case diagram of the proposed system.

## 4.2 Class Diagram

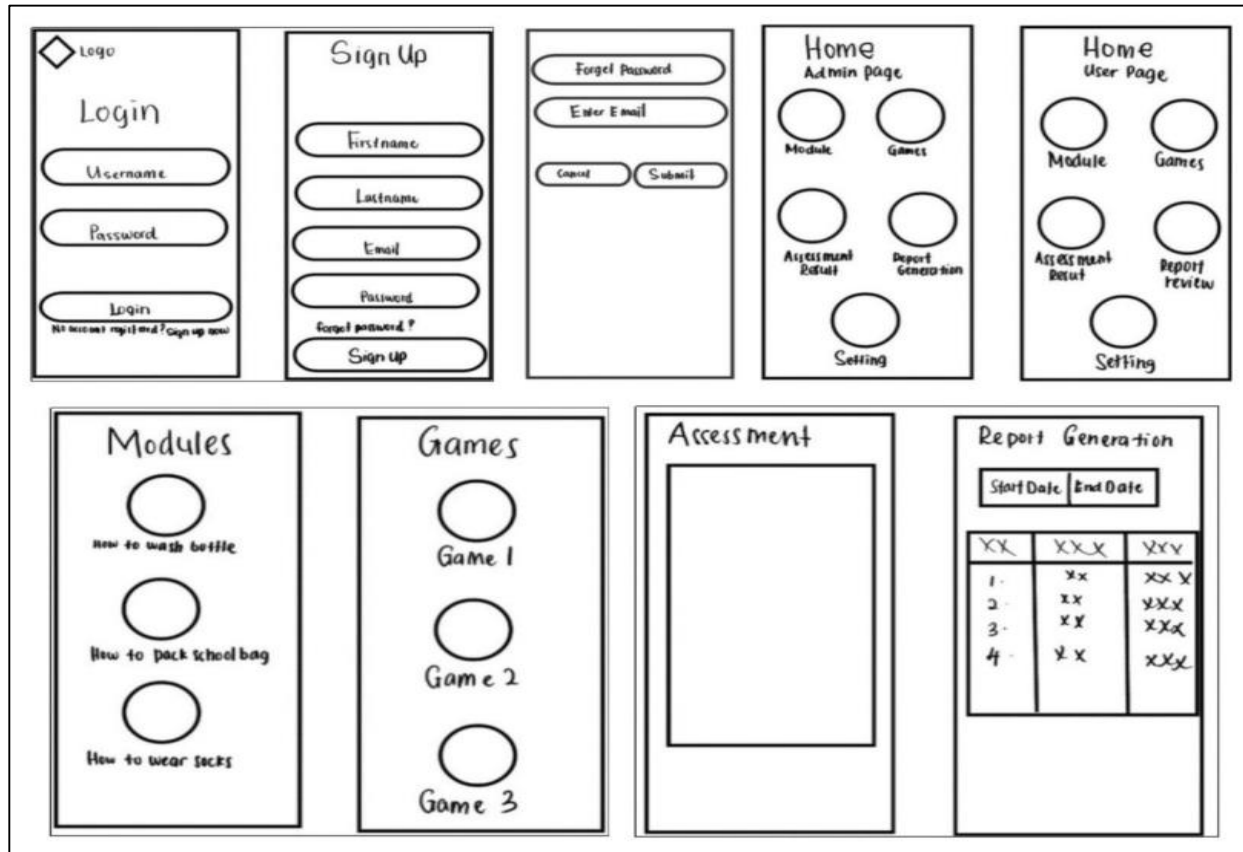
The class diagram is a unified modelling language (UML) diagram used to describe and visualize the classes, attributes, operations, and relationships between objects of the system. This type of diagram provides a high level view of the system structure, which allows the developer to clearly understand and know what those classes are to do and what the service offers. The class diagram of the proposed system is shown in Fig 2.



**Fig 2** Class diagram of the purposed system.

### 4.3 Interface Design

The section will detaily analyse on the application's design interface. The author had used hand drawing on tablet using in order to replicate the real look of the application. In this section, the author will brief the design interface. As for figure 3, the login page is as shown below, whereby figure 6 is the page to register the account.



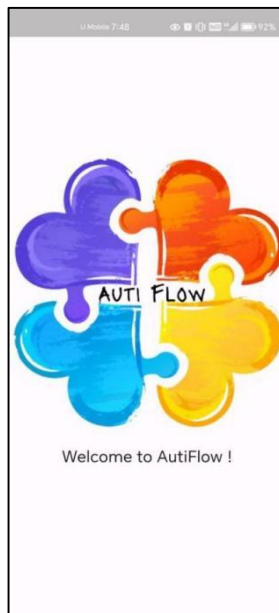
**Fig 3** Wireframe of the purposed system.

### 5 Result and Discussion

The project will be coded using Flutter programming language. Besides the software used is Visual studio code, Android Studio and Firebase. The Visual studio code is an integrated development environment for Android application building. Firebase is a mobile and web application development platform provided by Google that offers features such as aFirestore database, authentication, and more.

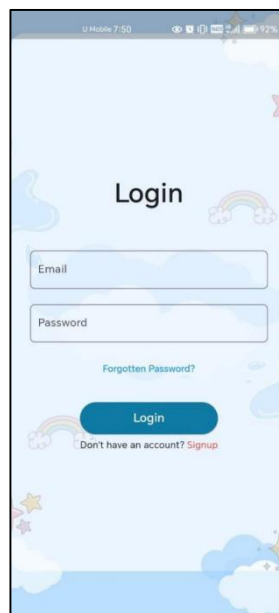
### 4.4 System Implementation

This section briefly discusses the development of functional modules in a system. Fig 4 shows a splash screen. When the user clicks the "Autism Learning Mobile" application, the splash screen with the logo will be displayed.

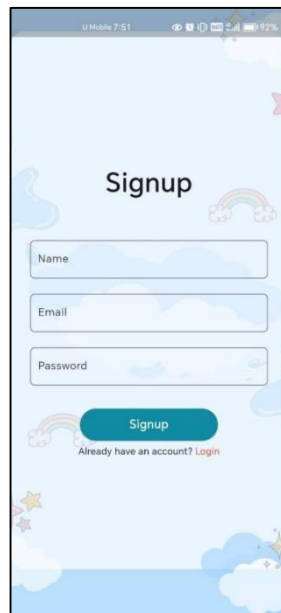


**Fig 4** *Splash screen*

The user is required to log in to the application using the user's email addresses and passwords. Fig 5 shows the login page interface and Fig 6 shows the signup page interface. Users who have not signed up can sign up for an account first. The user must fill out the name, email address, and password and select the role on the signup page.

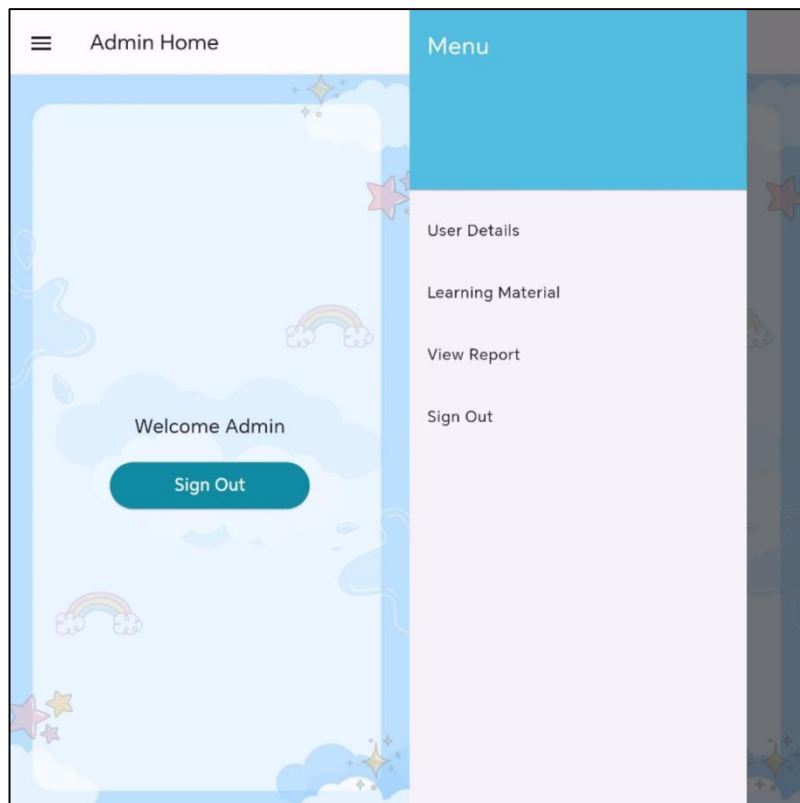


**Fig 5** *Login page.*



**Fig 6** Signup page.

Fig 7 shows the home interface of the teachers. There are 4 icons in the home interface. It contains the User details, Learning material, view report, and sign out.



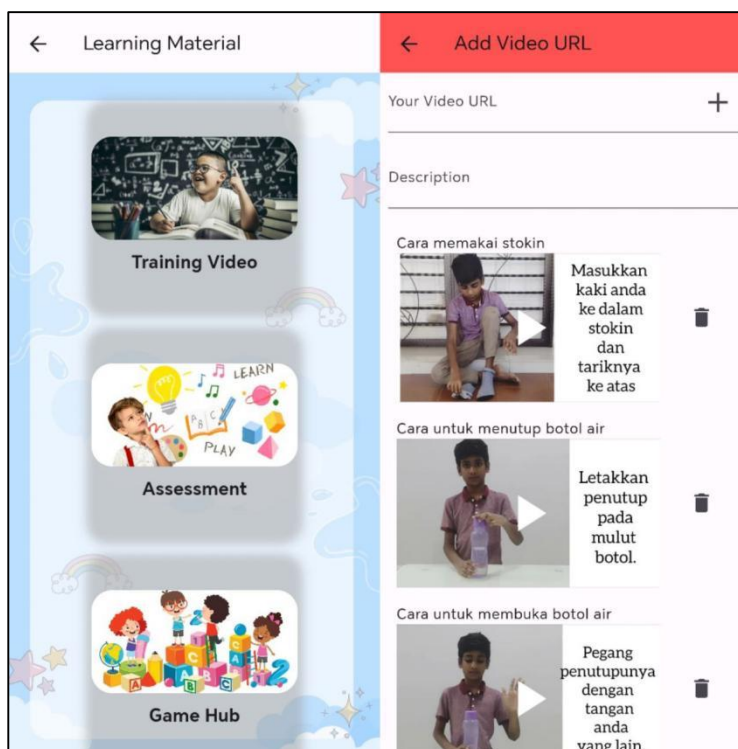
**Fig 7** Home interface of the Teacher.

Fig 8 illustrates the user details page, which is accessible to admin. On this page, admin can view the user's name and email address, alongside a delete button for each user. Admin have the capability to delete users from this page.



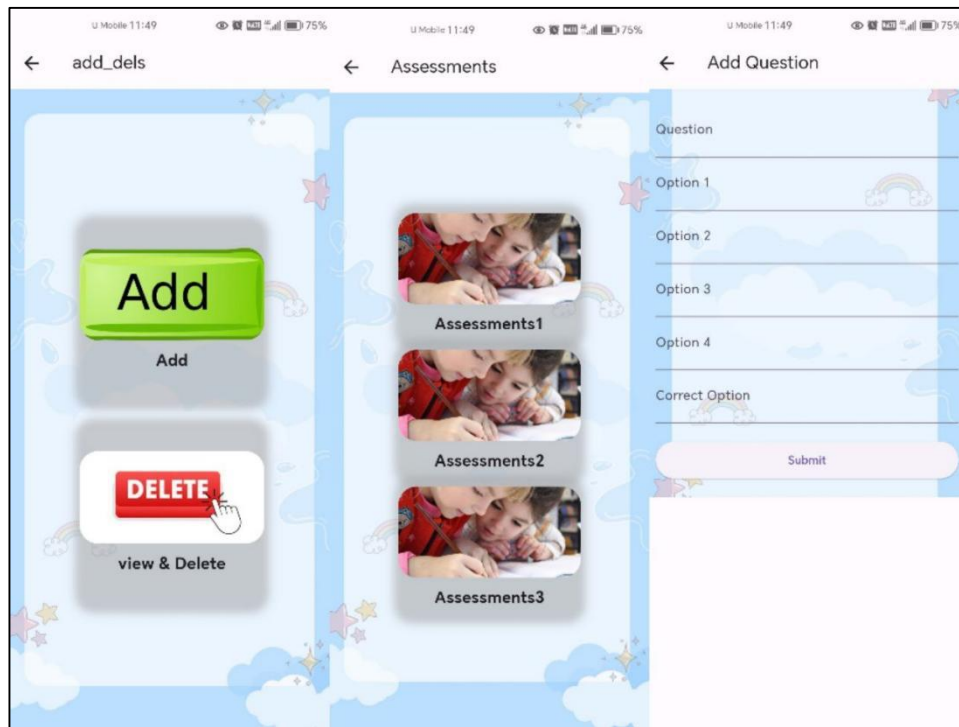
**Fig 8** Manage questionnaire module interface.

Fig 9 illustrates the learning material page, which includes sections for training videos, assessments, and the game hub. On the training videos page, admin can upload videos by pasting the video link in the provided space and providing a description for each video. Admin also have the capability to delete video modules from this page.



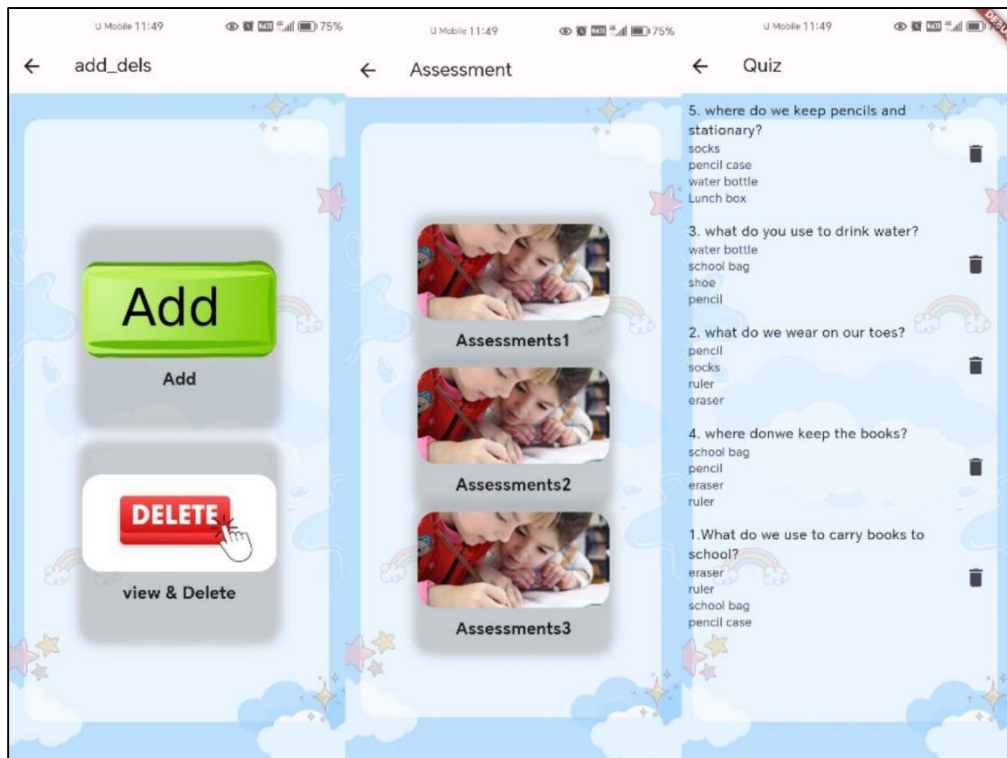
**Fig 9** Training video module interface

Fig 10 illustrates the assessment module page. To add an assessment, the admin clicks the "Add" button, which navigates to a list of assessments, including Assessment 1, Assessment 2, and Assessment 3. After selecting Assessment 1, the admin can add questions, input four options for each question, and specify the correct option. The admin must click the "Submit" button to upload the assessment. Each assessment contains questions of varying difficulty levels.



**Fig 10** Add assessment module interface

Fig 11 illustrates the assessment module page for viewing and deleting assessments. To view and delete an assessment, the administrator clicks the "Delete" button to enter the page. The admin can view the uploaded assessment questions. To delete a specific assessment question, the admin clicks the corresponding "Delete" button.



**Fig11** Delete assessment module interface

Figure 12 illustrates the add game module page. To add a game, the administrator clicks the "Add" button, which navigates to a list of games, including "Identify Image," "Count Game," and "True or False." After selecting "Identify Image," the administrator can add an image and a question, input four options for each question, and specify the correct option. The administrator must click the "Submit" button to upload the game. Each game type has different requirements based on its type.

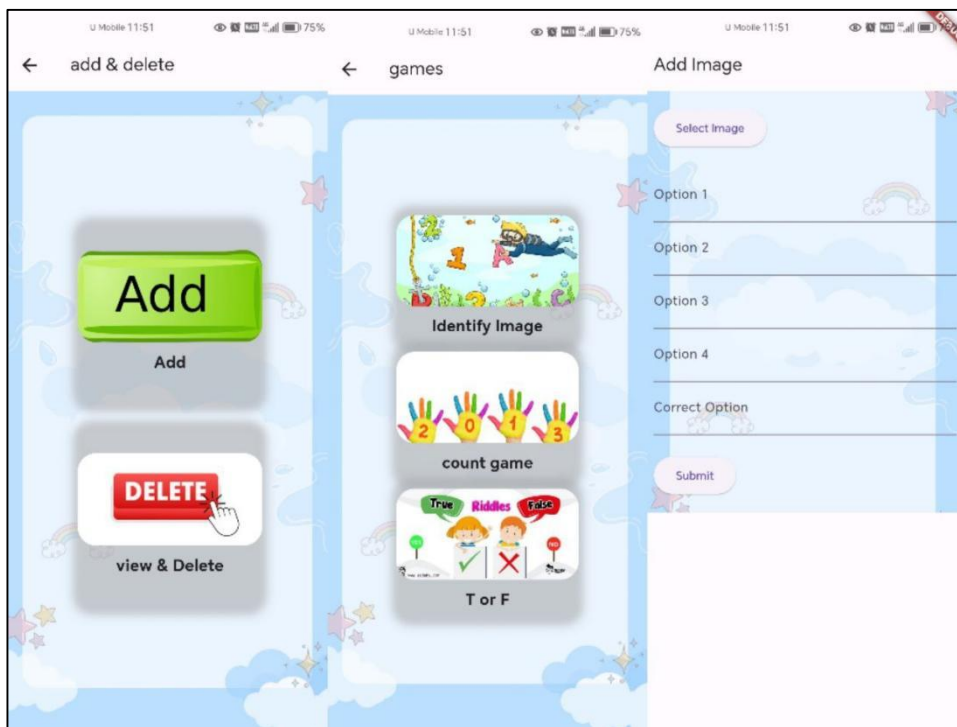


Fig12 Add game module interface

Fig 13 illustrates the game module page for viewing and deleting games. To view and delete a game, the admin clicks the "Delete" button to enter the page. The admin can view the uploaded game questions. To delete a specific games, the admin clicks the corresponding "Delete" button.

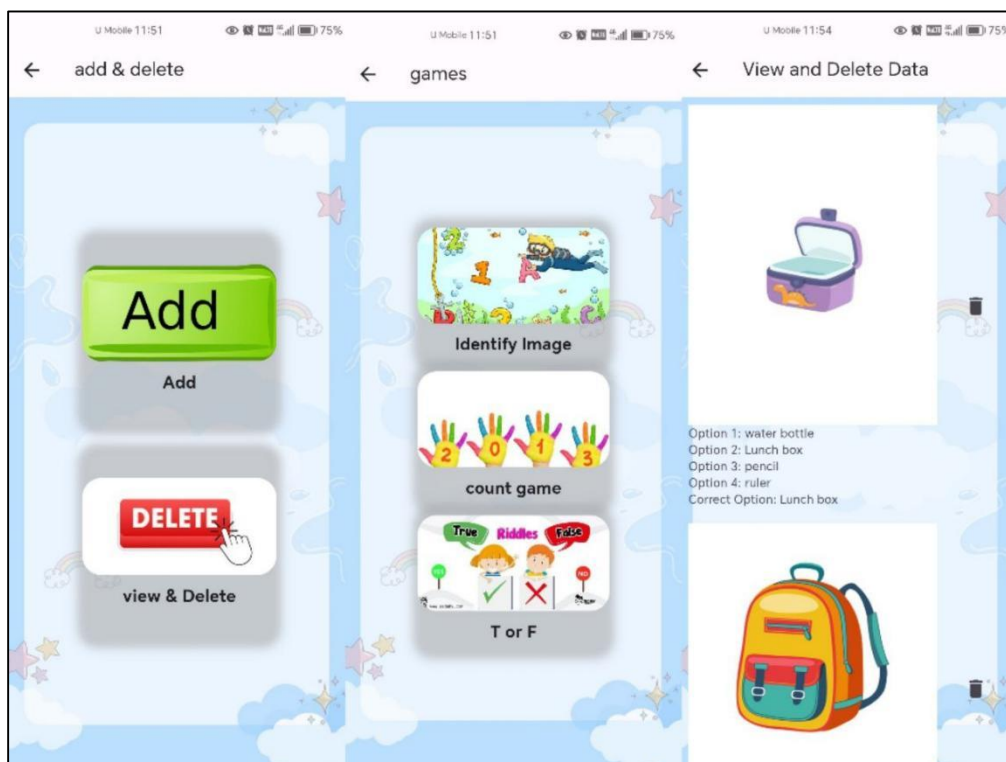


Fig 13 View and delete game module interface

Fig 14 illustrates the page where the admin can view all student reports. On this page, the admin can see the marks for Assessments 1, 2, and 3, as well as the scores for the "Identify Image," "Count Game," and "True or False" games in the view report section.

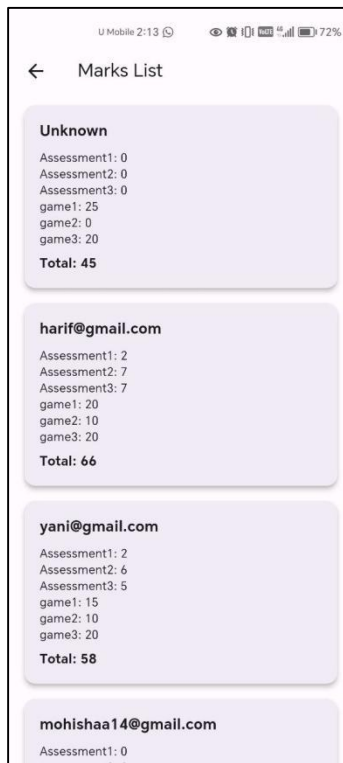


Fig14 View report interface

Fig 15 shown home interface for teachers, featuring five icons. These icons represent the following sections: Learning Video, Assessment, Game Hub, View Report, and Sign Out.



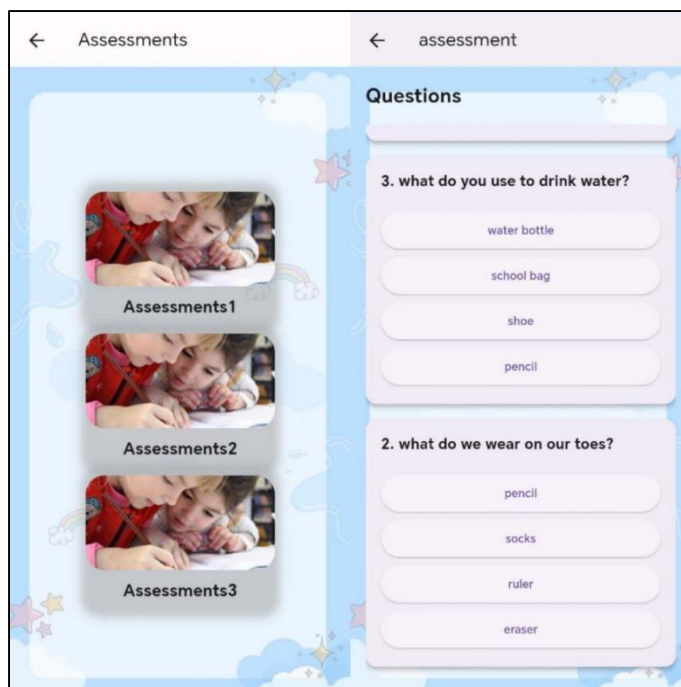
Fig 15 Student home page interface

Fig 16 illustrates the training video page. On this page, students can view videos in a step-by-step sequence.



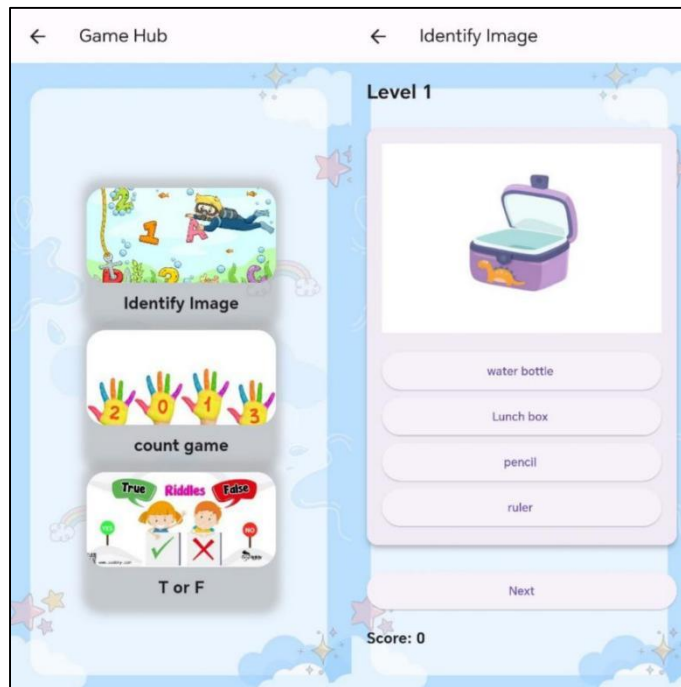
**Fig16** training video interface

Fig 17 illustrates the assessment page for students. This page includes Assessment 1, Assessment 2, and Assessment 3. Students can complete the assessments, progressing from easy to hard levels. Each assessment contains questions of varying difficulty levels.



**Fig17** Assessment interface

Fig 18 shows the Game Hub where students find three types of games: Identify Image, Count Game, and True or False. In the Identify Image game, they match pictures with the right choices. Count Game is about numbers, and True or False is where they decide if statements or pictures are right or wrong. It gives students fun ways to learn different things.



**Fig 18** Game interface

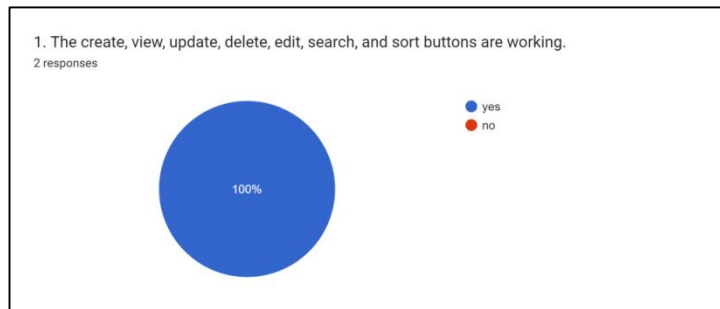
Figure 19 displays the Report page for students, where they can check their own assessment and game results.



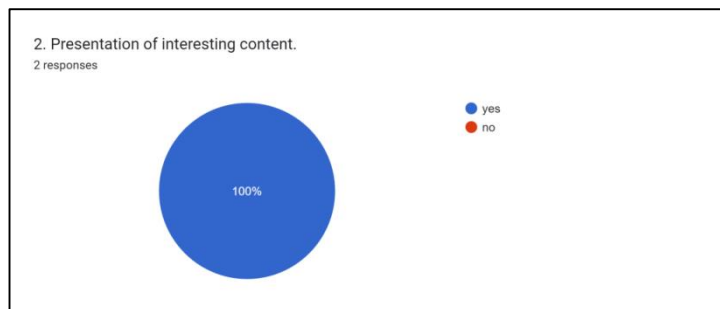
**Fig 19** view report interface

## 4.5 Beta Testing

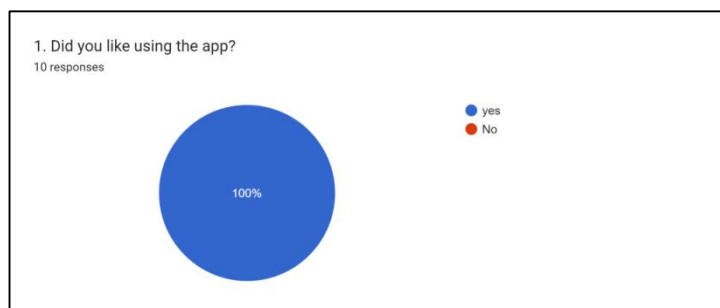
This section uses beta testing to collect and analyse feedback on the Autism Learning Mobile application. As a result, a set questionnaire was created. The graph shows the results of the questionnaire. The survey asked respondents to rate the user application. Figure 20 and figure 21 shows user testing (Teachers) results. Figure 22, 23, 24 shows User testing for students. Therefore, these results indicate that most participants were highly satisfied, indicating an excellent appreciation for the design.



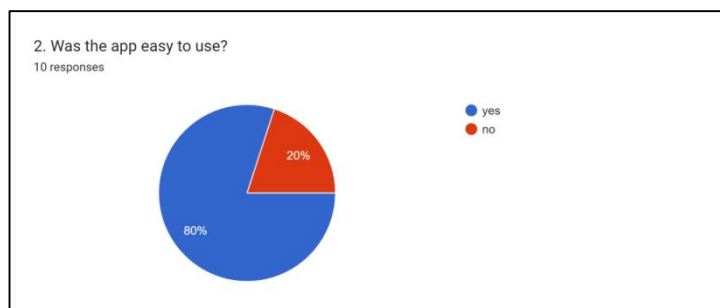
**Fig 20** User Testing (Teachers)



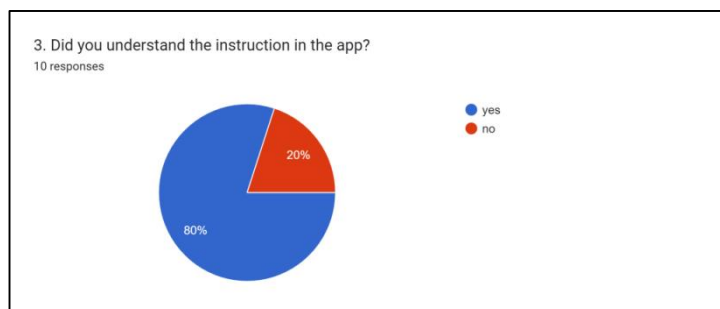
**Fig 21** User Testing (Teachers)



**Fig 22** User Testing (Students)



**Fig 22** User Testing (Students)



**Fig 22** User Testing (Students)

## 5. Conclusion

The project aims to develop a feature-rich mobile application designed specifically for students with autism. This application will assist students in learning basic skills through step-by-step instructional videos. In the assessment section, students can demonstrate their understanding of the video content independently. The game section offers interactive learning opportunities, allowing students to acquire new knowledge daily in an engaging manner. This approach simplifies the learning process for students with autism, fostering independence, boosting confidence, and reducing anxiety. The application features personalized content tailored to the needs and weaknesses of students with autism. It provides parents with tools for targeted support, facilitating their child's development. Additionally, the mobile application enhances convenience, supervision, and cooperation between teachers and students, serving as a collaborative platform that aligns efforts toward the development of students with autism. Overall, the application bridges the gap between teachers and students, fostering a shared focus on supporting the growth and development of students with autism.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

This journal requires that all authors take public responsibility for the content of the work submitted for review. The contributions of all authors must be described in the following manner:

*The authors confirm contribution to the paper as follows: **study conception and design:** Mohishaa A/P Satiakumar, Munirah Binti Mohd Yusof; **data collection:** Mohishaa A/P Satiakumar; **analysis and interpretation of results:** Mohishaa A/P Satiakumar, Munirah Binti Mohd Yusof; **draft manuscript preparation:** Mohishaa A/P Satiakumar. All authors reviewed the results and approved the final version of the manuscript.*

An author name can appear multiple times, and each author name must appear at least once. For single authors, use the following wording:

*The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.*

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### Appendix A: System Testing Form (Teachers)

**Part A.**  
Please mark (X) on Yes or No.

No	Question	Assessment	Yes	No
<b>System Contents</b>				
1	The create, view, update, delete, edit, search, and sort buttons are working.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Presentation of interesting content.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Management of Admin Learning Mobile Application is sufficient, including the training video, assessment, game hub and report generation.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether the system includes management functions, such as signup and login.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>User Friendly</b>				
1	This application is easy to use.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The interface design is simple and beautiful, aligning with the aesthetics.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	This application helps provide easy management to the teachers.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	New users can quickly get started using the application.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Test</b>				
1	The writing used is clear and easy to read.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The writing used is appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The word used is easy to understand.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether the layout of the text is reasonable will help improve the reading experience.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Graphic</b>				
1	The background is appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The colors used are appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Appropriate interface design.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether graphics and icons are helpful in understanding and operating the application.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Overall System Assessment</b>				
1	Does the system demonstrate good performance metrics, such as fast loading?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Does the overall system functionality meet expectations?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Does the system provide sufficient security and data protection measures?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Have usability tests been conducted to evaluate the overall user experience?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments: *entry is not be make student user only on app the make being check it by user or perform the user*

Signature: *[Signature]*  
Cop: *[Signature]*  
Rohayah Binti Said Abu Guru Besar SK Pendidikan Khas Batu Pahat  
Tarikh: 5/6/2024

**Part B.**  
Please mark (X) on Yes or No.

No	Question	Assessment	Yes	No
<b>System Contents</b>				
1	The create, view, update, delete, edit, search, and sort buttons are working.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Presentation of interesting content.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Management of Admin Learning Mobile Application is sufficient, including the training video, assessment, game hub and report generation.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether the system includes management functions, such as signup and login.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>User Friendly</b>				
1	This application is easy to use.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The interface design is simple and beautiful, aligning with the aesthetics.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	This application helps provide easy management to the teachers.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	New users can quickly get started using the application.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Test</b>				
1	The writing used is clear and easy to read.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The writing used is appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The word used is easy to understand.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether the layout of the text is reasonable will help improve the reading experience.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Graphic</b>				
1	The background is appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The colors used are appropriate.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Appropriate interface design.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Whether graphics and icons are helpful in understanding and operating the application.		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Overall System Assessment</b>				
1	Does the system demonstrate good performance metrics, such as fast loading?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Does the overall system functionality meet expectations?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Does the system provide sufficient security and data protection measures?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Have usability tests been conducted to evaluate the overall user experience?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Signature: *[Signature]*  
Cop: *[Signature]*  
Rohayah Binti Said Abu Guru Besar SK Pendidikan Khas Batu Pahat  
Tarikh: 5/6/24

### Appendix B: System Testing Form (Students)

**Part A.**  
User Testing Questions:

Question	YES	NO
1. Did you like using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Was the app easy to use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Did you understand the instructions in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Did you find the pictures in the app helpful?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Did you learn something new from the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Was it easy to find what you wanted in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Did you need help from someone to use the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Did you find the video interesting?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Would you like to use the app again?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did you feel happy while using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Student Name: *[Signature]*

**Part B.**  
User Testing Questions:

Question	YES	NO
1. Did you like using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Was the app easy to use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Did you understand the instructions in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Did you find the pictures in the app helpful?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Did you learn something new from the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Was it easy to find what you wanted in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Did you need help from someone to use the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Did you find the video interesting?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Would you like to use the app again?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did you feel happy while using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Student Name: *[Signature]*

**Part C.**  
User Testing Questions:

Question	YES	NO
1. Did you like using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Was the app easy to use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Did you understand the instructions in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Did you find the pictures in the app helpful?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Did you learn something new from the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Was it easy to find what you wanted in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Did you need help from someone to use the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Did you find the video interesting?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Would you like to use the app again?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did you feel happy while using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Student Name: *[Signature]*

**Part D.**  
User Testing Questions:

Question	YES	NO
1. Did you like using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Was the app easy to use?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Did you understand the instructions in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Did you find the pictures in the app helpful?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. Did you learn something new from the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Was it easy to find what you wanted in the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Did you need help from someone to use the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Did you find the video interesting?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Would you like to use the app again?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did you feel happy while using the app?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Student Name: *[Signature]*

Appendix C: SK Pendidikan Khas Batu Pahat



Appendix D: Letter authorized by Sk pendidikan khas batu pahat

Mohishaa Satiakumar ,  
 No 9 , Persiaran Permata 1,Permata Hill Park,  
 Sungai Petani, Kedah, 08000  
[mohishaasatiakumar@gmail.com](mailto:mohishaasatiakumar@gmail.com)  
 0165039775  
 June 4, 2024

Puan Munirah Binti Mohd Yusof,  
 Ds52 Pensyarah Kanan,  
 Fakulti Sains Komputer dan Teknologi Maklumat,  
 Universiti Tun Hussein Onn Malaysia (UTHM),  
 Persiaran Tun Dr. Ismail,  
 86400 Parit Raja, Johor.

Dear Puan Munirah,

I hope this message finds you well. I am writing to formally request your approval and signature on a permission letter for my upcoming visit to Sekolah Kebangsaan Pendidikan Khas Batu Pahat school as part of my Postgraduate Studies (PSM) project.

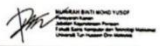
The purpose of this visit is to assess the suitability of an autism learning mobile application I developed for the students at Sekolah Kebangsaan Pendidikan Khas Batu Pahat, integral to my research and project objectives.

Specifically, I aim to evaluate the effectiveness and usability of the mobile application in enhancing the learning experience and meeting the unique requirements of autism students. By conducting observations and obtaining feedback from educators and students, I seek to ensure that the application aligns with their needs and preferences.

I have prepared a permission letter for Sekolah Kebangsaan Pendidikan Khas Batu Pahat, outlining the visit details and assuring compliance with guidelines. Your support is crucial, and I appreciate your assistance in making copies for distribution.

Thank you for your attention to this matter. I look forward to receiving your approval and signature at your earliest convenience.

Sincerely,  
 Mohishaa Satiakumar  
 D1210077

  
 Puan Munirah Binti Mohd Yusof

**TERIMA**  
 UNIT PERKHIDMATAN  
 05 JUN 2024  
 SK PENDIDIKAN KHAS  
 BATU PAHAT

SK PENDIDIKAN KHAS BATU PAHAT	
PERMATAHAN	TINDAKAN
Ujru Besar	Bancang
GPX 1	Makluman
GPX HEM	Uraian
GPX KO	Sila Hadir
PPP	Faikan
PT	
CARIKAT:	

