An-Najah National University

Faculty of Engineering and Information Technology

Computer Engineering Department

Graduation Project 1

Bright Minds



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Presented in partial fulfillment of the requirements for the

Bachelor’s degree in Computer engineering

January , 2026

Acknowledgment

First and foremost, we say, “Thank God.” We would like to express our deepest gratitude to God for the blessings, strength, patience, and guidance that supported us throughout our graduation project journey—and every journey we have faced in our lives. His blessings and satisfaction have been a constant source of motivation and support, helping us overcome challenges and successfully complete this hardware graduation project. Truly, we can never say “Thank God” enough.

We would like to offer our special thanks and extend our deep appreciation to our supervisor, Dr. Ashraf Armoush , for his invaluable guidance and the precious advice he provided throughout our work. He consistently made time for us and never hesitated to offer constructive feedback and share his valuable experience with us. Thank you for your continuous support, which has greatly enhanced our knowledge and contributed significantly to the success of our project.

Finally, we would like to extend our deepest gratitude to our beloved families and supportive friends, who stood by us with love, patience, and encouragement throughout this entire journey. In moments of stress and challenge, their words, smiles, and presence gave us the strength to keep going. This accomplished project is not only the result of our efforts but also a reflection of the incredible, unwavering support we are blessed to have. Thank you for believing in us every step of the way.

Disclaimer Statement

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Chapter 1

Abstract

In the modern technology era, mobile phones, tablets, and laptops have become available in almost every household and are widely used by children, who spend long periods of time on digital devices. This increased usage raises concerns about content safety, screen time control, and the quality of digital experiences provided to children.

To address these challenges, we developed **Bright Minds**, an educational and entertainment platform available as both a website and a mobile application. The platform provides a safe, age-appropriate digital environment for children while allowing parents to monitor their children's activities.

Bright Minds supports four main user roles: **Kids, Parents, Supervisors, and Admins**. It includes several integrated sections, such as a video section for safe educational and entertainment content, a story section that encourages children to write and publish stories under supervision to enhance their talent , a drawing section for free drawing and painting or using guided images, and a game section that combines learning with interactive entertainment and scoring.

The platform targets two age groups (5–8 and 9–12), with customized content for each group. In addition, daily screen-time limits and a reward system are implemented to promote healthy screen usage, enhance engagement, and motivate children to learn in a safe environment.

Chapter 2

Introduction

2.1 General Background

In the past, children's educational resources were limited to books, classroom sessions, and other manual, face-to-face learning methods. Entertainment activities mainly relied on social interaction, such as gathering with friends to play traditional games or practice popular sports like football and basketball. However, in the current digital era, many of these activities have shifted to online platforms, as technology offers vast opportunities for both learning and entertainment.

As a result, children have become increasingly exposed to mobile phones, tablets, and laptops, often spending long hours engaging with digital content. While digital content has expanded significantly and includes many valuable educational and entertaining resources, it also exposes children to inappropriate material, excessive screen time, and limited parental supervision. These issues present major challenges for parents.

Therefore, ensuring that children can safely navigate digital environments while benefiting from educational and creative experiences has become an important concern for parents, educators, and developers alike. Digital platforms that integrate learning, creativity, and entertainment within a controlled and secure environment can play a key role in addressing these challenges.

2.2 Objectives of The Work

The main objective of this project is to design and implement **"Bright Minds"**, an educational and entertainment platform for children.

The specific objectives are as follows:

- To deliver age-appropriate educational and entertainment content within a safe digital environment.
- To implement screen-time management for children and usage monitoring features for parents.

- To provide a supervision system that enables supervisors to review user activities and manage content quality.
- To develop interactive sections including videos, stories, drawing activities, and educational games that enhance creativity and learning.
- To design a rewards and points system that encourages positive engagement and responsible use of technology.
- To introduce habit-forming challenges that promote positive daily behaviors.
- To customize platform content and features for two age groups (5–8 years and 9–12 years) to suit their developmental needs.

2.3 Significance of The Work

This platform is significant because it addresses the growing need for a safe, educational, and entertaining digital environment for children. By integrating parental monitoring, content supervision, screen-time management, and interactive content, Bright Minds helps children learn and grow while ensuring safe and supervised use of digital technology.

Moreover, it combines learning with entertainment, encouraging creativity, knowledge acquisition, and problem-solving through enjoyable activities. The platform also provides valuable insights for parents and supervisors, helping them guide children toward productive and safe digital habits.

2.4 Organization of the report

This report is organized to provide a comprehensive overview of the Bright Minds platform. It is divided into several chapters, each focusing on a different aspect of the project:

Abstract – This chapter presents a brief overview of the project, its objectives, and the key features of the Bright Minds platform, highlighting its significance in providing a safe and educational digital environment for children.

Introduction – This chapter introduces the general background, objectives, and significance of the project. It sets the context for the reader and explains the motivation behind developing Bright Minds.

Literature Review – This chapter reviews existing research and software platforms related to children's educational and entertainment applications. It examines their features and limitations, and highlights the importance of developing a safe and interactive platform like Bright Minds.

Methodology – This chapter details the system design, development process, and implementation strategies. It describes the platform architecture, user roles, features, software development tools, and design considerations, providing a complete explanation of how Bright Minds was developed.

Results & Discussion – This chapter presents the outcomes of the project, evaluates how the platform meets its objectives, and discusses its contributions, benefits, limitations, and potential impact on children, parents, and supervisors.

Conclusion & Recommendations – This final chapter summarizes the key findings, draws conclusions based on the results, and offers recommendations for future improvements and potential extensions of the platform.

Chapter 3

Literature Review

Technology has become an integral part of daily life, with mobile phones, tablets, and laptops serving both educational and entertainment purposes for individuals of all ages, including children. A 2020 survey in the USA reported that the average daily screen time for children was approximately 4.5 hours, increasing to 8 hours and 40 minutes during COVID-19 lockdowns [1]. Children's interests vary significantly with age; content that engages a 5-year-old may not hold the attention of a 12-year-old [2].

Despite the availability of educational content online, children may still face risks such as cyberbullying, exposure to inappropriate material, and insufficient supervision [3]. Experts recommend parental guidance and the use of safe browsing tools, such as Eyes and iShield, to protect children from these risks and manage their screen usage [4].

To address these challenges, several platforms have been developed to provide safe and educational experiences for children. **PBS Kids Games** is a free, child-friendly section of the PBS Kids website that offers interactive educational games featuring characters from PBS shows. These games support the development of reading, math, science, problem-solving, creativity, and social skills. The platform does not include parent monitoring or teacher supervision, and the games are static, providing the same content for children of all ages [5].

Similarly, **E-Learning** *for Kids* provides interactive science and math lessons in a secure environment, while **Starfall** supports early literacy and numeracy through games, songs, stories, and interactive activities [6][7]. These platforms demonstrate that structured, age-appropriate, and safe digital content can enhance children's learning and make education more engaging. Parents can guide learning, and teachers may use the platforms to complement classroom instruction.

While existing platforms provide safe and educational content, most offer static content, limited creative engagement, and minimal tracking of children's progress. These limitations highlight the need for platforms that combine safety, interactivity, age-appropriate content, and features that encourage creativity, engagement, and healthy digital habits.

Chapter 4

Methodology

4.1 System Design

The Bright Minds platform is designed to provide a safe, educational, and engaging experience for children across web and mobile platforms. The system consists of three main components: the frontend, backend, and database.

- **Frontend:** Developed using Flutter, the frontend supports both web and mobile applications from a single codebase, ensuring a consistent user experience. It handles user interactions, presents content such as games, videos, and drawing activities, and communicates with the backend via RESTful APIs.

- **Backend:** Implemented with Node.js, the backend manages business logic, data processing, and secure access control. It provides API endpoints for all platform functionalities, including content retrieval, activity tracking, and achievement management.

- **Database:** MongoDB serves as the primary data store, handling user profiles, activity logs, educational content, and media assets. Its NoSQL document-based structure offers flexibility for evolving content and scalable data management.

The system follows a **multi-layered architecture**, consisting of routers, controllers, services, models, and middleware. This structure ensures modularity, maintainability, and clear separation of concerns. Communication between frontend and backend is handled via RESTful APIs, which support standard HTTP methods (GET, POST, PUT, DELETE) to manage dynamic content and user interactions.

4.2 Development Tools and Technologies

4.2.1 Tools

We used a collection of tools to facilitate frontend and backend workflows, testing, and collaborative development while building **Bright Minds**:

- **Visual Studio Code**: Served as the primary code editor for the Node.js backend and the Flutter frontend. It supported development through features such as syntax highlighting, an integrated terminal, real-time debugging, and Git integration.

- **Android Emulator**: Used to test the mobile application on various virtual Android devices. This allowed us to verify layout functionality, responsiveness, and performance across different screen sizes and system versions.

- **Chrome**: Used to test the web design and functionality of the platform.

- **Postman**: Used to verify and test API endpoints. It enabled simulation of various HTTP request types and inspection of responses to ensure that APIs operated as intended.

- **GitHub**: Utilized for collaborative development and version control. The team employed GitHub's pull request system to review code changes, track issues, and maintain source code in private repositories.

4.2.2 Programming Languages and Frameworks

We selected technologies for the development of **Bright Minds** that support scalability, cross-platform functionality, and seamless integration between frontend and backend systems.

- **Flutter**: The primary framework used to develop both the web and mobile user interfaces. Its cross-platform capabilities allowed the use of a single codebase for Android and web applications, ensuring a consistent user experience across platforms.

- **Dart**: The programming language used with Flutter. Dart provides a clear and expressive syntax, enabling the development of reactive and responsive user interfaces.

- **Node.js**: Used for backend development due to its event-driven and asynchronous architecture. It enabled efficient handling of multiple client requests and the development of scalable RESTful APIs. Additionally, Node.js offers access to a wide range of packages through npm, which accelerated backend development and frontend integration.

- **MongoDB**: Used as the primary database for storing user data, content information, and activity records. Its NoSQL document-based structure provides flexibility in data modeling and supports scalability, making it suitable for handling dynamic and evolving application data.

4.2.3 External APIs and Services

The Bright Minds platform integrates several external APIs and services to support core functionalities:

- **Cloudinary**: Used for secure storage and management of images and media files uploaded to the platform.
- **OpenAI API**: Integrated to support AI-driven features such as content assistance and interactive functionality, while maintaining controlled access through the backend.
- **YouTube Data API**: Used to retrieve and display educational video content in a structured and child-friendly manner.
- **Pixabay API**: Used to provide royalty-free images for educational and creative activities within the platform.
- **JWT (JSON Web Tokens)**: Used to handle authentication and authorization, ensuring secure access for users and administrators.

4.2.4 Database Design and Management

During the development of Bright Minds, we chose **MongoDB** as the primary database system due to its flexibility, scalability, and ability to handle dynamic, hierarchical data, unlike relational databases. MongoDB stores information in JSON-like documents, allowing efficient management of diverse content types, such as games, videos, drawing activities, and user activity logs. This flexible structure is particularly suited for our platform, as content and interactions vary across different age groups and user behaviors.

The database is organized into collections representing core entities. These collections include:

User Collection: Manages user accounts, private information, and roles (children, parents, supervisors, and administrators).

Video Collection: Stores videos added by supervisors and presented to children on the platform.

VideoHistory Collection: Tracks videos watched by each child.

Playlist Collection: Manages playlists created from existing videos in the system.

Quizzes Collection: Stores quizzes associated with videos, authored by supervisors, and made available for children.

Games Collection: Stores game templates and manages the games presented to children.

Notification Collection: Manages notifications across different sections, ensuring users are informed about relevant platform updates.

Chat Collection: Supports the platform's messaging system between users.

DailyWatch Collection: Tracks children's daily time spent on videos and games, enforcing daily time limits.

Badges Collection: Stores badges awarded to children for achievements and accomplishments.

Tasks Collection: Allows supervisors to create and manage their daily tasks .

Actitivtylogs collection: Logs user activities and store success / error details for monitoring and debugging.

Challengeprogresses collection: Tracks each child's daily progress in the weekly challenge plan (done/not done).

Challengetemplets collection : Stores reusable weekly challenge templates (title, category, sticker) to generate plans for kids.

Weekliychallengeplans collection: Stores the weekly challenge plan assigned by a supervisor to children (7 days mapped to templates).

Childcolorbynumberprogress collection: Tracks a child's color-by-number progress per activity (filled regions, colors, and completion percentage).

Childdrawign collection: Stores each child's submitted drawing for an activity, including the image, submission status, and supervisor feedback/rating.

Drawingactivity collection: Stores drawing activities created by supervisors.

Drawigntimesessions collection: Records how long a child spends drawing (per section or specific activity).

Viewstories collection: Records each time a child views a story for view-counting and analytics.

Stories collection: Stores each child's story (pages + elements like text/images/audio), including status, feedback, and publishing info.

Storylikes collection: Stores which user liked which story, ensuring each user can like a story only once.

Storyprogresses collection: Tracks each child's reading progress in a story template.

Storyreviews collection: Stores supervisor reviews for stories (rating, comment, and review status).

Storywritingsessions collection: Tracks each child's story-writing time sessions.

4.3 Mobile App Features

Welcome Page: This is the first interface displayed when you enter the application.



Figure 4.1 :Welcome Page

From the welcome page, you can navigate to the **Sign In** page to access your account or to the **Sign Up** page to create a new account if you don’t have one.

Our platform consists of four roles:

- Supervisors
- Children
- Parents
- Kids

The platform includes two age groups of children: **5–8** and **9–12**. Each child is assigned to **one supervisor only**, and each supervisor is responsible for a specific number of children from a single age group.

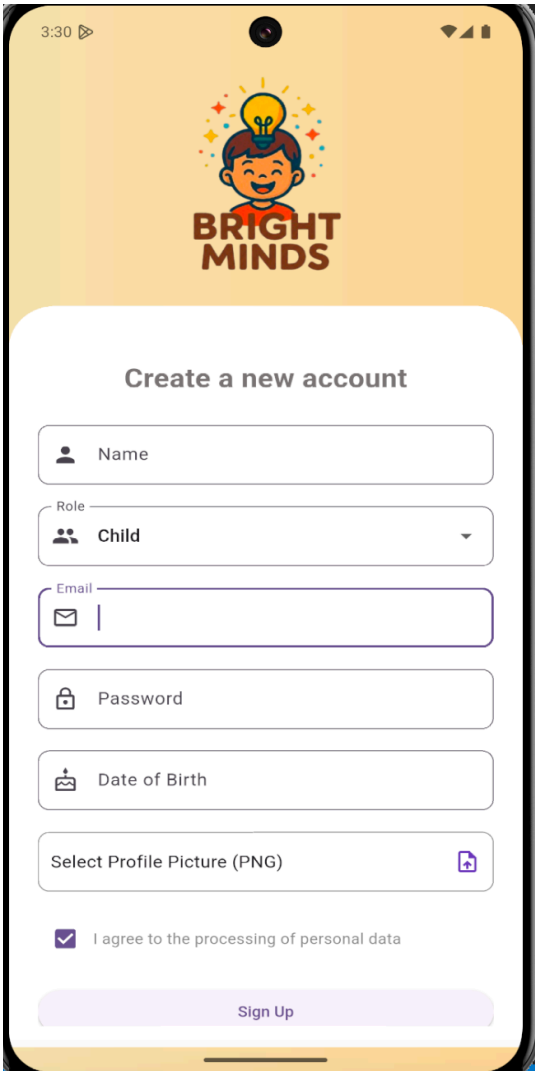


Figure 4.2: Child Sign Up

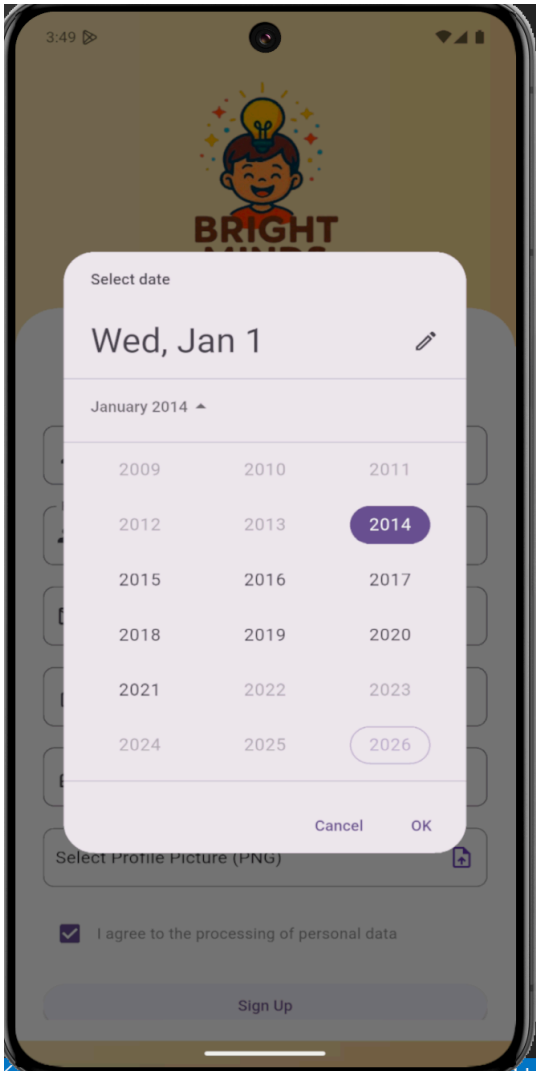


Figure 4.3: Child Enter Date

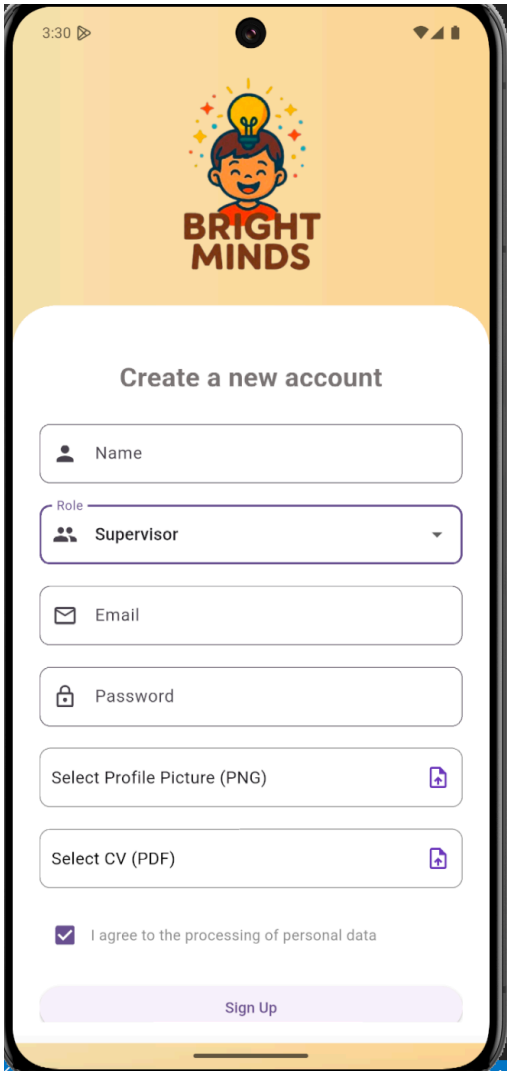


Figure 4.4: Supervisor Sign Up

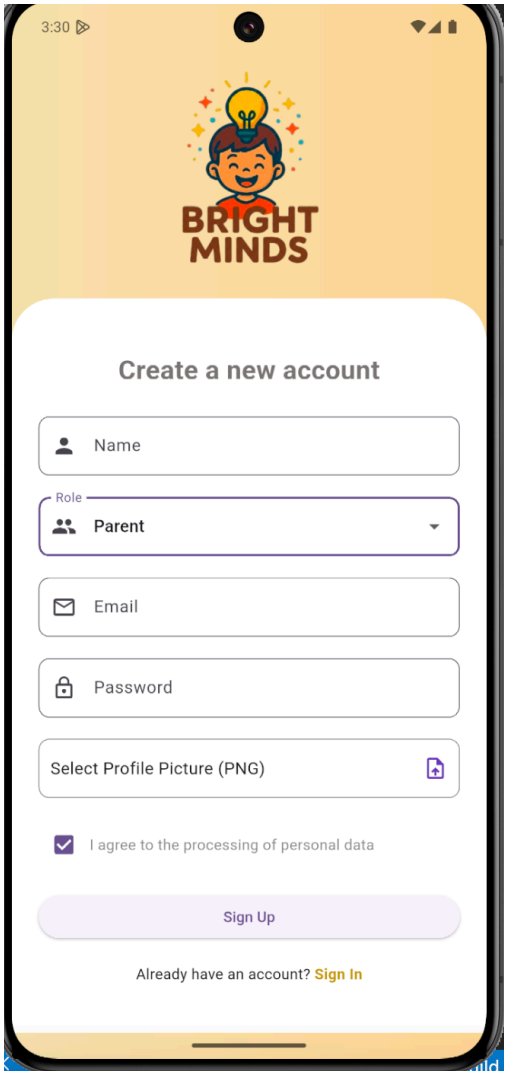


Figure 4.5: Parent Sign Up

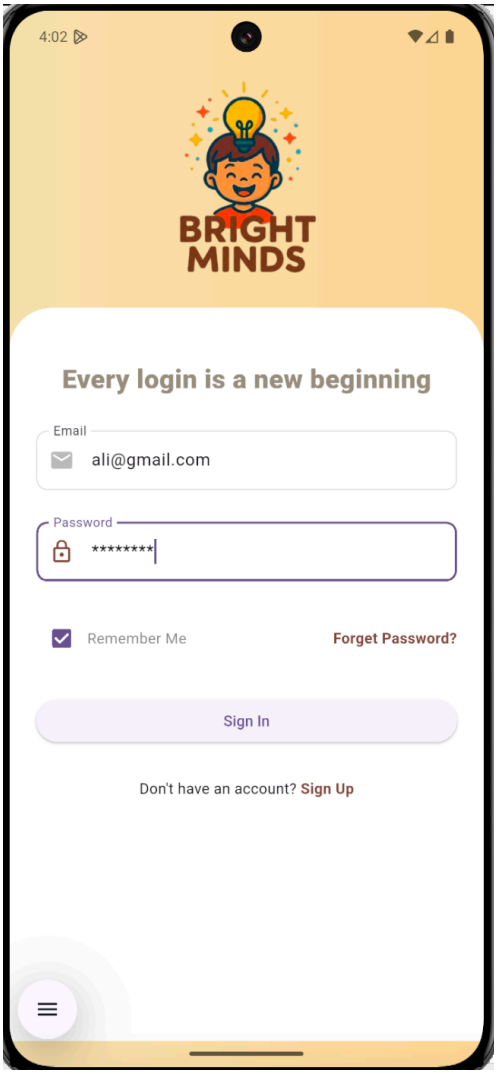


Figure 4.6: User Sign In

4.3.1 Supervisor Pages

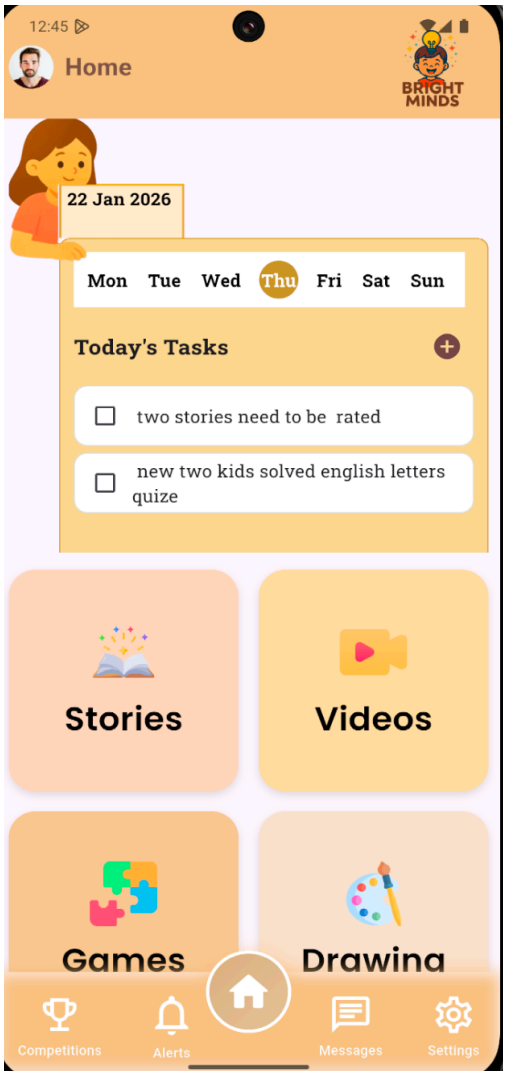
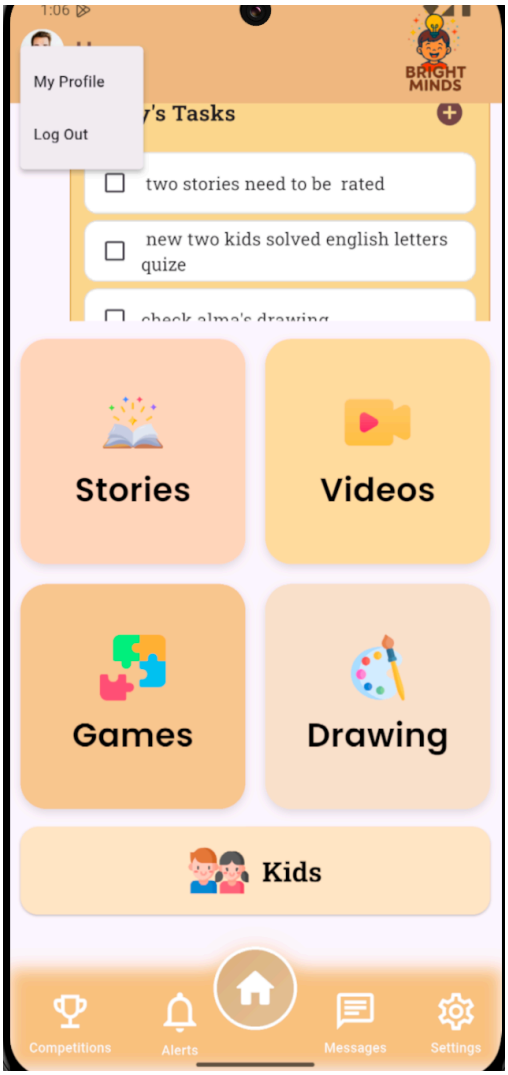
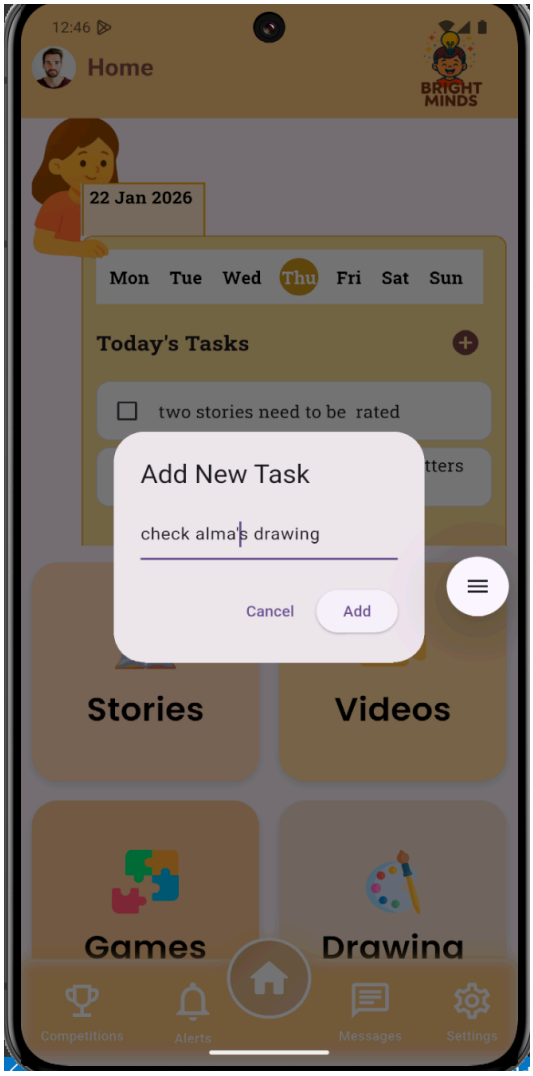


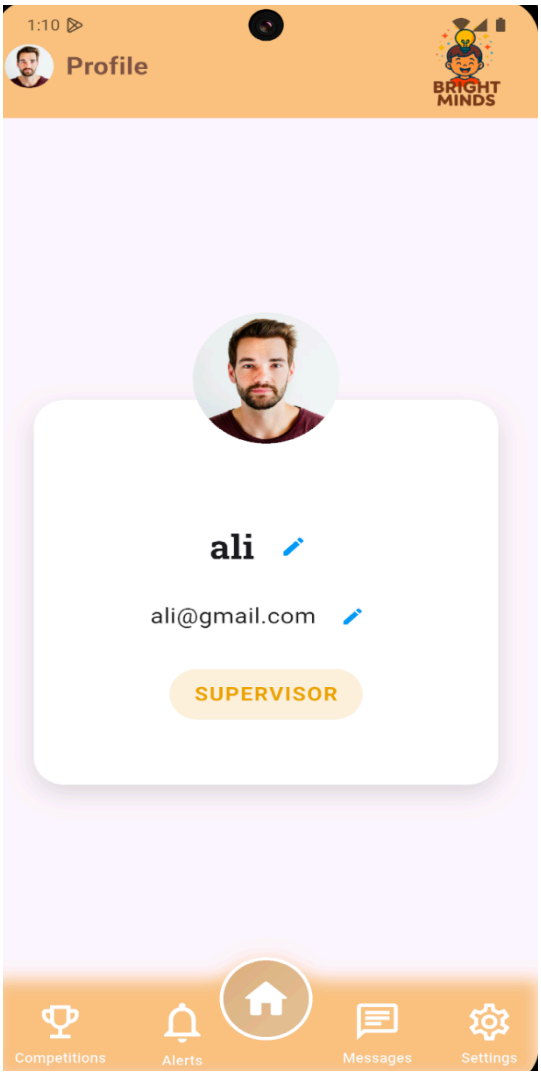
Figure 4.7: Supervisor Home Page - View 1



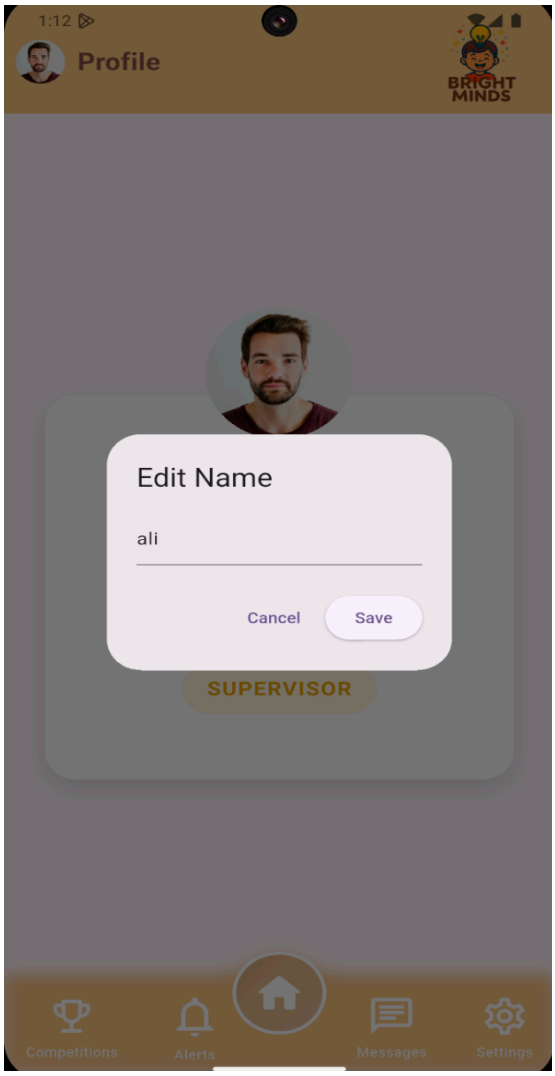
4.8: Supervisor Home Page - View 2


12:46
Home
BRIGHT MINDS
22 Jan 2026
Mon Tue Wed Thu Fri Sat Sun
Today's Tasks
two stories need to be rated
Add New Task
check alma's drawing
Cancel
Add
Stories
Videos
Games
Drawing
Competitions
Alerts
Messages
Settings

4.9: Add Task



4.10: Supervisor Profile Page



4.11: Edit Name Field

Videos Section :

This section includes all videos added by the supervisor, **with publishing controlled by the supervisor**, for children in the assigned age group.

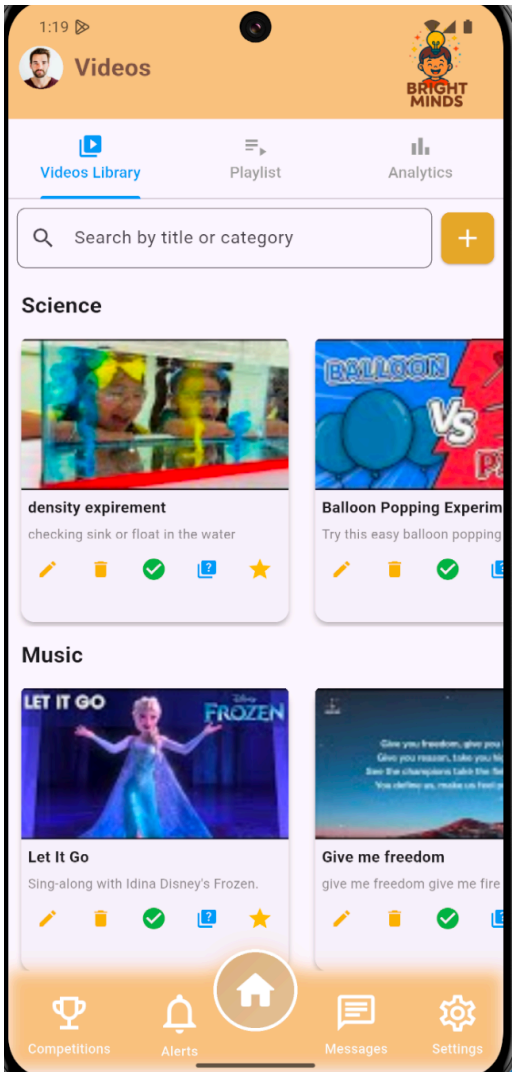


Figure 4.12: Added Videos Page

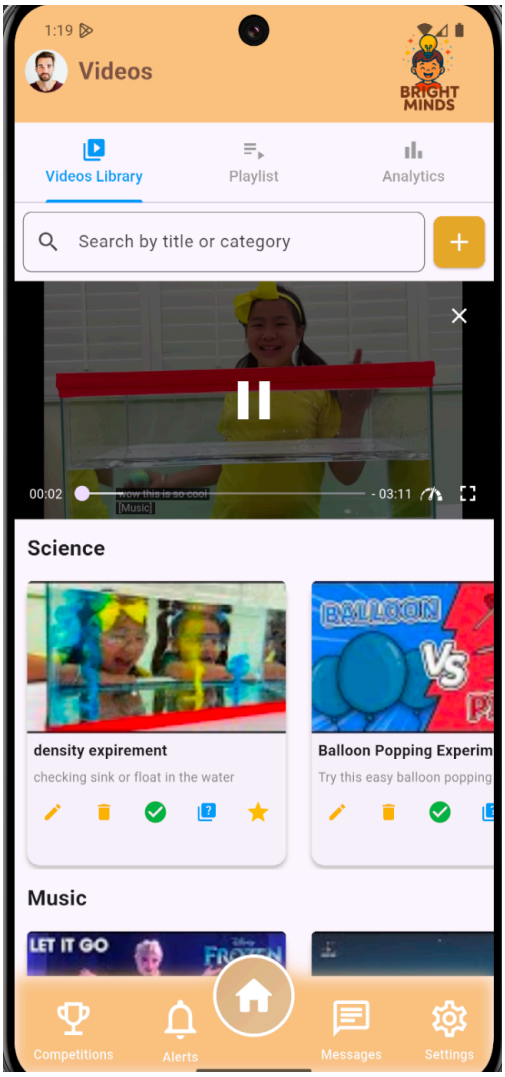


Figure 4.13: Supervisor Video Playback

Each video includes **five icons**:

- **Edit icon:** Used to edit the video information.
- **Delete icon:** Used to delete the video.

- **Publish/Unpublished icon:** Used to publish or unpublished the video for children.
- **Quiz icon:** Used to create a quiz related to the video content.
- **Recommend icon:** Used to mark the video as a recommended video. It will then appear in the **"Recommended Videos"** section for children.

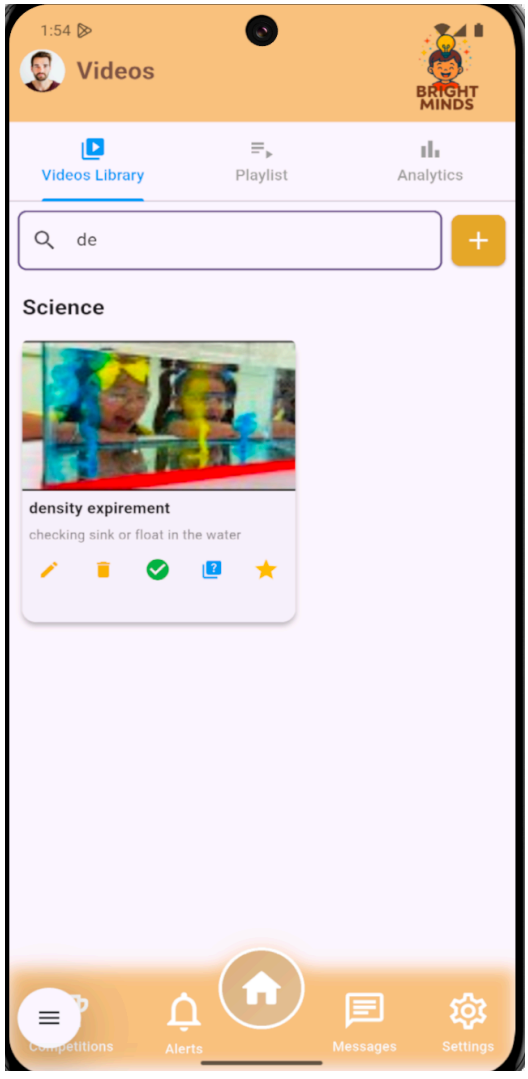


Figure 4.14: Search About Video

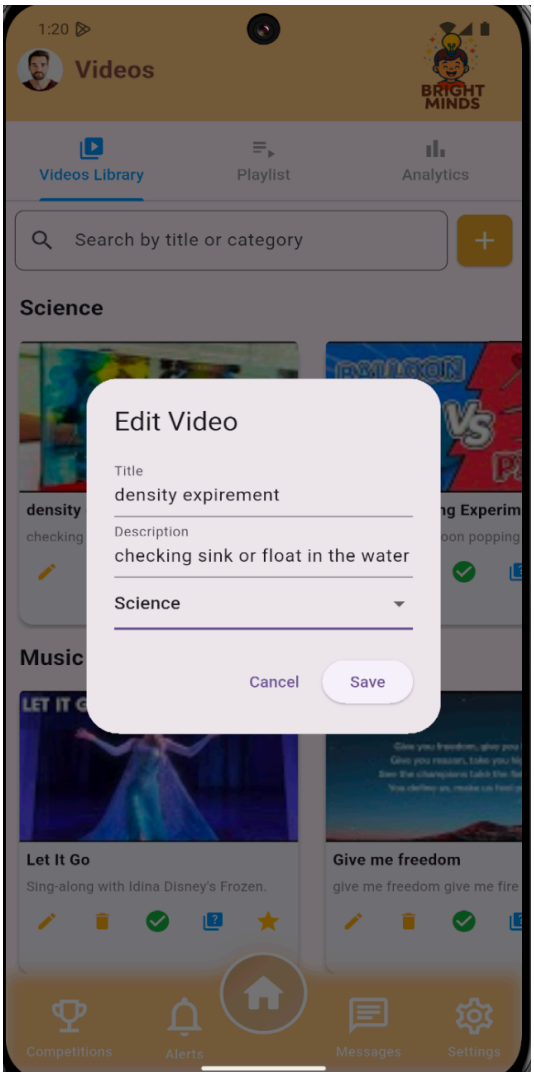


Figure 4.15: Edit Video Information

When you click on the **Quiz icon**, if a quiz has already been created, you can view or edit the existing quiz. If no quiz has been created, you can create a new one.

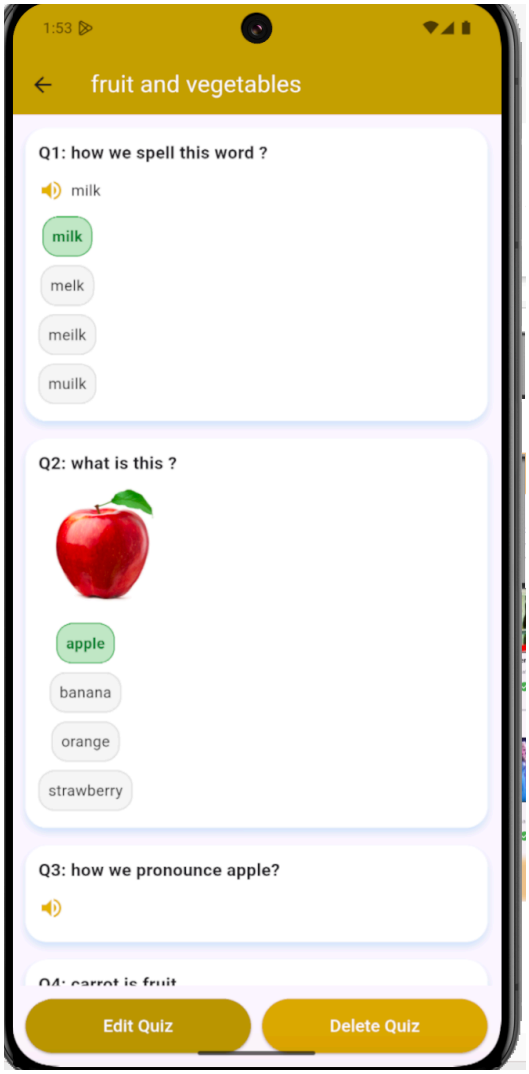
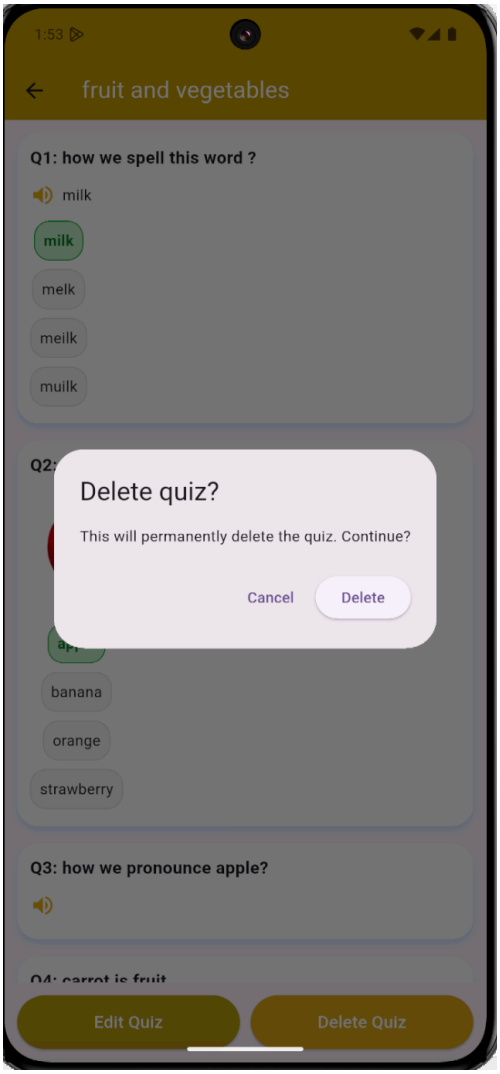


Figure:4.16: Preview Existing Quiz



4.17: Delete Quiz

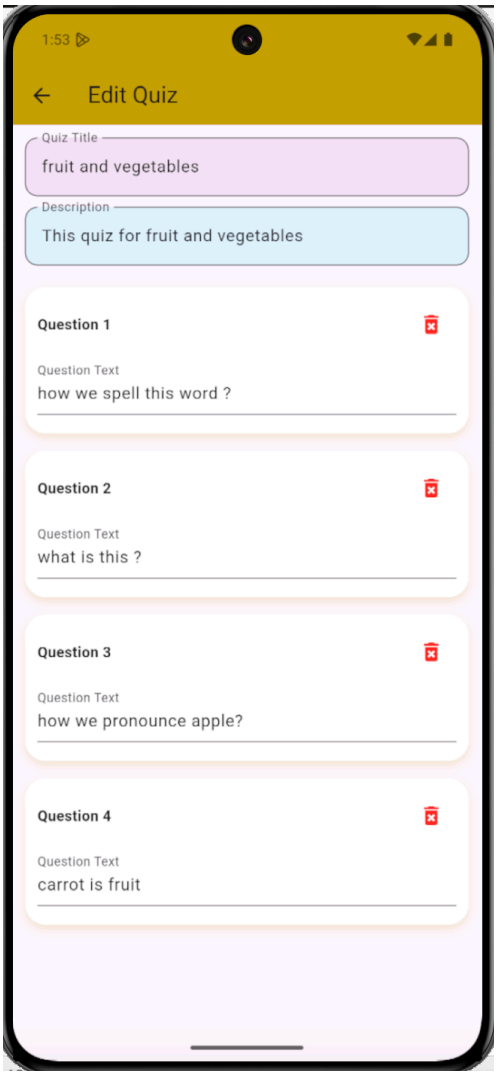


Figure 4.18: Edit Existing Quiz

Quiz questions and options can contain **text, images, and audio**.

The audio is generated using text-to-speech: the supervisor writes the text of the question, but it is only presented to the user as speech, without showing the text. This approach reduces memory usage and is more practical and flexible for supervisors than storing pre-recorded audio files.

For voice-answer questions, **speech-to-text** is used. The supervisor stores the correct answer as text. When the child plays and pronounces the word, it is transformed into text and compared to the text entered by the supervisor.

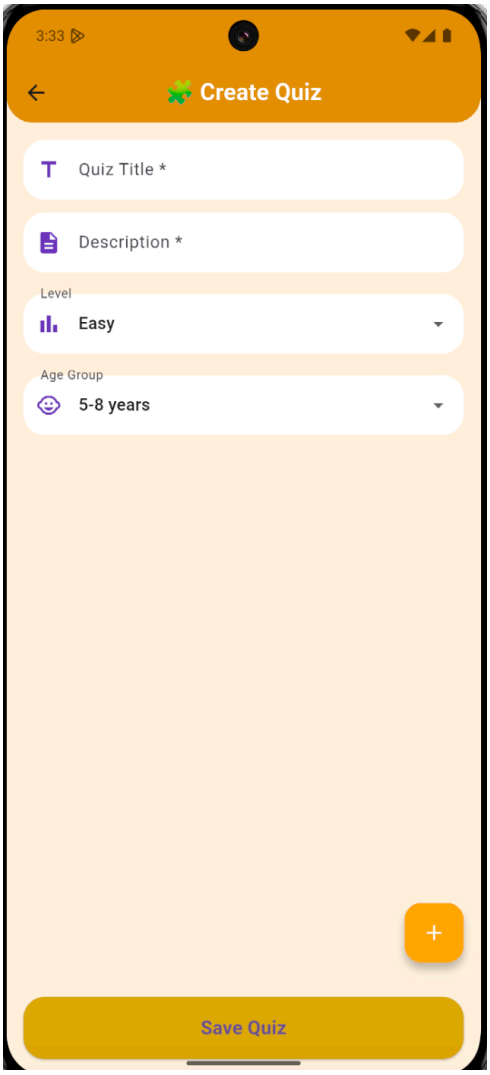


Figure:4.19: Create New Quiz

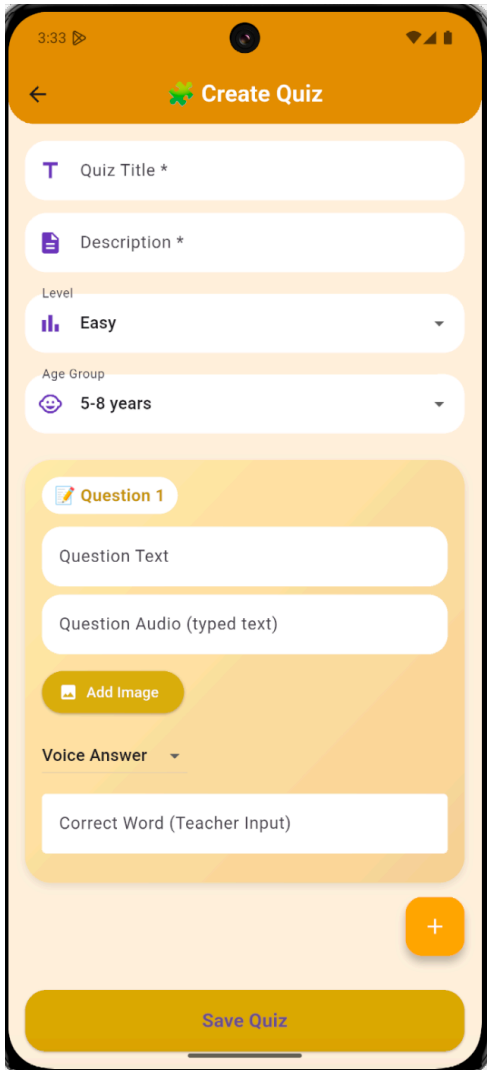


Figure:4.20: Create Voice Answer Question

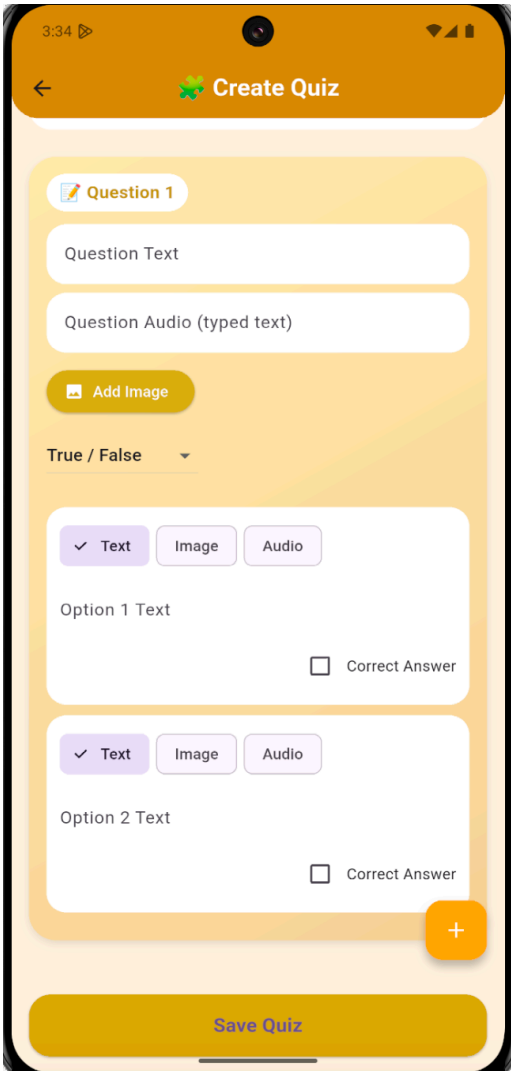


Figure 4.21: Create True/False Question

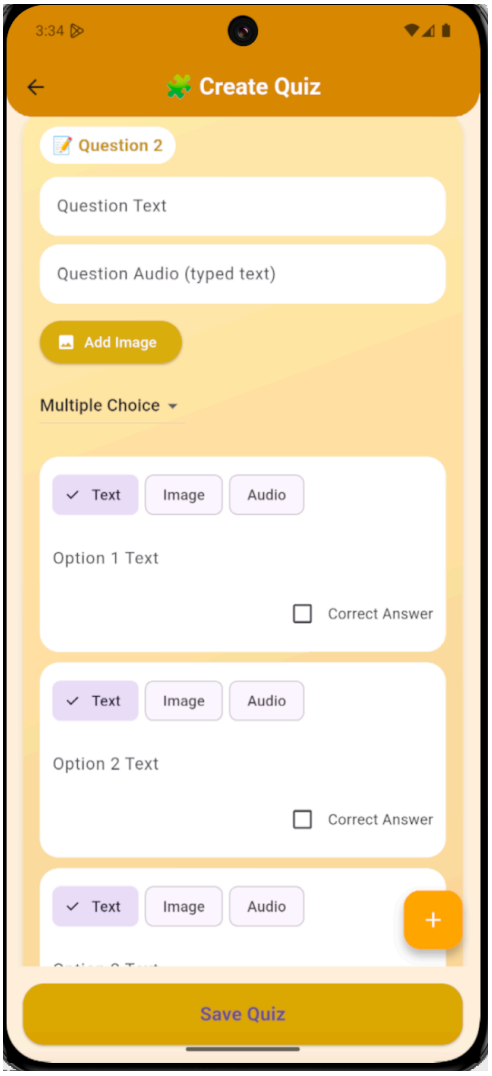


Figure 4.22: Create Multiple Choice Question

A supervisor can add videos in two ways:

1. By adding the URL link of a specific video.
2. By searching for a **specific topic**. The YouTube API is used to fetch videos related to this topic, and the supervisor can add any video from the search results.

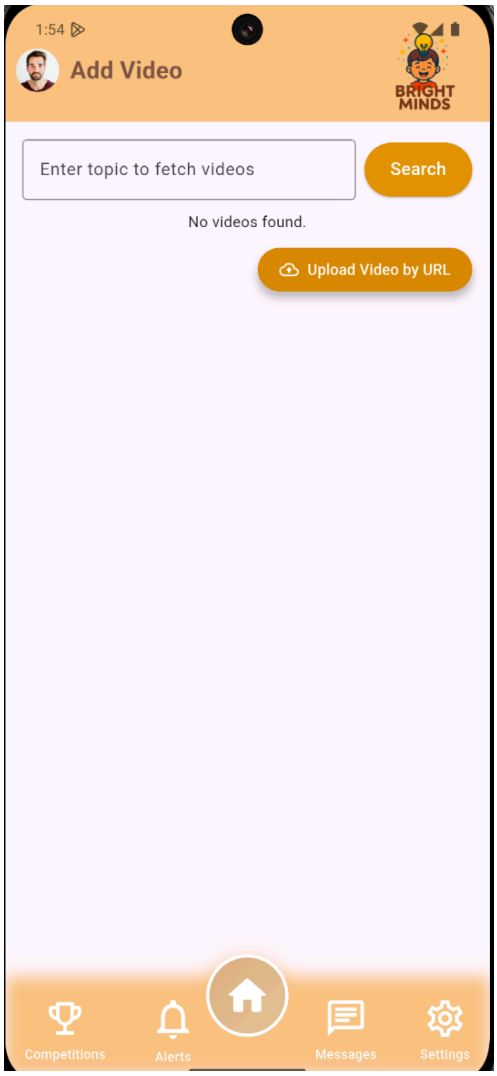


Figure 4.23: Add Video Page

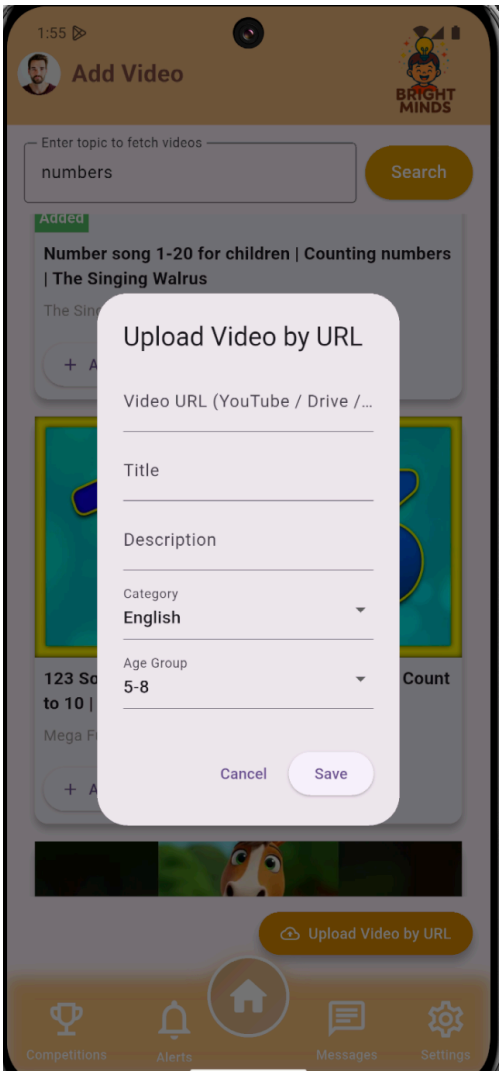


Figure 4.24: Add Video By Url

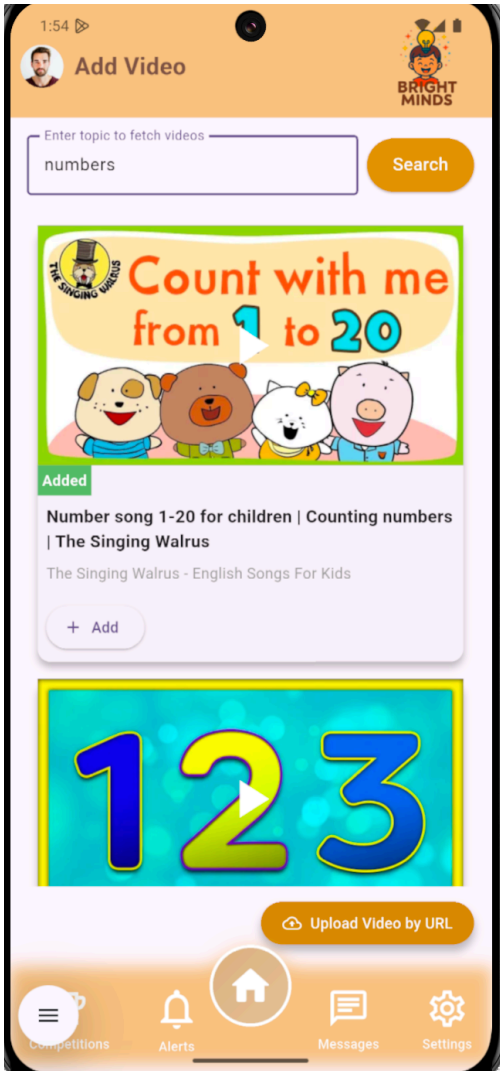


Figure 4.25: Search for Video Topics

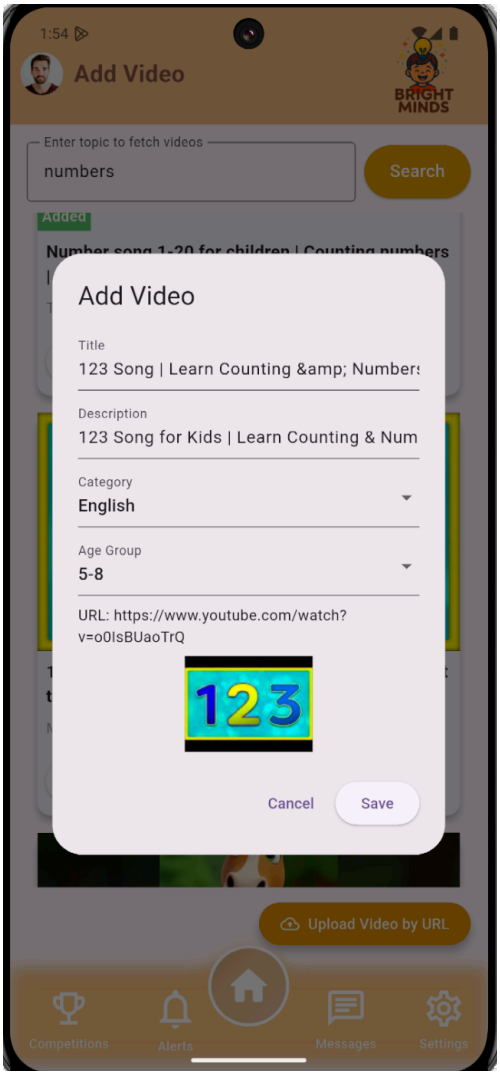


Figure 4.26: Add Video from Search Results

The supervisor can create playlists from their published videos, which are displayed as a list.

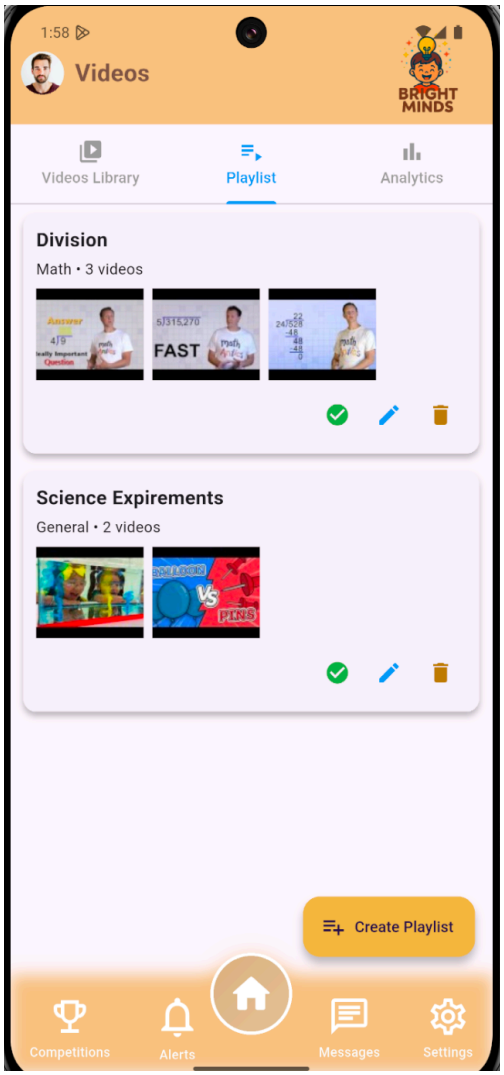


Figure 4.27: Created Playlists Page

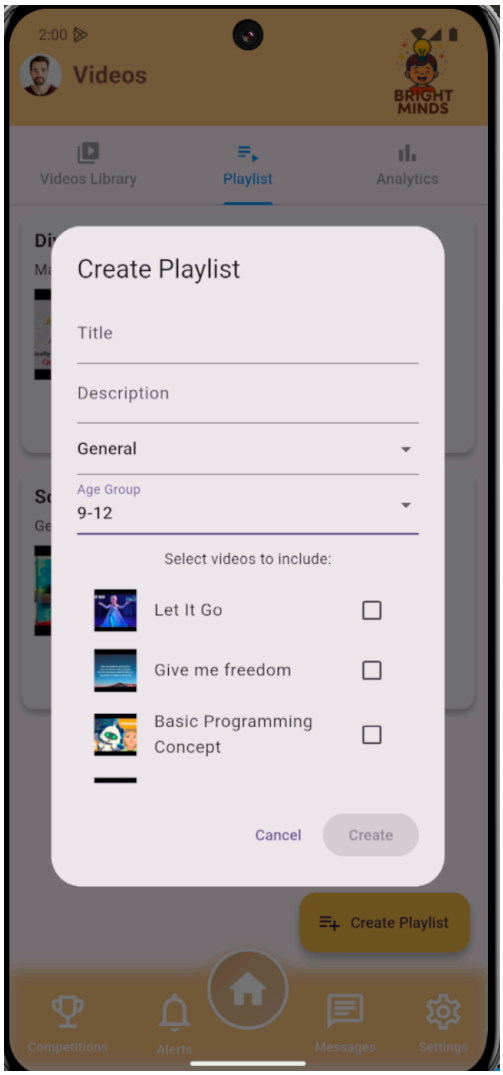


Figure 4.28: Create New Playlist

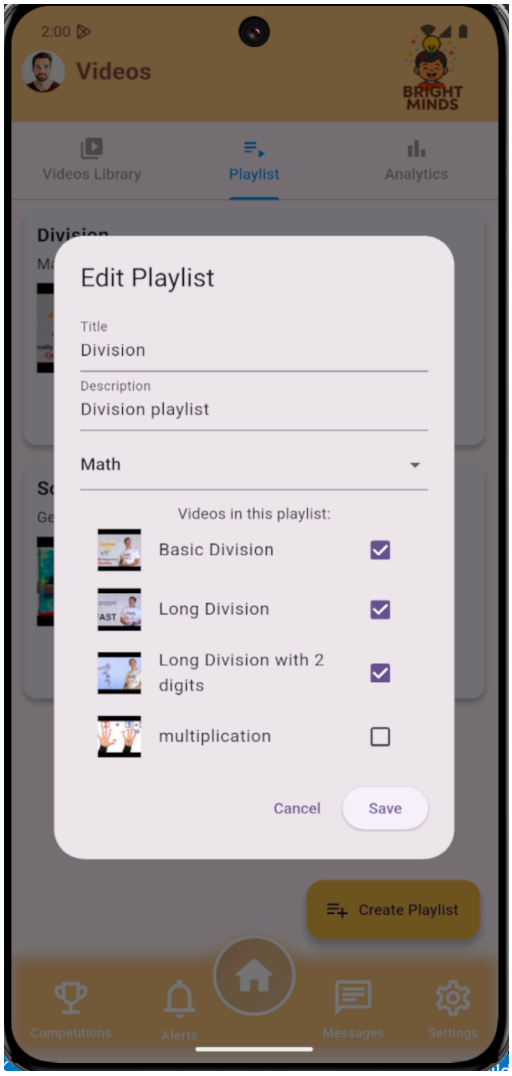


Figure 4.29: Edit Playlist Information

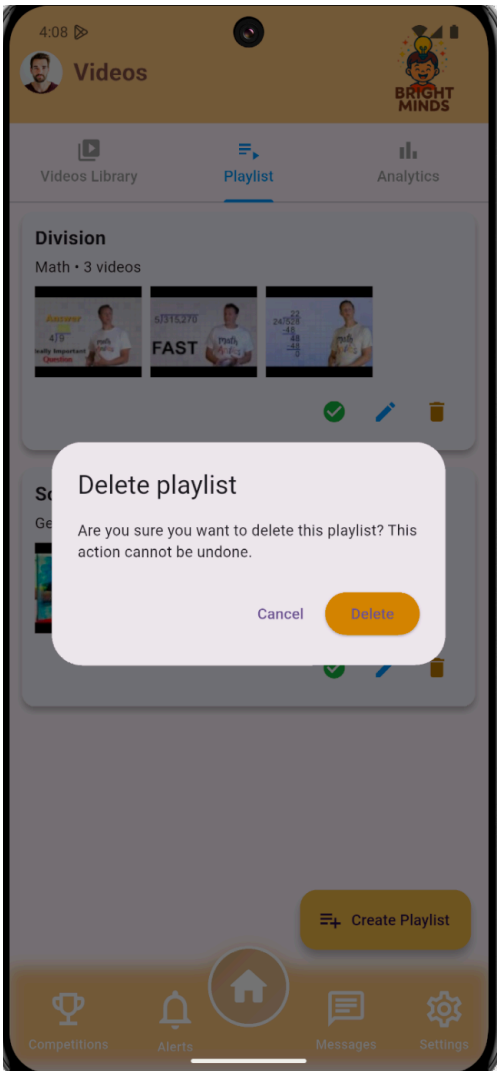


Figure 4.30: Delete Playlist

Video Analytics shows the analytics of videos added **only by this supervisor**.

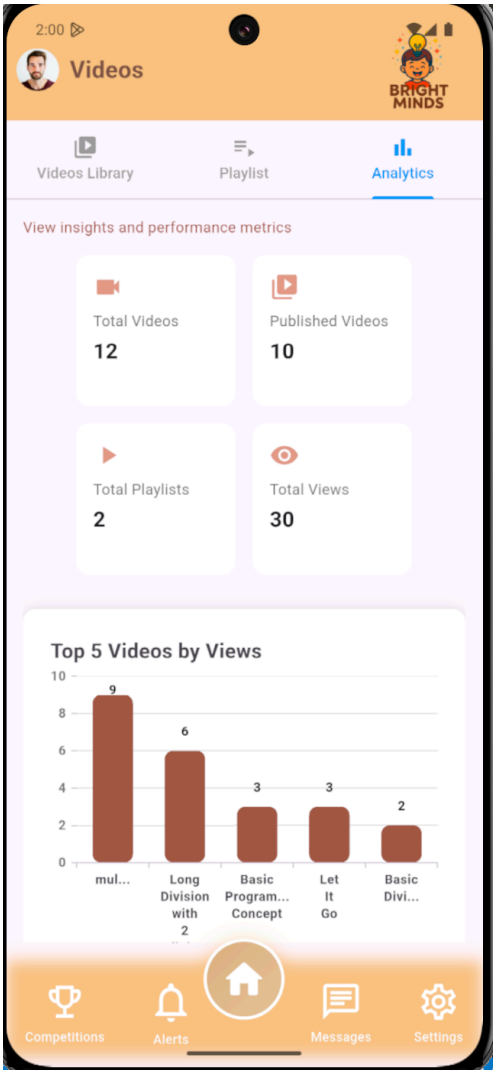


Figure 4.31: Videos Analytics

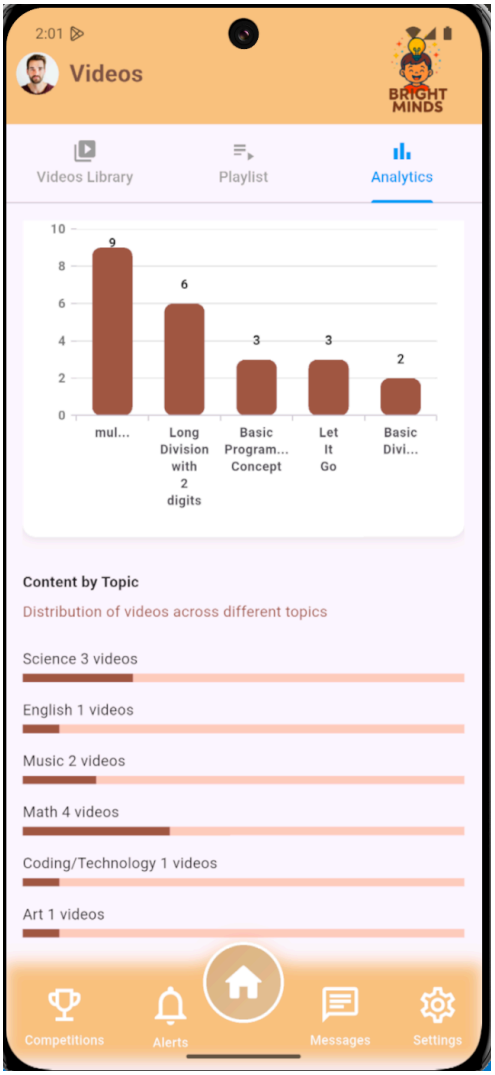


Figure 4.32: Videos Analytics

Games Section:

This section includes templates for games. The supervisor can use these templates to create games for the children they supervise. What distinguishes this feature is that the game content remains **dynamic** — it is not always the same. Supervisors can create new games from time to time and publish them to the children.

The **"Suggested Word"** shown in the templates is fetched using OpenAI. Additionally, the images for the image clues in the Guess Word game are fetched from the **Pixabay API**.

Games Screen for Supervisor of Age Group 9–12 :

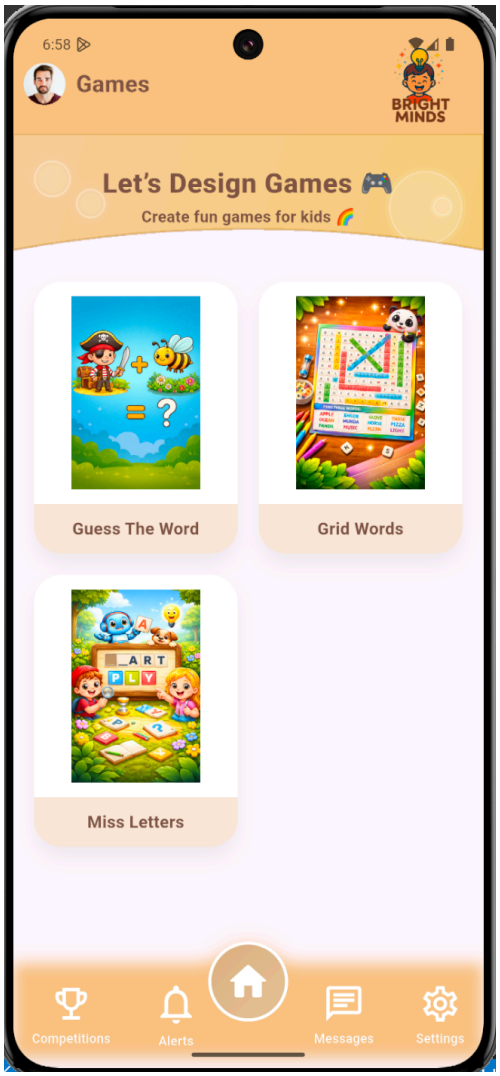


Figure 4.33: Supervisor Game List Page (Age Group 9-12)

Guess Word Game: This game presents a list of clues, which may be **text** or **two pictures**, and the child needs to guess the word.

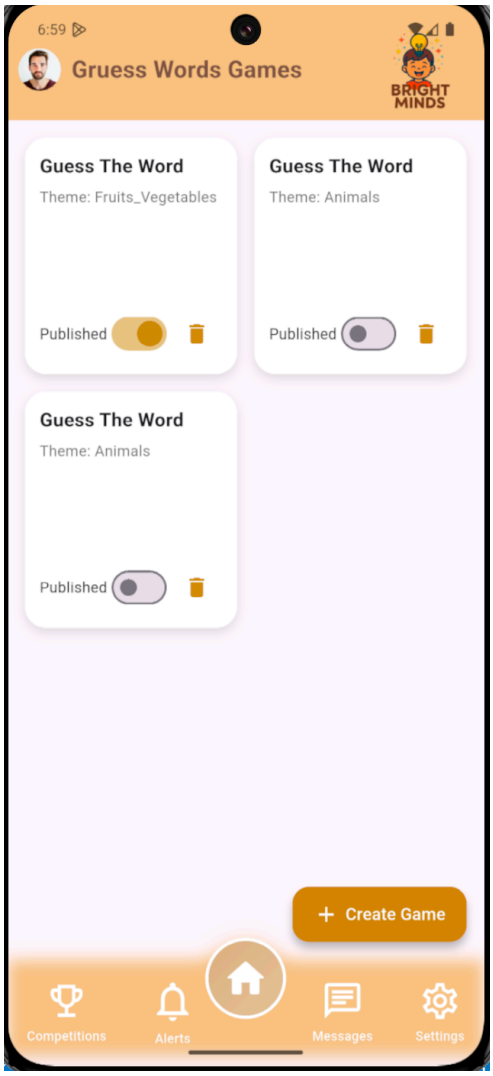


Figure 4.34: Created Versions of Guess Word

The created versions shown are the versions of the game **created by this supervisor only**.

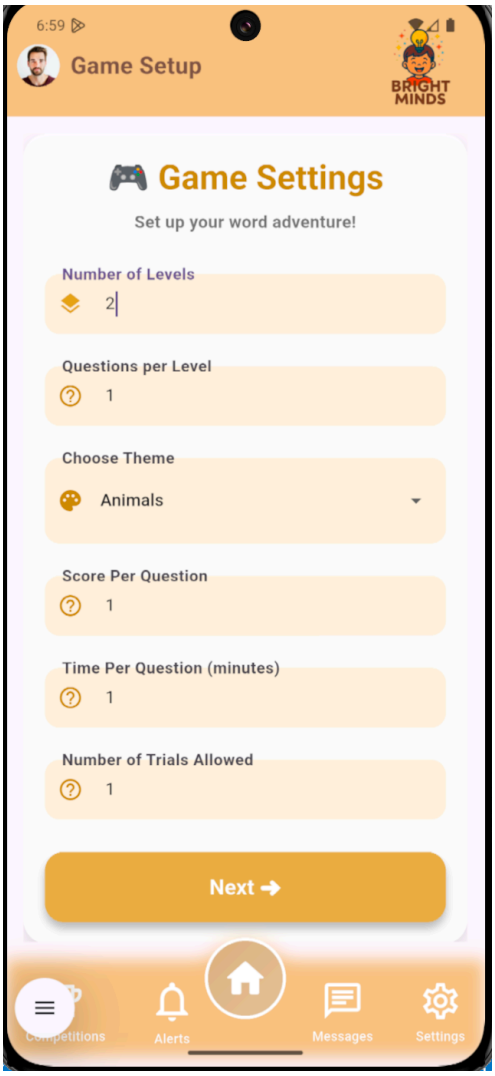


Figure 4.35: Create New Guess Word -View1

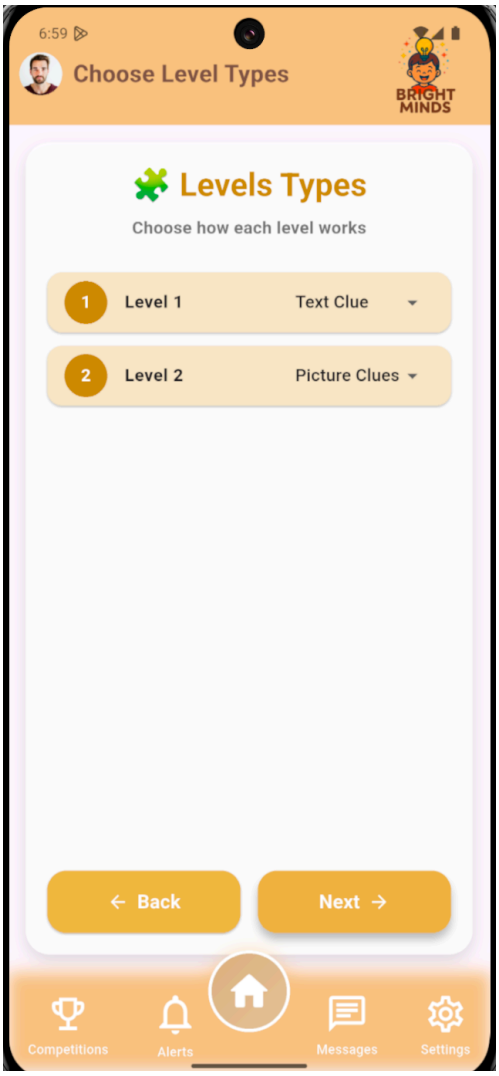


Figure 4.36: Create New Guess Word -View2

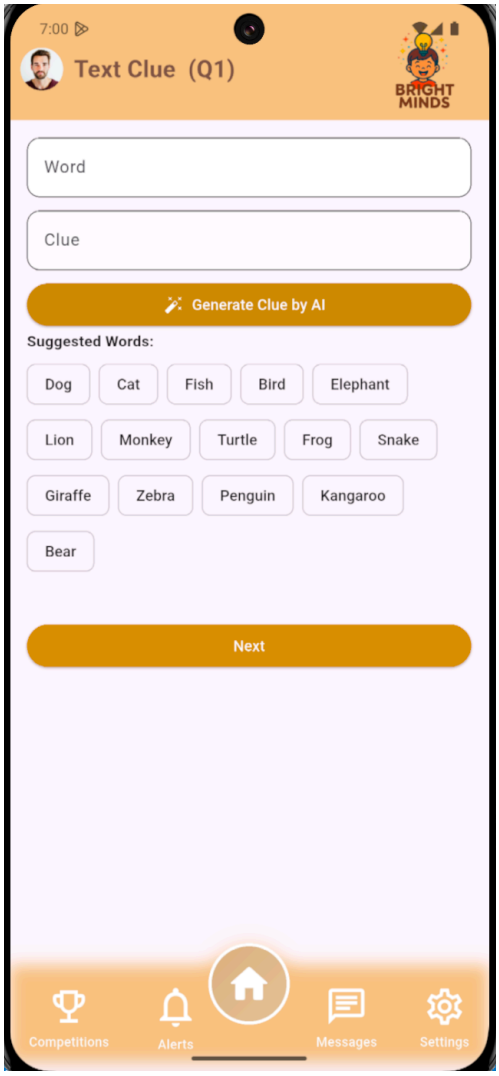


Figure 4.37: Create Text Clue for Guess Word - View 1

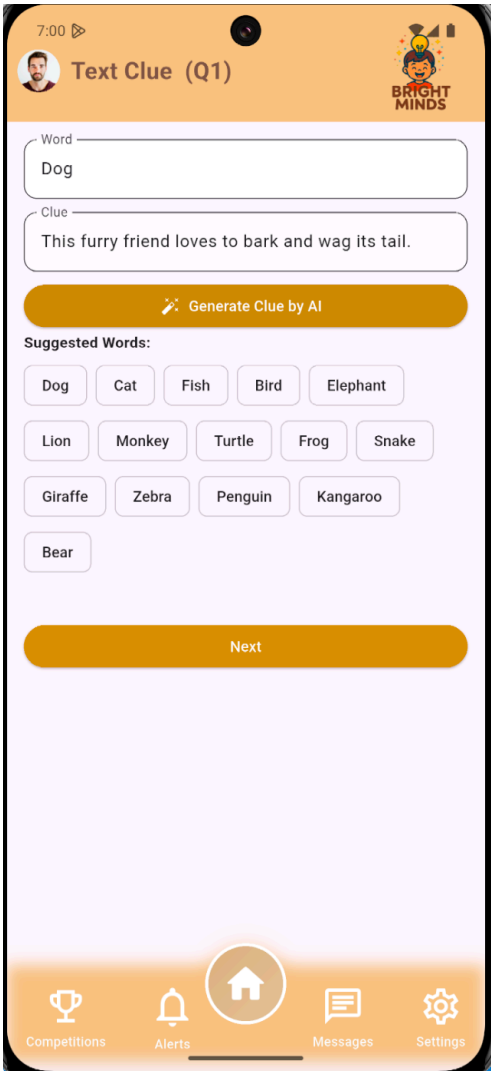


Figure 4.38: Create Text Clue for Guess Word -View 2

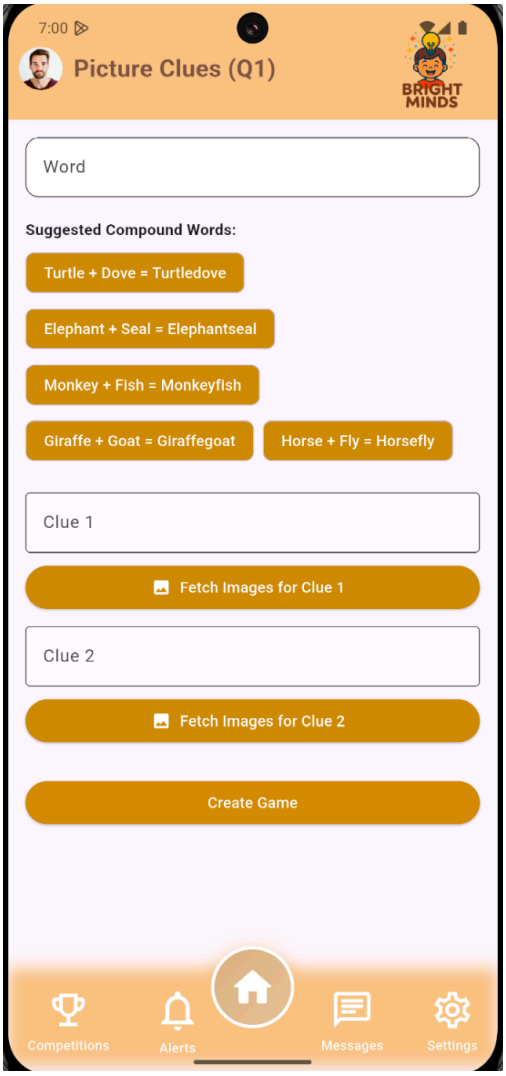


Figure 4.39: Create Image Clue for Guess Word -View 1

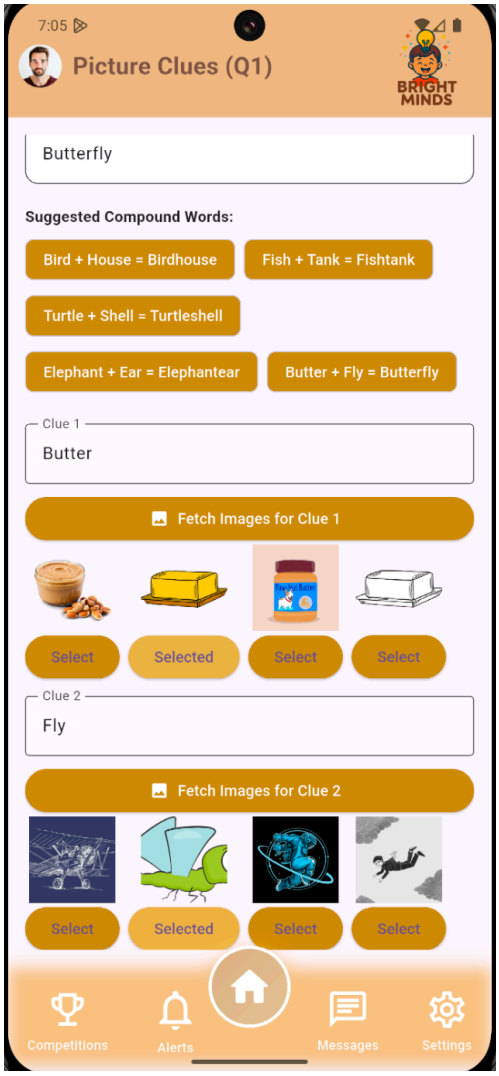


Figure 4.40: Create Image Clue for Guess Word - View 2

Grid Words Game: This is a game where a grid is presented, and the player needs to find the listed words within the grid.

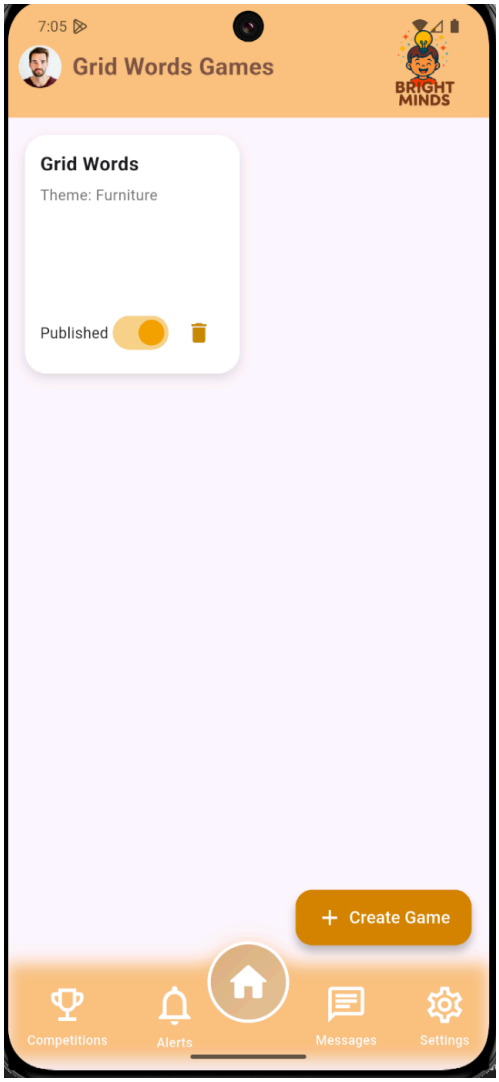


Figure 4.41 : Created Versions of Grid Words

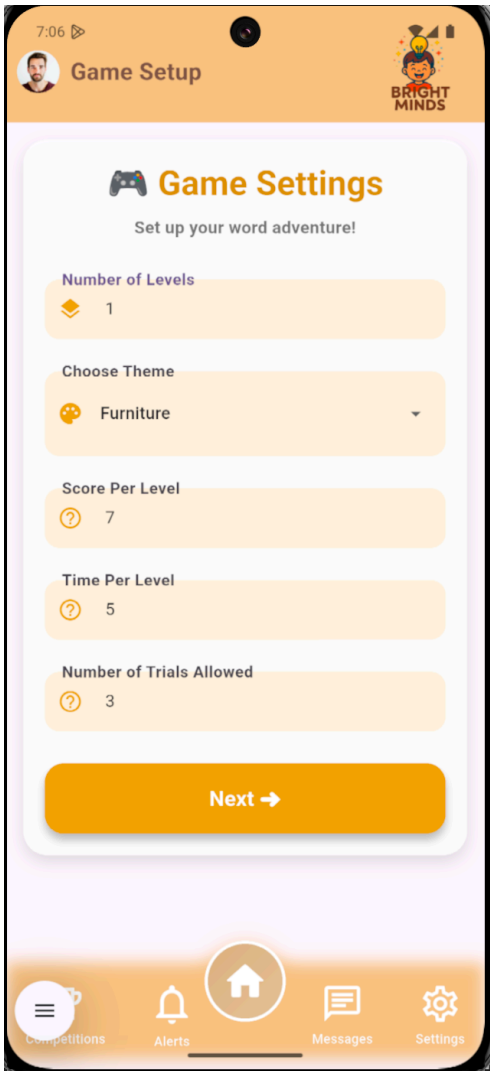


Figure 4.42: Create New Grid Words -View1

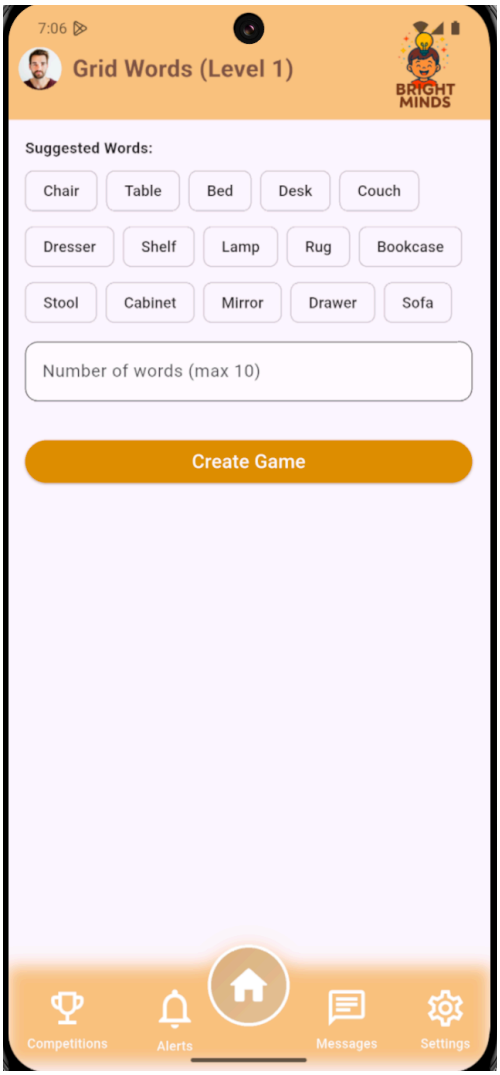


Figure 4.43: Create New Grid Words -View2

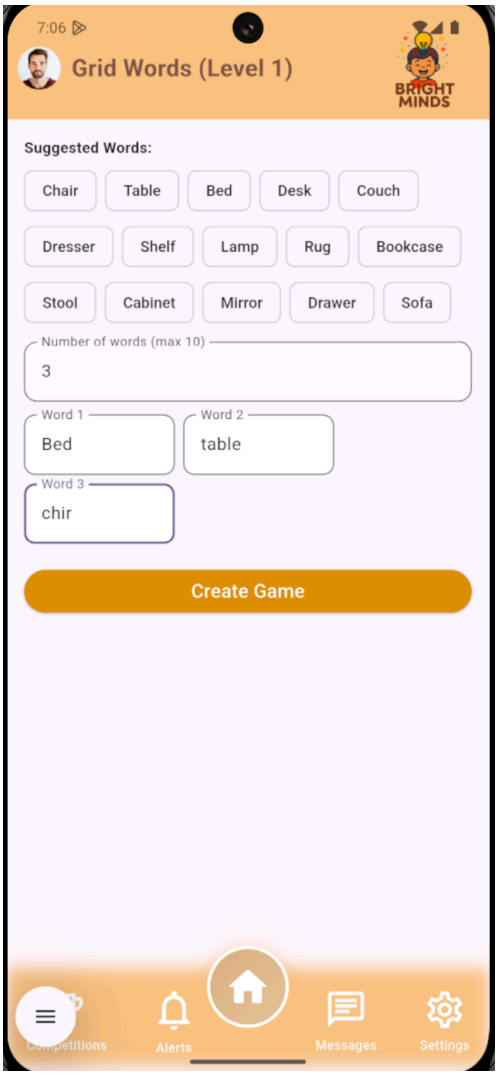


Figure 4.44: Create New Grid Words -View3

Missing Letters Game: This is a game where a list of words is presented, and each word has one or more missing letters with multiple choices. The child must select the correct choice to complete the word.

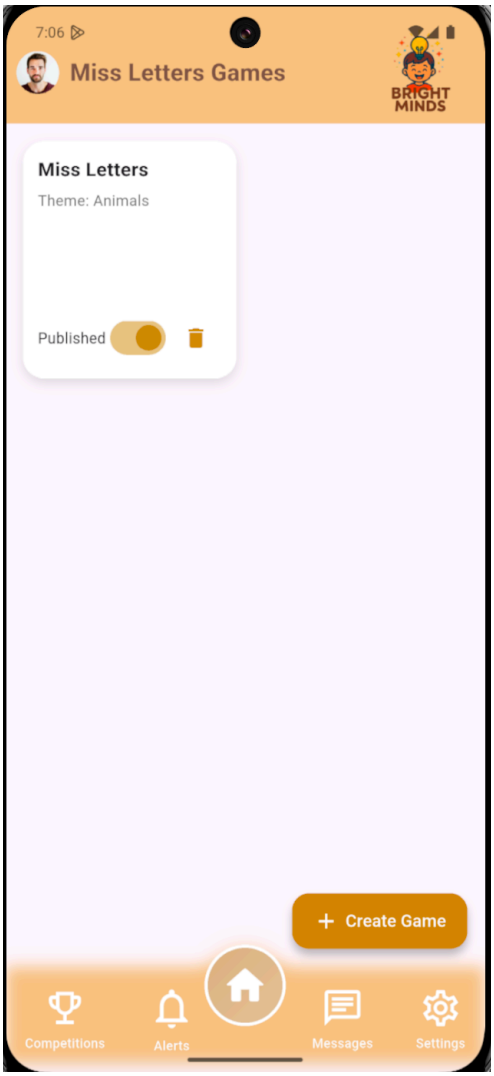


Figure 4.45: Created Versions of Missing Letters

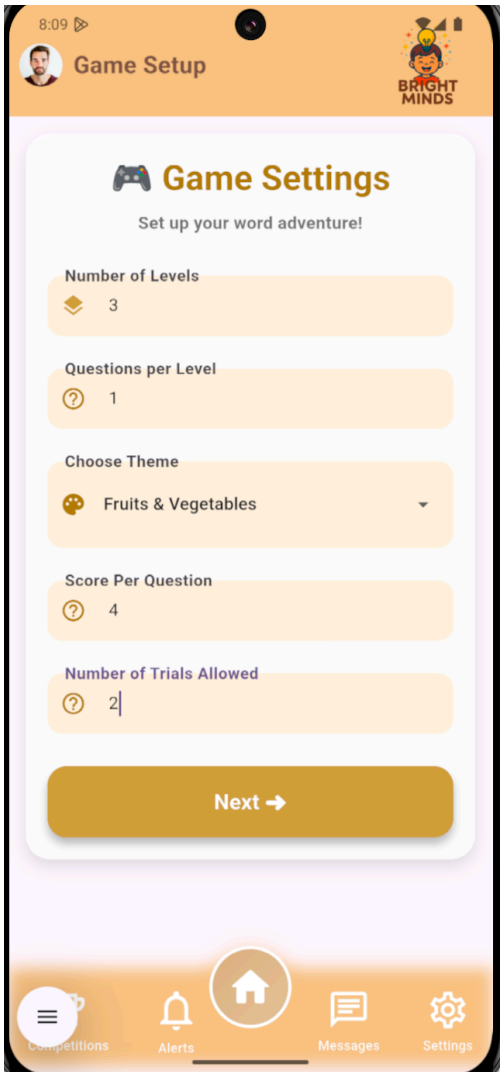


Figure 4.46: Create New Missing Letter -View1

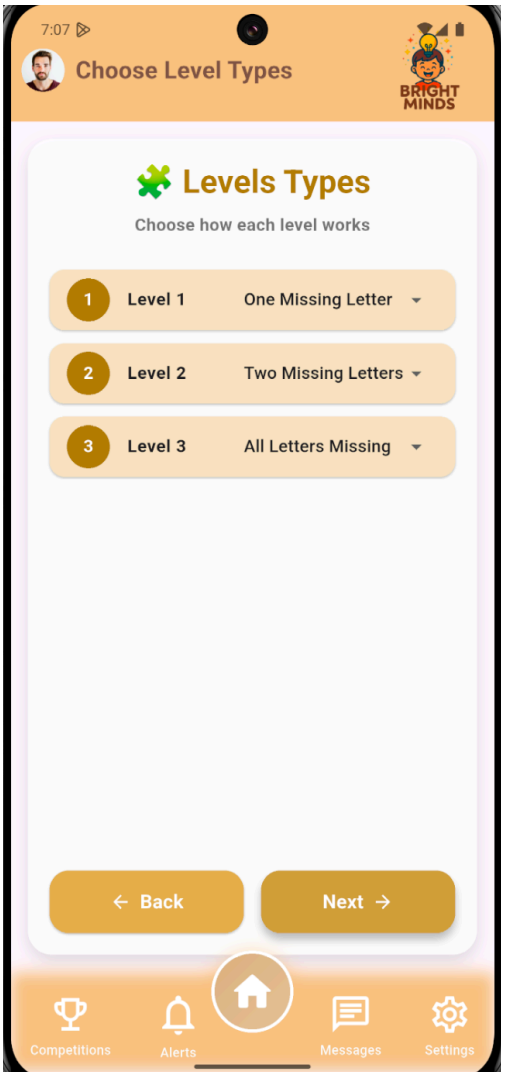


Figure 4.47: Create New Missing Letter -View2

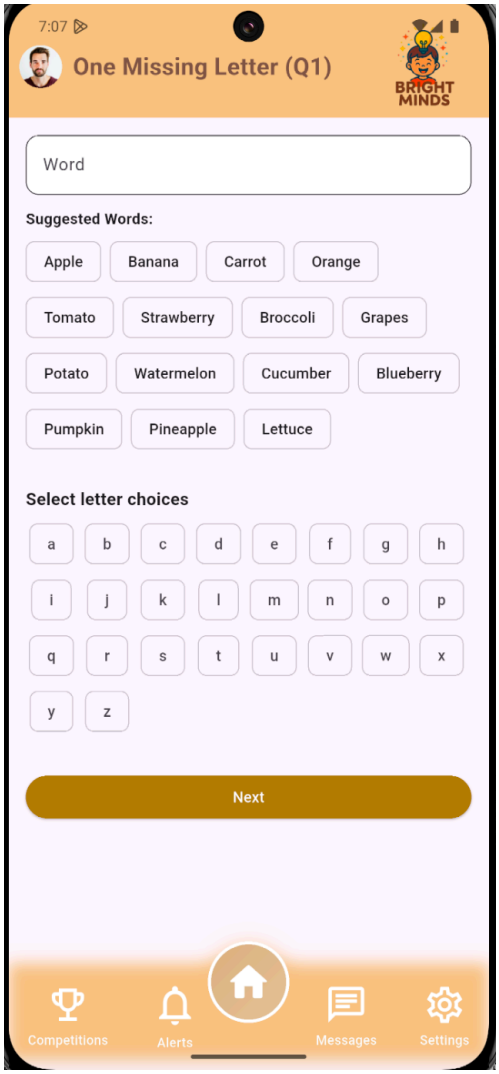


Figure 4.48: Create One Missing Letters Question -View1

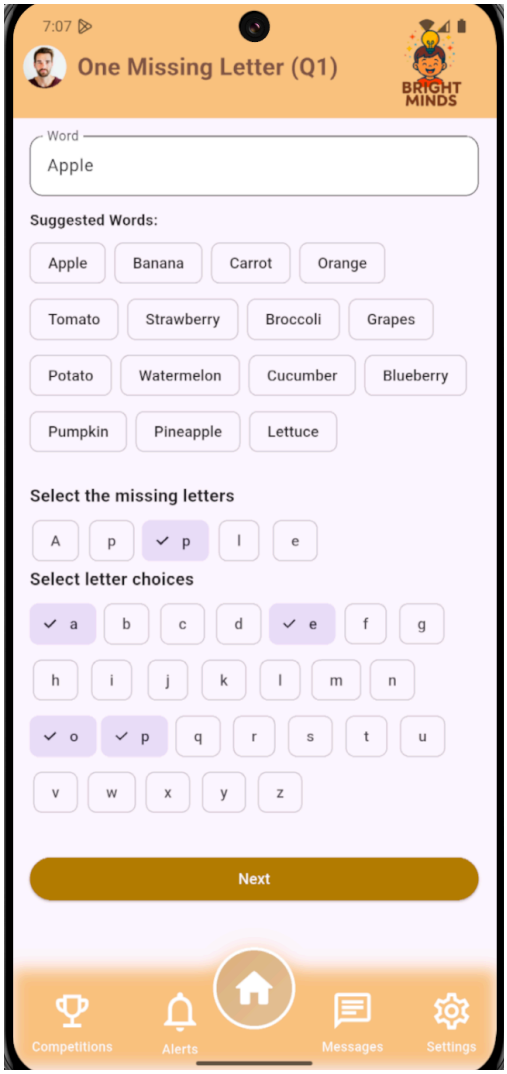


Figure 4.49: Create One Missing Letters Question -View2

Games Screen for Supervisor of Age Group 5–8 :

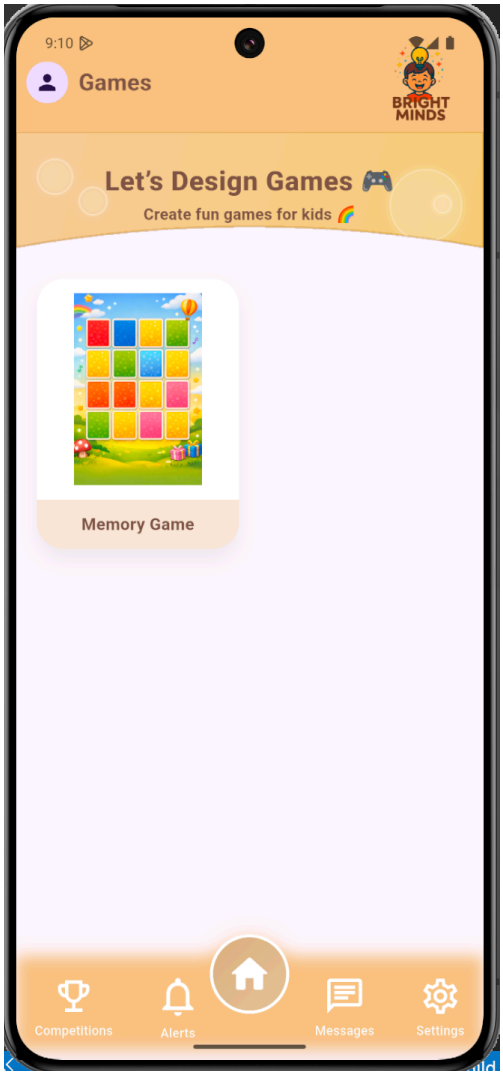


Figure 4.50: Supervisor Game List Page (Age Group 5-8)

Memory Card Game: This is a game where there are pairs of cards that are briefly revealed at the beginning of the level. After they are flipped face down, the player has to find all the matching pairs.

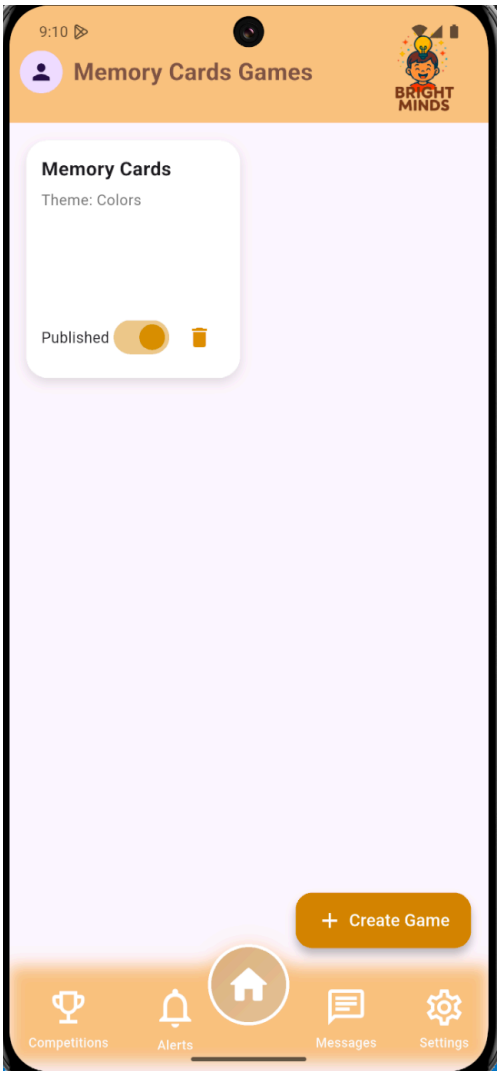


Figure 4.51 : Created Versions of Memory Cards

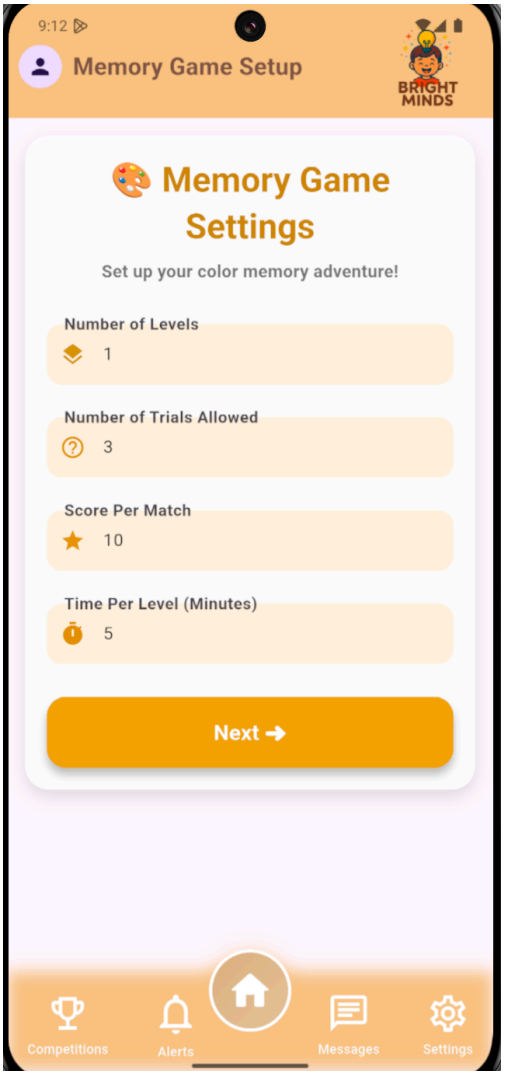


Figure 4.52: Create New Memory Cards-View1

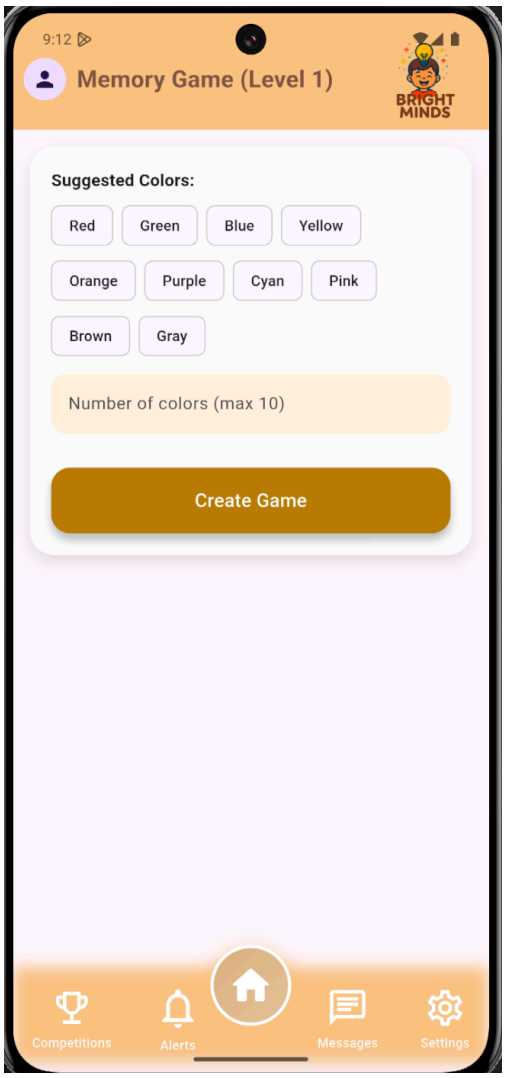


Figure 4.53: Create New Memory Cards-View2

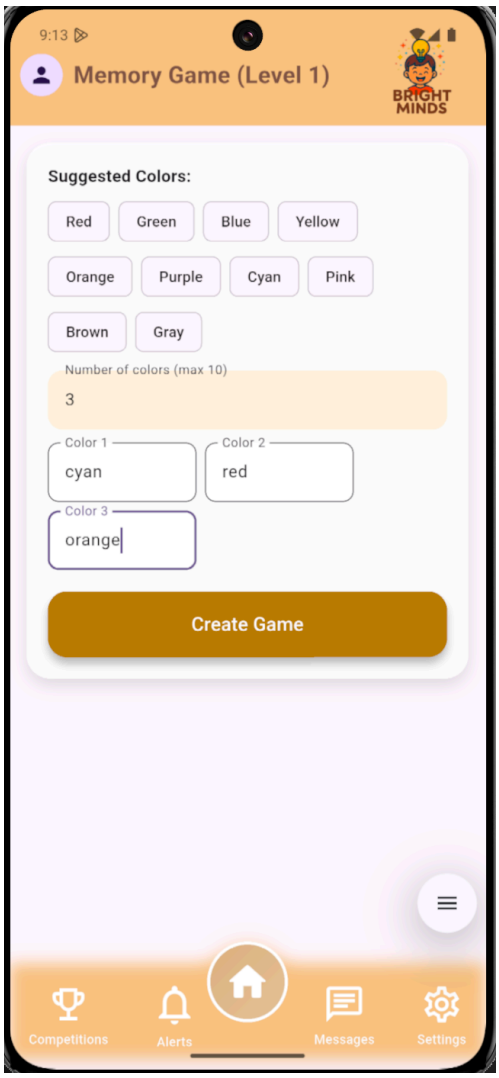


Figure 4.54: Create New Memory Cards-View3

Stories Section :

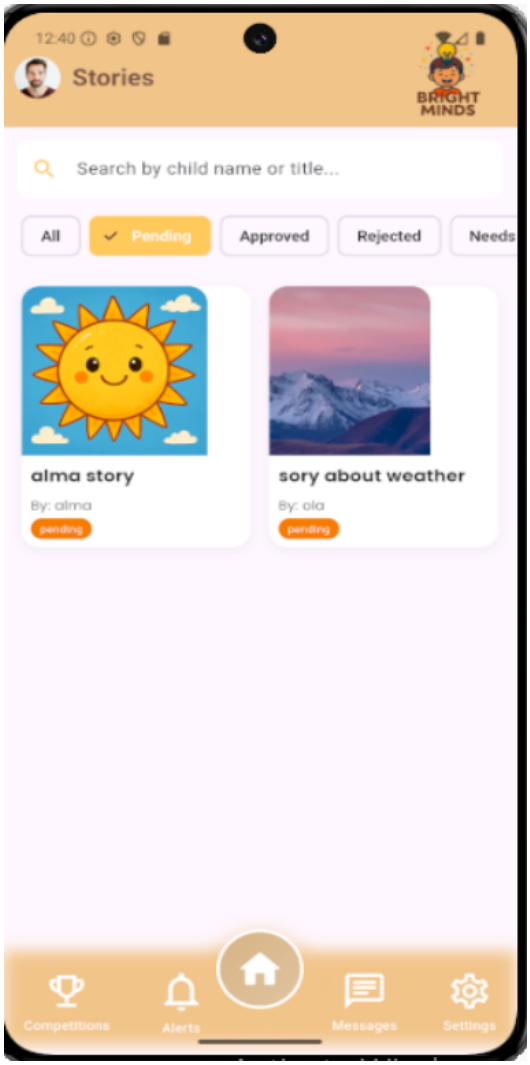


Figure 4.55: Pending Stories List

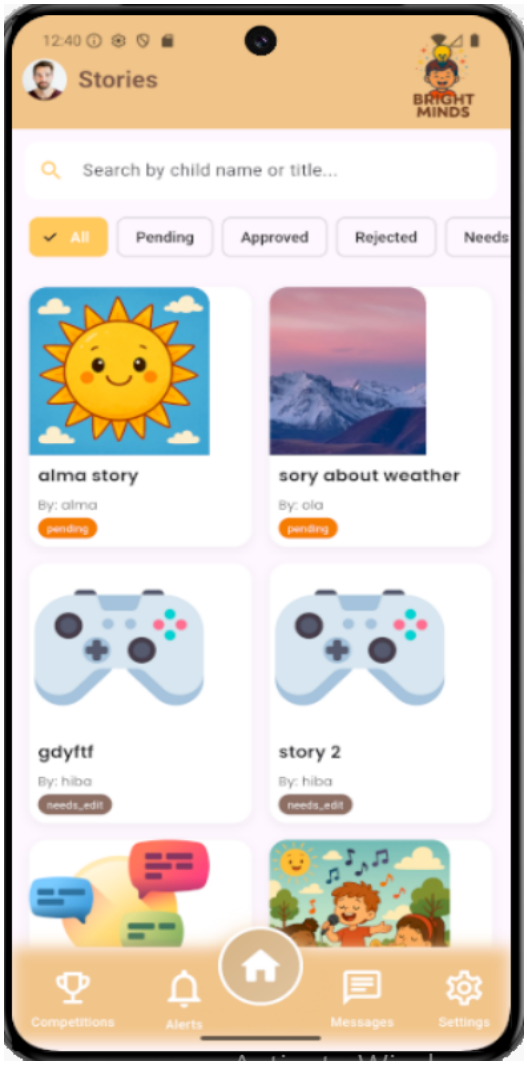


Figure 4.56: Story Filters View

The supervisor opens the Stories section, the first screen displays the stories that require review and rating (pending stories). After that, the supervisor can use filters to view stories based on their status. The available filters are: All, Pending, Approved, Rejected, and Needs Edit.

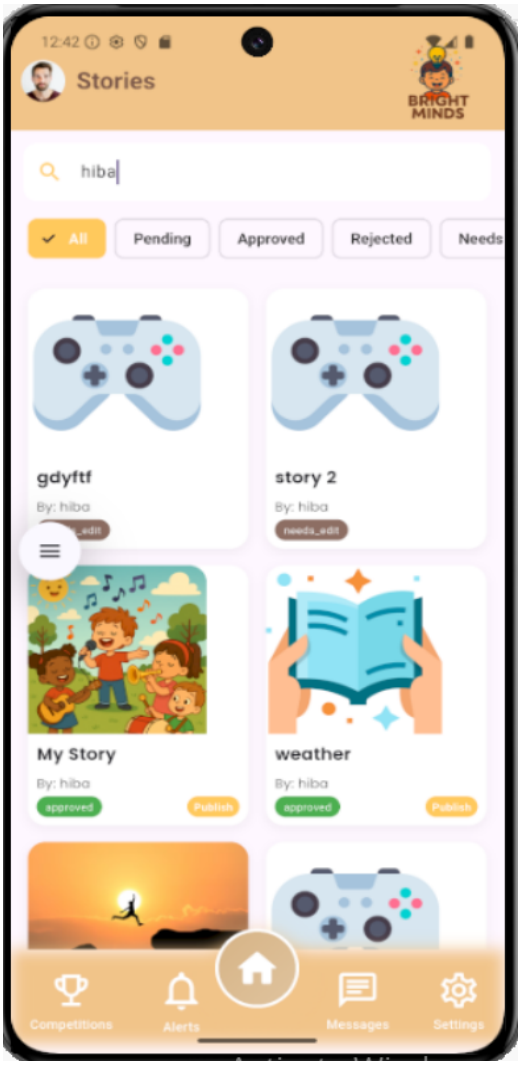


Figure 4.57: Searching By Child Name

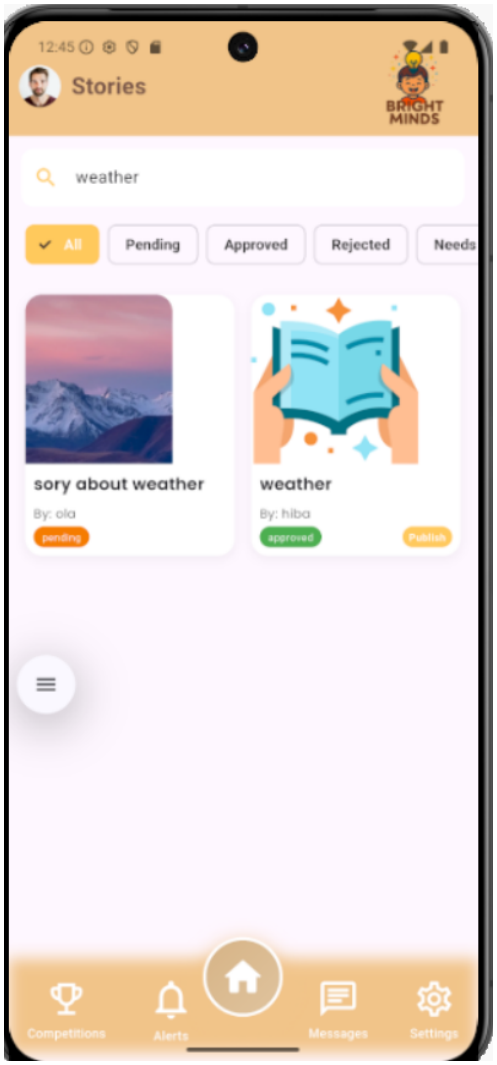


Figure 4.58: Searching By Story Title

The supervisor can quickly search for stories using the search bar. The search supports filtering by child name or story title, making it easier to locate specific stories for review.



Figure 4.59: Review Story Screen Displaying The Story Pages

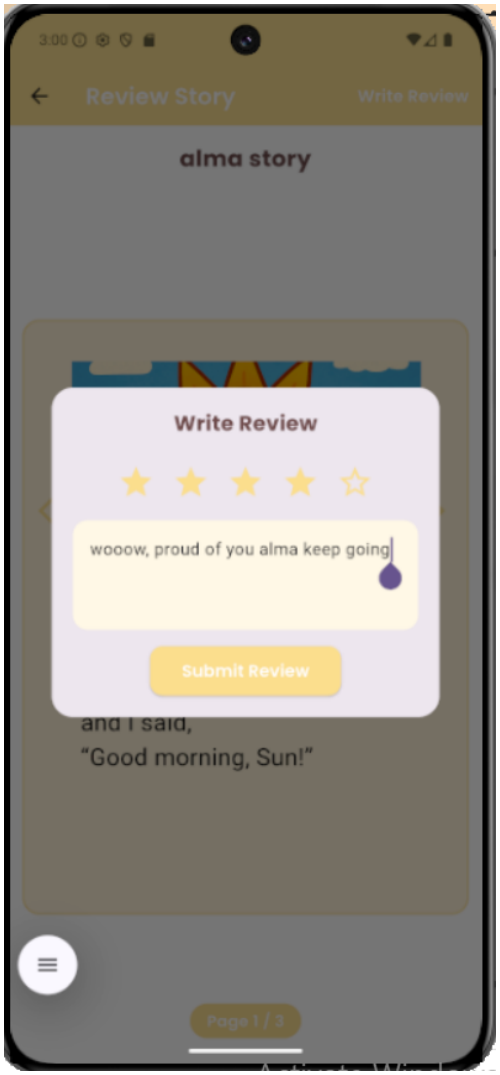


Figure 4.60: Write Review Popup For Rating And Commenting On The Story

The supervisor can read the story and navigate between its pages. After reviewing, the supervisor can write a review by selecting a star rating and adding a comment. The rating determines the story status: **1–2 stars** means the story is **Rejected**, **3 stars** means it **Needs Edit**, and **4–5 stars** means it is **Approved**. Approved stories can be published by the supervisor so that all children in the app can view them.



Figure 4.61: Approved Stories List

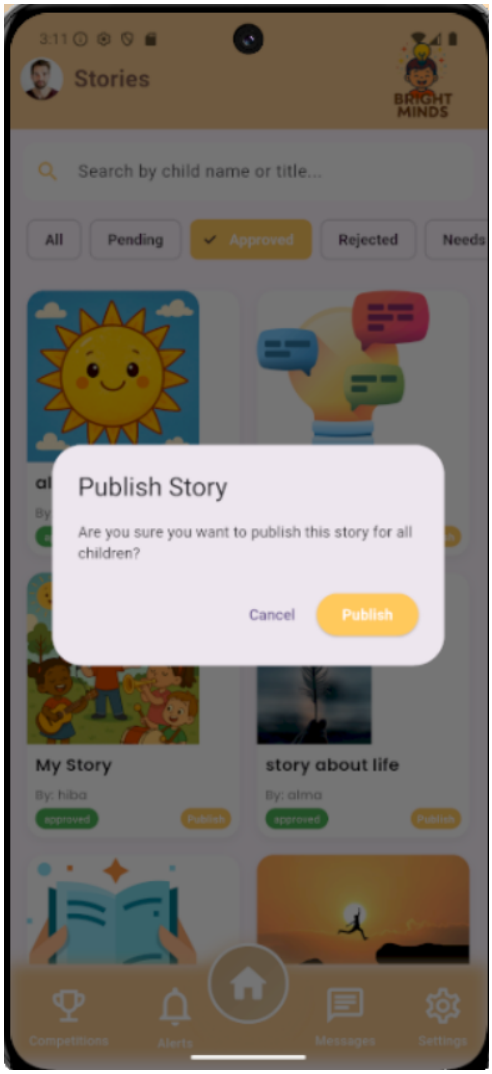


Figure 4.62: Publish Story

When a story is reviewed and marked as **Approved**, a **Publish** button appears in **yellow** under the story cover. When the supervisor clicks this button, a confirmation dialog is displayed asking whether they want to publish the story for other children in the app. The supervisor can then confirm to publish it.

Drawing Section :

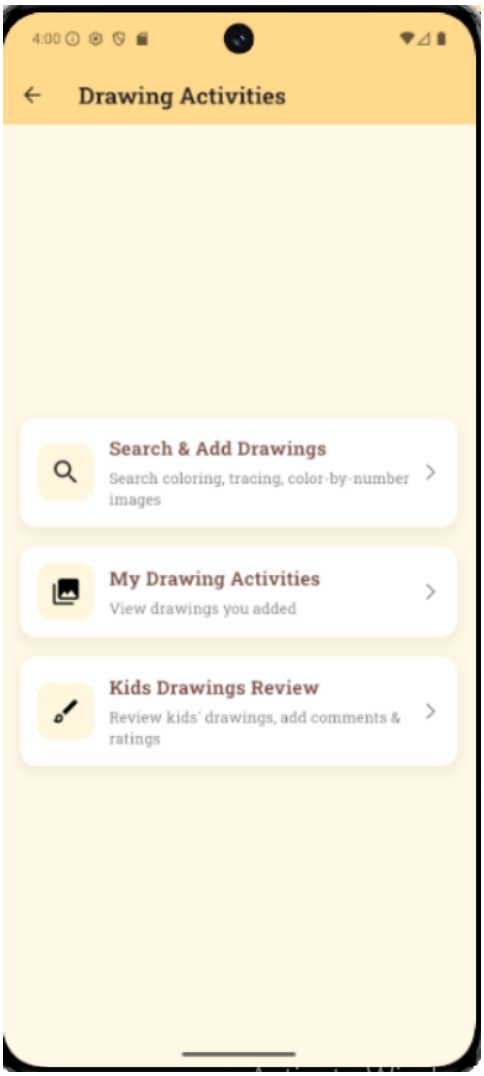


Figure 4.63: Supervisor Drawing Activities Main Menu

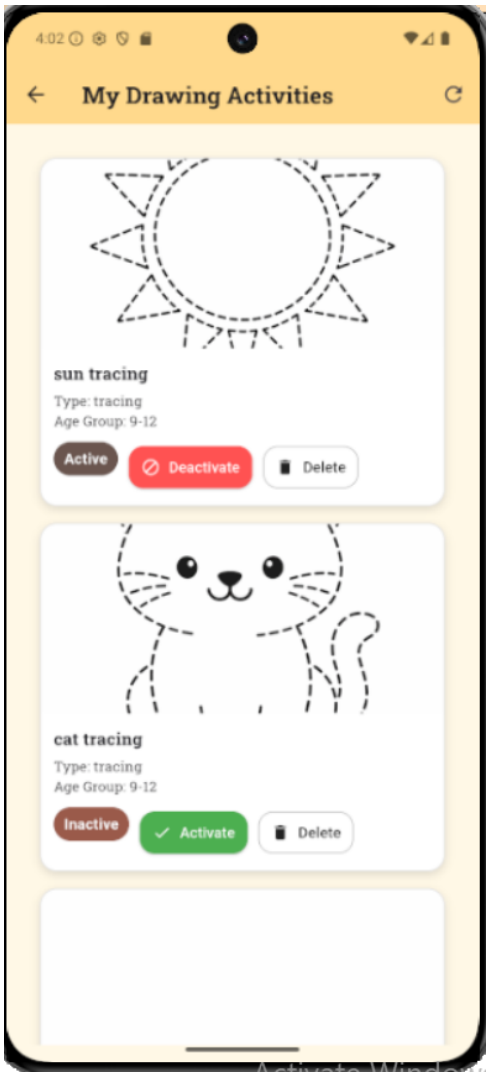


Figure 4.64: All Drawing Activities Supervisor Created

This screen represents the **Drawing Activities menu** for the supervisor. It includes three main options: **Search & Add Drawings**, **My Drawing Activities**, and **Kids Drawings Review**. When the supervisor selects **My Drawing Activities**, a page opens showing all drawing activities created/ added by the supervisor. From this page, the supervisor can **delete** any activity, or keep it saved without showing it to children by using the **Deactivate** button. If needed later, the supervisor can **activate** the activity again so it becomes available for children in the application.



Figure 4.65: Search & Add Drawing

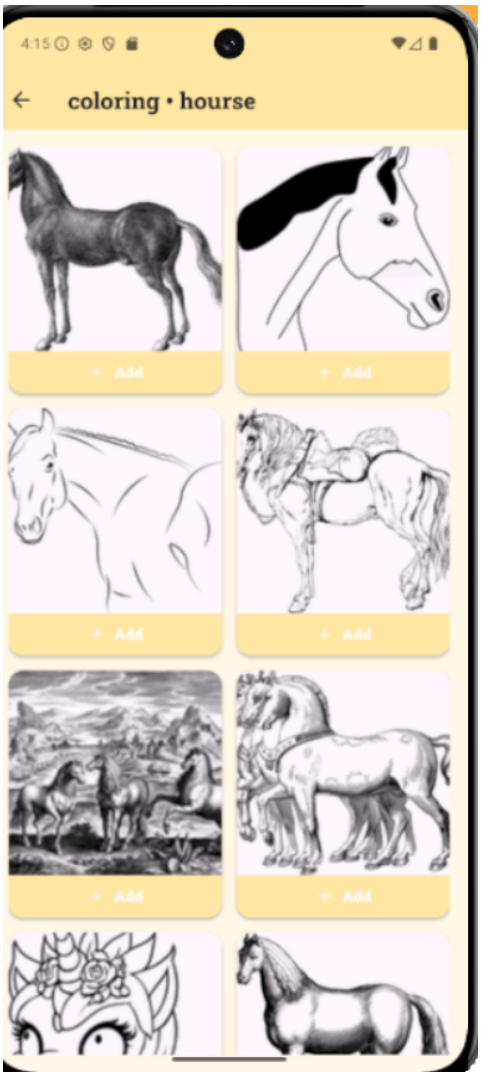


Figure 4.66: Drawings By Coloring Choice

This page allows the supervisor to **search for drawing images** and add them as activities. It provides **five main options**: **Coloring**, **Tracing**, **Drawing by Reference**, **Color by Number**, and **Upload from Device**. The **Coloring** option retrieves images from an external **API** based on the search keyword. The **Tracing** option generates tracing-style images using **OpenAI**, where the drawing is designed as an outline path for children to trace. The **Drawing by Reference** option also generates images using **AI** to provide a reference picture for kids to draw. The **Color by Number** option generates AI images prepared for color-by-number activities. Additionally, the **Upload from Device** option allows the supervisor to upload an image directly from their device. In the shown example, the supervisor searched for the keyword **"horse"**, then a list of results from the API appeared, and the supervisor can select any image and click **Add** to create a new drawing activity.



Figure 4.67: Drawings By Tracing Choice



Figure 4.68: Drawings By Reference Choice

The **Tracing** option generates tracing images using **AI (OpenAI)**. These images are designed as clean **outline drawings** with clear paths and shapes, so children can **trace over the lines** on the canvas. This activity helps improve children's **hand control**, **fine motor skills**, and **drawing accuracy**, since they follow a predefined path instead of drawing freely.

The **Drawing by Reference** option generates a **reference image using AI (OpenAI)** based on the selected keyword. The generated image is shown to the child as a **visual example** to copy. The child then draws the same object on a blank canvas, improving their **observation skills**, **creativity**, and ability to reproduce shapes and details by looking at an example.

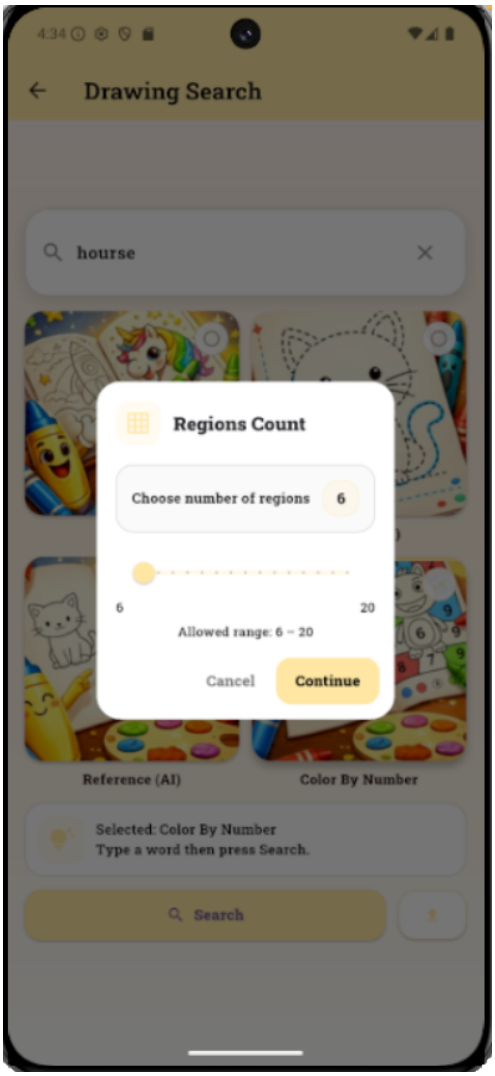


Figure 4.69: Coloring-by-Number Drawing with Region Selection

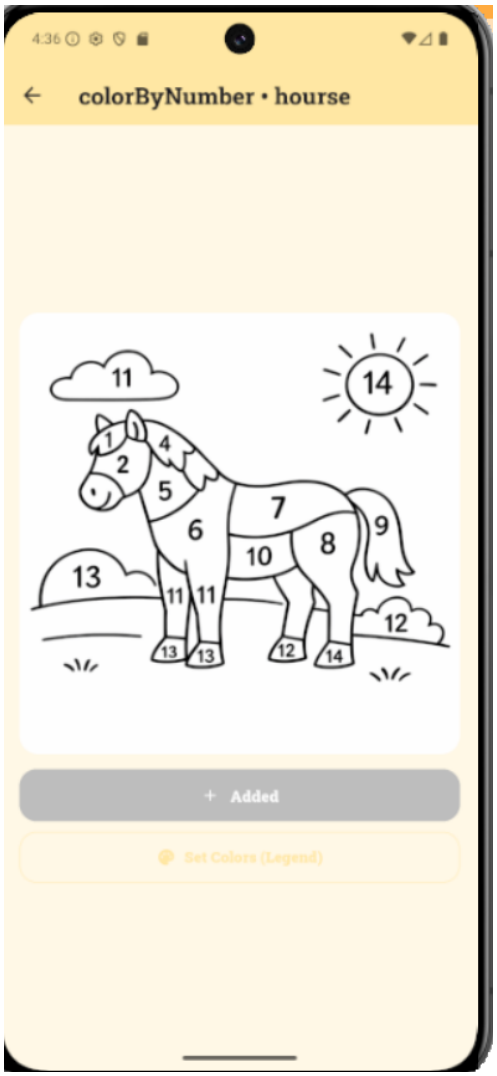


Figure 4.70: Coloring-by-Number Drawing Selection

In the **Color by Number** option, the supervisor first selects the **number of regions** to generate, then clicks **Continue**. After that, the system generates and displays the image with **numbered regions**, where each region is labeled with a number. This prepares the supervisor to move to the next step, where the colors will be assigned for each number.

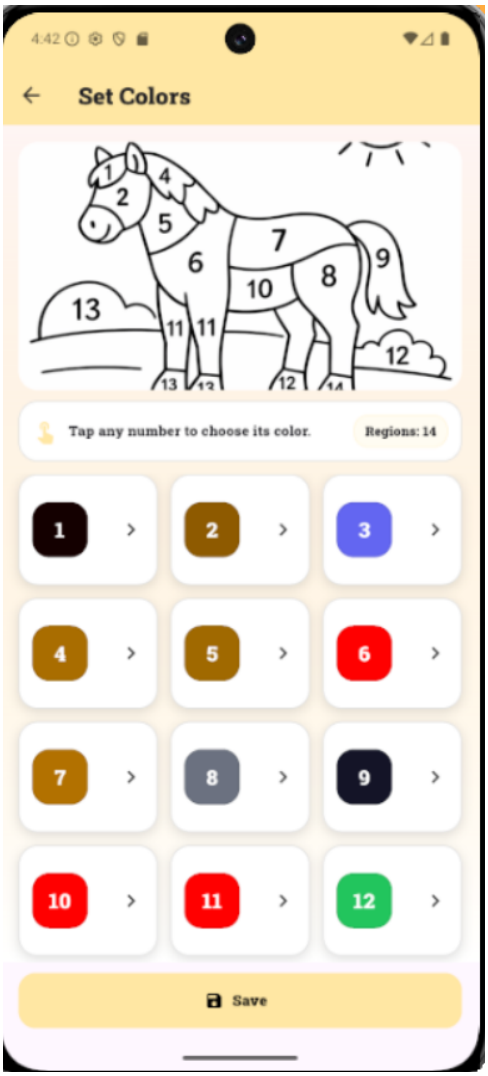


Figure 4.71: Set Colors

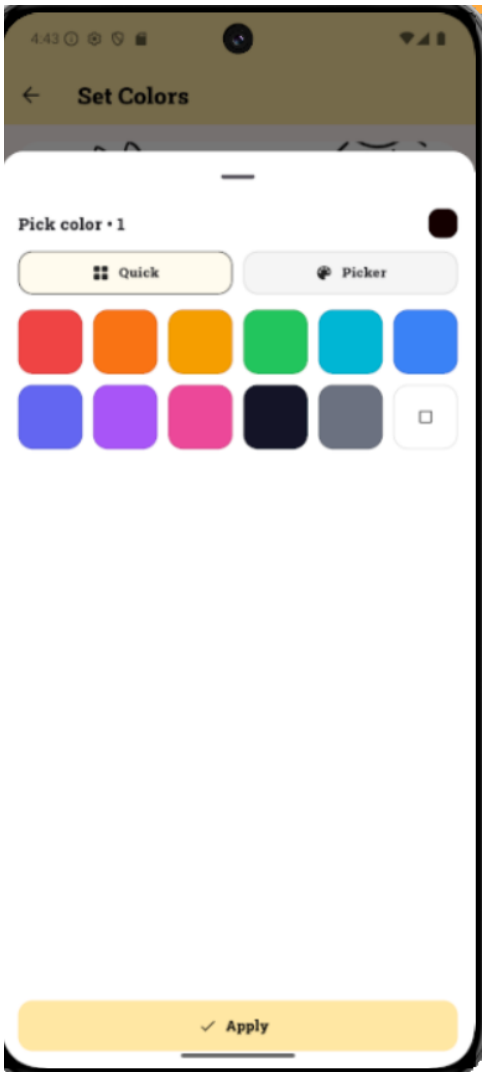


Figure 4.72: Color Selection Using Color Picker or Quick Choice

This screen allows the supervisor to assign a **color for each number** in the Color by Number activity. By clicking on any number, a quick color selection panel appears with predefined colors for fast choosing, as well as a **color picker** option. After selecting the desired color, the supervisor clicks **Apply** to confirm it for that number. Once all colors are selected for all numbers, the supervisor clicks **Save** to save the drawing activity and its legend.



Figure 4.73: Kids Drawing

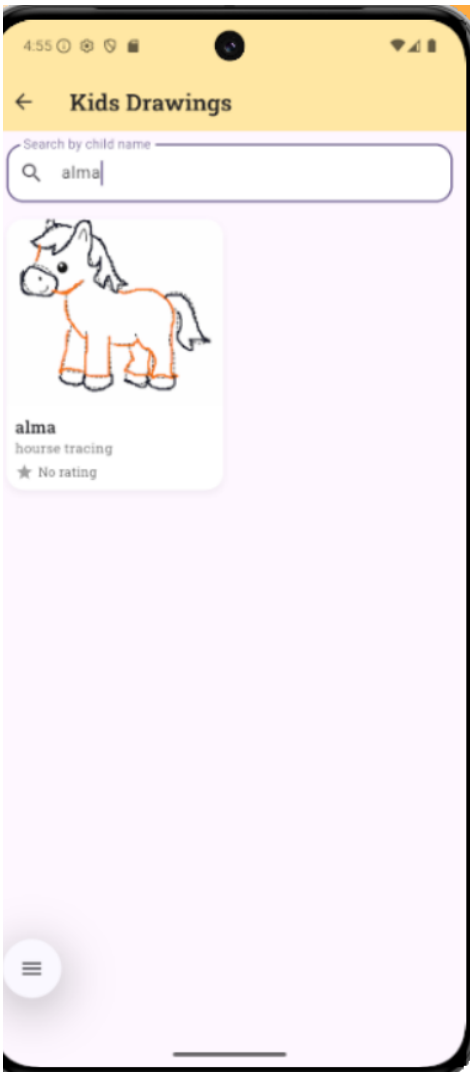


Figure 4.74: Search By Child Name

This page displays the **children's submitted drawings** so the supervisor can view and evaluate them. The supervisor can open each drawing to provide feedback and rating. In addition, a search feature is available to quickly find drawings **by the child's name**.

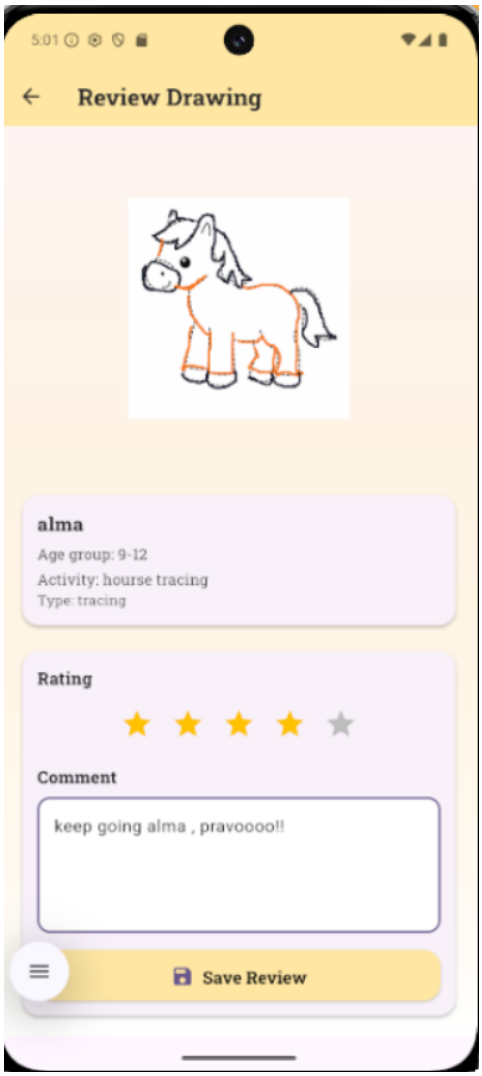


Figure 4.75: Kids Review Drawing



Figure 4.76: Kids Drawing After Review

This screen allows the supervisor to **evaluate a child's drawing** by selecting a **star rating** and writing a **comment**. After submitting, the evaluation is saved and linked to the drawing for future review.

Challenges Section :

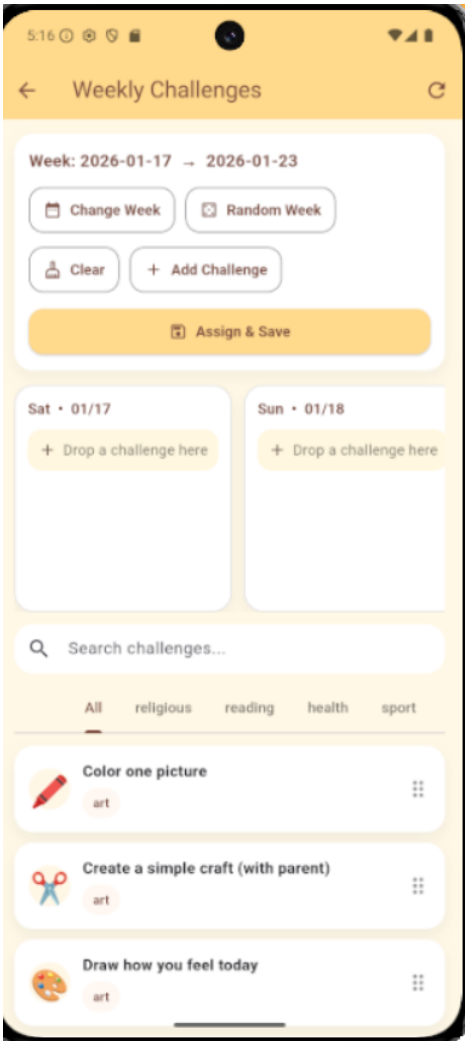


Figure 4.77: Challenges Screen

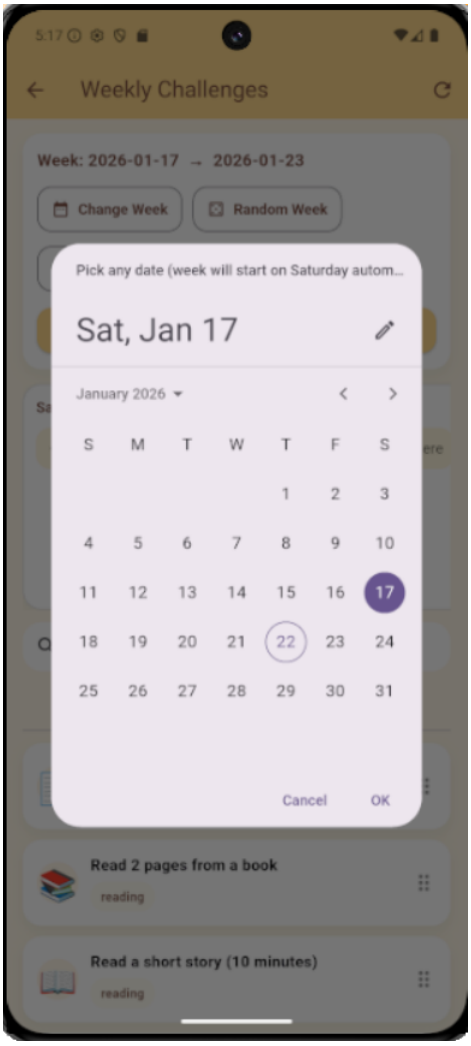


Figure 4.78: Choose Week For The Challenges

This page allows the supervisor to assign **simple weekly challenges** to the children they supervise. These challenges are **optional**, fun, and useful, and they include a variety of categories such as **religious**, **reading**, **health**, **sport**, **behavior**, **art**, and **nature** (e.g., Morning Adhkar, reading tasks, drinking water, short exercises, kindness, drawing, and cleaning). From this screen, the supervisor can choose **which week** to plan for, then build a **7-day schedule**. The **Random** button automatically generates a full week plan by selecting activities from different categories, while the **Clear** button removes all assigned challenges. The supervisor can also create the plan manually using **drag and drop**, by dragging a challenge and dropping it onto the desired day.

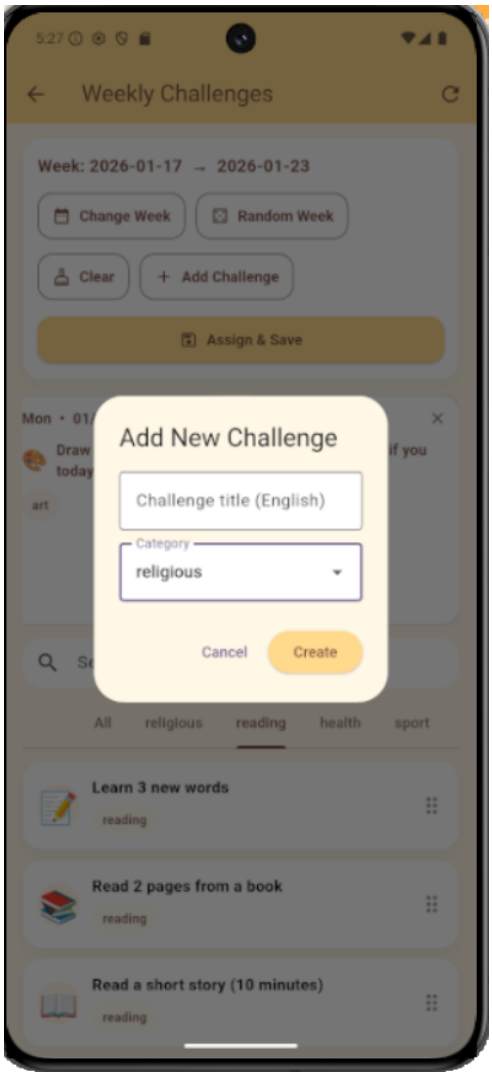


Figure 4.79: Add New Challenge

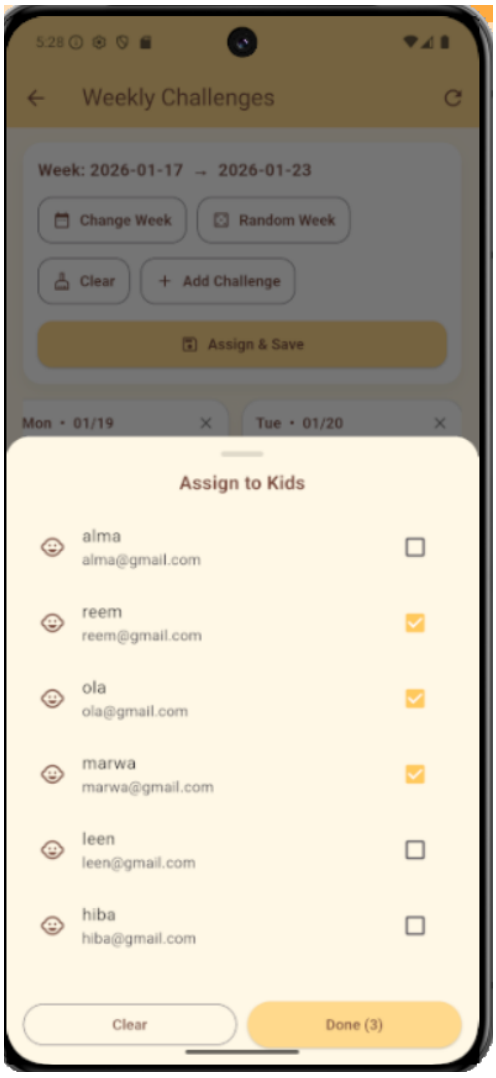


Figure 4.80: Assign challenges to kids

If the supervisor wants to add a **new challenge** in addition to the existing templates, they can create and include it from this section. After finishing the weekly plan, the supervisor clicks **Assign** to choose which children will receive the challenges. The supervisor can also send **different challenge plans** to different children, so each child can have a customized set of challenges.

Alerts Section :

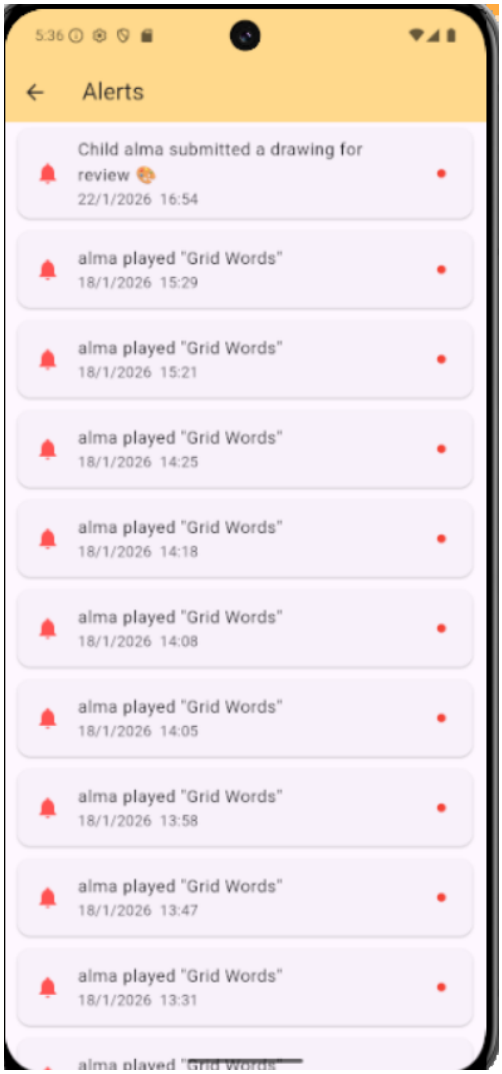


Figure 4.81: Alerts Come From Kids

Setting Section :

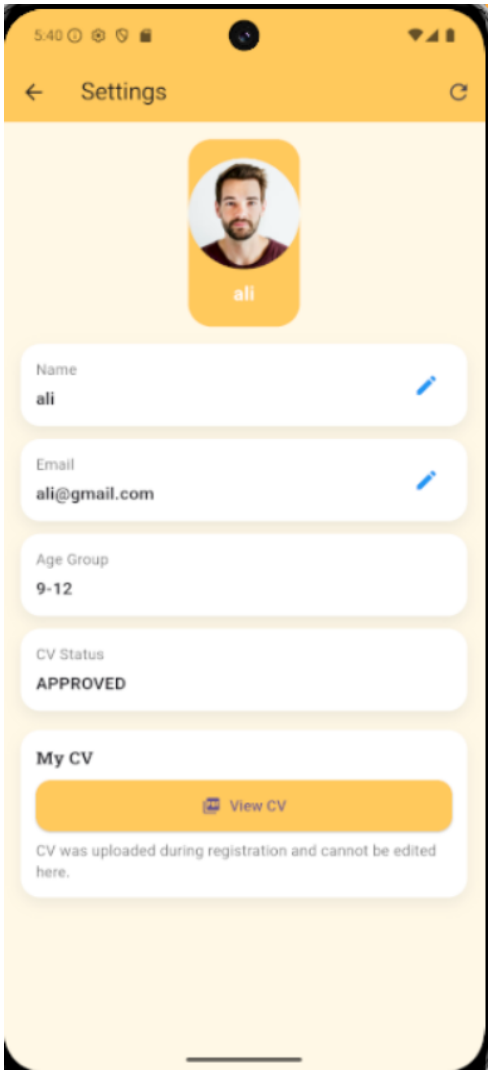


Figure 4.82: Setting For Supervisor

The **Notifications** screen shows updates when children submit any activity, allowing the supervisor to track new submissions. The **Settings** screen allows the supervisor to update their profile information (such as **name** and **email**) and view their **CV**.

Messages Section :

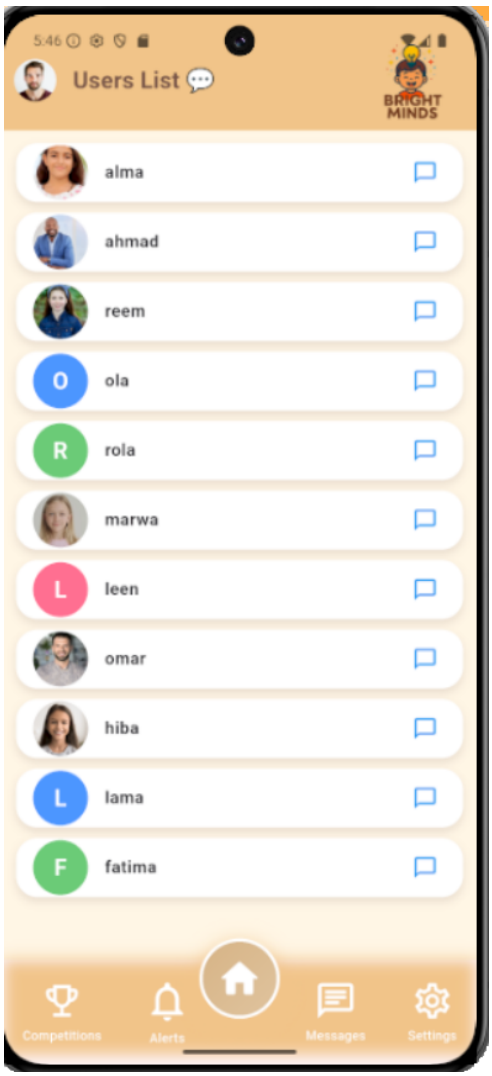


Figure 4.83: User List Screen

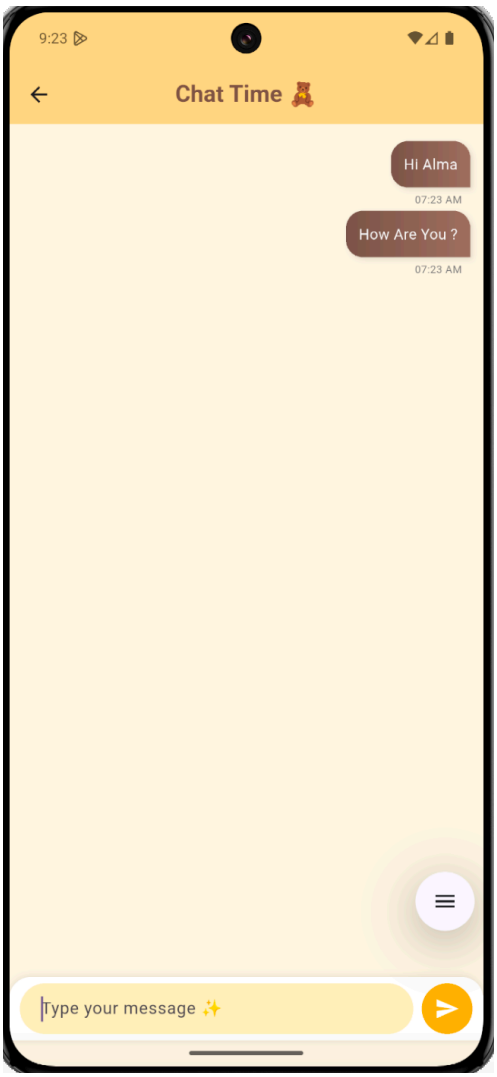


Figure 4.84: Messages Screen

This is the **Messaging** screen, where the supervisor can communicate with the **admin**, the supervised **children**, and the **parents** of those children.

Kids Section :

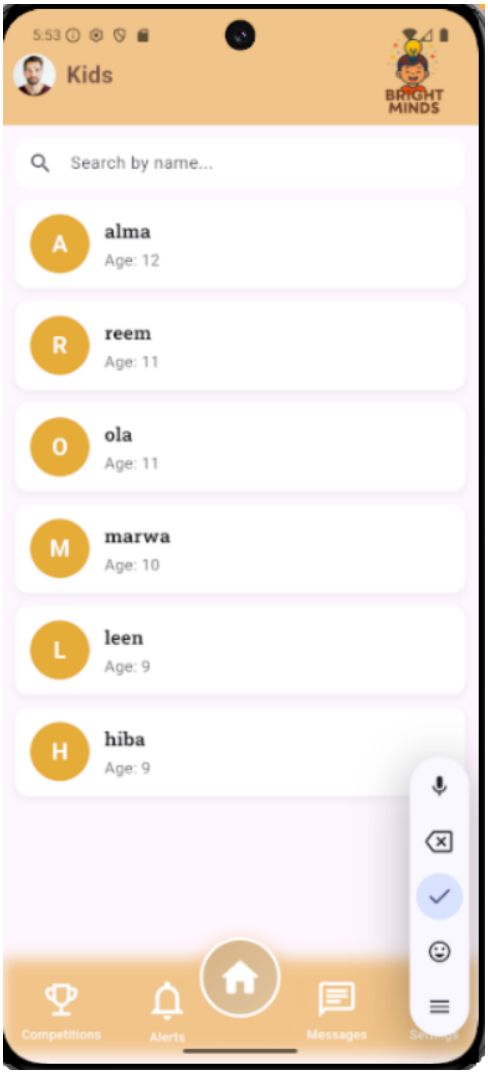


Figure 4.85: Kids Screen

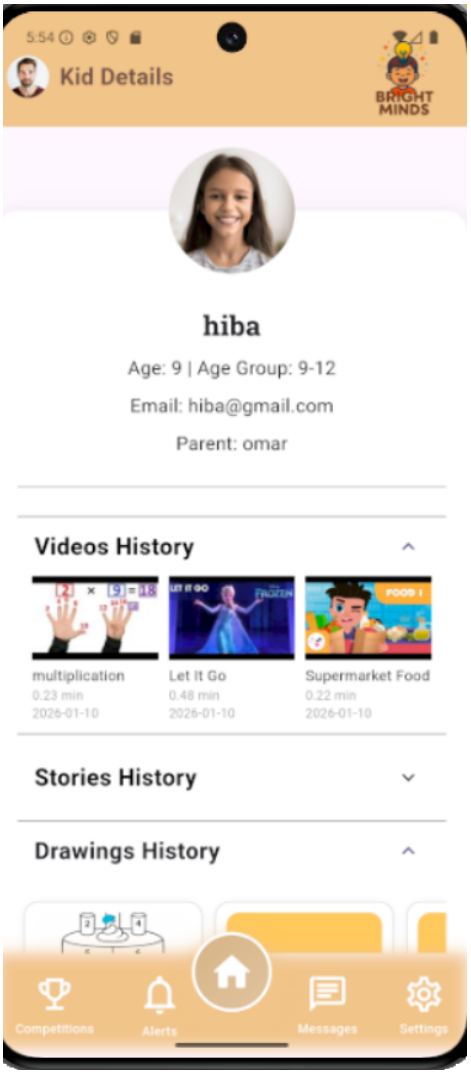


Figure 4.86: Kids Profile For Supervisor

From this screen, the supervisor can view the children they are responsible for. When the supervisor selects a child, the child's profile details appear along with their activity history in the application.

4.3.2 Child Pages

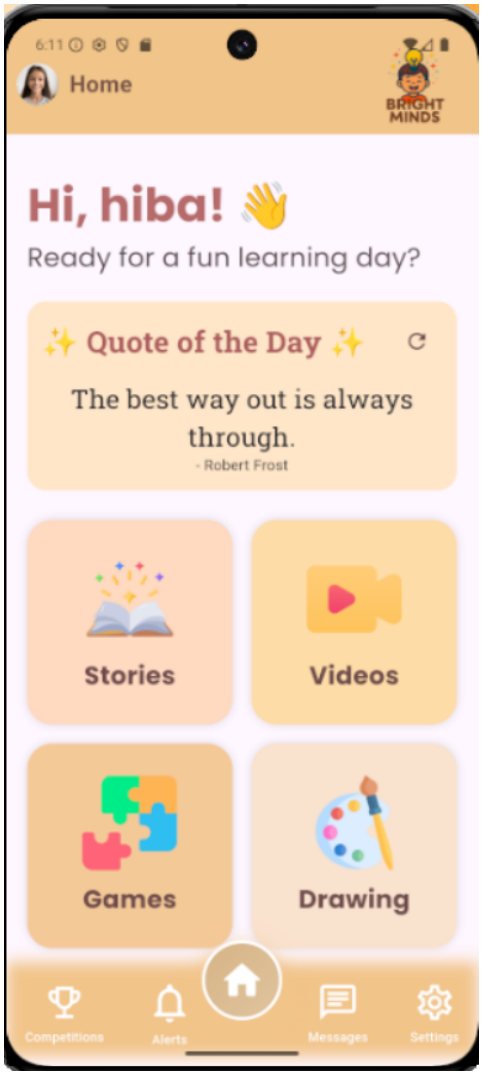


Figure 4.87: Kids Home Screen - View 1

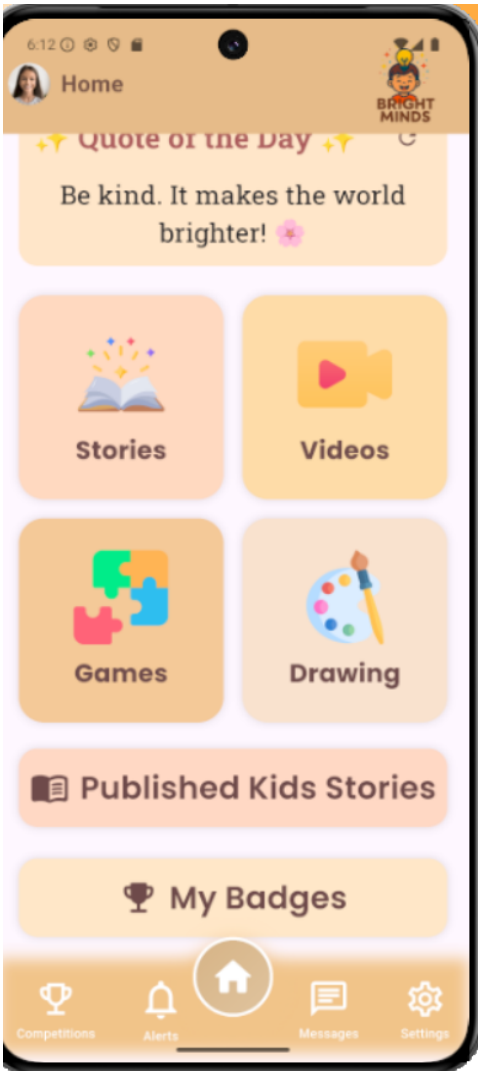


Figure 4.88: Kids Home Screen - View2

This is the **child's home screen**, which displays a motivational quote fetched from an **API**. The quote updates frequently, providing short encouraging messages to inspire the child.

Videos Section :

- The Video section for both age groups has the same functionality; the only difference is the content of the videos.

- When a child watches a video, it will be stored in the child's video history along with the duration of the watch. Each view of a video by a child is counted as **one view**, even if the video is watched multiple times.

- Each video has two icons: a **favorite icon** to add the video to the favorites list, and a **quiz icon** to attempt the quiz associated with the video.

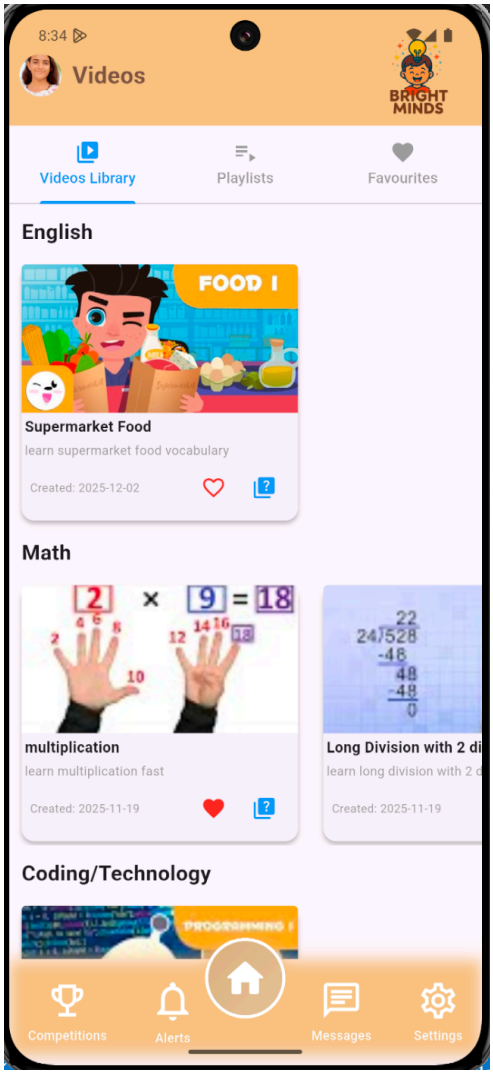


Figure 4.89: Video Library for Age Group 9–12

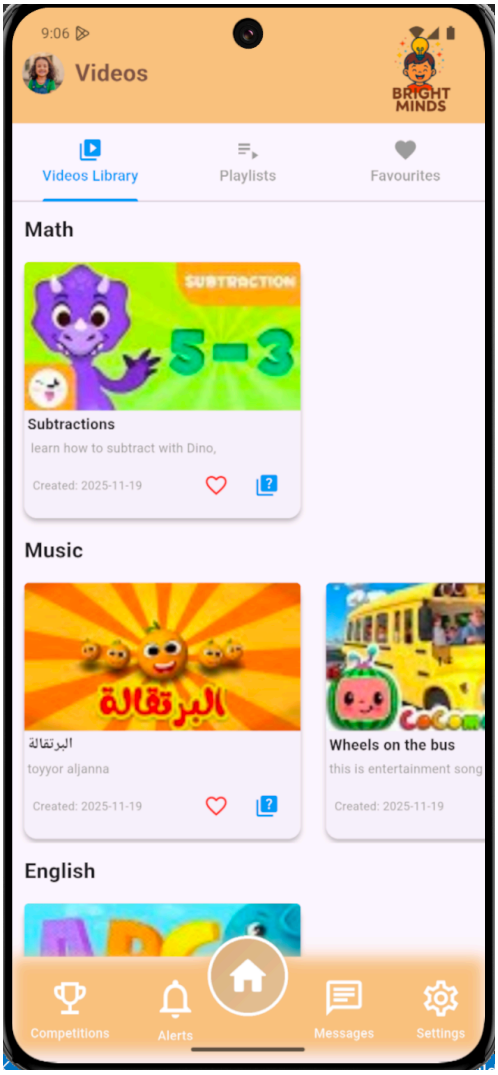


Figure 4.90: Video Library for Age Group 5–8

Each quiz has a specific number of attempts, set when it is created. If the user exceeds this number of attempts, they cannot attempt the quiz anymore.

All questions have an **audio option** to help children who have not yet mastered reading, since this platform is designed for younger age groups.

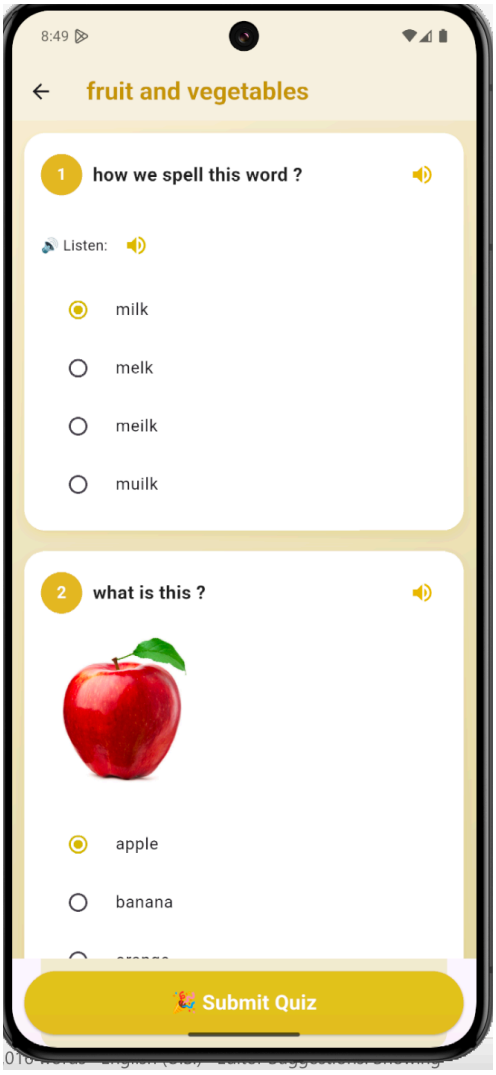


Figure 4.91: Attempting the Quiz for the Fruit and Vegetable Video

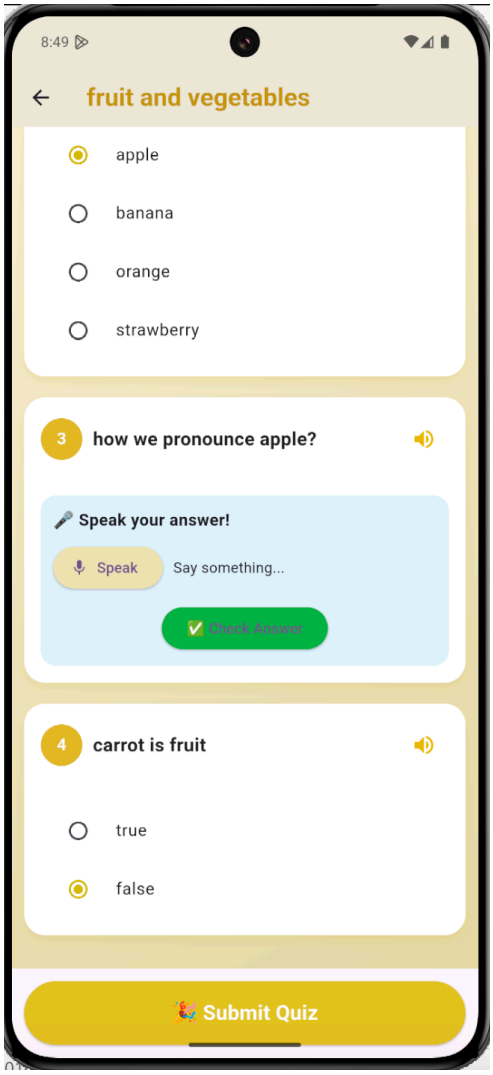


Figure 4.92: Attempting the Quiz for the Fruit and Vegetable Video



Figure 4.93: Quiz Result

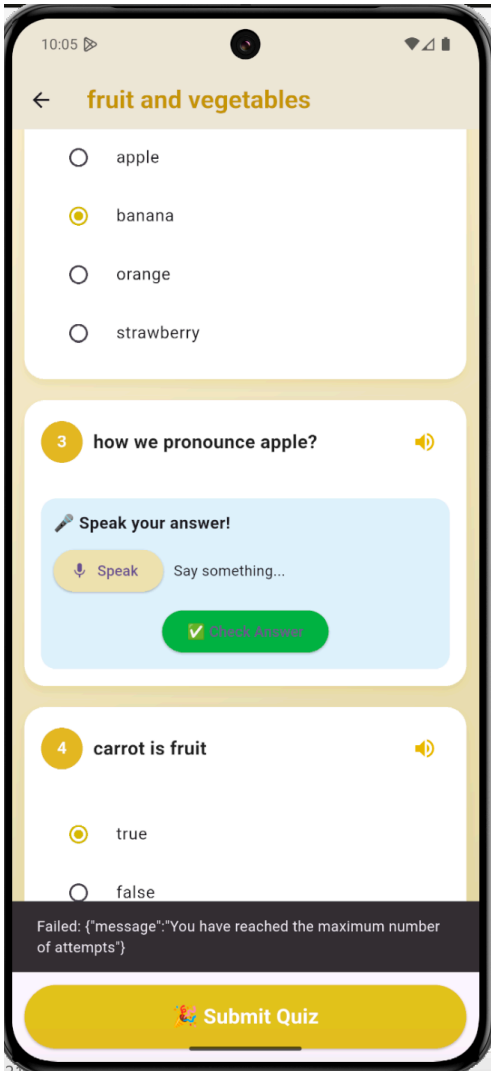


Figure 4.94: Attempting a Quiz After Completing Previous Attempts

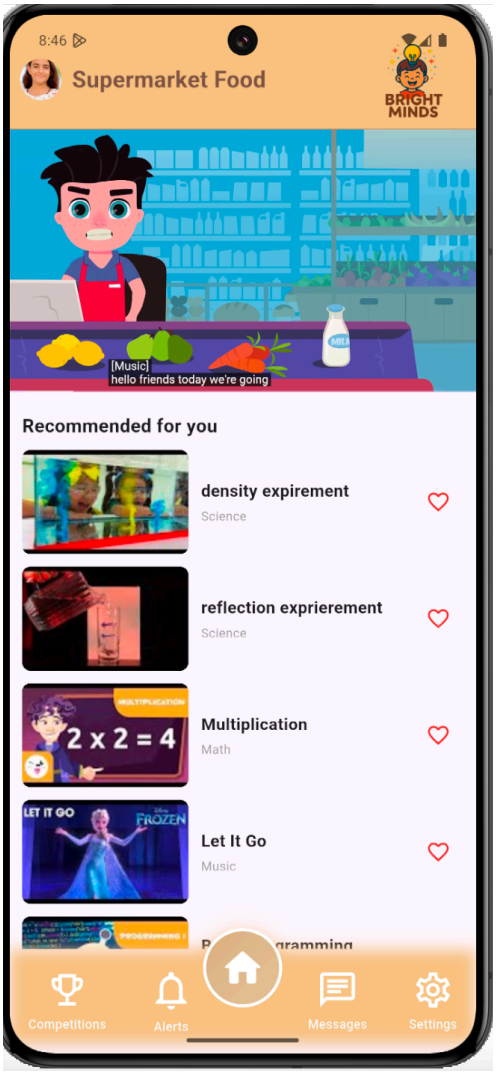


Figure 4.95:Child Watching Video

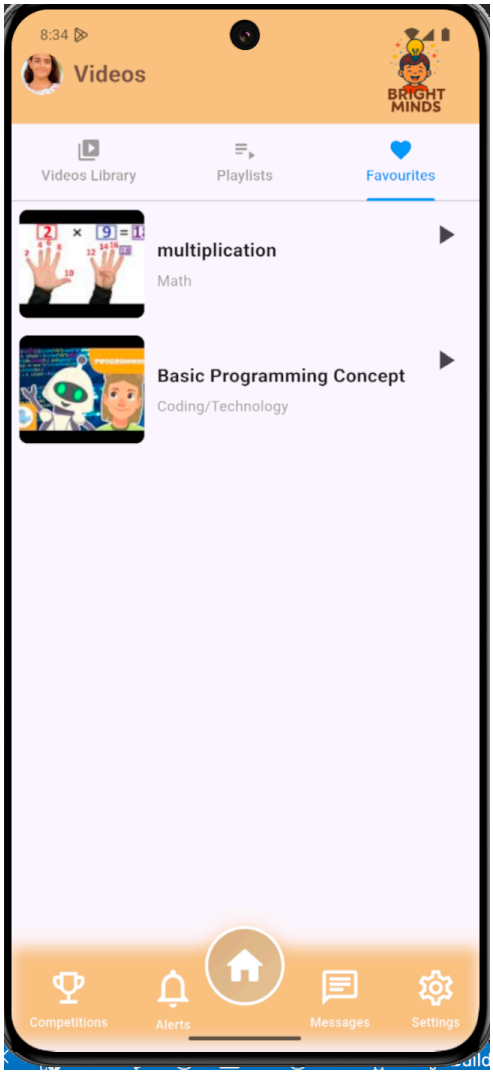


Figure 4.96 : Favorite List Of Child

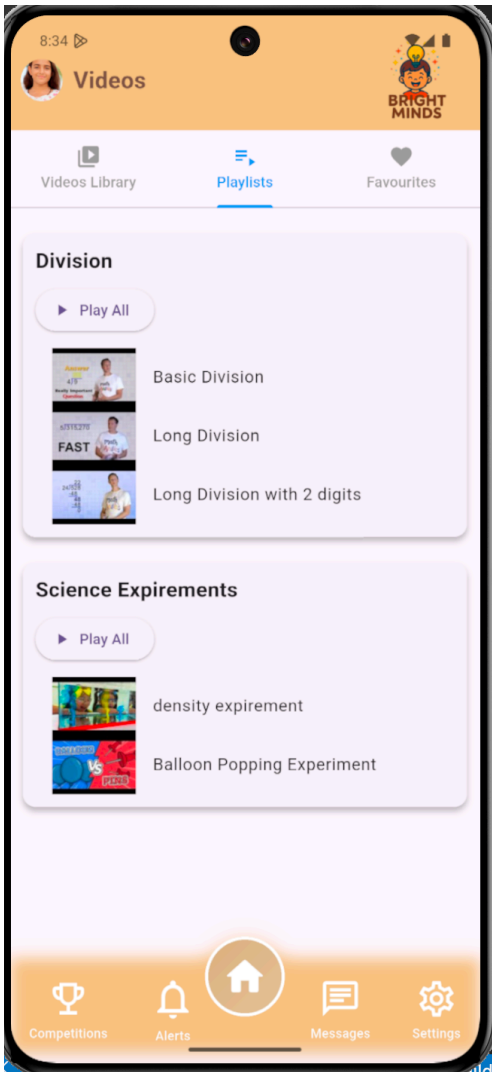


Figure 4.97: Playlists Library

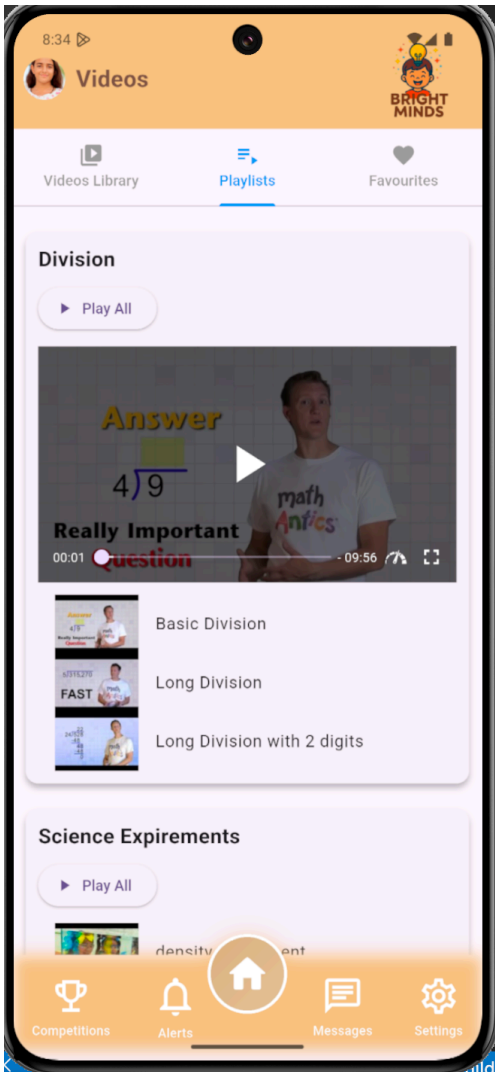


Figure 4.98: Playing a Playlist

Each child’s daily watch time is limited to 30 minutes. After 30 minutes, no more videos can be played until the next day.

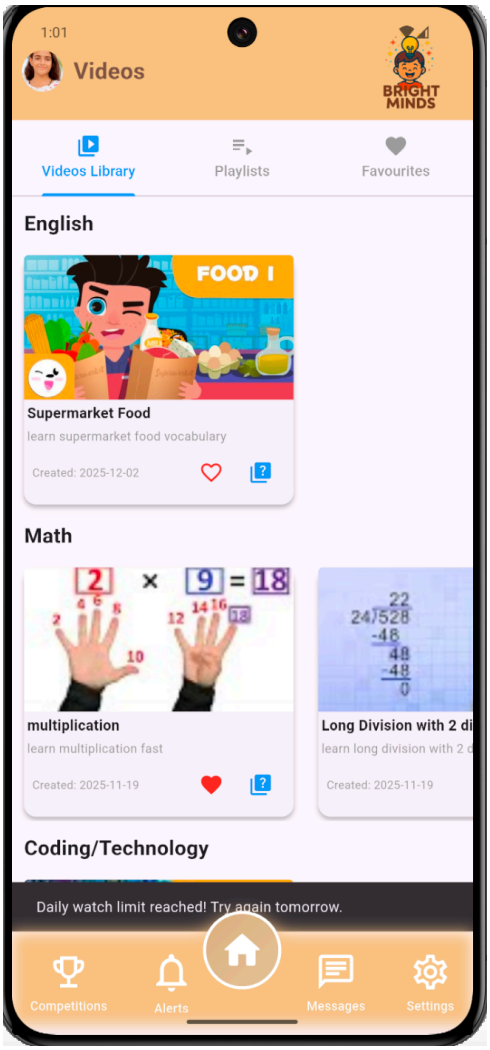


Figure 4.99 : Child Video Watching Daily Limit

Games Section :

Each age group has different games; they share only one common entertainment game, which is the Snake Game.

Each game contains a specific number of trials, set when the game is created. The trials are consumed if the game times out or if the player gives a wrong answer. Once all trials are finished, the game is over, and the child must start again from the beginning.

Games For Age Group 9-12:

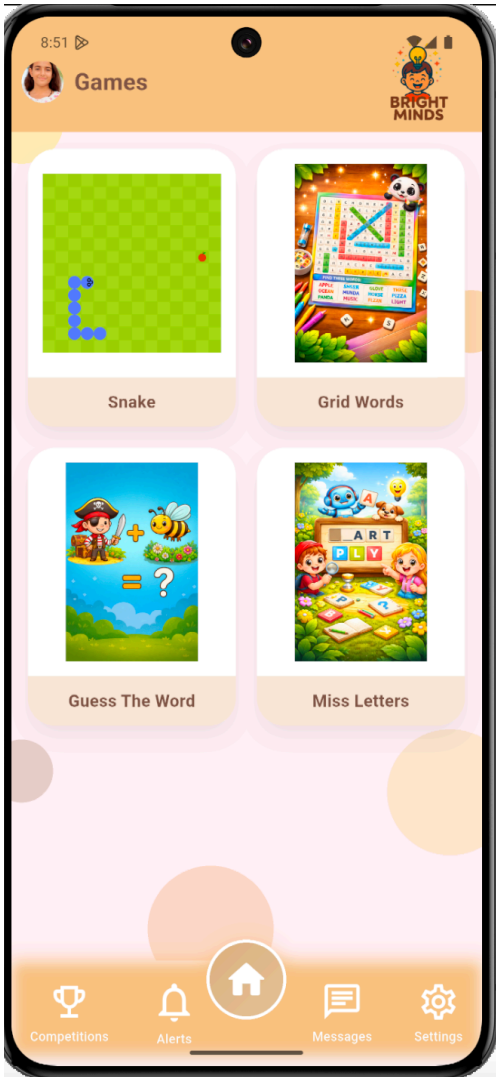


Figure 4.100 :Child Game List Page (Age Group 9-12)

Snake Game:

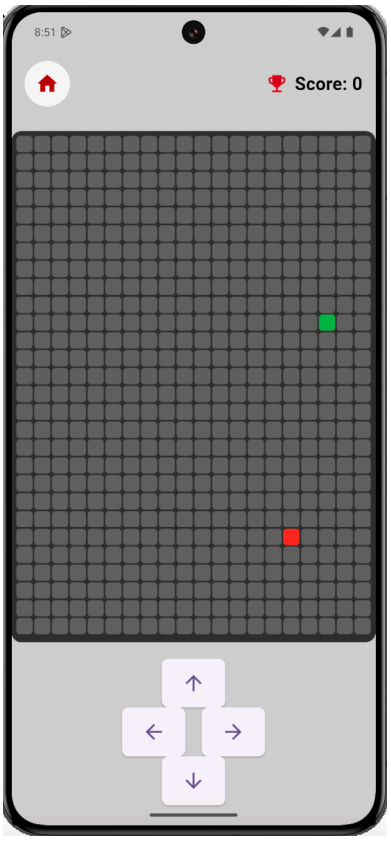


Figure 4.101: Snake Game -View1

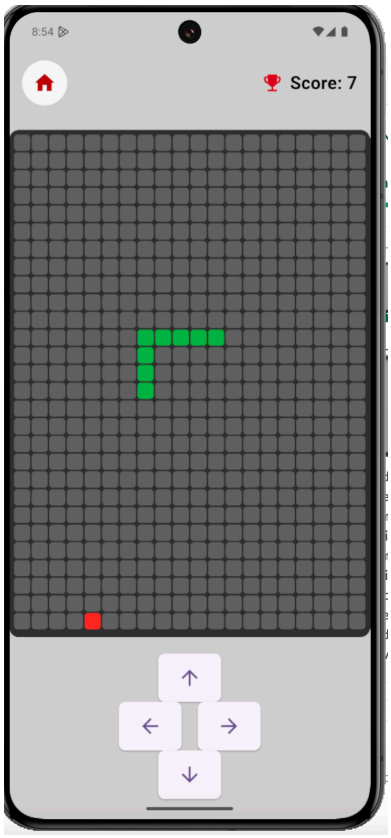


Figure 4.102: Snake Game-View2

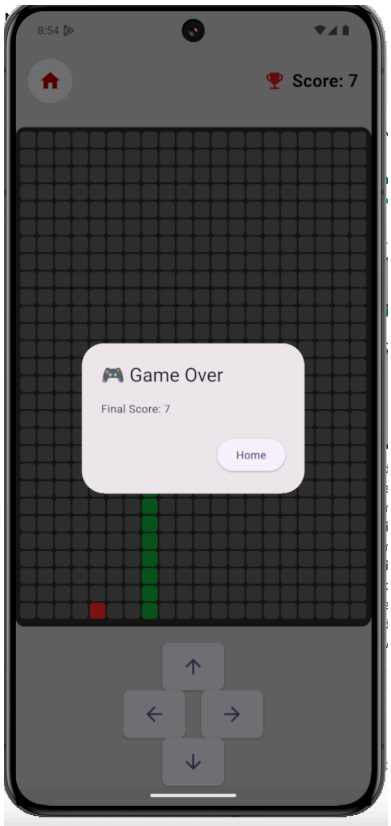


Figure 4.103: Snake Game -View3

Grid Words Game:

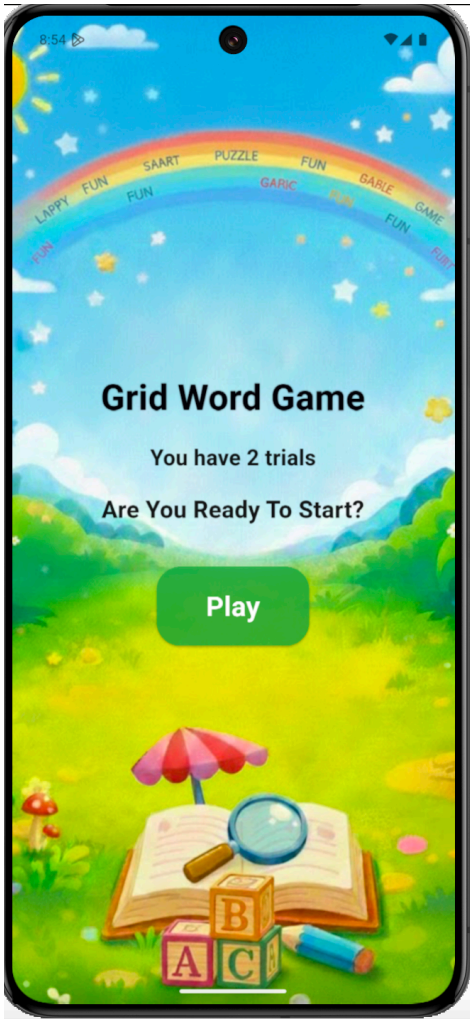


Figure 4.104: Grid Words Game -View1

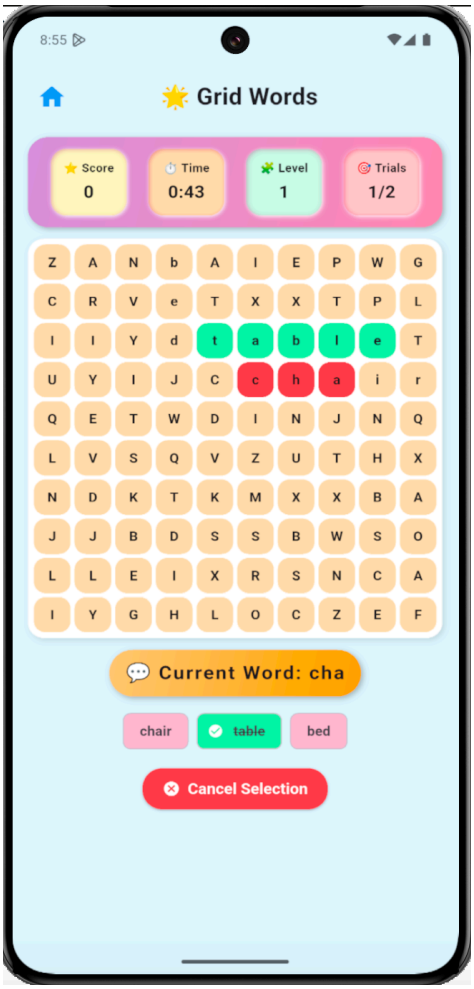


Figure 4.105: Grid Words Game -View2

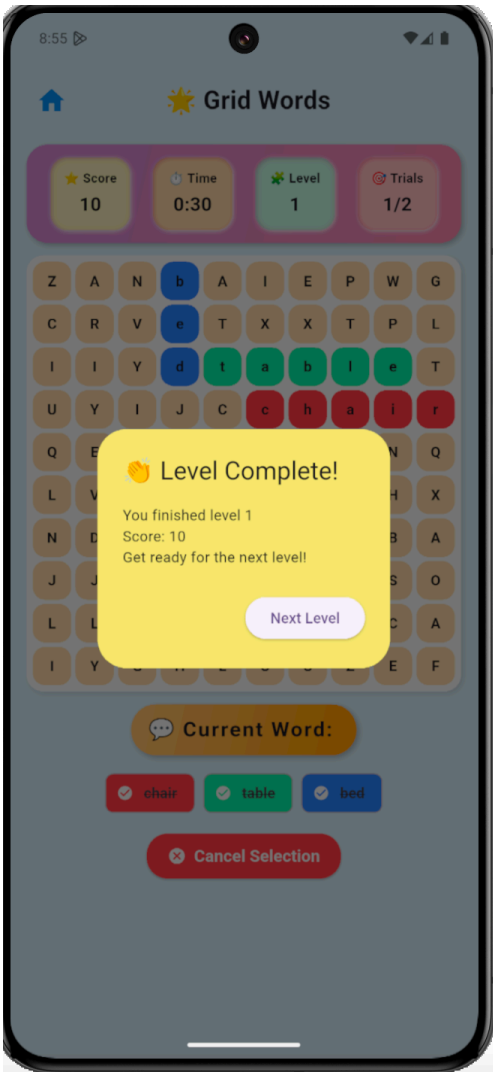


Figure 4.106: Grid Words Game -View3

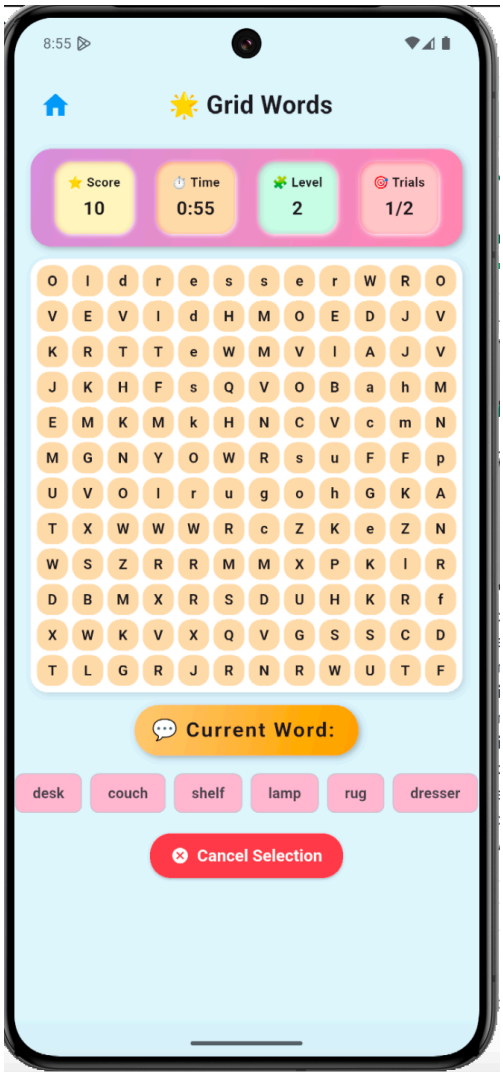


Figure 4.107: Grid Words Game -View4

Guess Word Game:

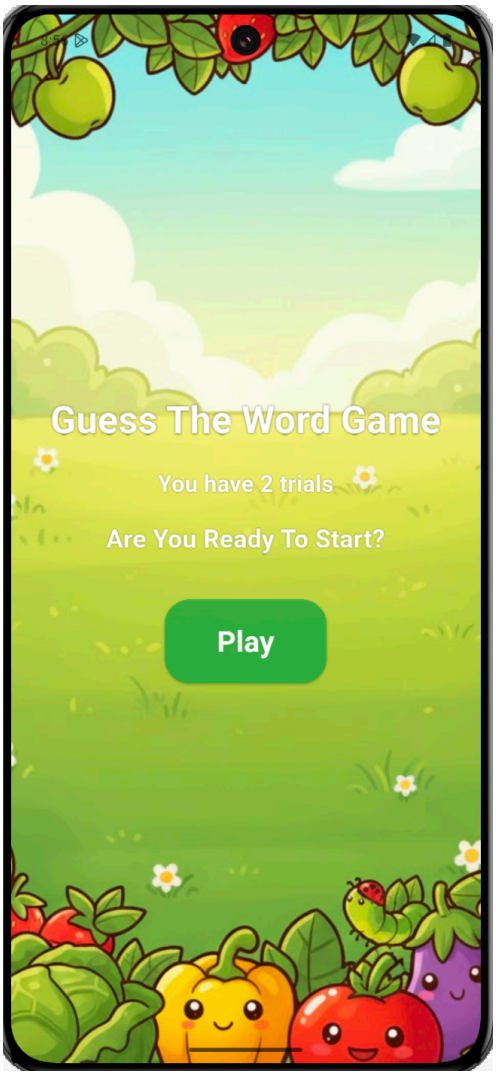


Figure 4.108 : Guess Word Game -View1

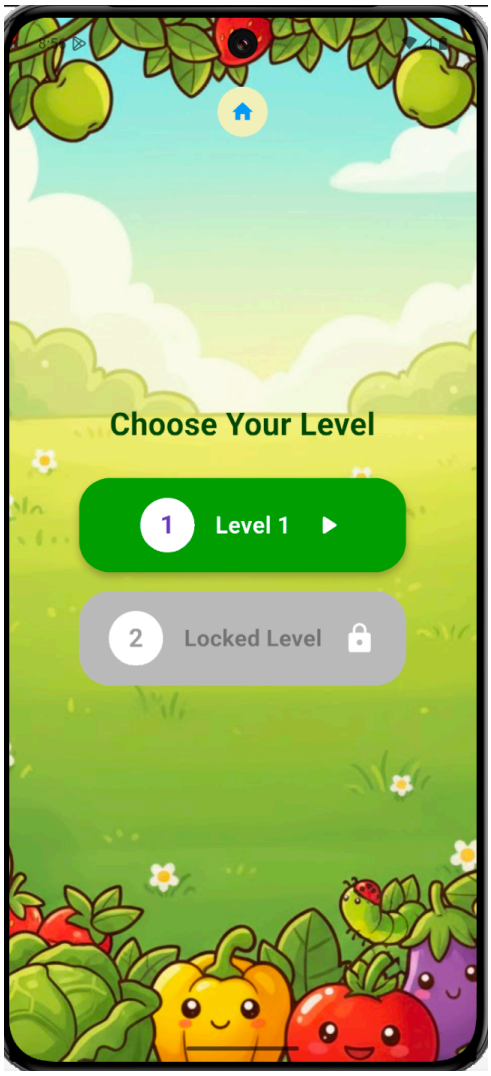


Figure 4.109 : Guess Word Game -View2

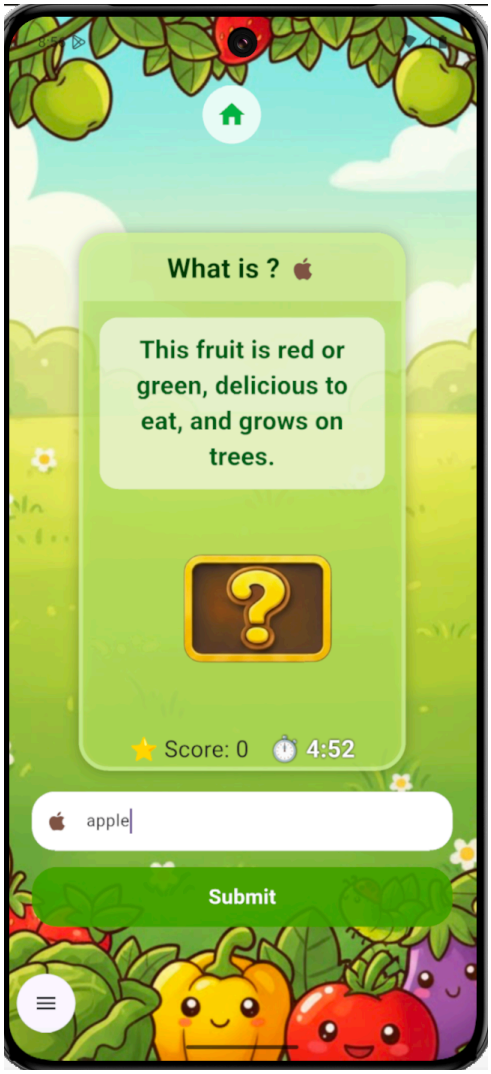


Figure 4.110 : Guess Word Game -View3

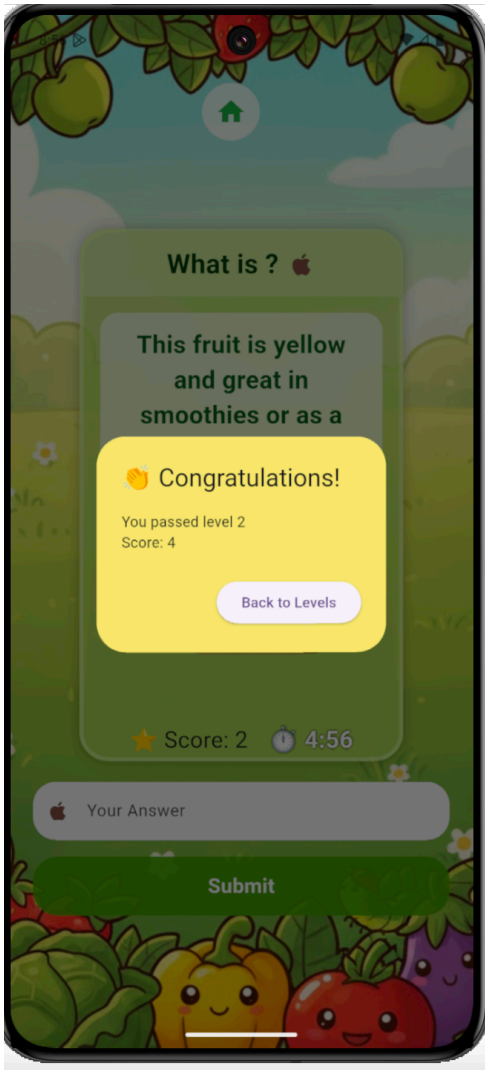


Figure 4.111 : Guess Word Game -View4

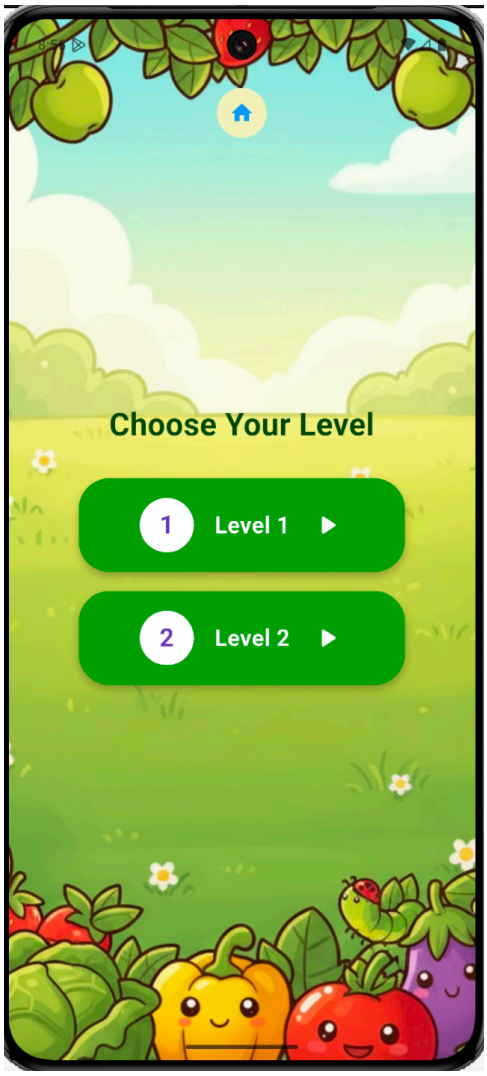


Figure 4.112 : Guess Word Game -View5

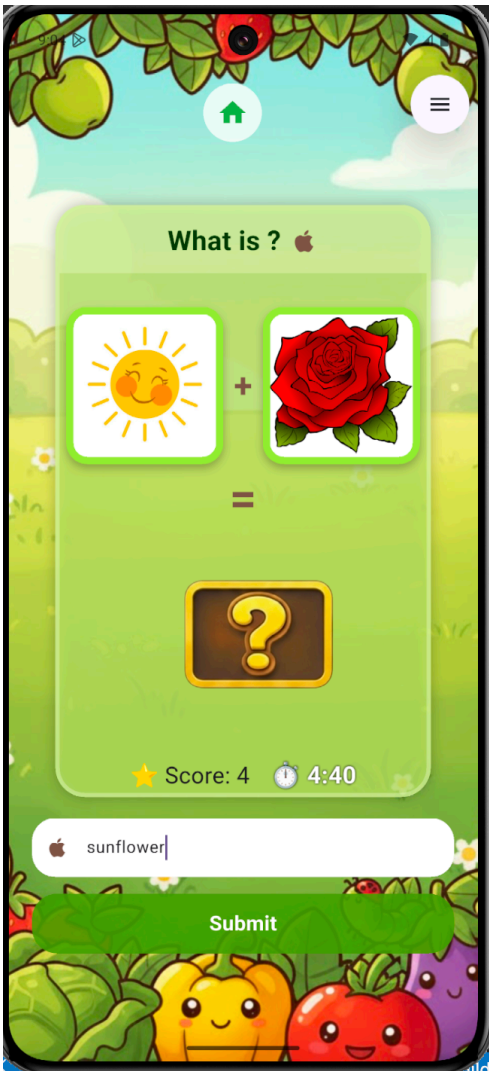


Figure 4.113 : Guess Word Game -View6

This game has different designs depending on the theme selected during creation. In the images above, the theme is **Fruits and Vegetables**, while the image below shows a game with an **Animal** theme.

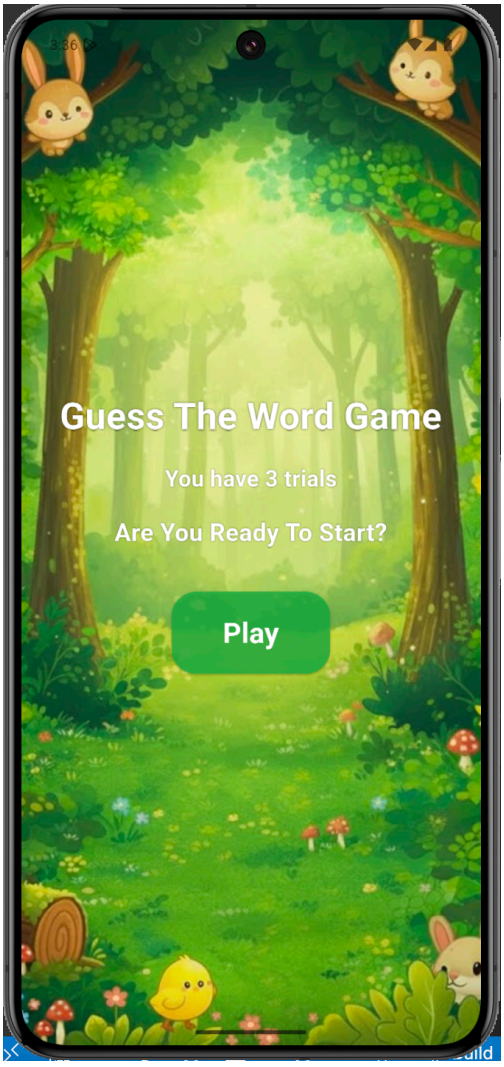


Figure 4.114 : Guess Word Game -View7

Miss Letters Game:

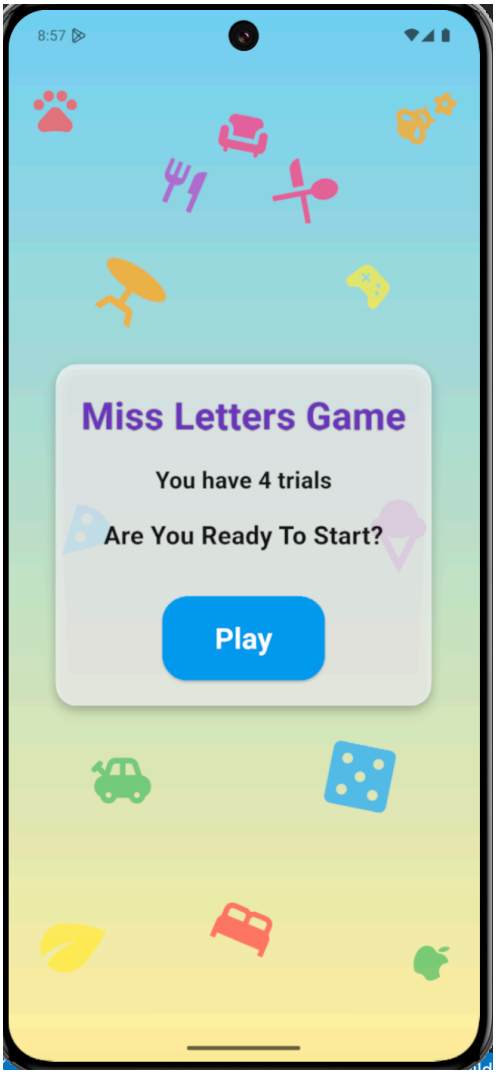


Figure 4.115 : Miss Letters Game -View1

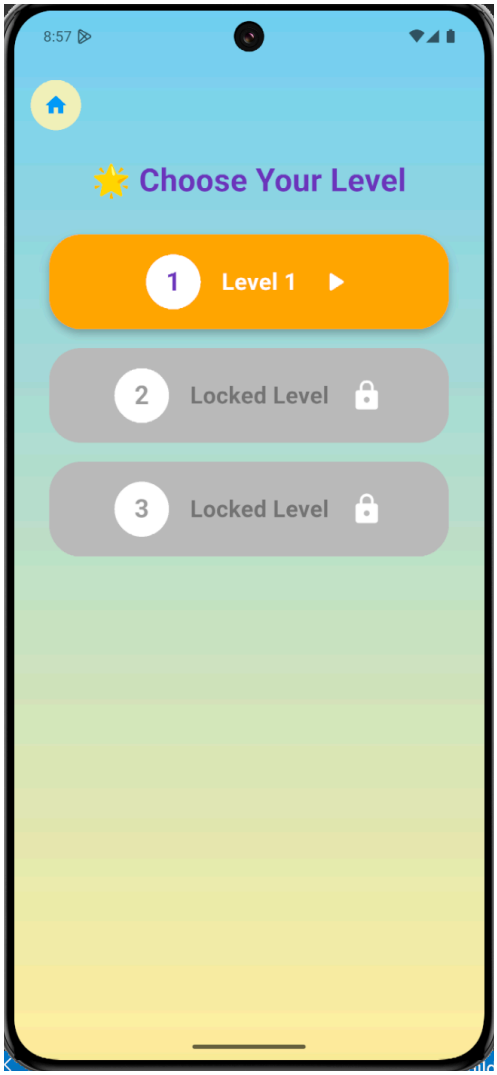


Figure 4.116 : Miss Letters Game -View2



Figure 4.117 : Miss Letters Game -View3

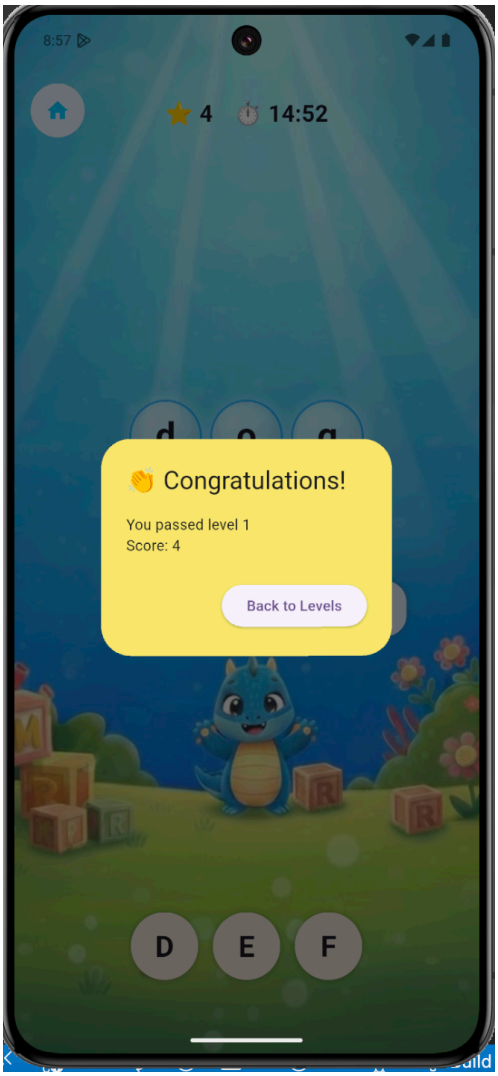


Figure 4.118 : Miss Letters Game -View4

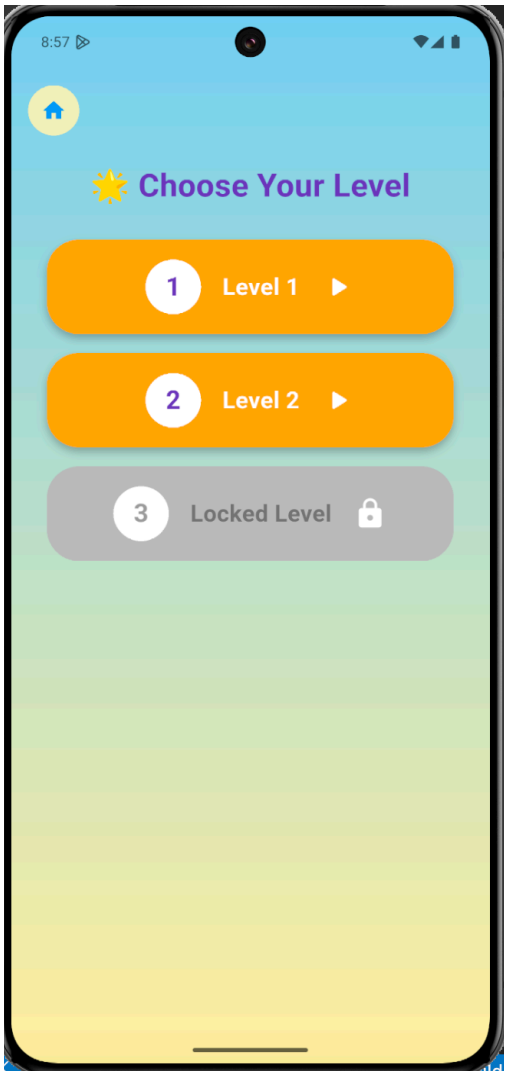


Figure 4.119 : Miss Letters Game -View5



Figure 4.120: Miss Letters Game -View6

Games For Age Group 5-8 :

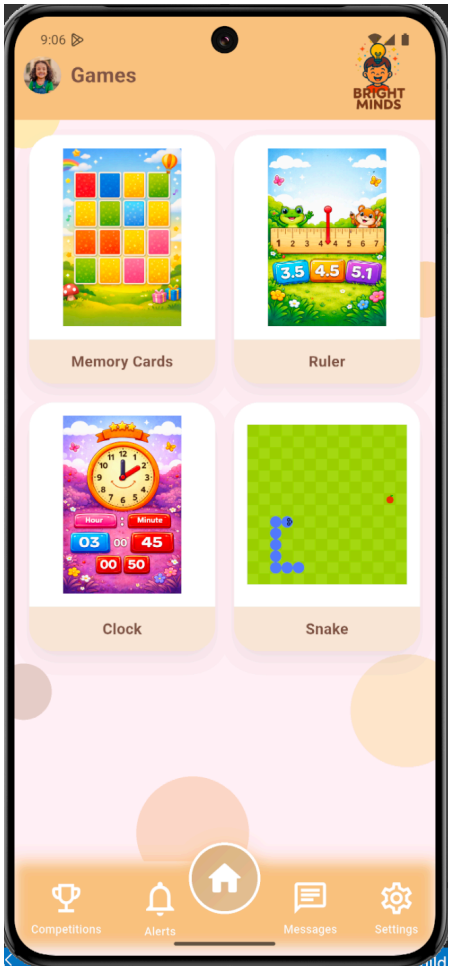


Figure 4.121 :Child Game List Page (Age Group 5-8)

The **Ruler** and **Clock** games have **three static levels**, while the game content remains **dynamic through randomization**.

Ruler Game:

It has three levels : one find integers . Find factor only 0.5 or zero , factor value maybe any number between 0 and 9.

The **Ruler Game** includes three levels:

- **Level 1:** Find integer values.
- **Level 2:** Find decimal values with a factor of **0.5 or 0**.
- **Level 3:** The factor value can be any number between **0 and 9**.

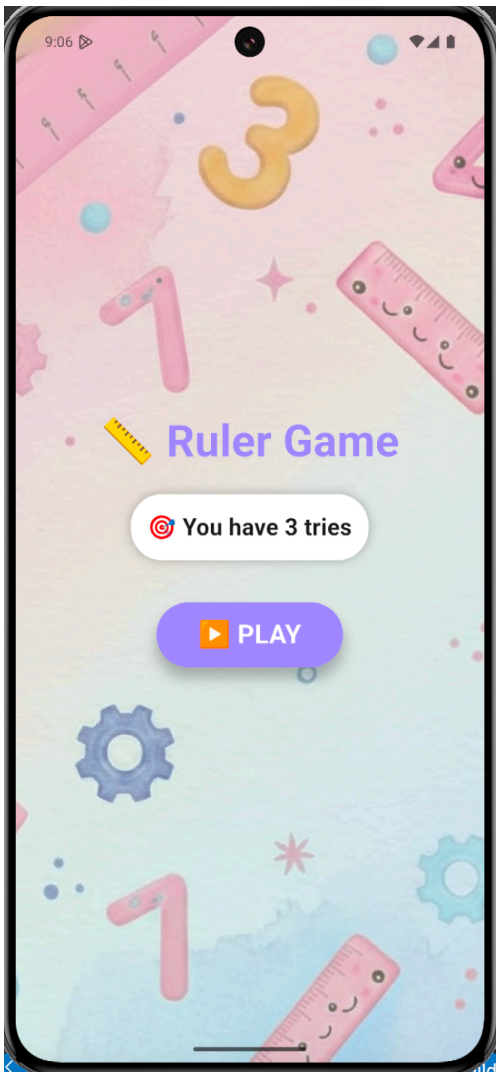


Figure 4.122.:Ruler Game -View 1

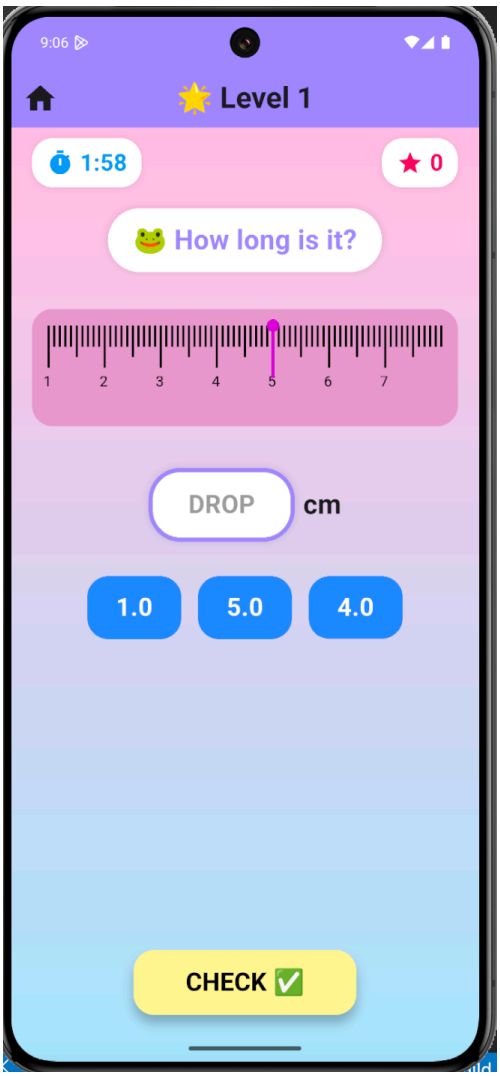


Figure 4.123.:Ruler Game -View2

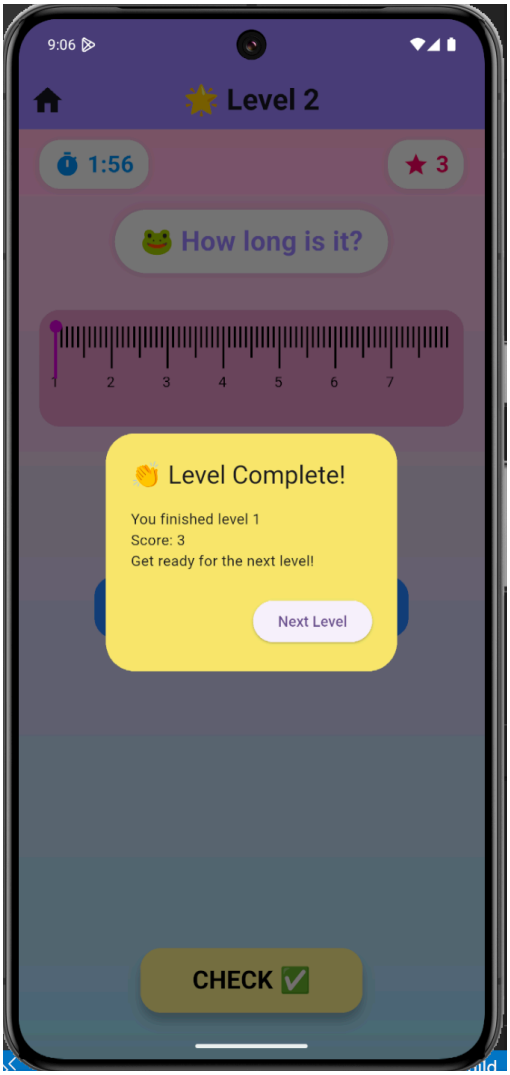


Figure 4.124.:Ruler Game -View3

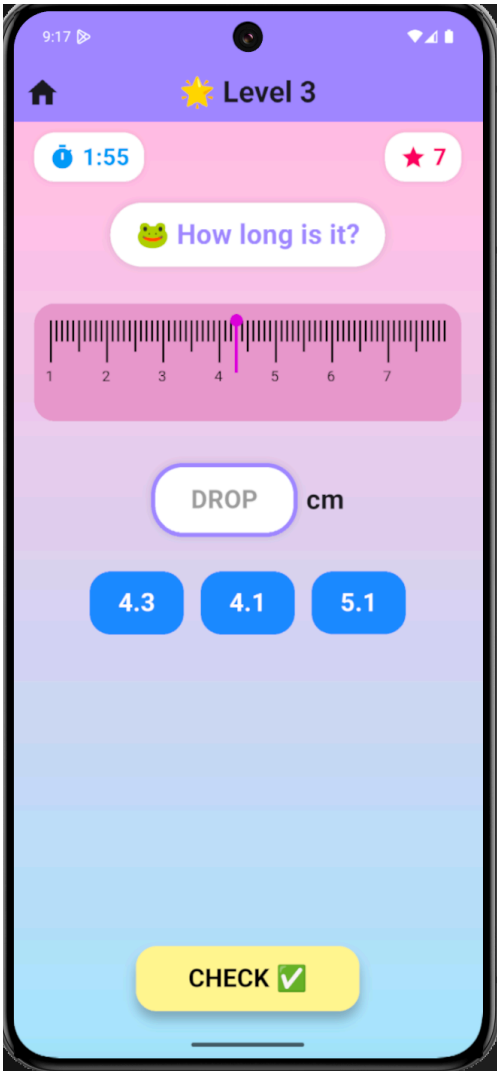


Figure 4.125.:Ruler Game -View4

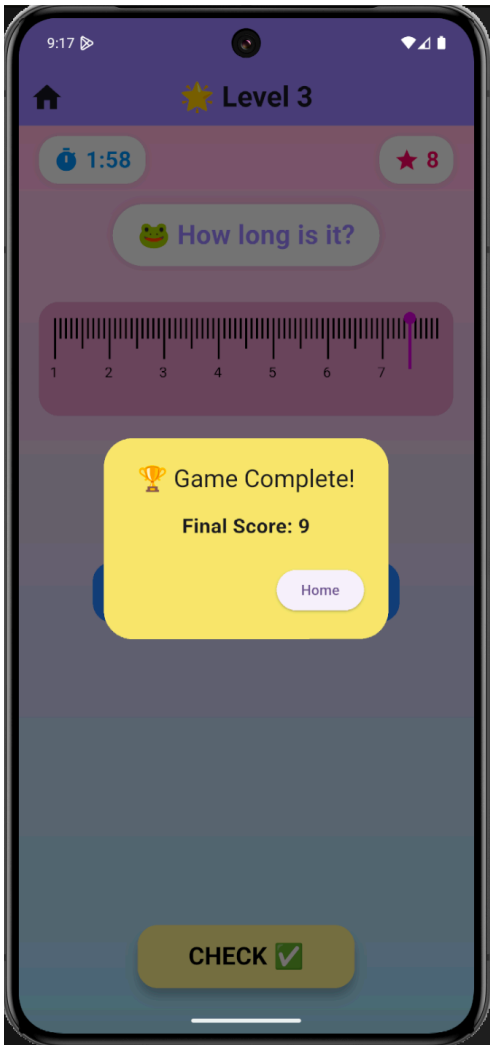


Figure 4.126.:Ruler Game -View 5

Clock Game:

The **Clock Game** includes **three levels**:

- **Level 1:** Find hour values.
- **Level 2:** Find minute values with **0 or 30** as choices.
- **Level 3:** The minute value can be **any multiple of 5**.

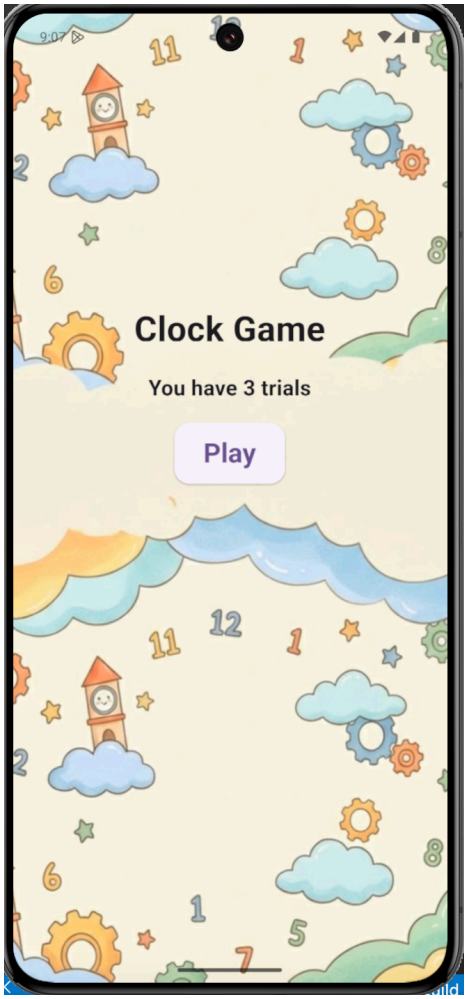


Figure 4.127: Clock Game -View1

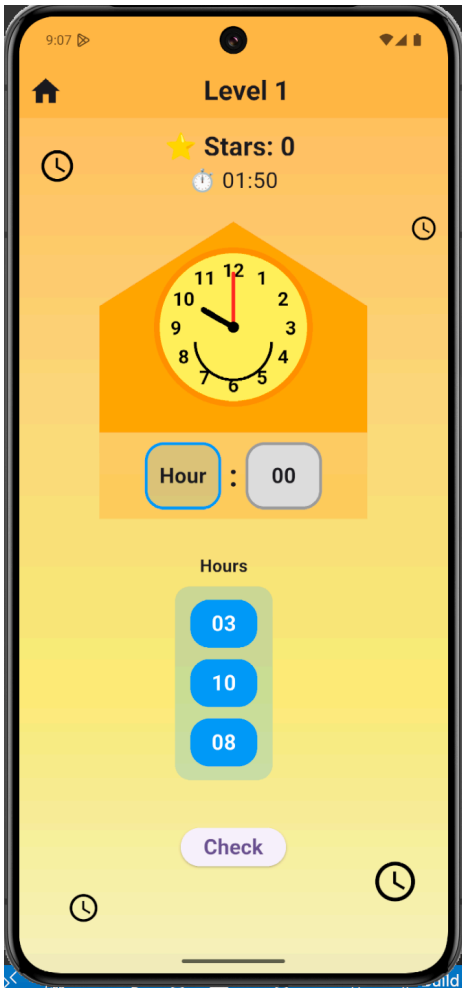


Figure 4.128: Clock Game -View2

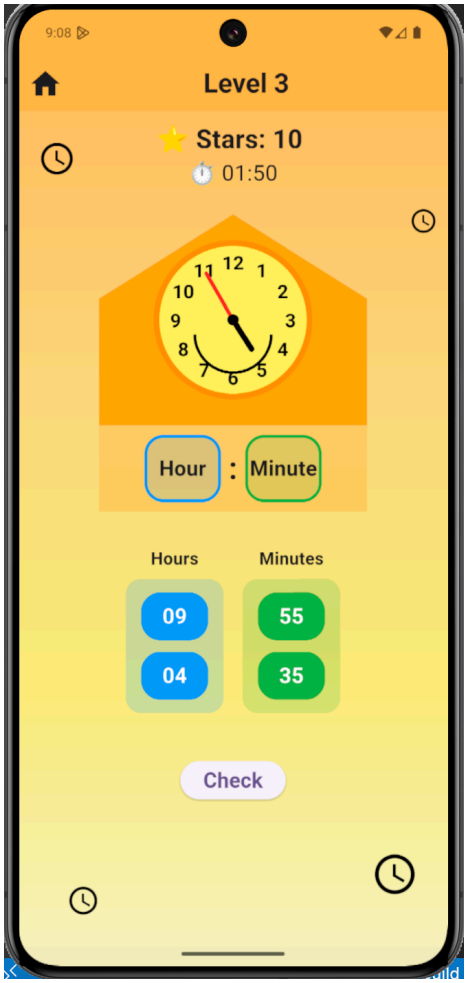


Figure 4.129:Clock Game -View3

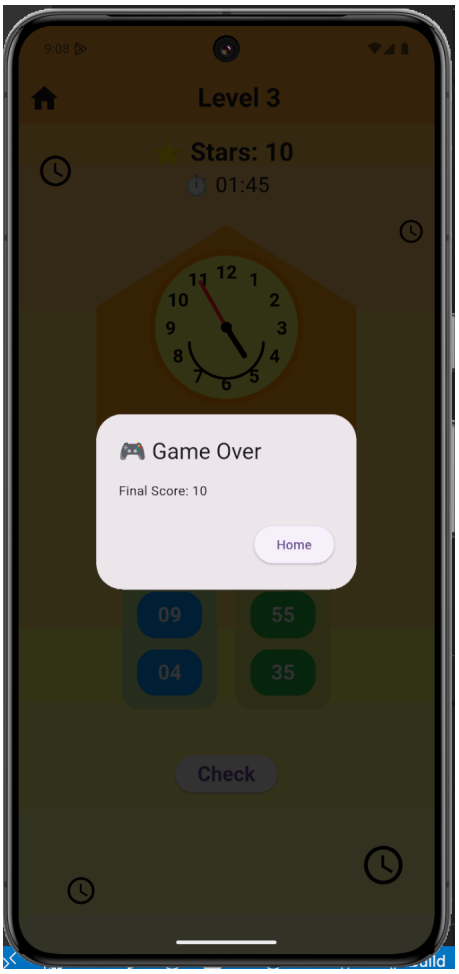


Figure 4.130:Clock Game -View4

Memory Cards Game:

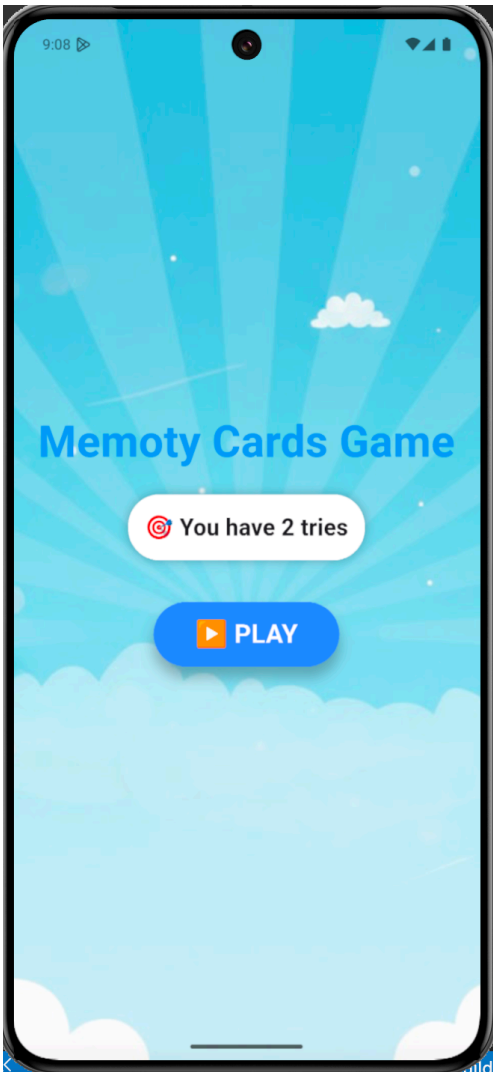


Figure 4.131:Memory Cards Game -View1

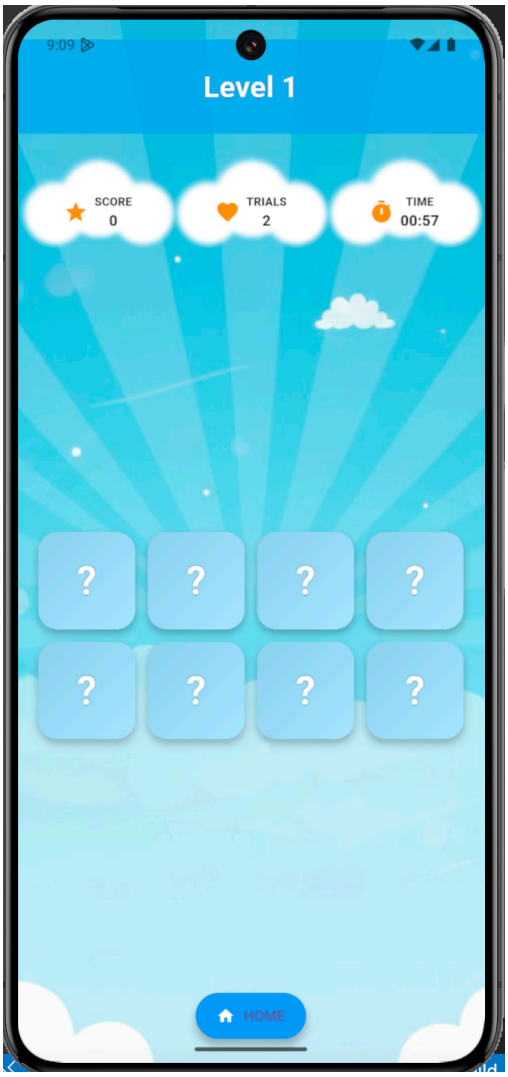


Figure 4.132: Memory Cards Game -View2

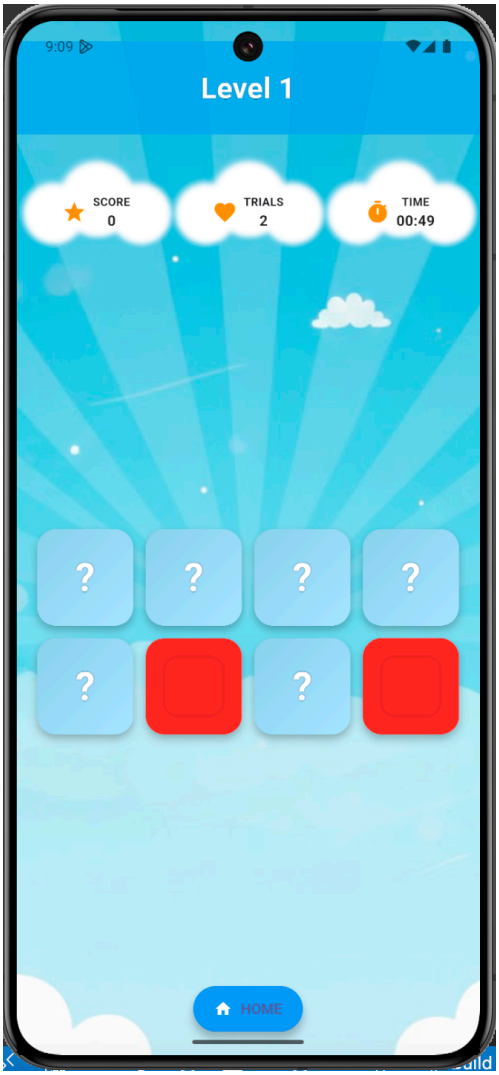


Figure 4.133: Memory Cards Game -View3

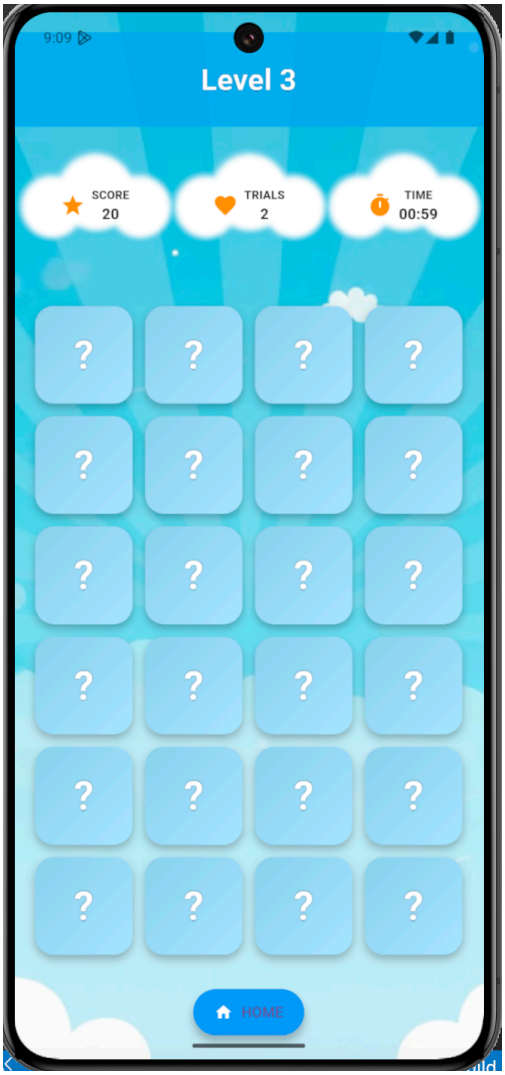


Figure 4.134: Memory Cards Game -View4

Each child’s daily game time is limited to 45 minutes. After 45 minutes, no more games can be played until the next day.

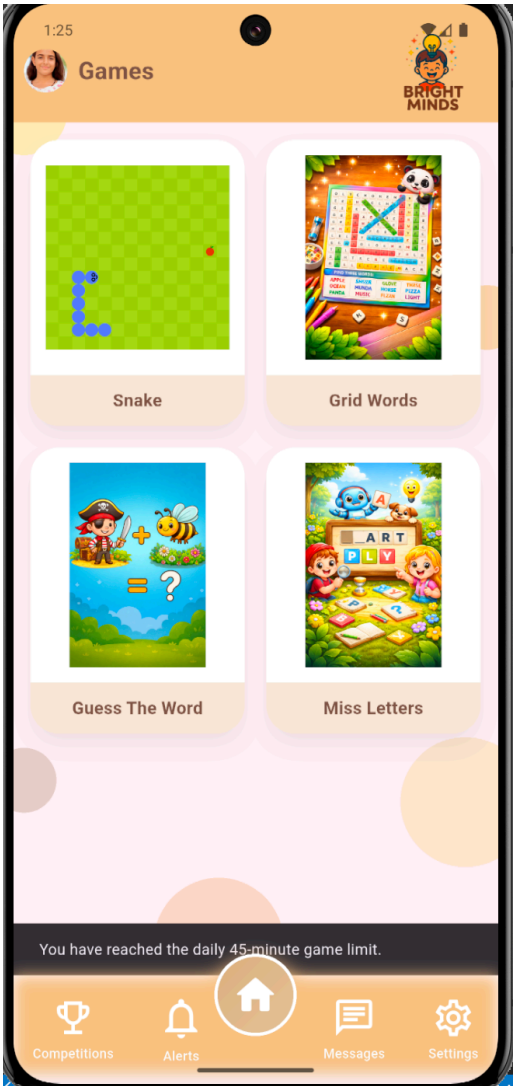


Figure 4.135.:Child Game Playing Daily Limit

Stories Section :



Figure 4.136: Child Stories List

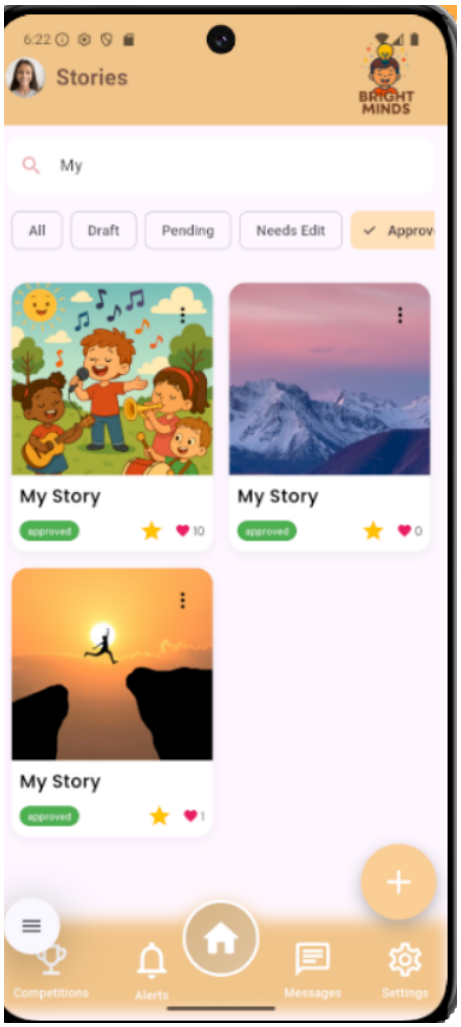


Figure 4.137: Filter Stories List

This is the child's Stories page, where the child can view all stories they have written. Each story shows its status displayed under the cover. If the story has been reviewed, a yellow star appears under the cover to indicate its rating. The number of likes is also shown under the cover (if the story received likes). The page includes a "+" button to create a new story. In addition, the child can filter stories by their status and search by the story title.

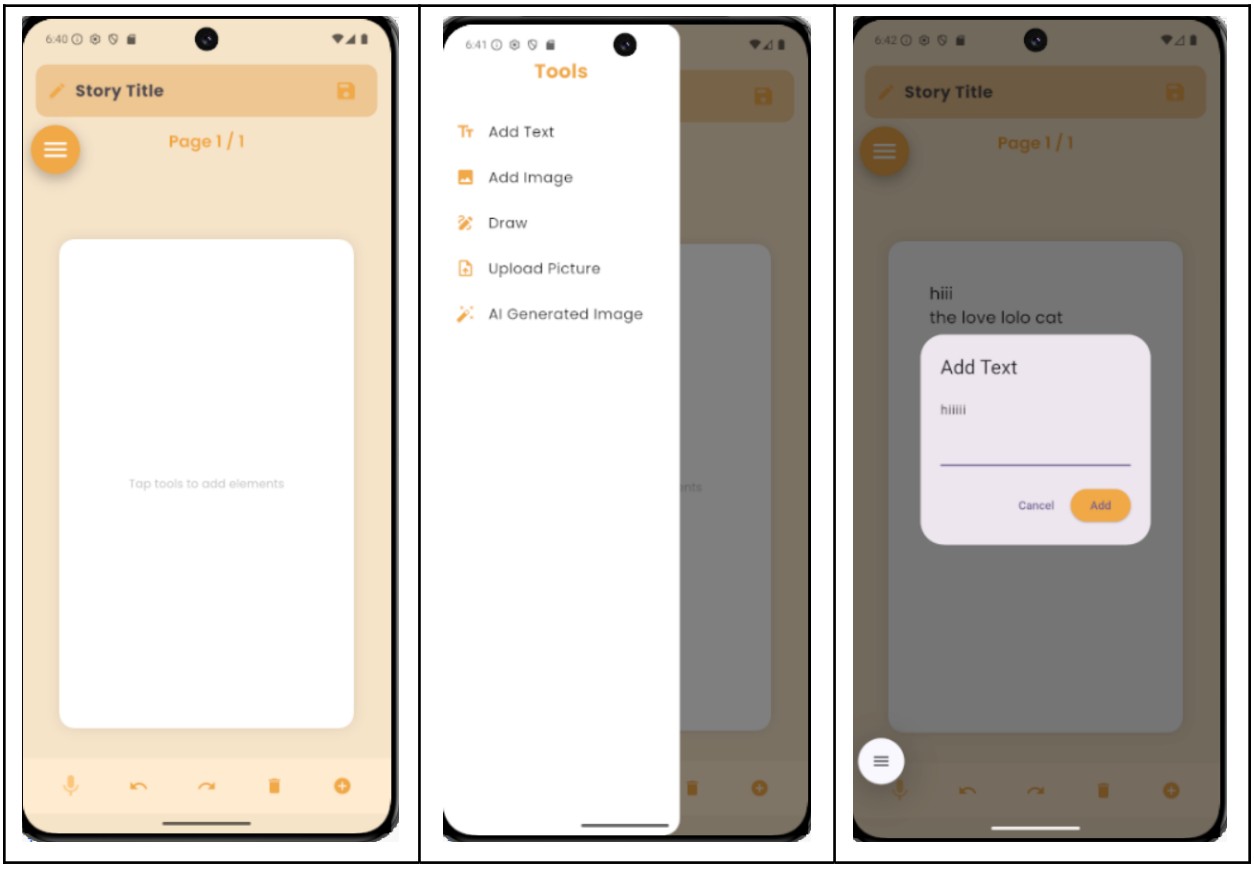


Figure 4.138: Creating New Story -View 1

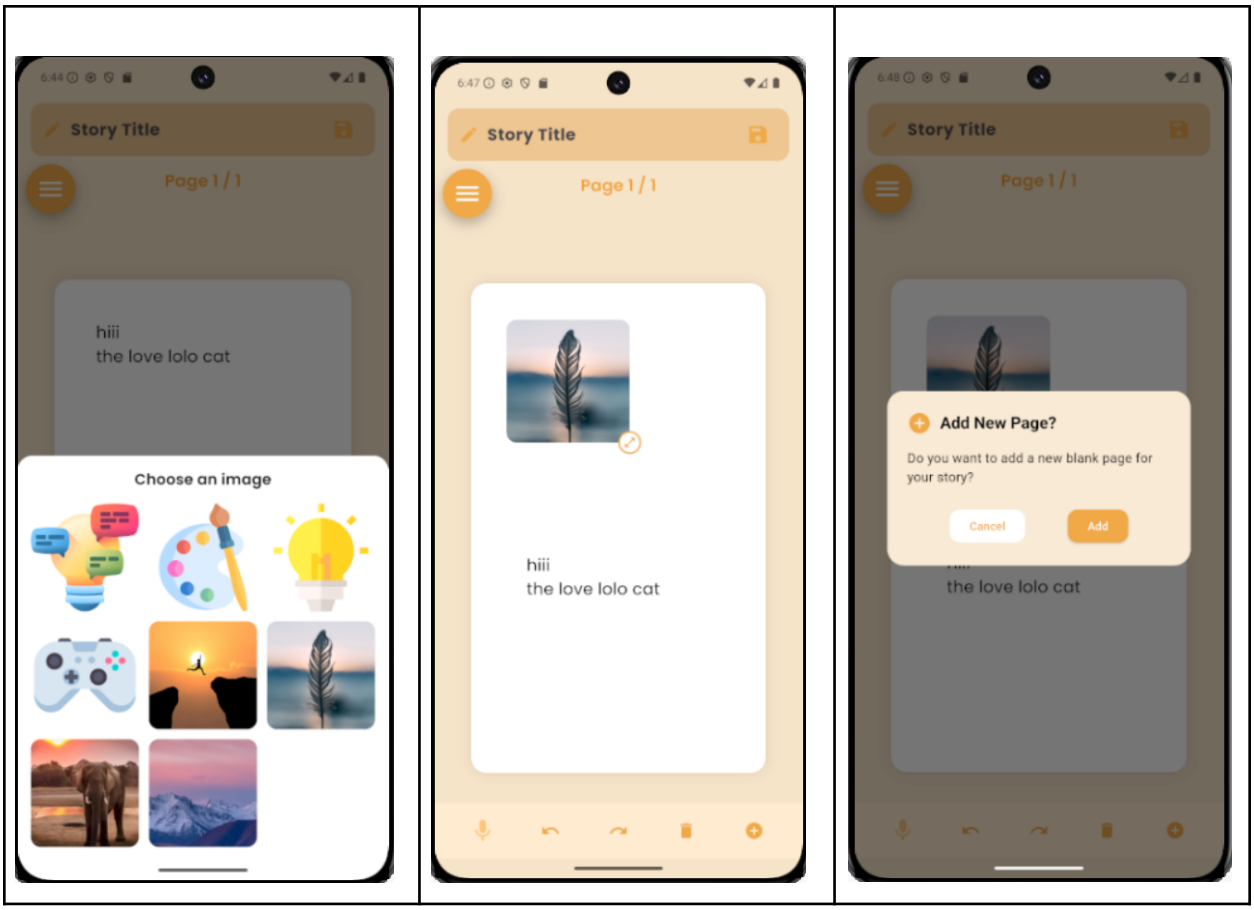


Figure4.139: Creating New Story -View 2

From this screen, the child can create their own story by first writing the **story title**, then adding different elements to the pages. The child can add **text** and customize its properties such as **size, color, bold/italic styling**, and alignment. The child can also add **images** in multiple ways, either by uploading from the device or generating images using **AI**. In addition, the child can draw their own artwork and insert it into the story. All added elements can be resized and moved freely to fit the page layout. The child can create as many pages as needed, navigate between pages, and delete any page. They can also remove any element by selecting it and confirming the deletion. Moreover, the child can record their voice and attach the audio to a story page, or use **text-to-speech** so the story can be narrated automatically.

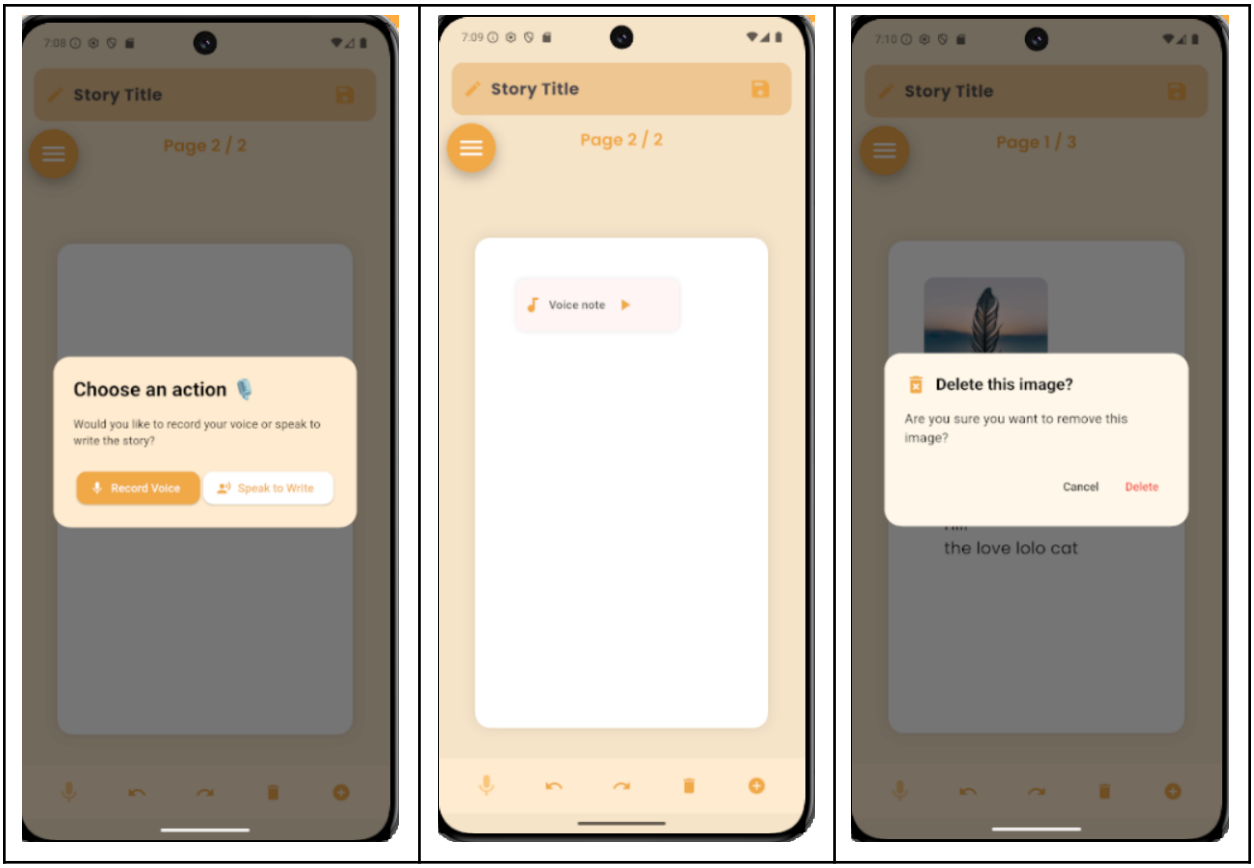


Figure 4.140: Creating New Story -View 3

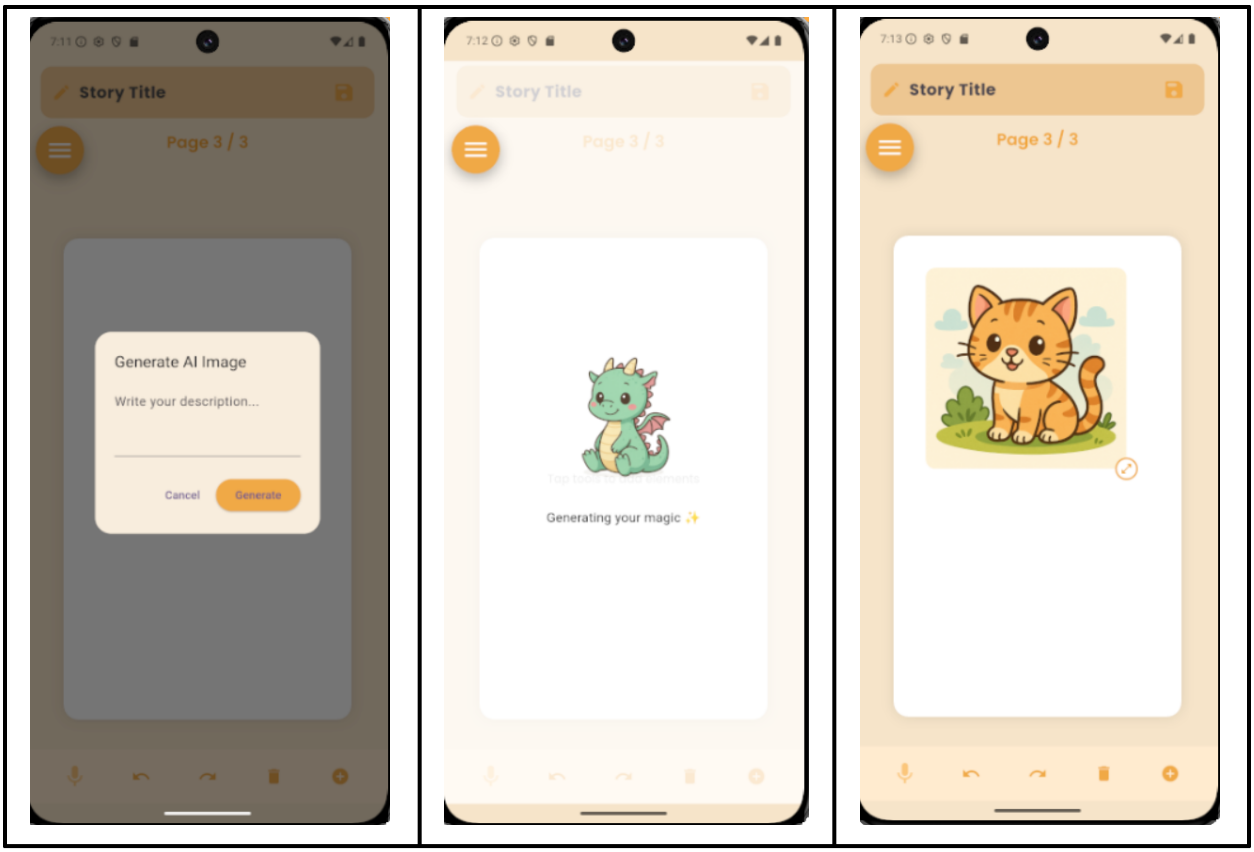


Figure 4.141: Creating New Story -View 4

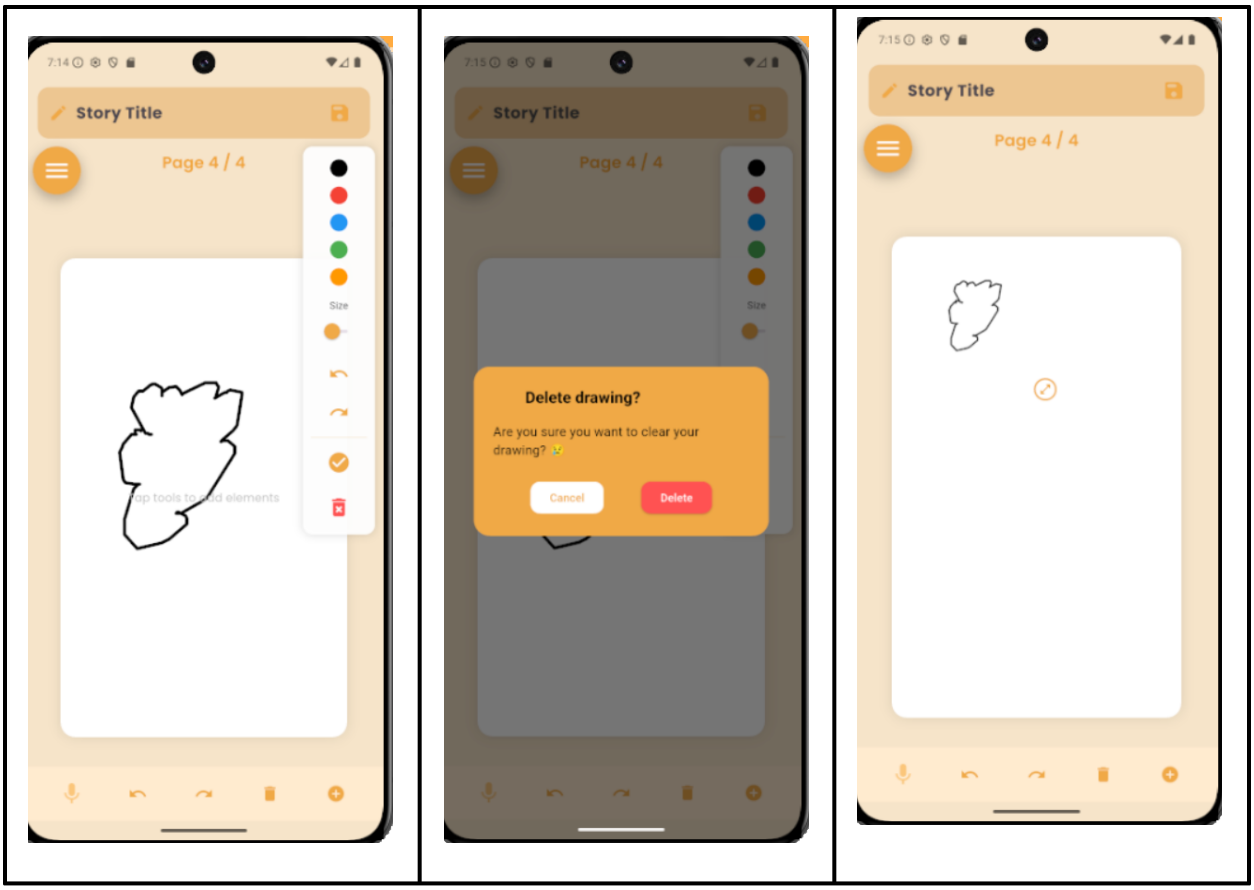


Figure 4.142: Creating New Story -View 5

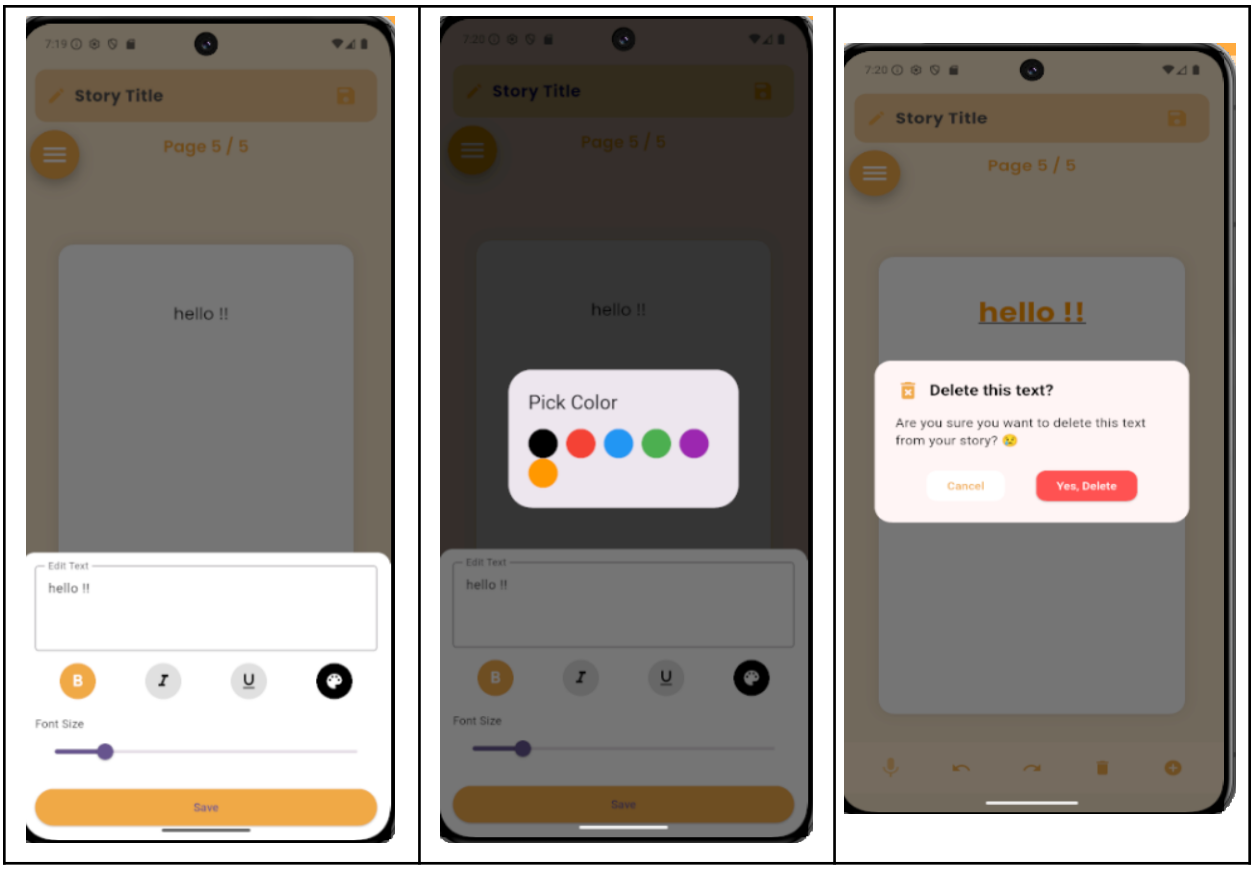


Figure 4.143: Creating New Story -View 6

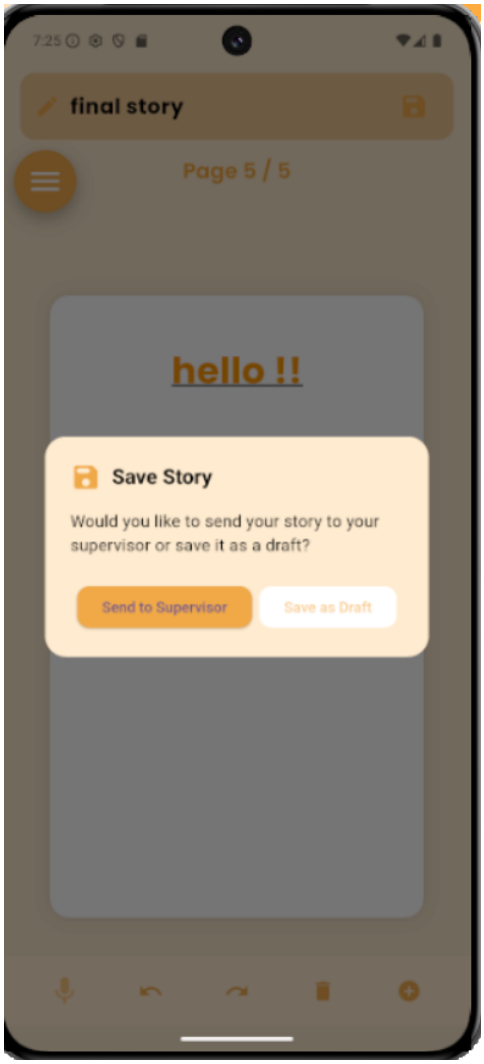


Figure 4.144: Save Story

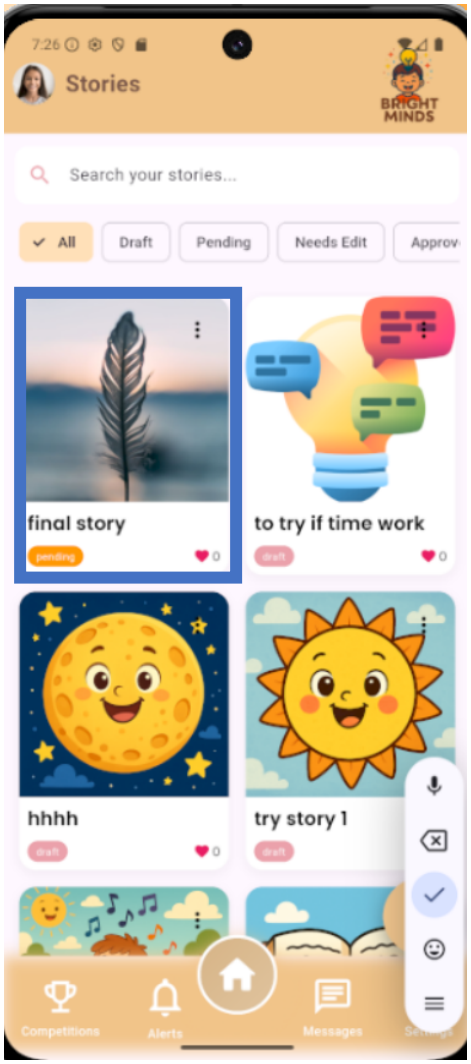


Figure 4.145: Story Sent To Supervisor

On this screen, the child can **save the story as a draft** or **submit it to the supervisor** for review. If the child saves it without submitting, the story remains in **Draft** status and can be edited later. Once the child submits the story, its status becomes **Pending**, and the child cannot edit it until the supervisor completes the review.

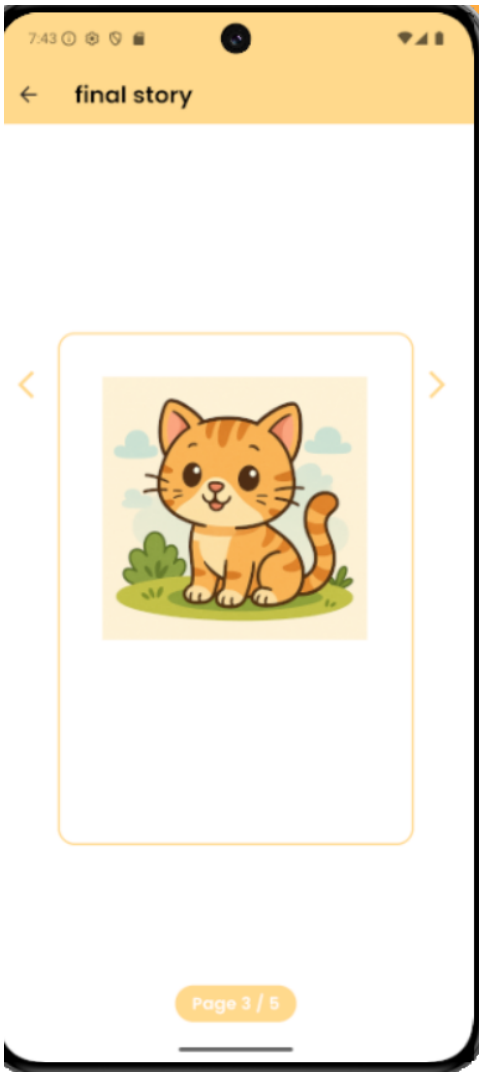


Figure 4.146: Read Story That Sent to Supervisor -View 1

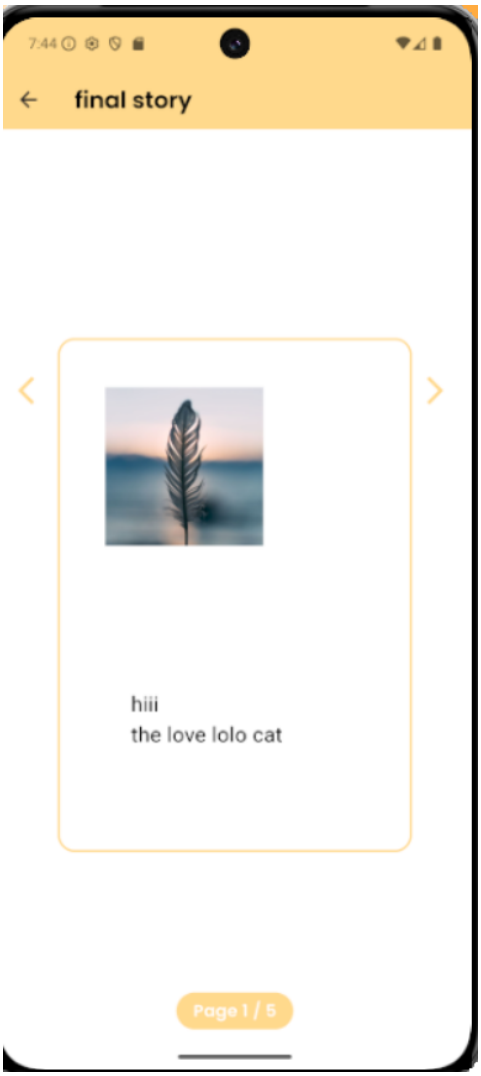


Figure 4.147: Read Story That Sent to Supervisor -View 2

Once the story is submitted, the child can read it in **reading mode** and navigate between pages, but cannot edit it. Editing becomes available again only if the supervisor returns the story with the status **Needs Edit**.

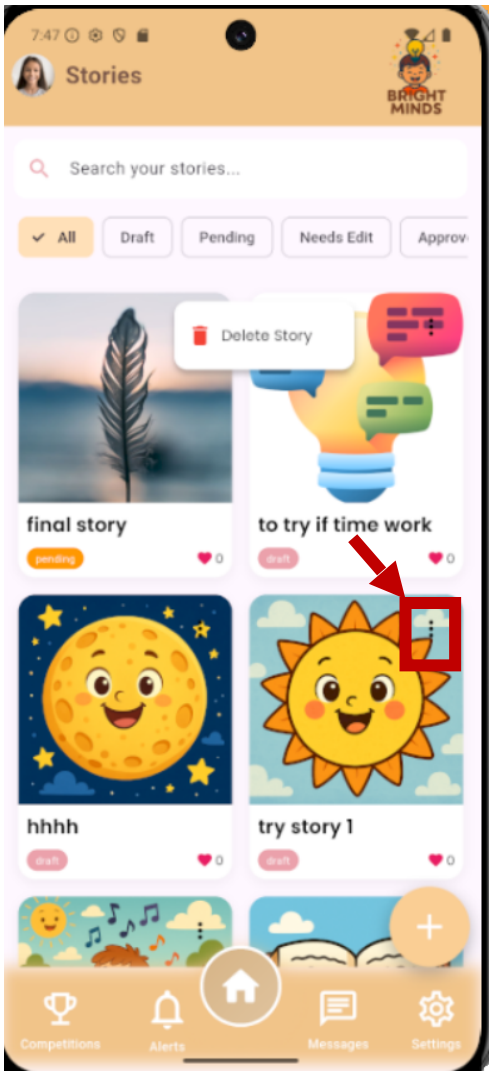


Figure 4.148: Child Delete Story -View 1

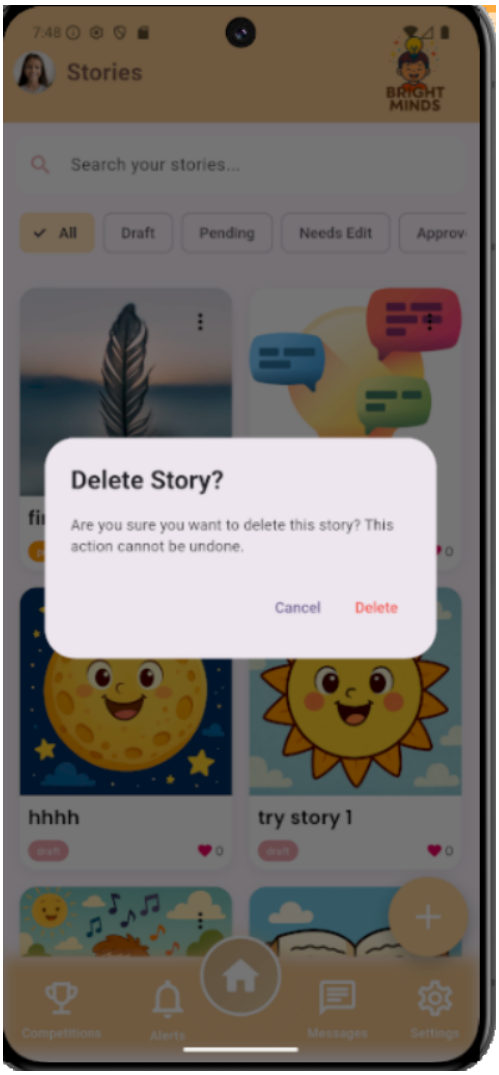


Figure 4.149: Child Delete Story -View 2

From the **three-dot menu** above the story cover, the child can choose to **delete the story**.

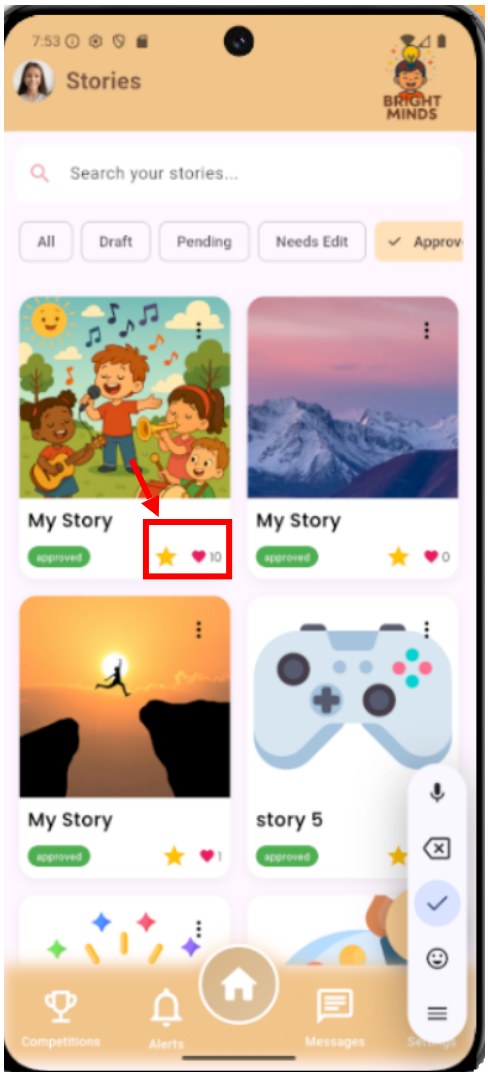


Figure 4.150: Approved & Published Story

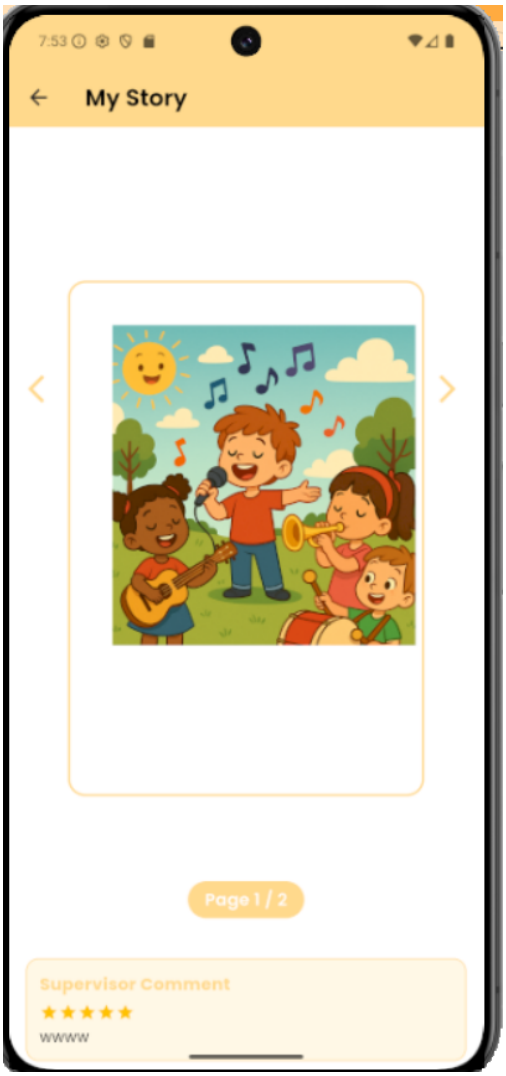


Figure 4.151: Approved Story and Supervisor Comment

This screen indicates that the story has been **reviewed and published**, and it has received **likes** from other children. When the child opens the story, it is displayed in **reading mode**, along with the **supervisor's comment**.



Figure 4.152: Story Needs Edit

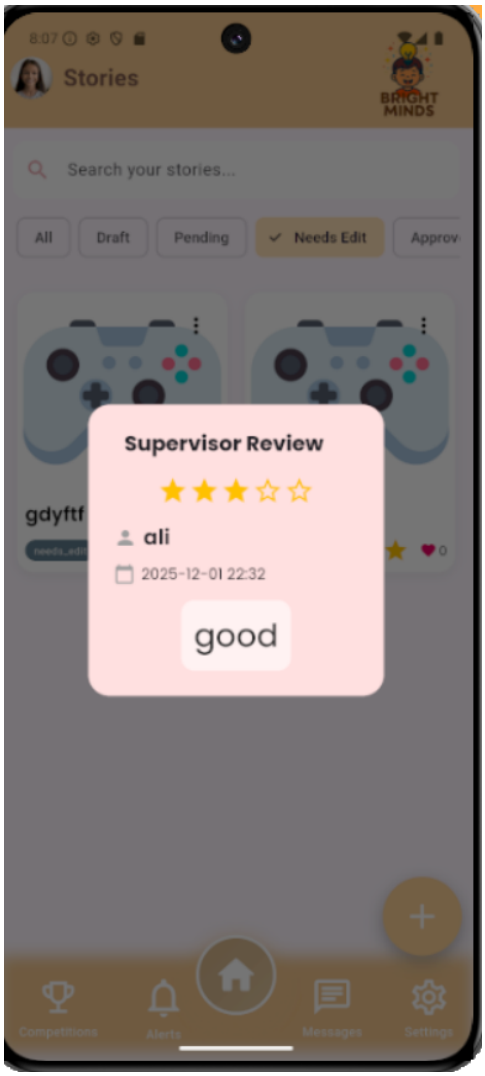


Figure 4.153: Comment for Story Needs Edit

This story was reviewed with the status **Needs Edit**. When the child opens it, they can edit the story and submit it again for review. To view the supervisor's evaluation, the child can click on the **yellow star**, which displays the supervisor's rating and feedback.

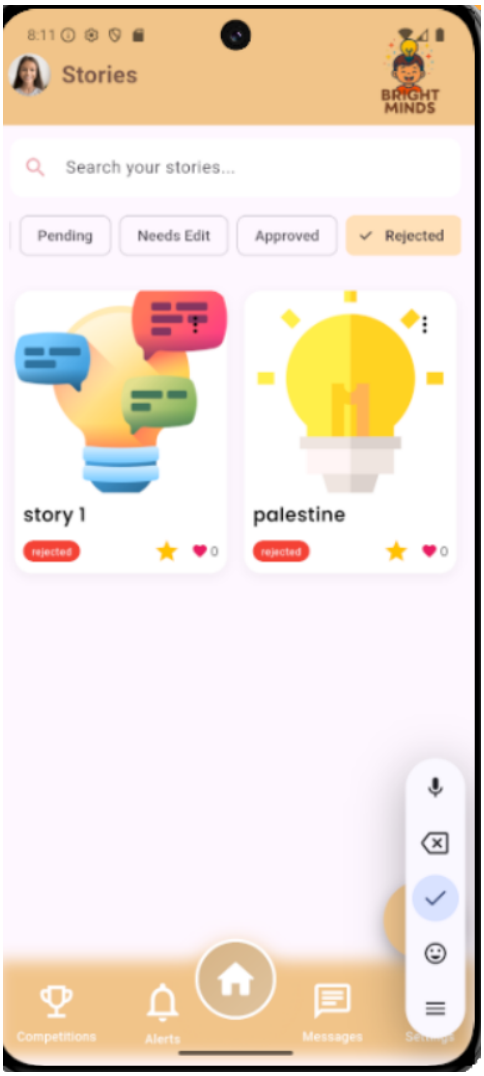


Figure 4.154: Story Rejected

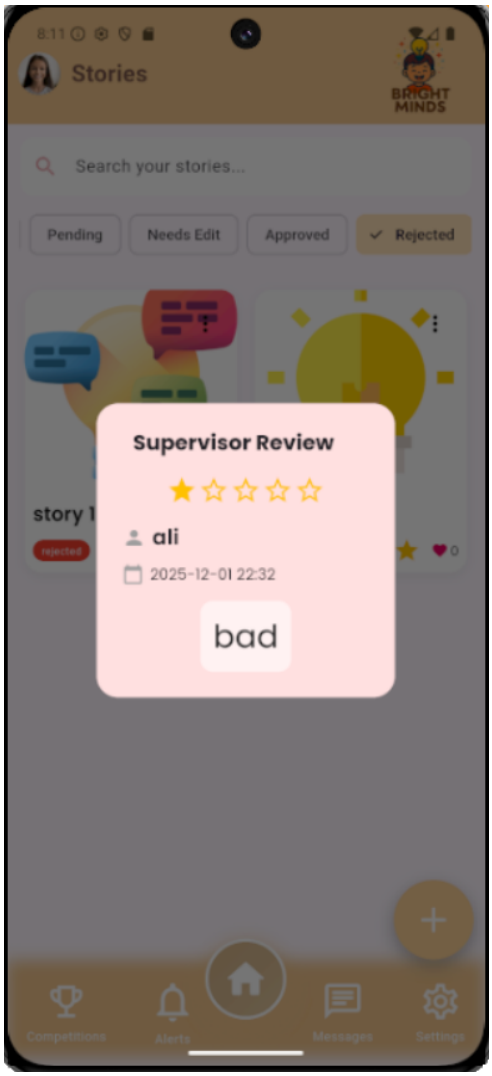


Figure 4.155: Story Rejected Comment

These are the stories that were **rejected by the supervisor**, along with their rating.

Published Stories Page:

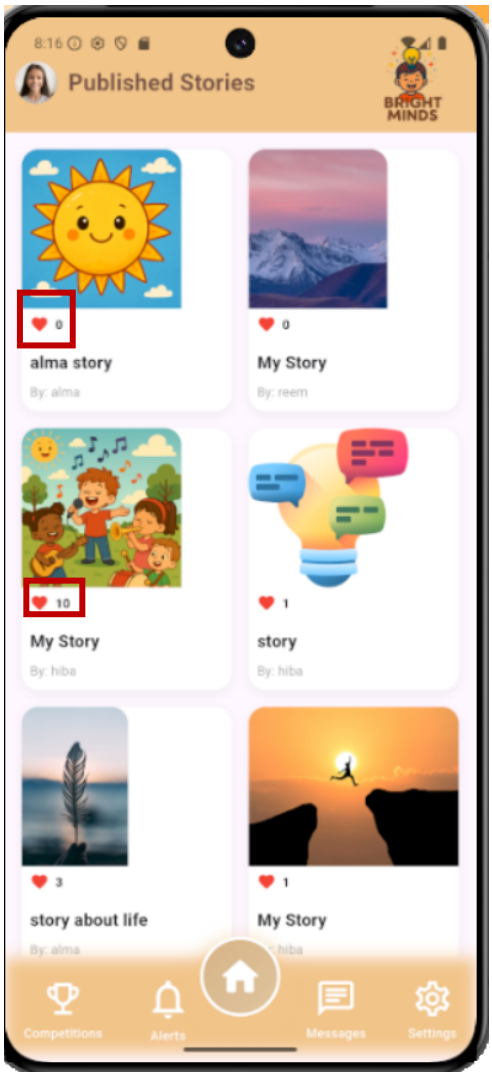


Figure 4.156: Story Published For All Children



Figure 4.157: Story Publish Can Read By Any Child

This screen shows the stories that were **approved and published** by the supervisor, making them available for other children to read and like. When a child opens any story, it is displayed in **reading mode**, and they can navigate between its pages.

Badges Screen :

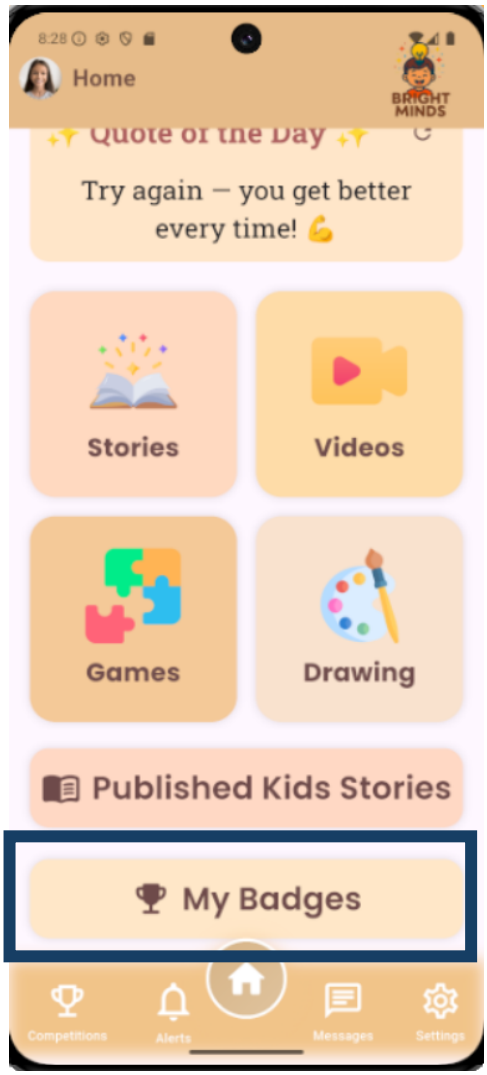


Figure 4.158: Navigating to the Badges Screen

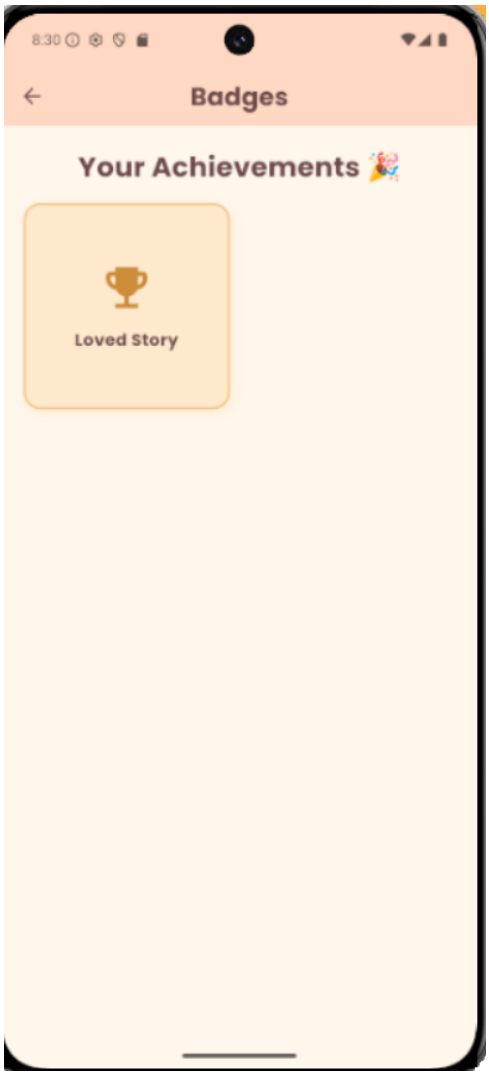


Figure 4.159: Badges Screen

This is the **Badges** page, where the child can earn achievements based on their story progress. For example, if the child's story reaches **10 likes**, a badge appears. Another badge is earned when the child creates their **first story** and it gets **approved by the supervisor**.

Drawing Section :

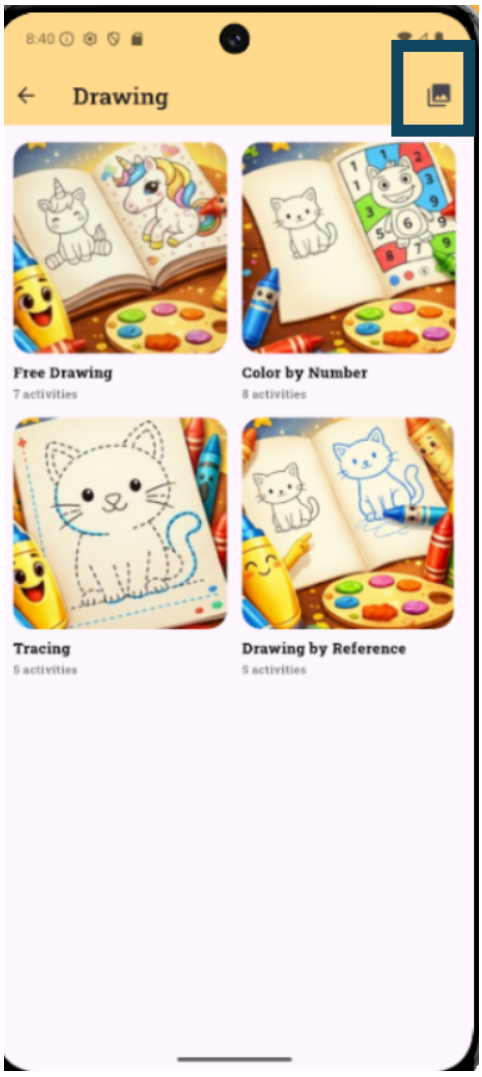


Figure 4.160: Drawing Screen For Child



Figure 4.161: Gallery For Child Drawing

In this screen, the child can choose the type of drawing activity they want to do. The screen includes **four different drawing activity types**, allowing the child to select the preferred one. The child can also open their **gallery** to view all of their saved drawings.

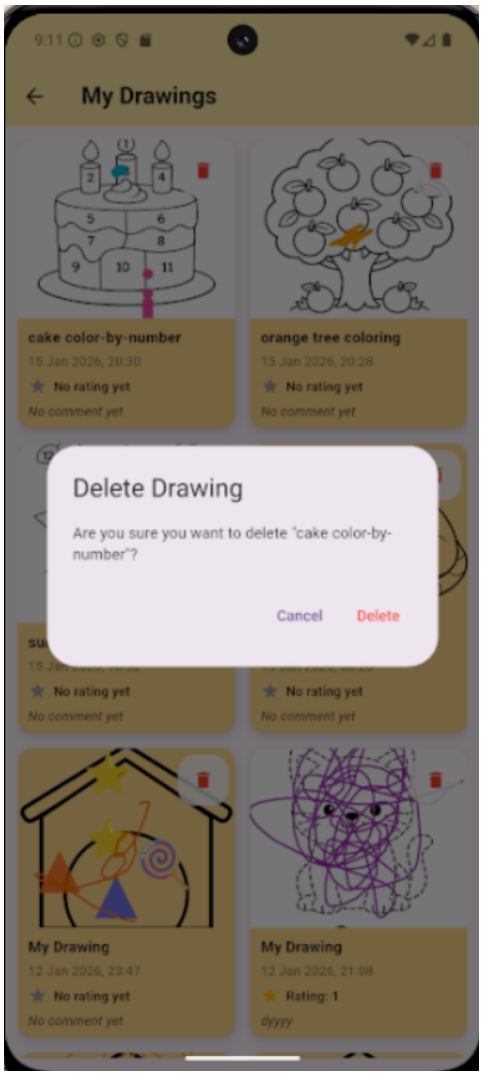


Figure 4.162: Delete Drawing Activates



Figure 4.163: Displaying the Drawing After Creation

From the gallery, the child can **delete any drawing** and check whether their drawings have been **reviewed by the supervisor**. The child can also open any drawing to view it.



Figure 4.164: Open Free Drawing Activity

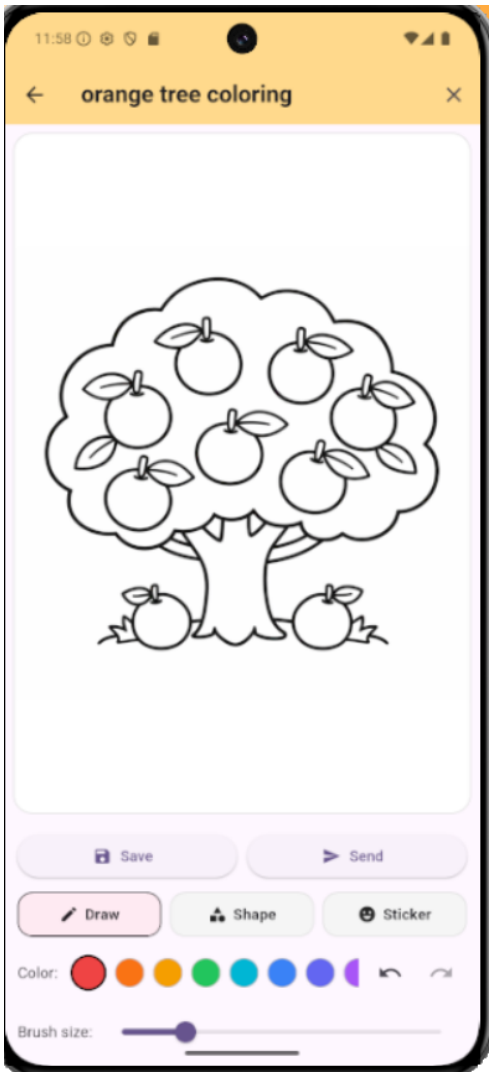


Figure 4.165: Open Activity To Draw

When the child selects an activity type, a list of drawings appears for that activity, and the child chooses the one they want. After selecting a drawing, the coloring screen opens, providing a color palette, brush thickness control, and an undo option to revert the last action.

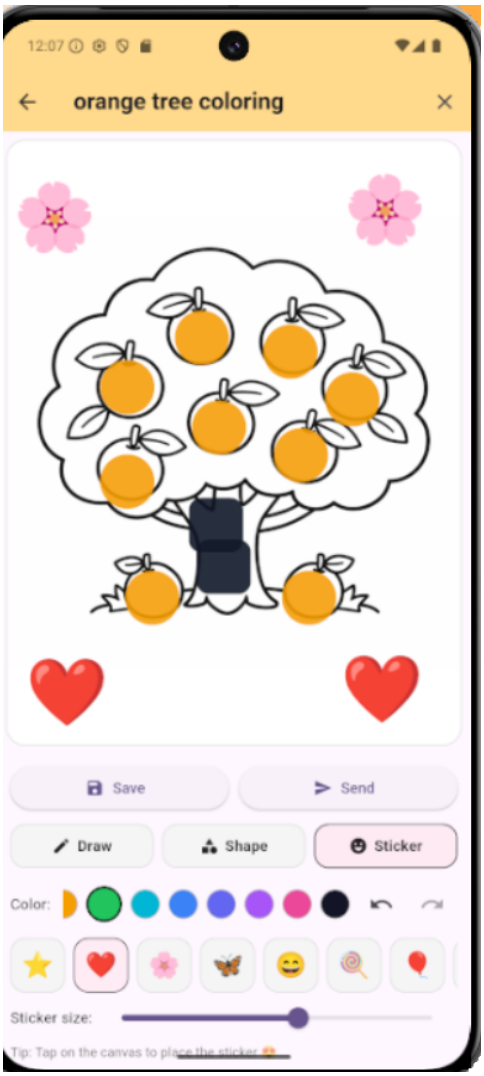


Figure 4.166: Open Activity to Draw Stickers

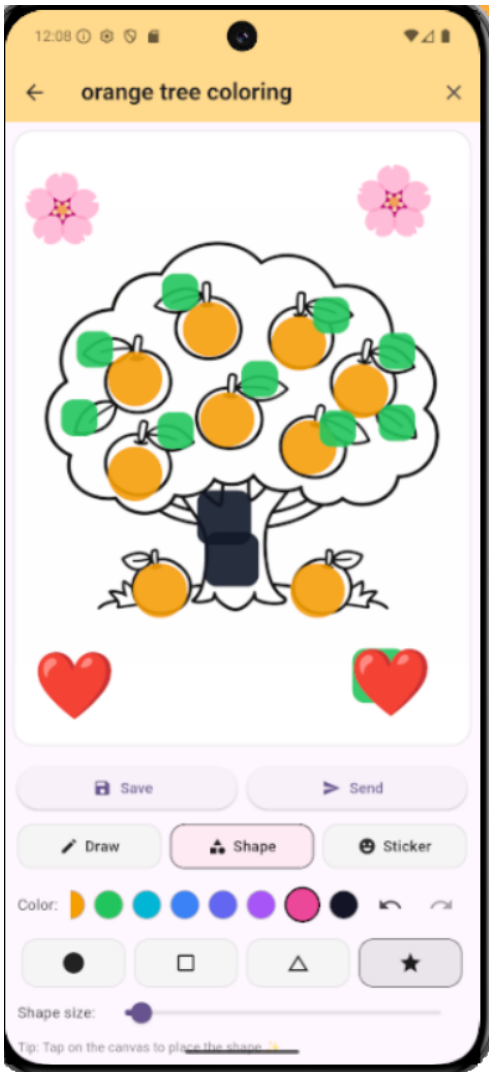


Figure 4.167: Open Activity to Draw Shapes

In addition, the coloring screen includes **stickers** and **geometric shapes** that the child can add in different colors and sizes. There is also an **“X” button** at the top to clear everything drawn on the image. The child can save the drawing and **submit it to the supervisor** for review.



Figure 4.168: Drawing By Tracing

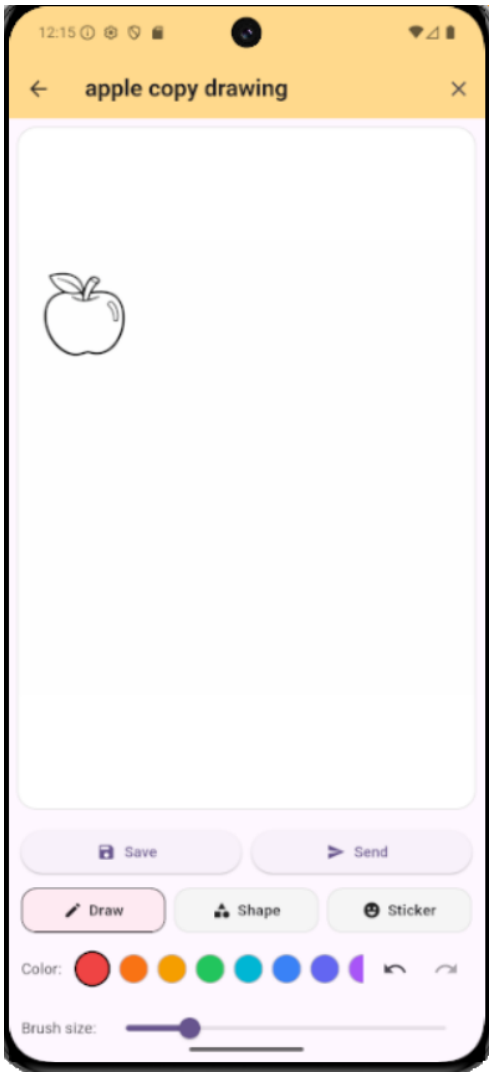


Figure 4.169: Drawing By Reference

Of course, the other activity types also provide multiple drawings to choose from. This is an example of the **Tracing** type and the **Drawing by Reference** type.

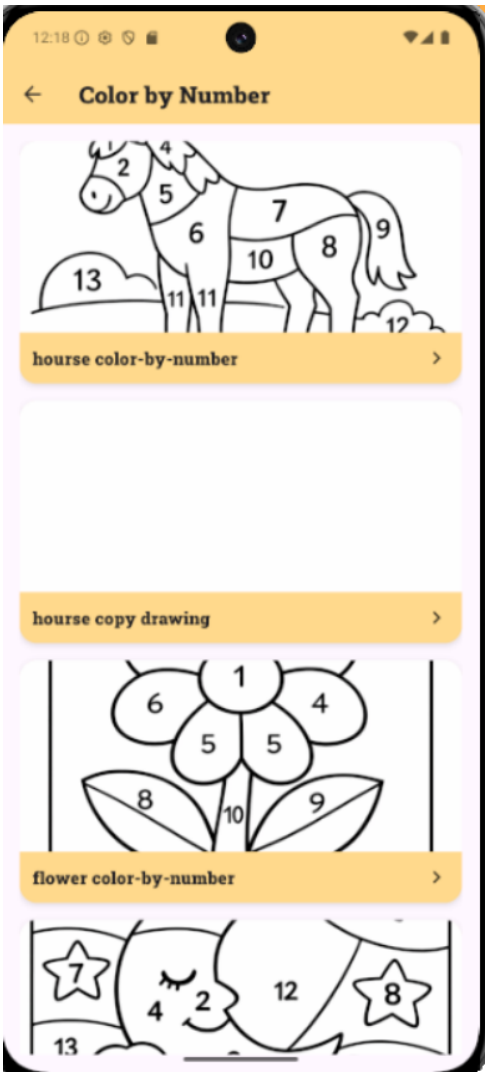


Figure 4.170: Drawing Color by Number Activities

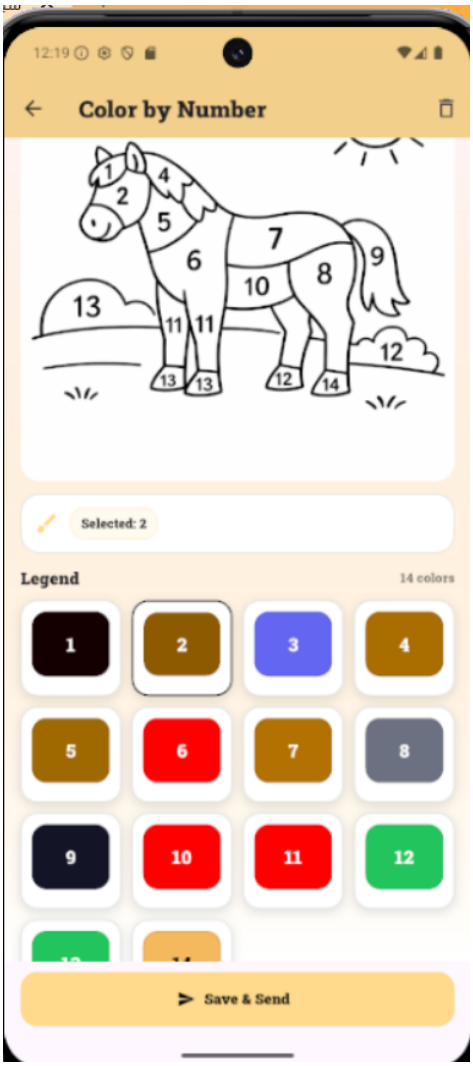


Figure 4.171: Drawing Color by Number

This is the **Color by Number** activity, where the child colors each region using the specific colors assigned to each number, as shown in the legend.

Alerts Section For Child :

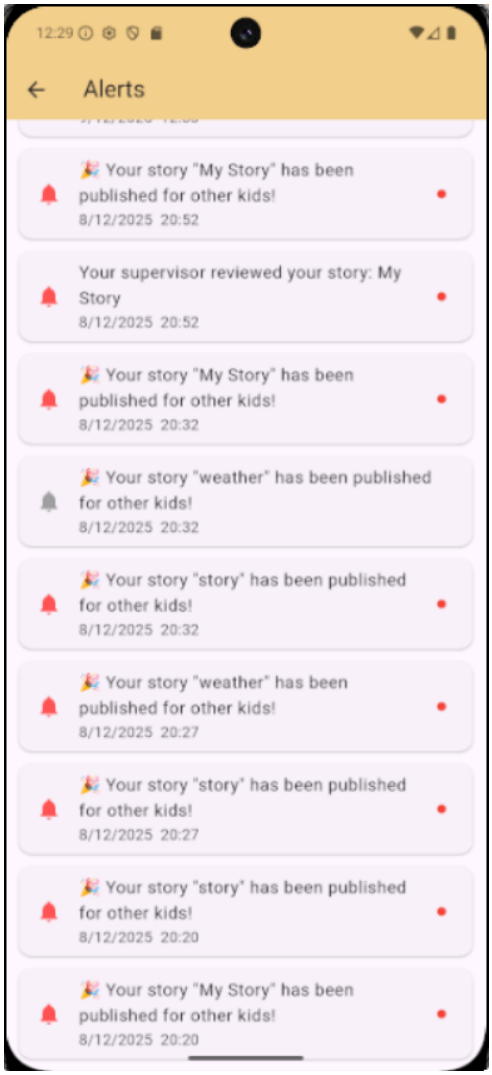


Figure 4.172: Alert Screen for Child

On this screen, the child can see notifications for any newly added activities and any evaluations or feedback provided by the supervisor.

Setting Section For Child:

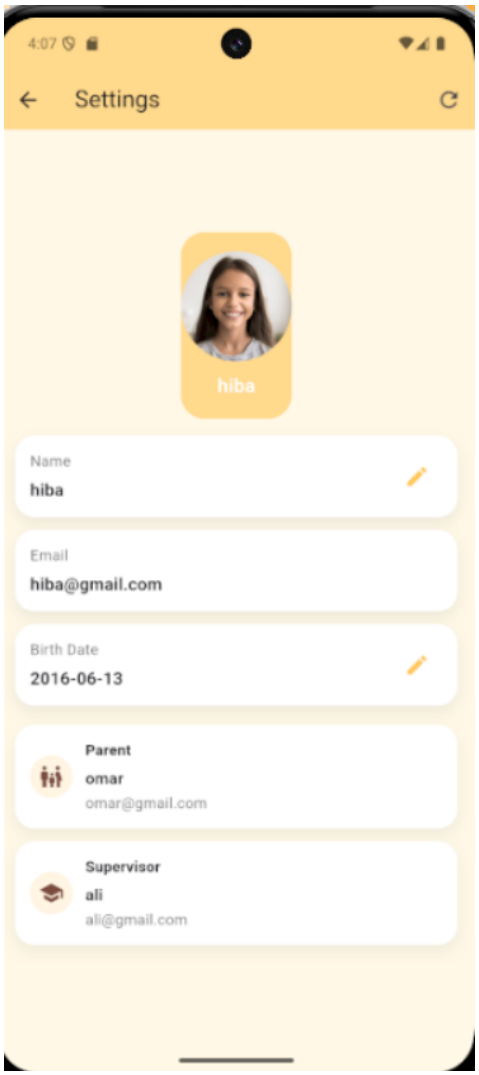


Figure 4.173: Setting Screen for Child

This is the child's **Settings** page, where the child's name and date of birth are displayed and can be edited. The page also shows the child's assigned **parent** and **supervisor**.

Message Section for child:

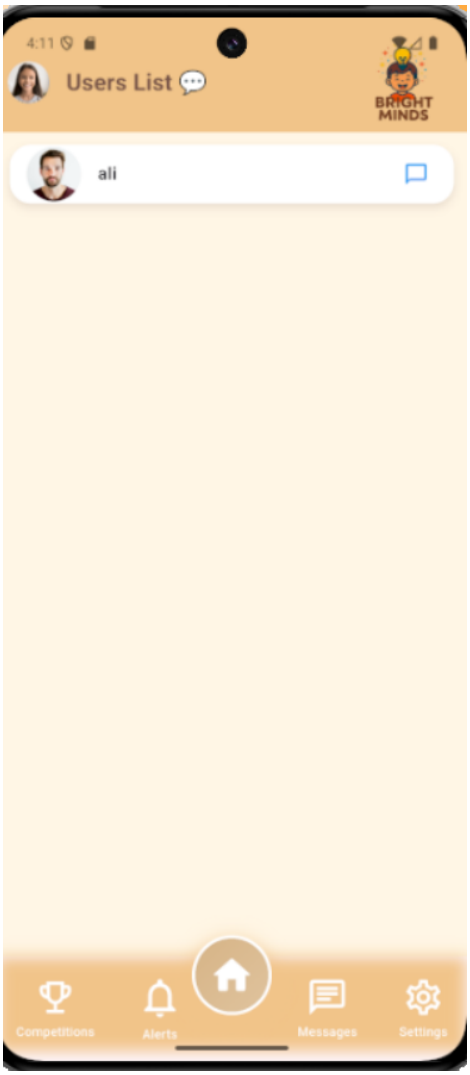


Figure 4.174: User List Screen for Child

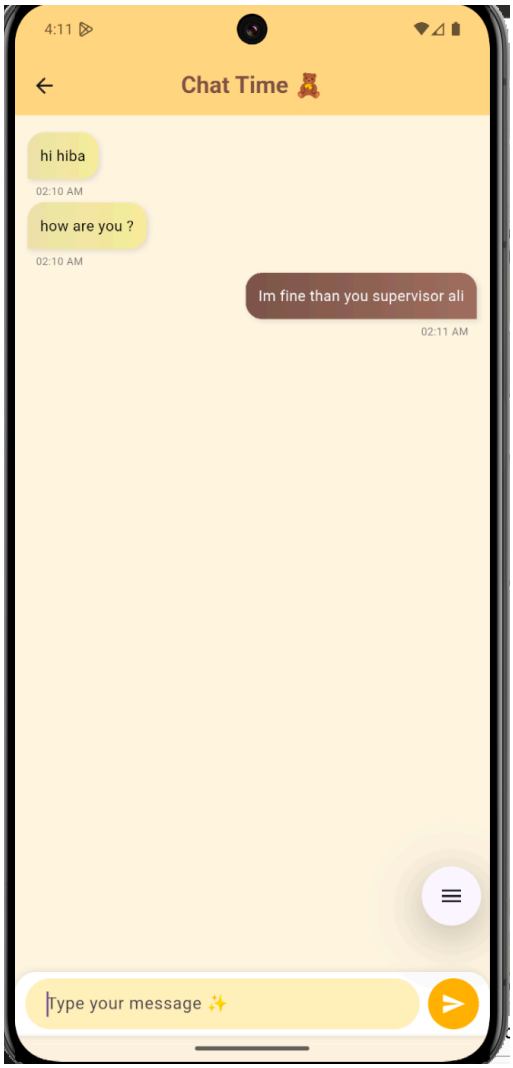


Figure 4.175: Messages Screen for Child

This is the child's **Messaging** screen, where the child can communicate only with their assigned **supervisor**.

Challenge Section For Child:

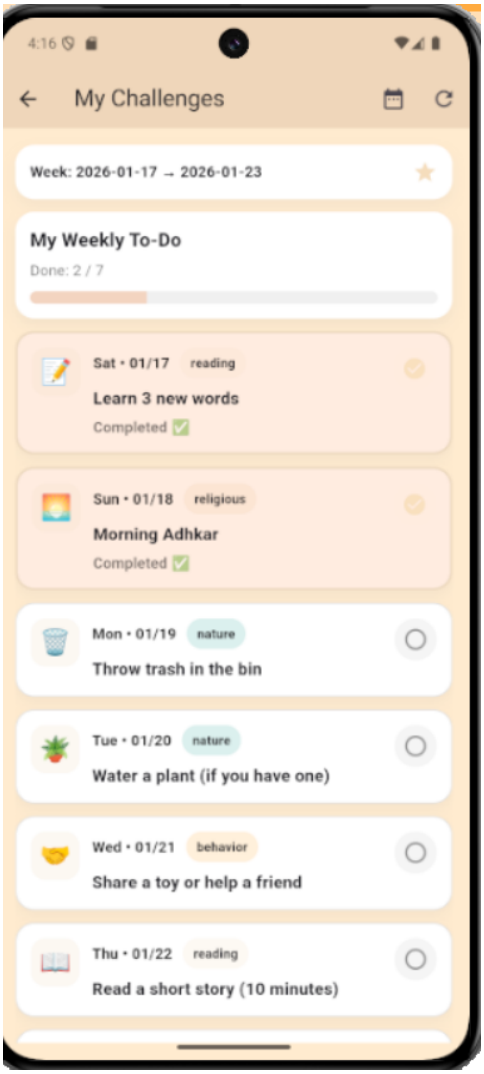


Figure 4.176: Challenge Screen for Child

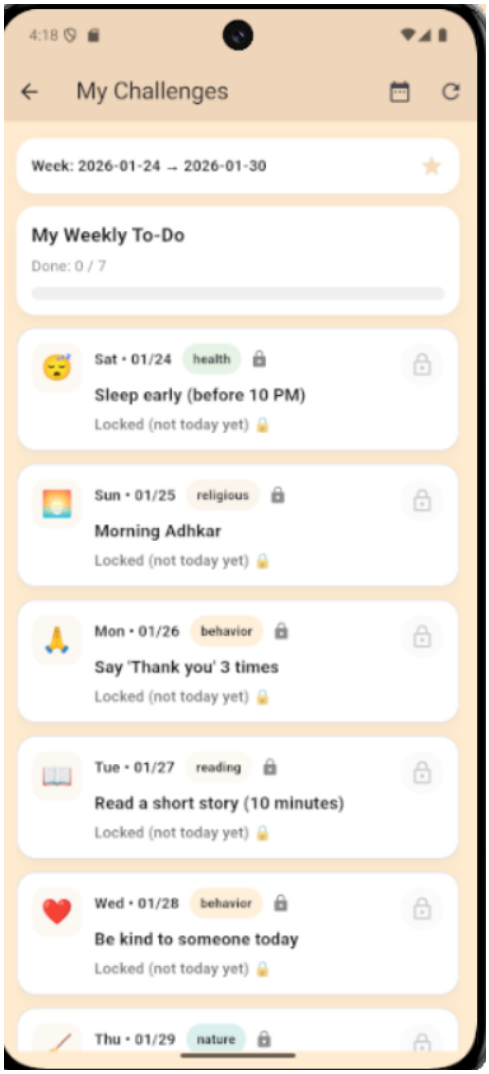


Figure 4.177: Challenge Screen for Child for Week Not Came Until Now

This is the child's **Challenges** screen, where the child can select the week they want to view. Each week contains a set of **simple, light, fun, and useful challenges** that the child can complete voluntarily. When the child checks a challenge as done, the checkmark cannot be removed. Also, if the challenge belongs to a future day, it remains **locked** until its day arrives, then it becomes unlocked automatically.

4.3.3 Parent Pages

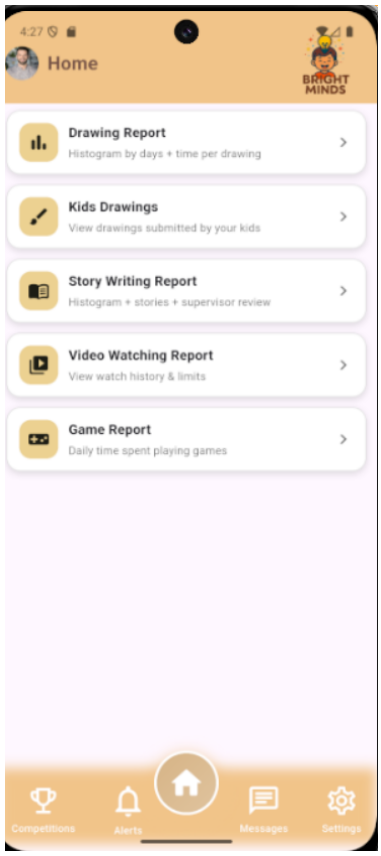


Figure 4.178: Parent Home Screen

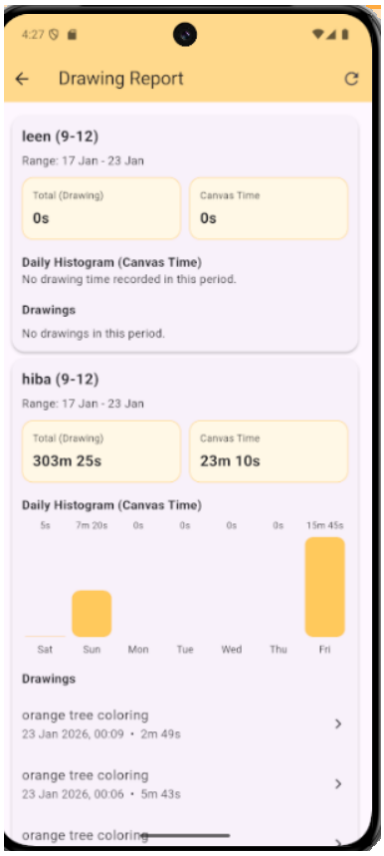


Figure 4.179: Drawing Reports

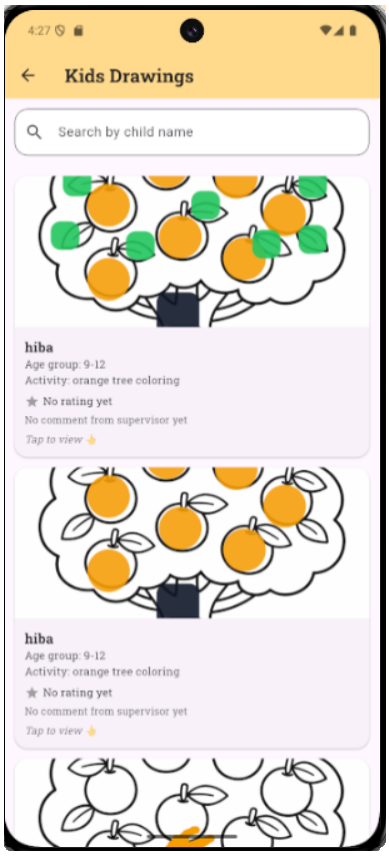


Figure 4.180: Children's Drawings

This is the parent's **main home screen**, where the parent can access reports about how the child spends time across different activities. The parent can also view the child's created **stories** and **drawings**. The available reports include **Drawing**, **Stories**, **Videos**, and **Games**. When the parent opens any report, a chart is displayed showing how much time the child spent on each activity across different days.

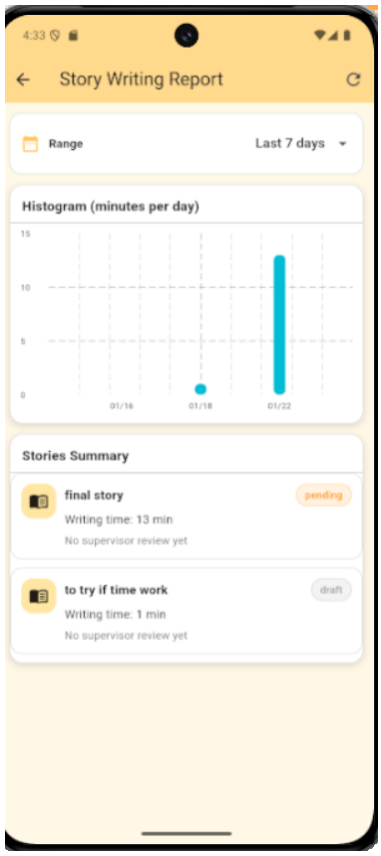


Figure 4.181: Story Reports

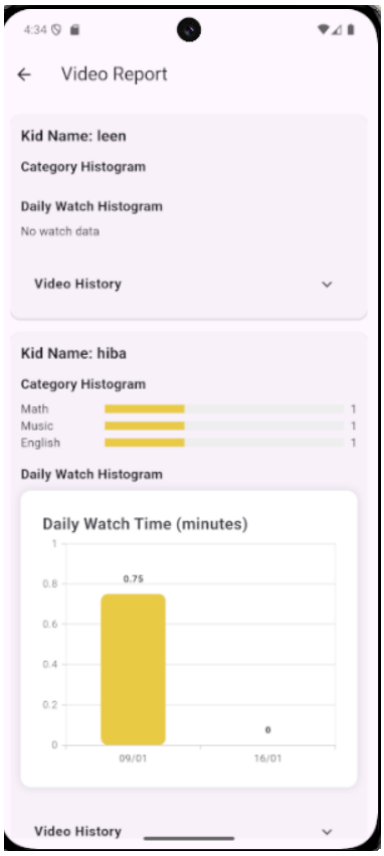


Figure 4.182: Video Reports

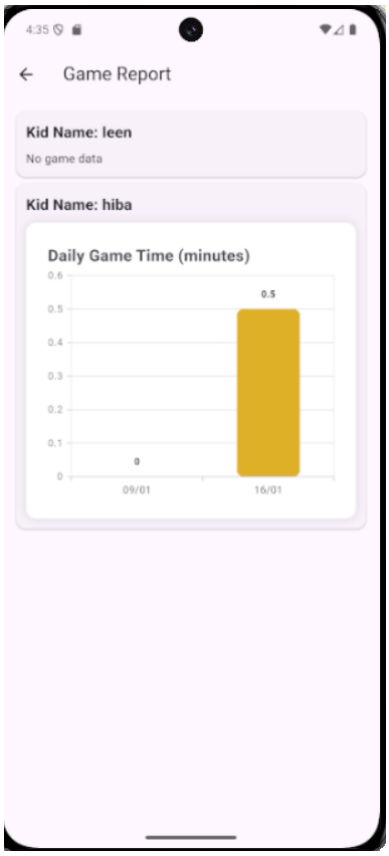


Figure 4.183: Game Reports

These screens present detailed reports for the child's activities. The **Stories report** shows the story titles along with their status. The **Videos report** displays the time spent watching videos and the video history. The **Games report** shows the games the child played and the total time spent on each game.

Challenge Section In Parent Screen

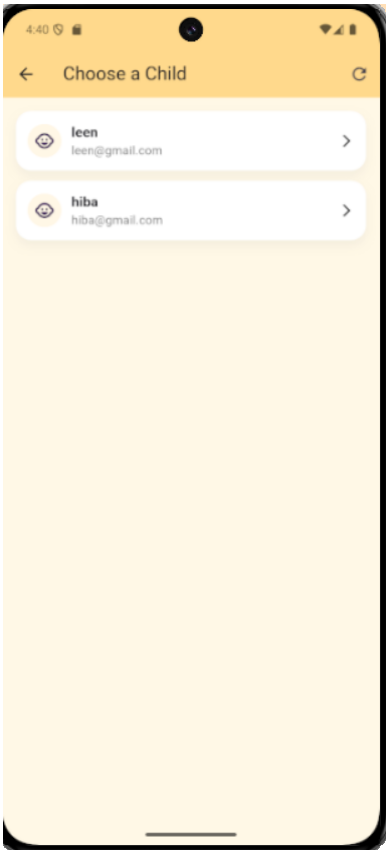


Figure 4.184: Choose a Child

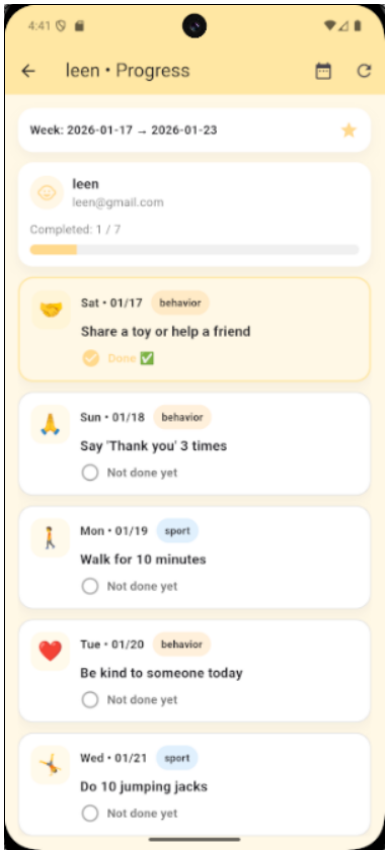


Figure 4.185: Challenge Report for the First Child

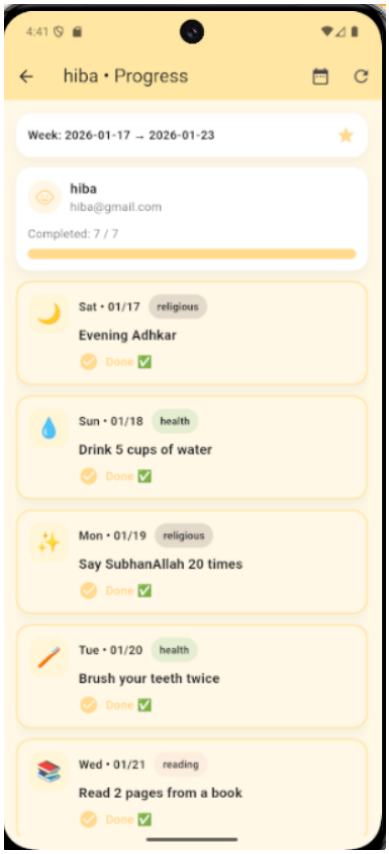


Figure 4.186: Challenge Report for the Second Child

From the **Challenges** screen, the parent can select which child to view and track their progress in the assigned weekly challenges.

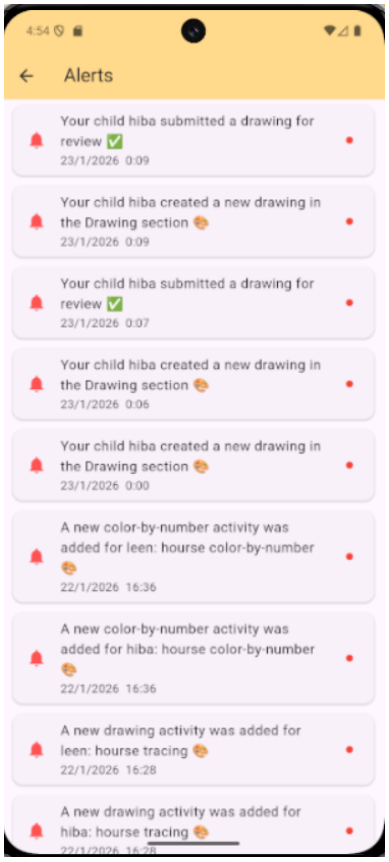


Figure 4.187: Alert Screen for Parent

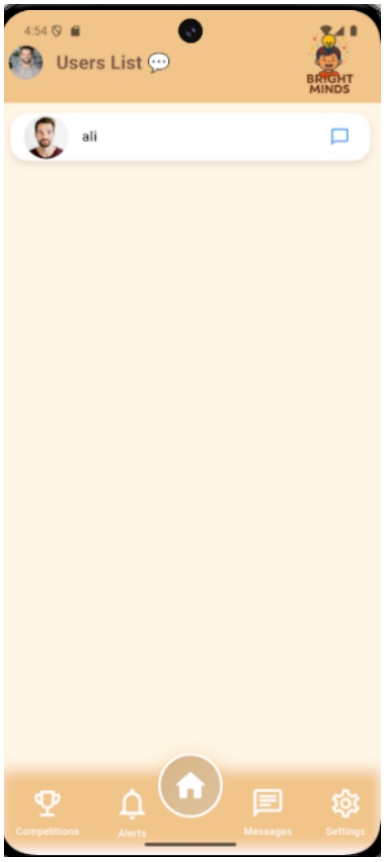


Figure 4.188: Messages Screen for Parent

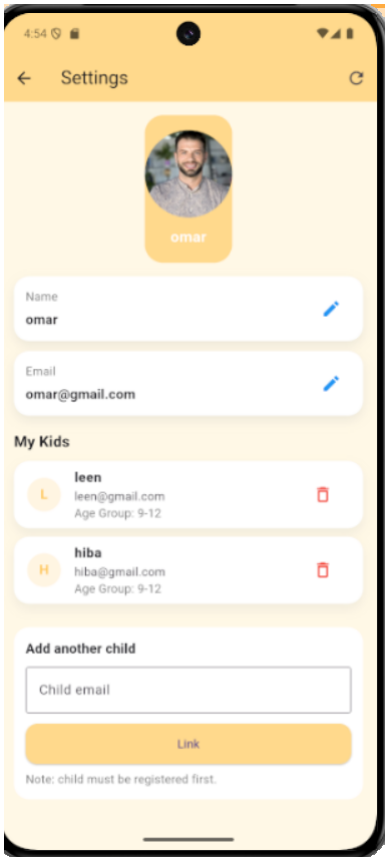


Figure 4.189: Setting Screen for Parent

Through the **Notifications** screen, the parent receives updates whenever their child creates a **drawing or story**, or when an activity gets **reviewed/evaluated**. Using the **Messaging** screen, the parent can communicate with the child's assigned **supervisor**. In the **Settings** screen, the parent can edit their **name** and **email**. The parent can also manage their children by adding a child using the child's **email**, as long as the email exists in the system and the child is not already linked to another parent. In addition, the parent can remove any child from their list; the child remains in the system but becomes **unlinked** (without a parent) after removal.

4.3.4 Admin Pages

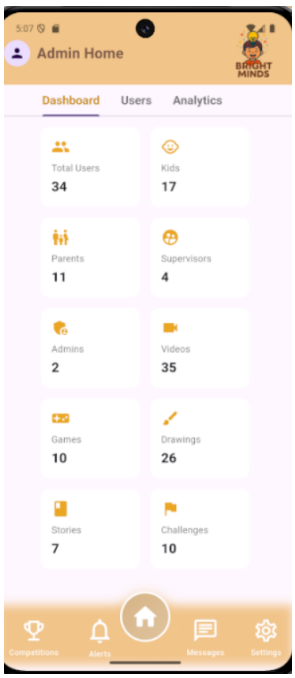


Figure 4.190: Admin Home Page

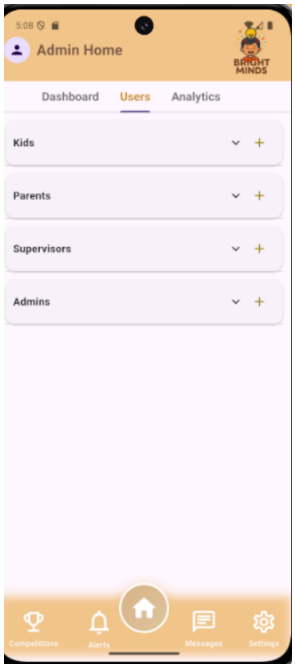


Figure 4.191: All Users in the App

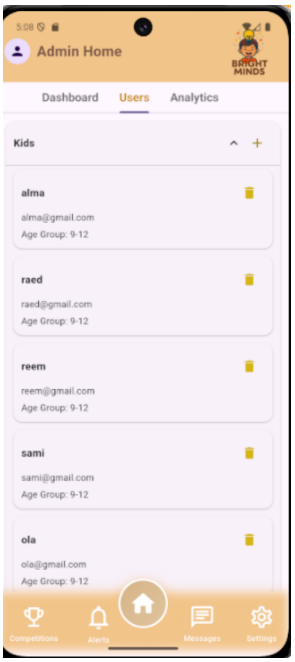


Figure 4.192: Kids in the App

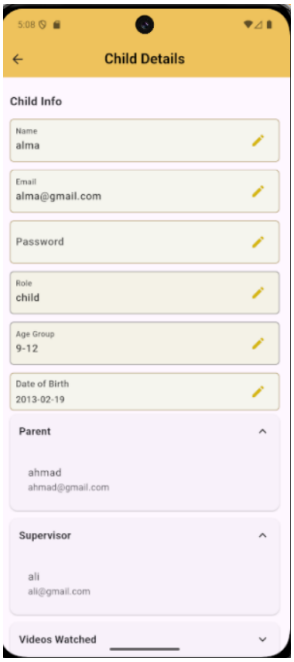


Figure 4.193: All Information about the Kid

This is the admin **main dashboard**, where the admin can view overall statistics and general information about all system components. In the **Users** section, the admin can view all registered users, update their information, or delete any user if needed. This screen shows an example of editing a child's profile details.

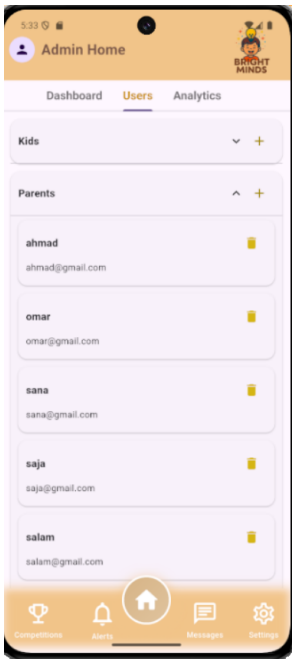


Figure 4.194: Admin Users Screen – Parents List

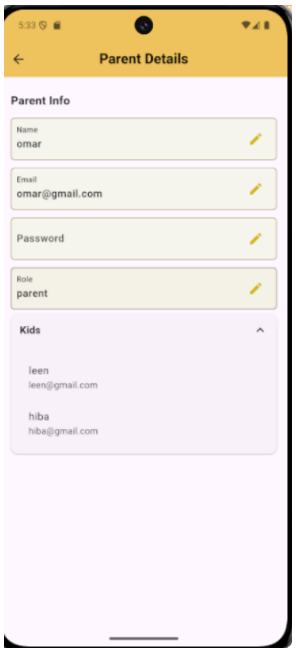


Figure 4.195: Parent Details – Parent Profile And Linked Kids

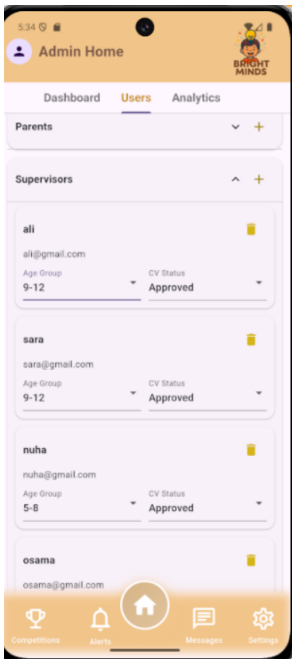


Figure 4.196: Admin Users Screen – Supervisors List

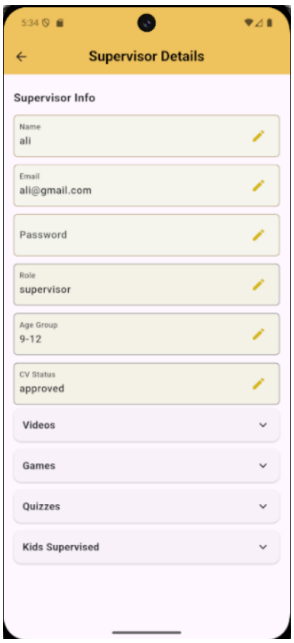


Figure 4.197: Supervisor Details – Supervisor Profile Information

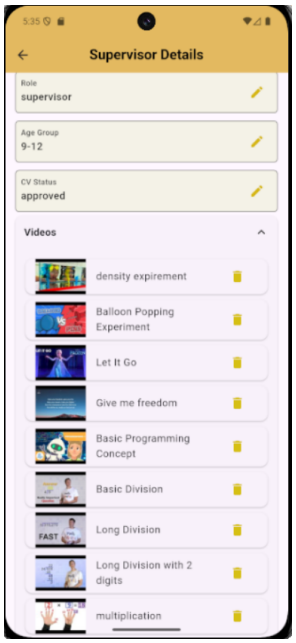


Figure 4.198: Supervisor Details – Videos Section

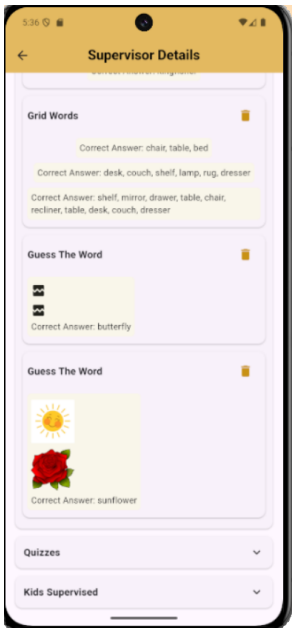


Figure 4.199: Supervisor Details – Games Activities List

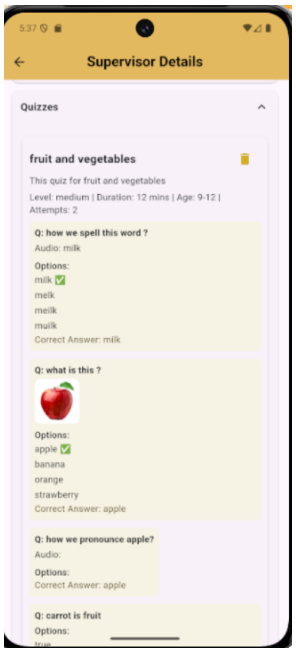


Figure 4.200: Supervisor Details – Quizzes Section

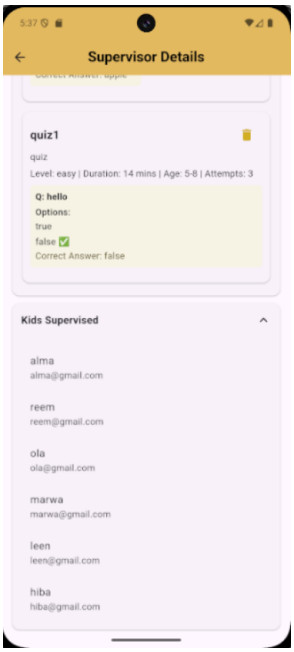


Figure 4.201: Supervisor Details – Kids Supervised List

The admin can manage the entire system by viewing user information and controlling platform content. Through the **Users** section, the admin can view all registered users (kids, parents, and supervisors), update their profile data (such as name, email, password, role, age group, and CV status), and delete users when needed. The admin can also open the details page for each user to review the assigned content (videos, games, quizzes) and view relationships such as supervised kids or linked children under a parent account.

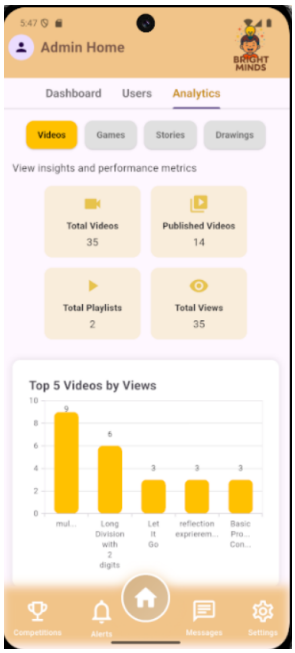


Figure 4.202: Admin Analytics – Videos Overview

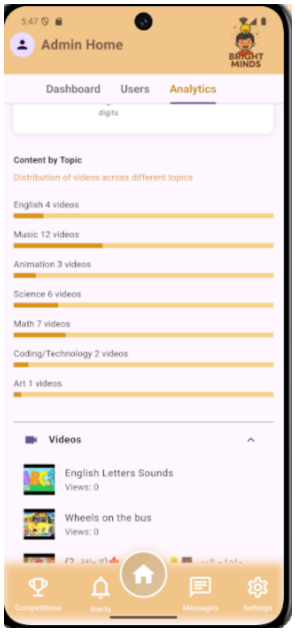


Figure 4.203: Admin Analytics – Videos by Topic Distribution

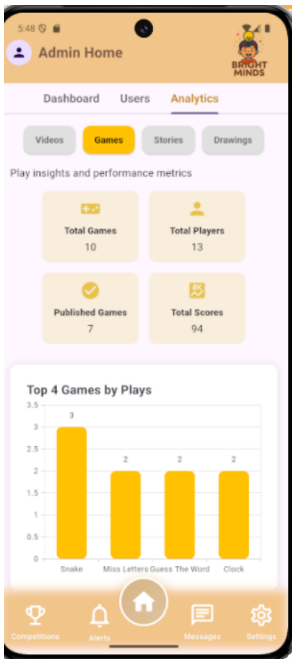


Figure 4.204: Admin Analytics – Games Overview

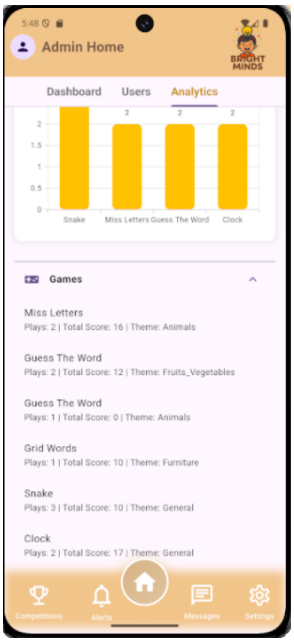


Figure 4.205: Admin Analytics – Games Details and Performance List

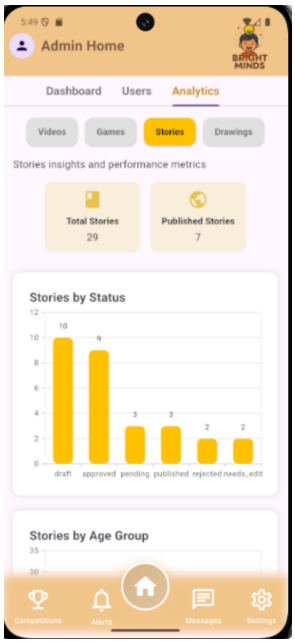


Figure 4.206: Admin Analytics – Stories Overview by Status

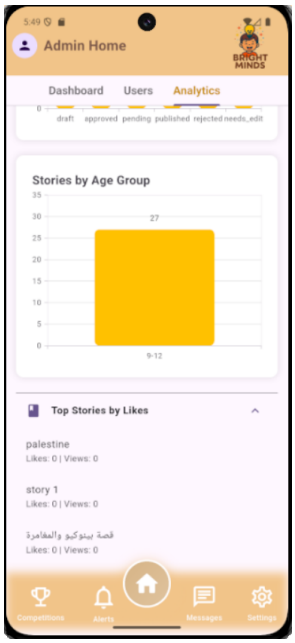


Figure 4.207: Admin Analytics – Stories by Age Group and Top Stories

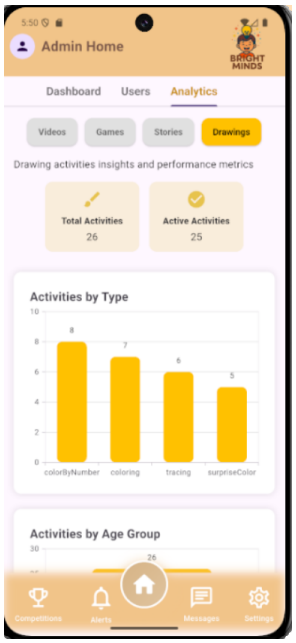


Figure 4.208: Admin Analytics – Drawing Activities Overview

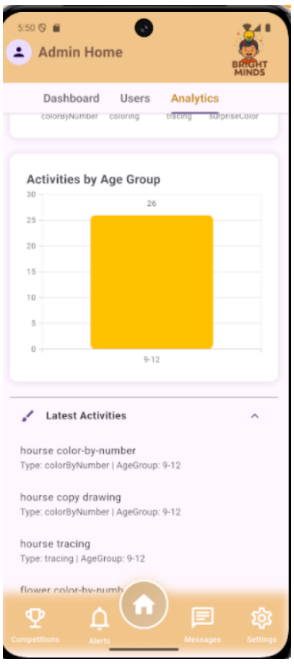


Figure 4.209: Admin Analytics – Drawing Activities by Age Group and Latest Activities.

The **Analytics** section provides performance insights about platform content. The admin can view statistics for **videos, games, stories, and drawing activities**, including totals, published content, views/plays, category distribution, age group distribution, and top-performing content.

4.4 **Web Application Features**

All features available in the mobile application are identical to those available on the web platform.

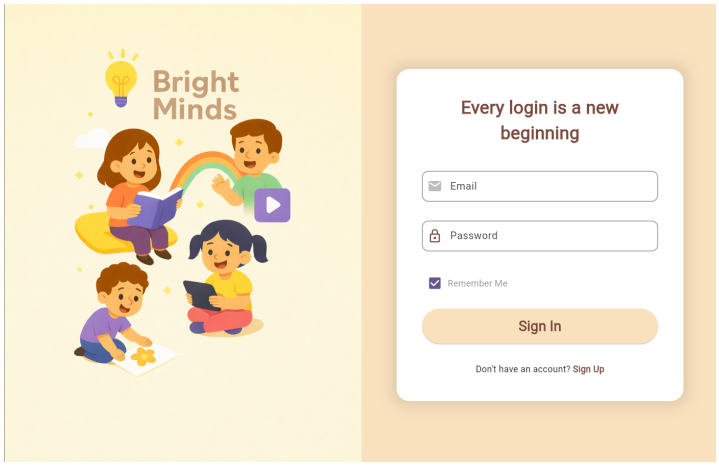


Figure 4.210: Sign In Page (Web)

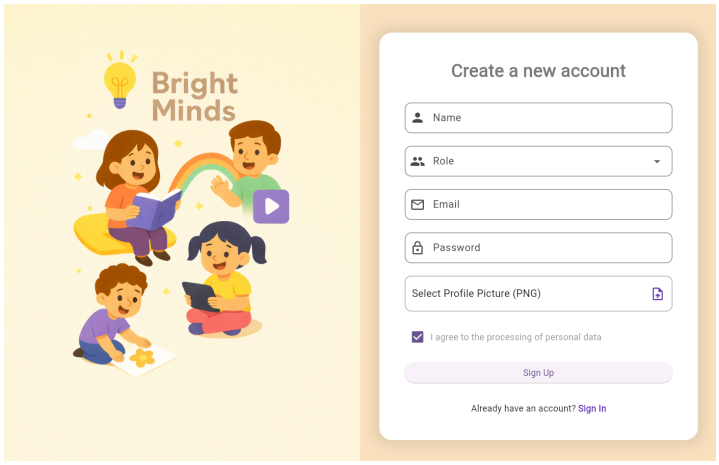


Figure 4.211: Sign Up Page (Web)

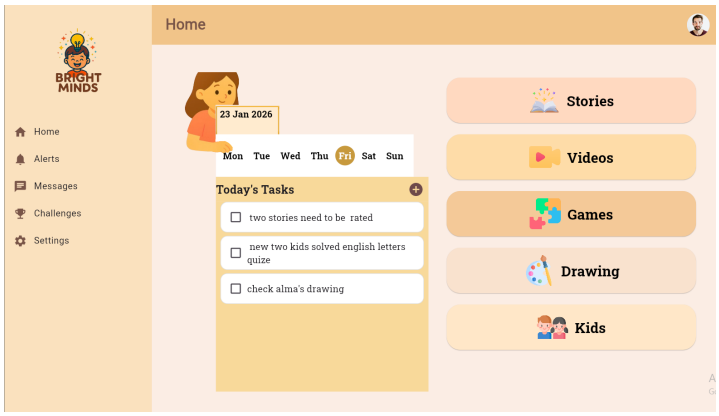


Figure 4.212 : Supervisor Home Page (Web)

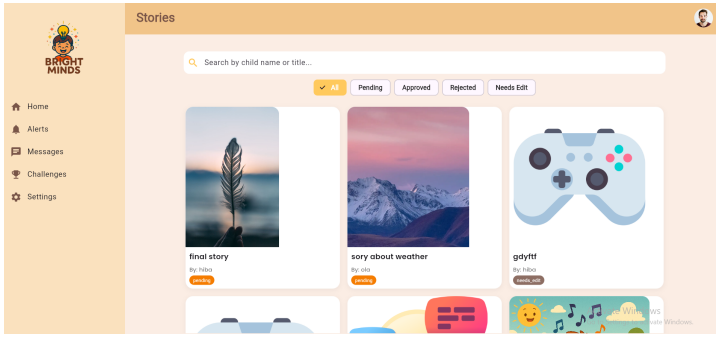


Figure 4.213: Supervisor Story Section (Web)

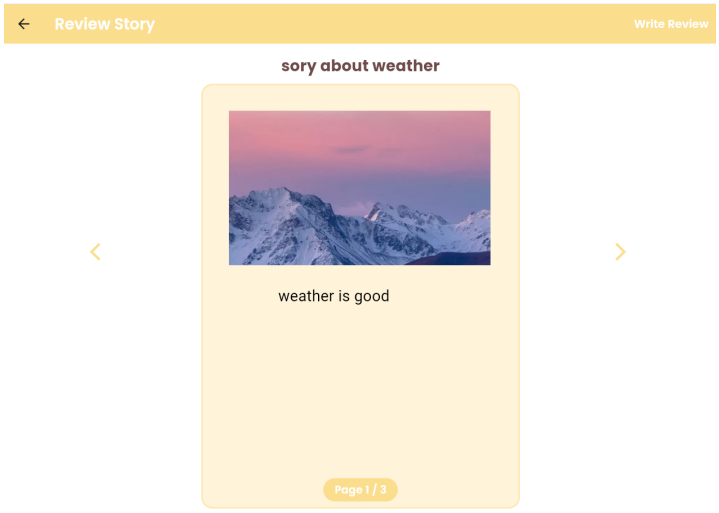


Figure 4.214 : Preview Story (Web)

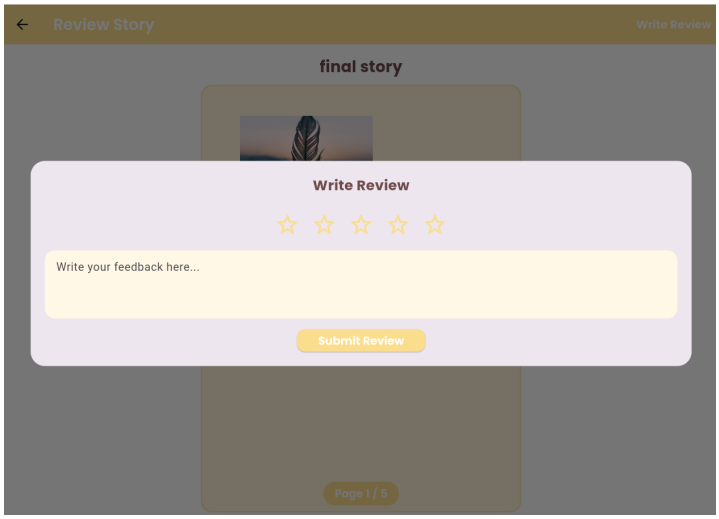


Figure 4.215: Add Kid Story Review (Web)

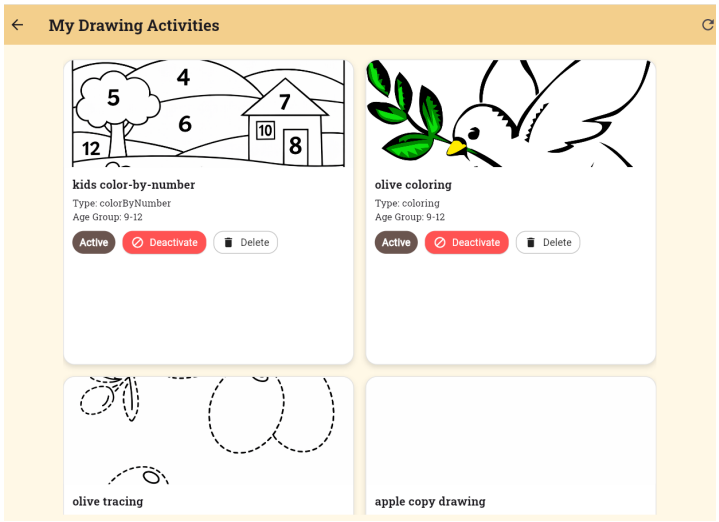


Figure 4.216: Supervisor Drawing Activities(Web)

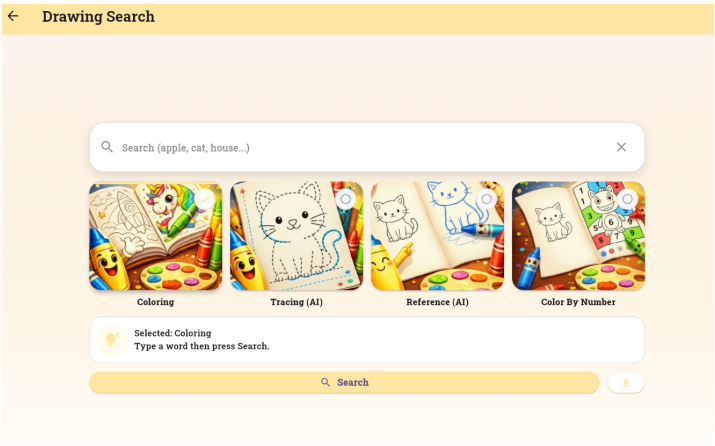


Figure 4.217: Supervisor Search Drawing (Web)

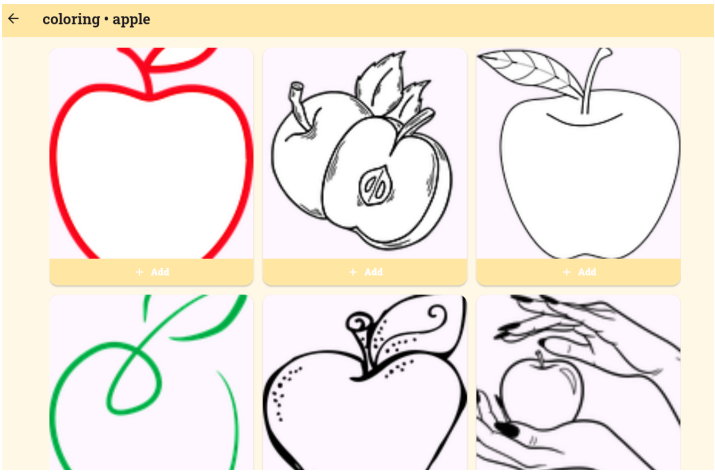


Figure 4.218: Supervisor Coloring Activity (Web)

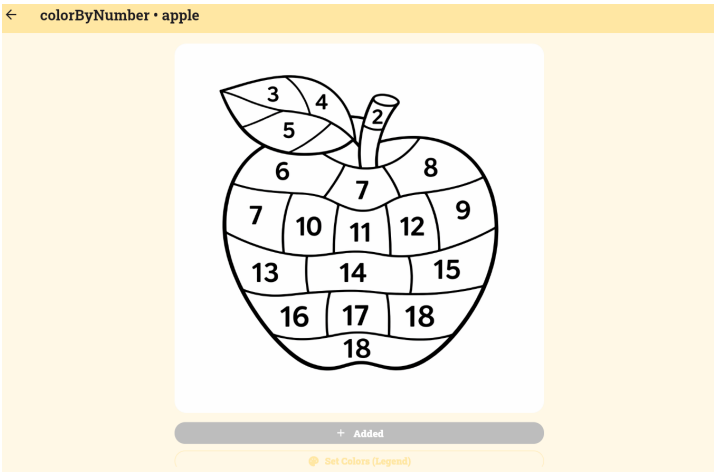


Figure 4.219: Supervisor Color By Number Activity (Web)

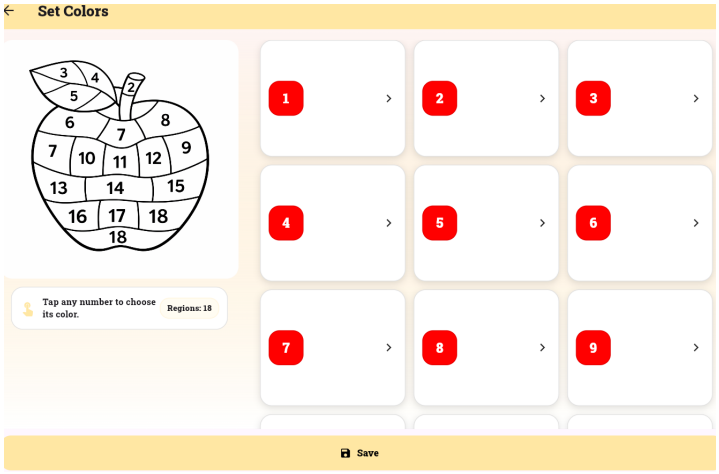


Figure 4.220: Supervisor Set Numbers for Color-by-Number Activity (Web)

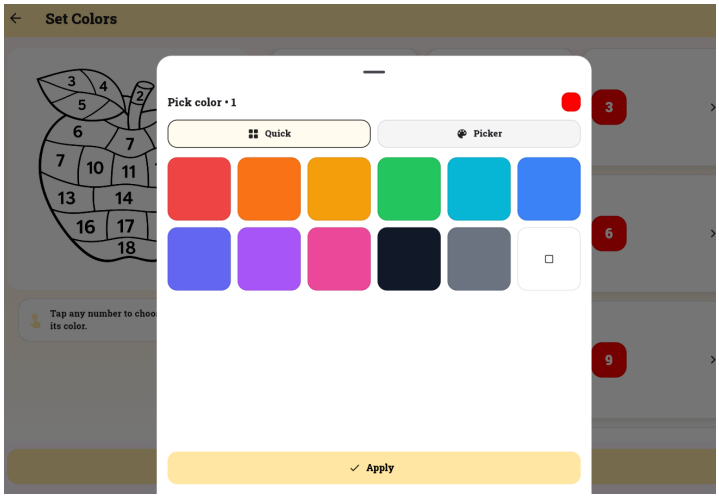


Figure 4.221: Set Colors For Color By Number Activity (Web)

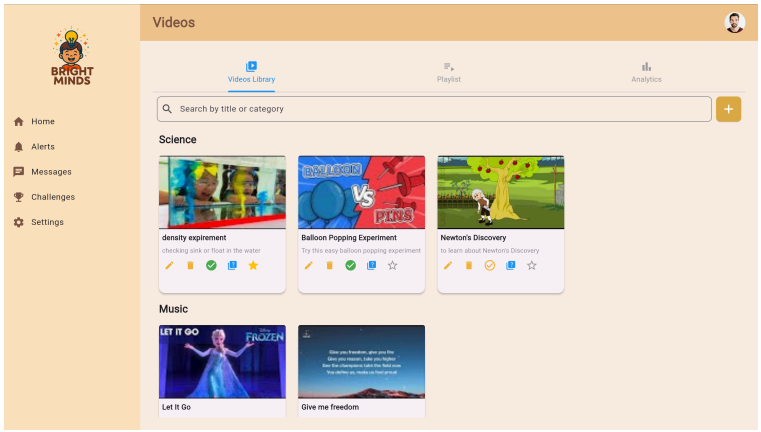


Figure 4.222: Supervisor Videos (Web)

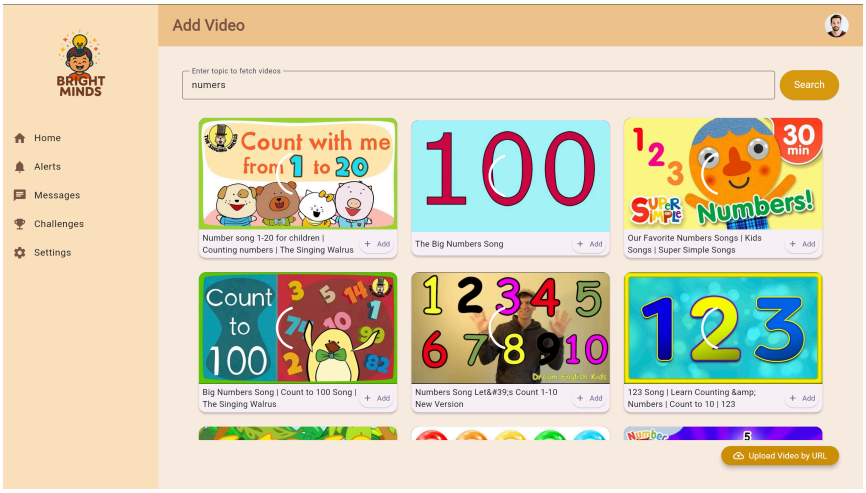


Figure 4.223: Add Video (Web)



Figure 4.224: Add Quiz (Web)

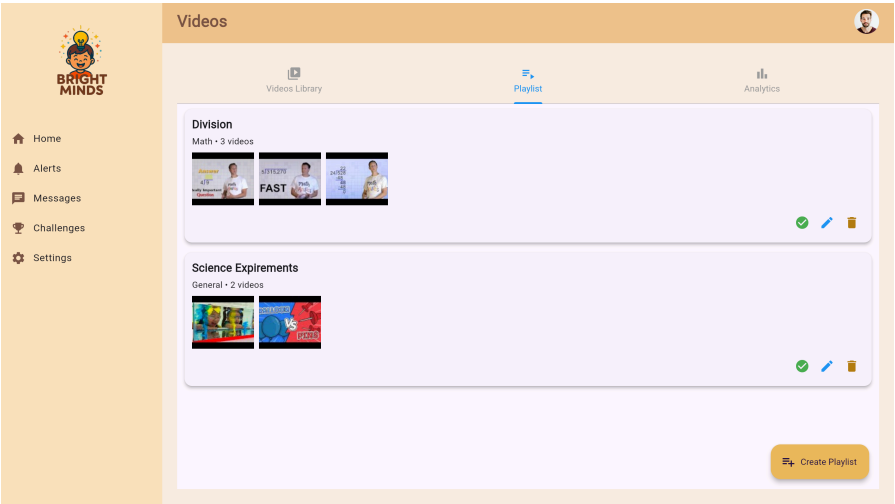


Figure 4.225: Supervisor Playlists (Web)

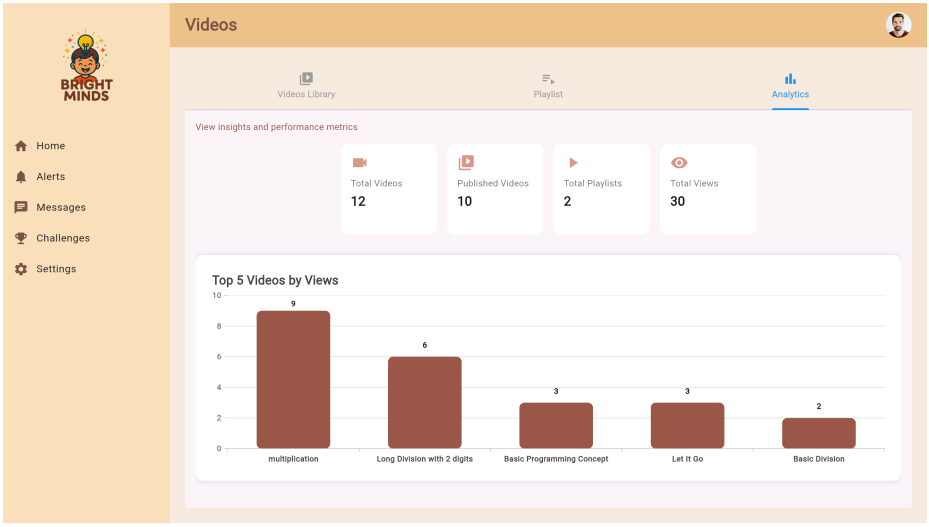


Figure 4.226: Supervisor Videos Analytics (Web)

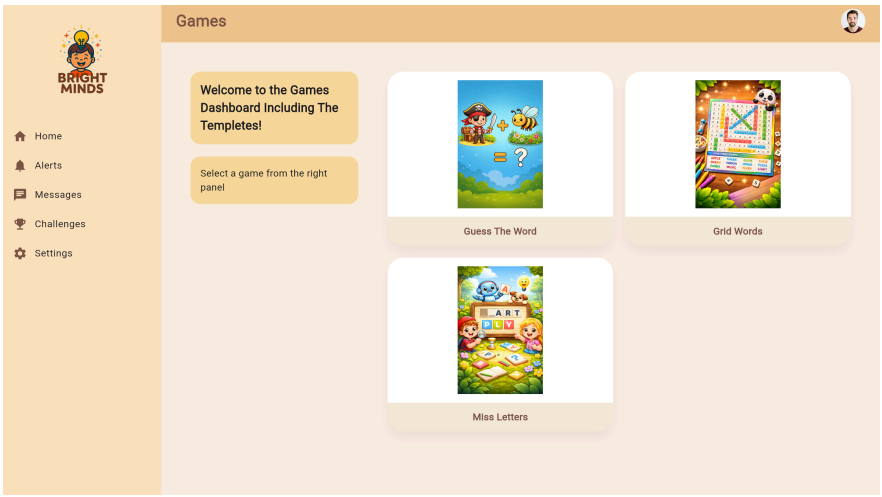


Figure 4.227: Supervisor Game List (Web)



Figure 4.228: Created Version of Missing Letters Game (Web)

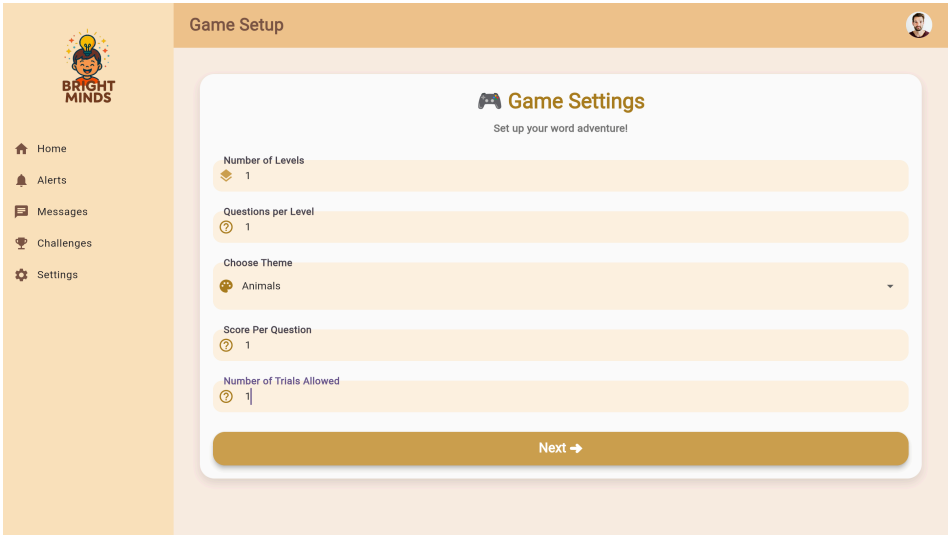


Figure 4.229: Missing Letters Game Setting (Web)

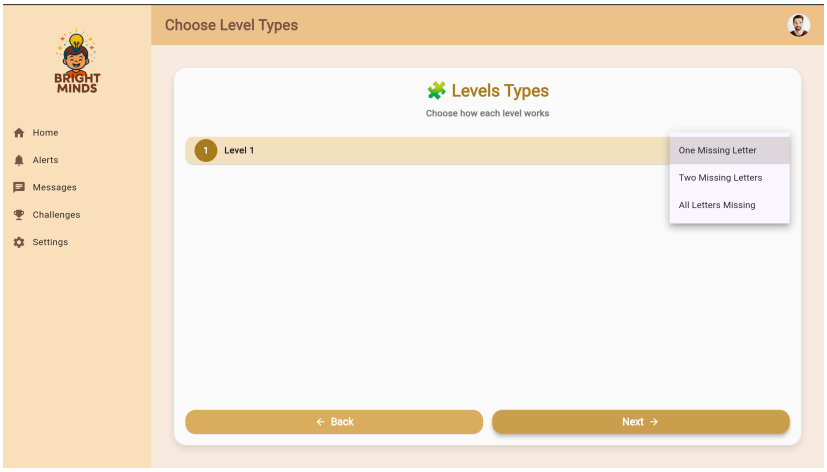


Figure 4.230 : Missing Letters Game Levels (Web)

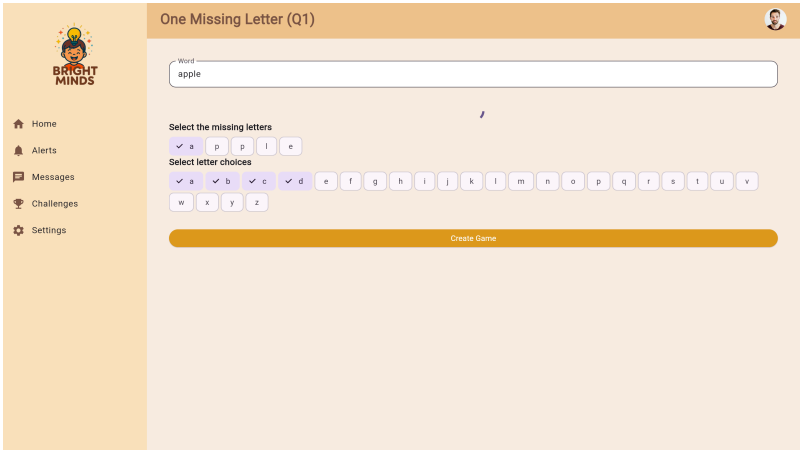


Figure 4.231:Missing Letter Game Question (Web)

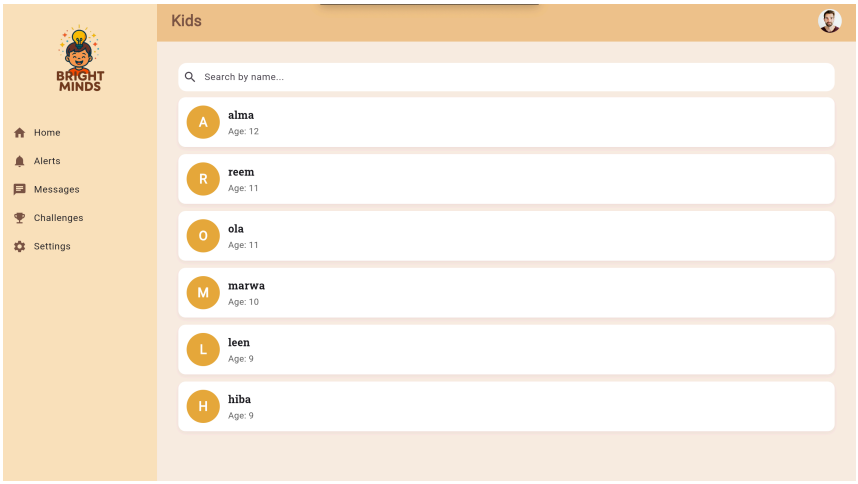


Figure 4.232: Supervisor Kids (Web)

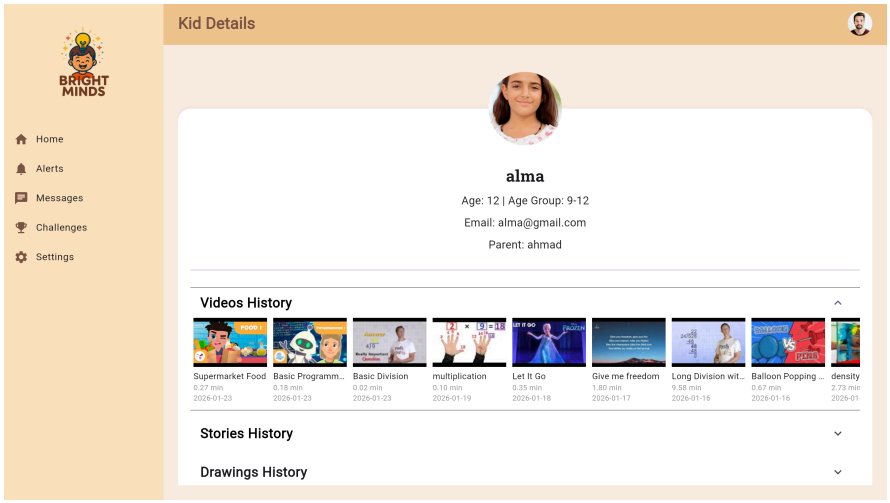


Figure 4.233: Kid Details (Web)

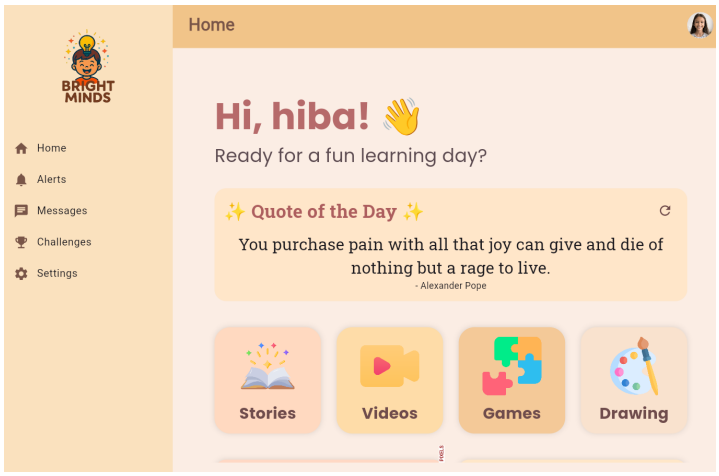


Figure 4.234: Child Home Page (Web)

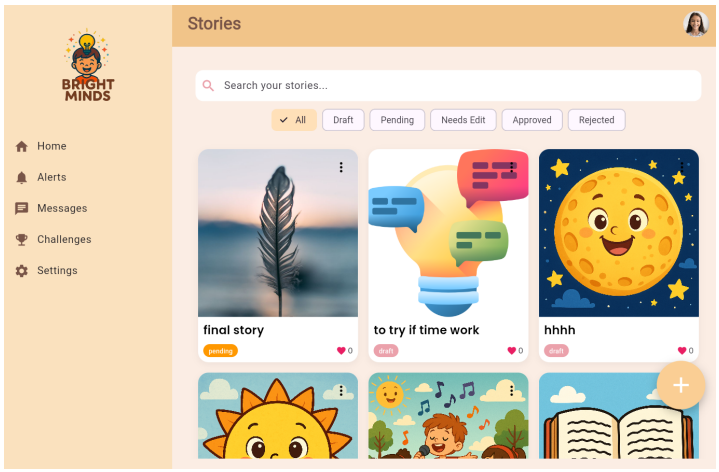


Figure 4.235: Child Story Section (Web)

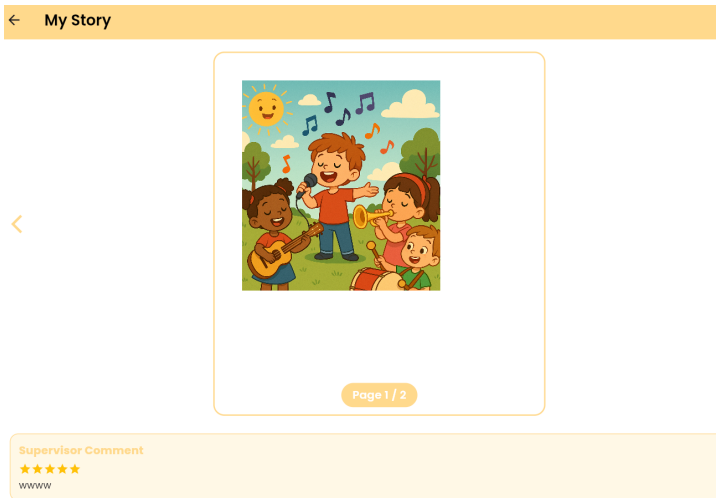


Figure 4.236: Child Story Preview(Web)

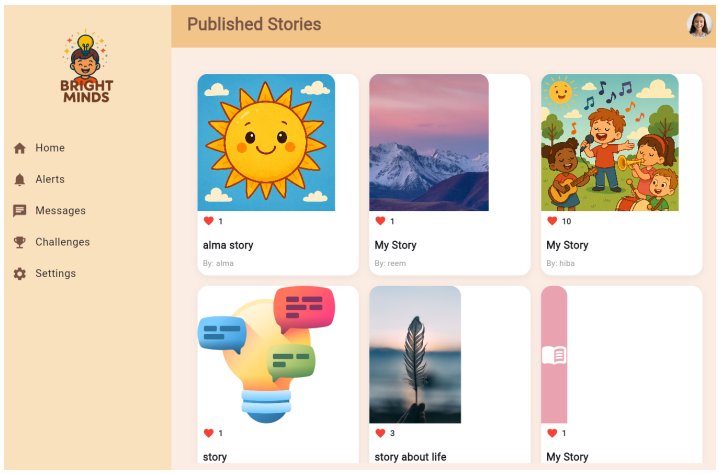


Figure 4.237: Published Stories (Web)

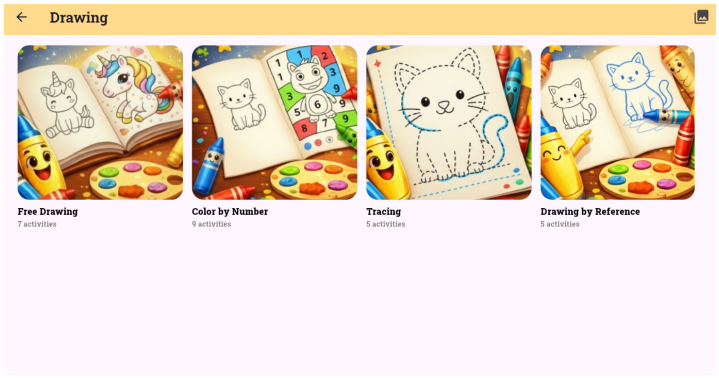


Figure 4.238: Child Drawings Section(Web)

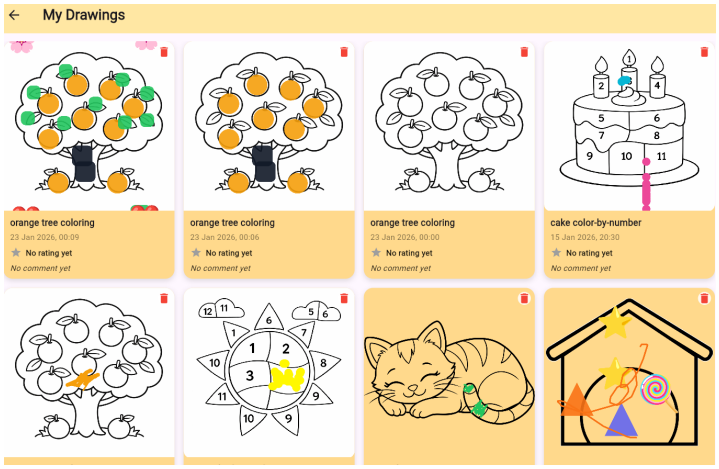


Figure 4.239: Child Drawings Preview (Web)

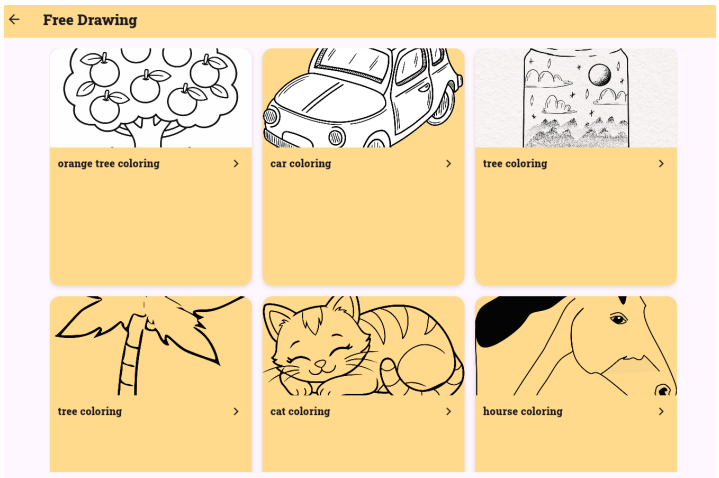


Figure 4.240: Child Drawings Activities -View 1 (Web)

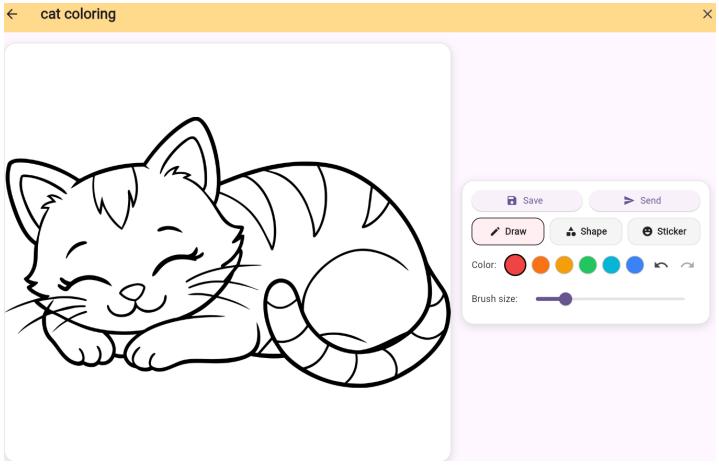


Figure 4.241: Child Drawings Activities -View 2 (Web)

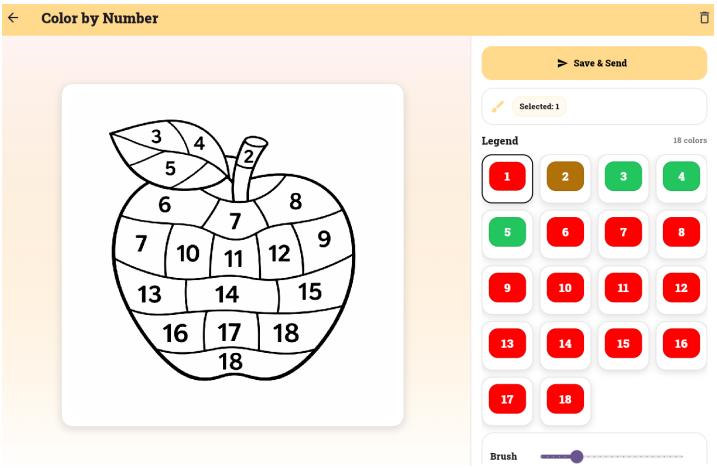


Figure 4.242: Child Drawings Activities -View 3(Web)

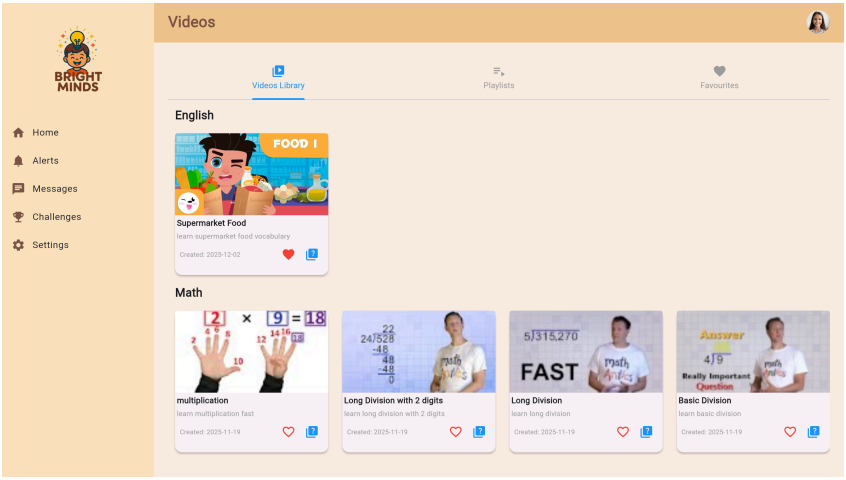


Figure 4.243 :Child Videos (Web)

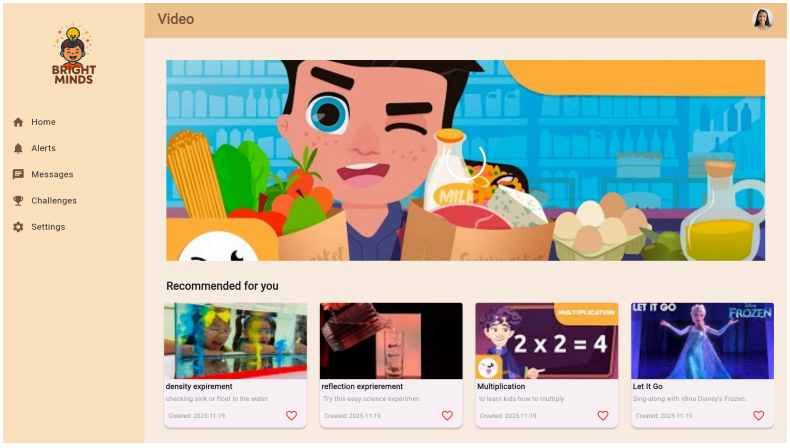


Figure 4.244: Child Watch Video (Web)

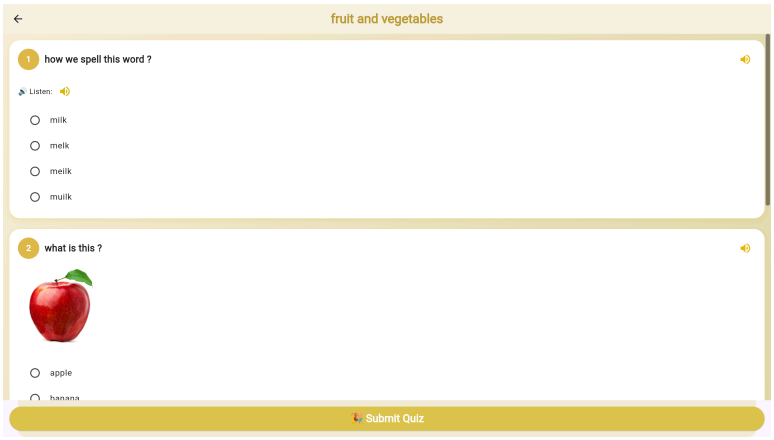


Figure 4.245: Solve Quiz (Web)

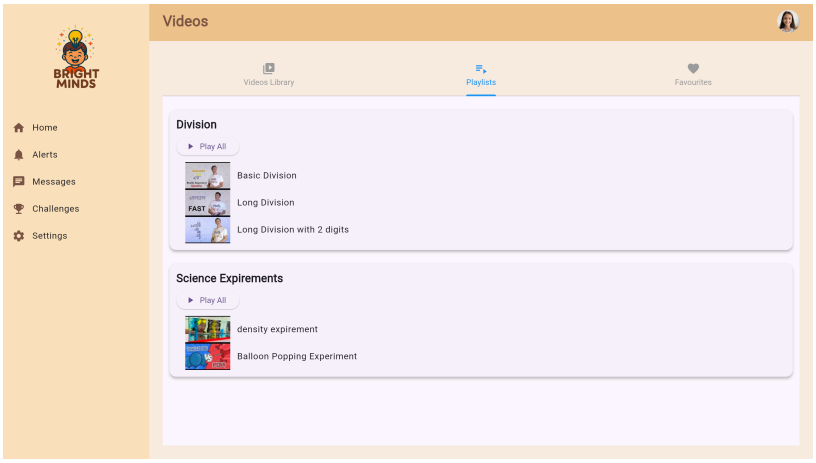


Figure 4.246: Child Playlists (Web)

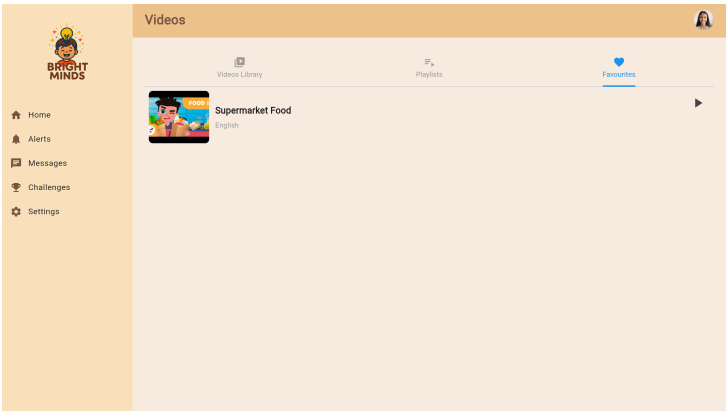


Figure 4.247: Favorite Videos (Web)

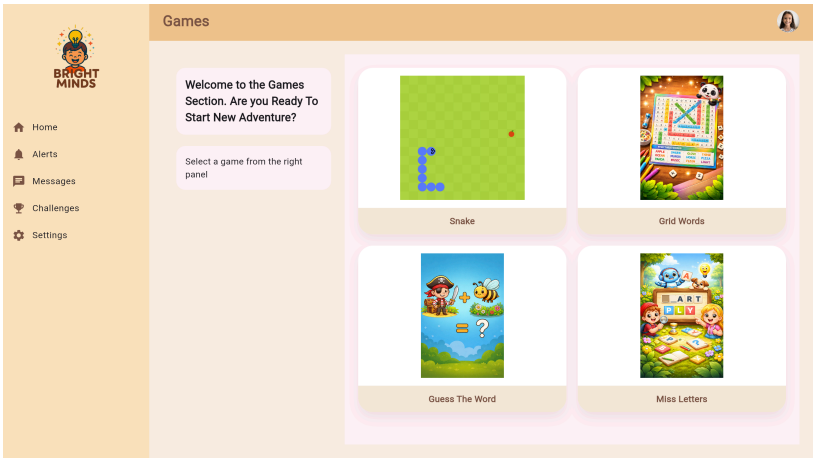


Figure 4.248: Child Game List (Web)

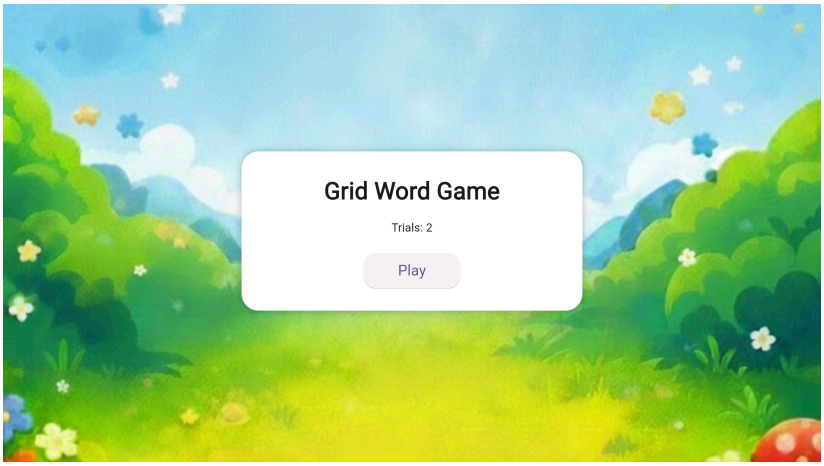


Figure 4.249: Grid Word Game Play - View 1(Web)

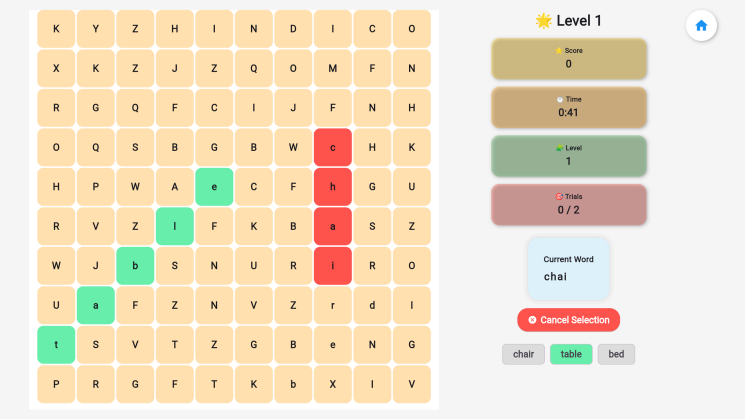


Figure 4.250: Grid Word Game Play - View 2 (Web)

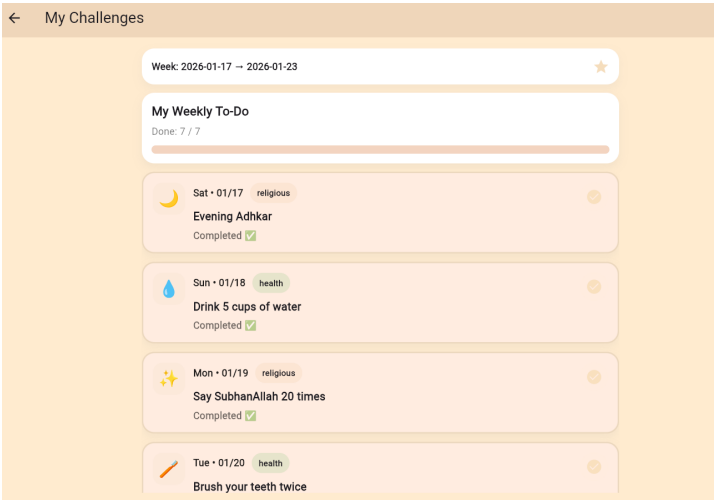


Figure 4.251: Child Challenges (Web)

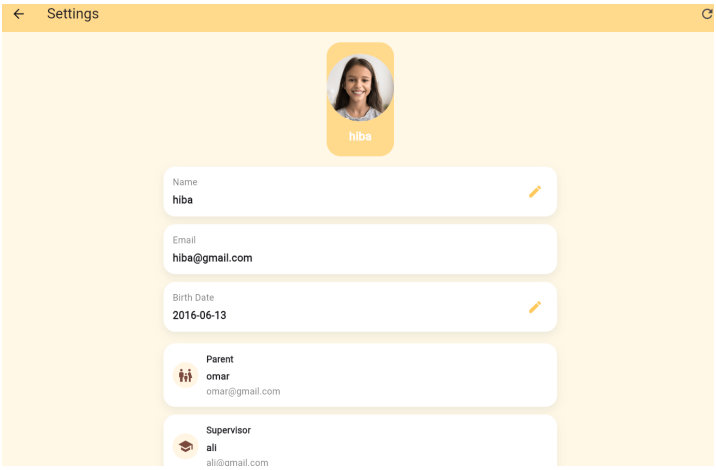


Figure 4.252: Child Setting (Web)

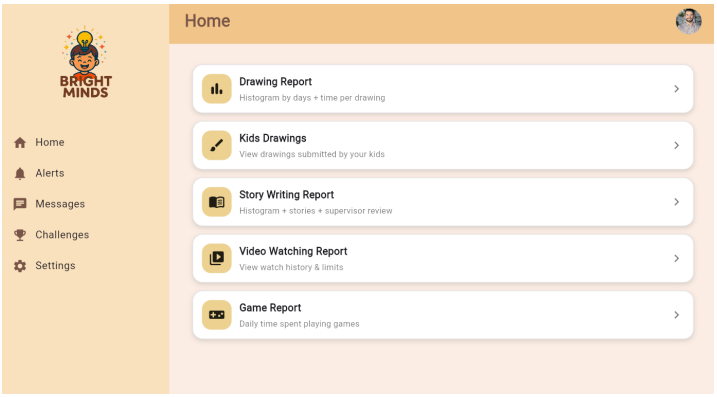


Figure 4.253: Parent Home Page (Web)

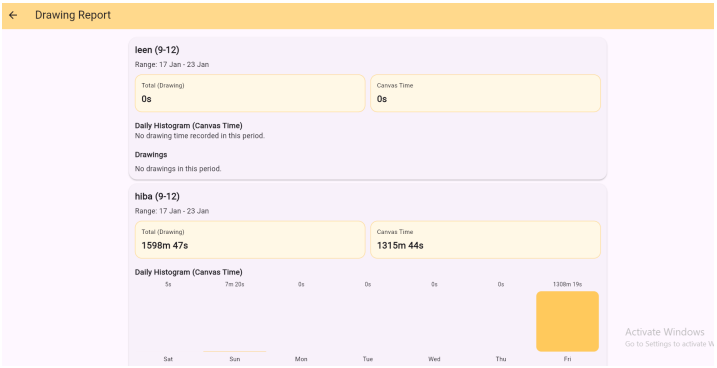


Figure 4.254: Drawing Report (Web)

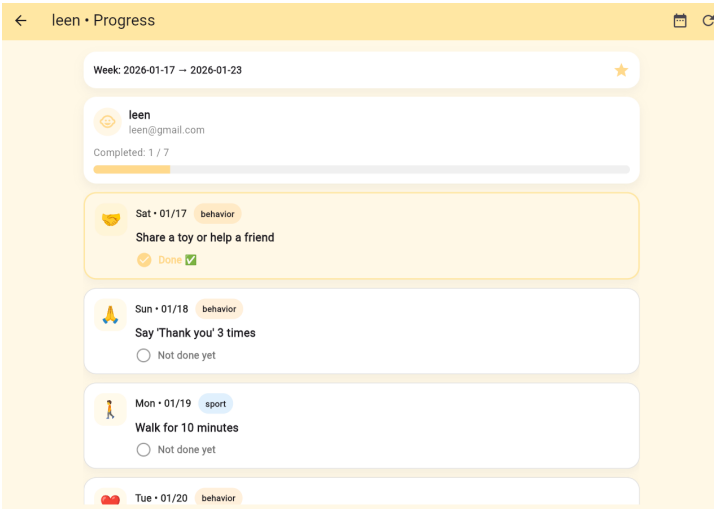


Figure 4.255: Parent Monitoring Child Challenges Progress (Web)

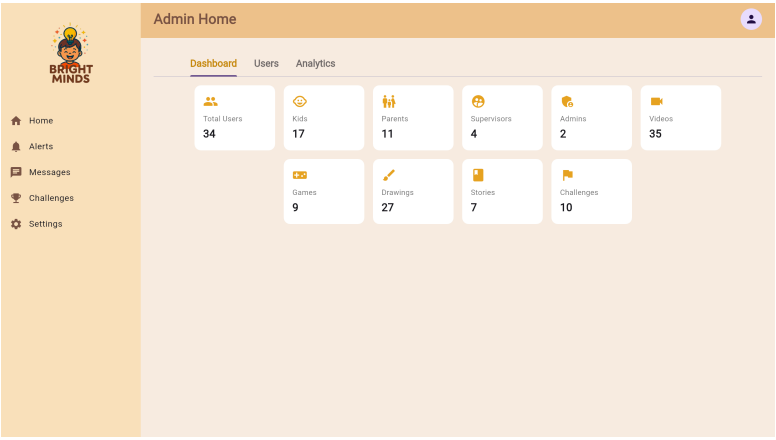


Figure 4.256: Admin Home Page (Web)

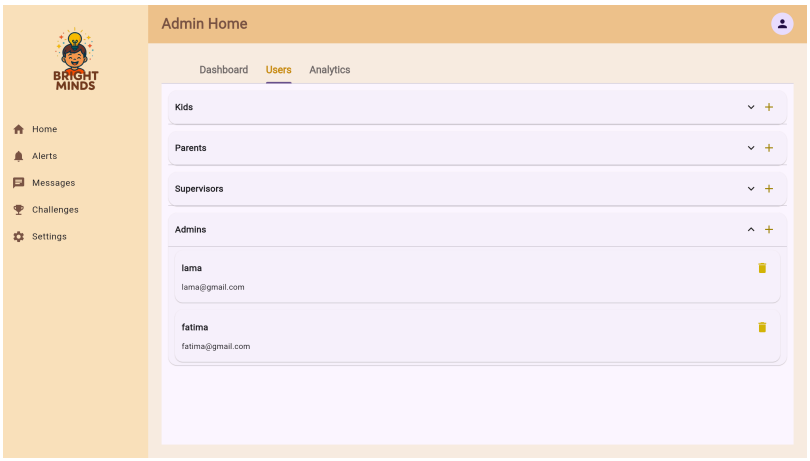


Figure 4.257: All Users Page (Web)



Figure 4.258: Admin View of User Activity Details (Web)

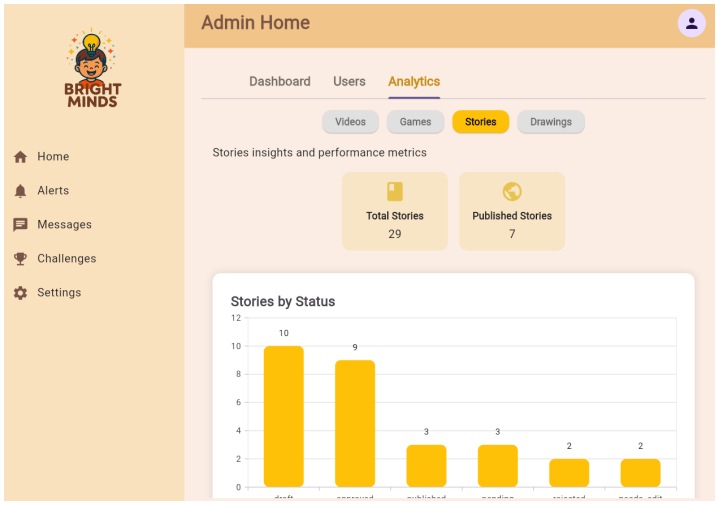


Figure 4.259: Admin Analytics (Web)

Chapter 5 :

Results and Analysis

The Bright Mind platform was successfully designed and implemented as a kid-friendly digital environment that combines entertainment, education, and content safety. The system supports four different user roles: children, parents, supervisors, and administrators. Each role has clearly defined permissions, ensuring effective monitoring, control, and content management across the platform.

For children, Bright Mind provides age-appropriate activities that include educational videos, drawing tools, games, and interactive stories, all designed to support learning and positive engagement in a safe digital space. The system enforces a daily time limitation for the videos and games sections, which helps regulate screen time and encourages balanced usage. The story section allows children to write their own original stories, which can be published on the platform and made available for other children to read, promoting imagination and peer interaction. The drawing section includes various drawing activities that enable children to create digital artwork and express themselves creatively. In addition, the challenges section was implemented to encourage good daily habits, such as learning consistency and positive behavior, by motivating children through rewards and progress tracking.

The games section is designed with dynamic content, meaning that the challenges, and experiences in each game can vary and be updated over time. Supervisors have the ability to manage and modify the content of games, ensuring they remain engaging, educational, and age-appropriate for children. This dynamic nature helps maintain children's interest and encourages repeated use while supporting problem-solving skills and active learning.

The video section is designed to allow children to watch content in a safe and controlled environment. All videos are carefully added, managed, and monitored by the supervisor, ensuring that children are exposed only to appropriate and educational media. The platform also provides the opportunity to include short interactive quizzes after videos to reinforce learning outcomes, assess understanding, and encourage active engagement.

Parents are provided with a detailed reporting system that allows them to monitor their children's activities within the application. These reports include information about videos watched, games played, stories written or read, drawing activities, and completed challenges.

Supervisors are responsible for managing and controlling the content available on the platform. They can add and manage educational videos and games, as well as monitor children's creative content, including stories and drawings, to ensure quality and content safety.

The admin role allows full control over the platform, including managing users, approving content, and maintaining overall system security. Testing results showed that the platform functions correctly across all roles, with smooth navigation, reliable access control, and clear separation of responsibilities.

Chapter 6

Discussion :

The development of Bright Mind highlights the importance of creating digital platforms that balance entertainment and education while maintaining a high level of content safety for children. By integrating learning activities with creative tools such as drawing and story writing, the platform encourages children to explore their interests in an enjoyable and productive way. This approach supports both cognitive development and creativity, which are essential during early learning stages.

An important aspect of Bright Mind is the implementation of daily time limitations in the games and videos sections. This feature helps reduce excessive screen time and encourages children to engage with the platform in a balanced manner. The time control mechanism contributes positively to children's digital well-being by preventing overuse while still allowing meaningful interaction with educational and entertaining content.

The games section is designed with dynamic content rather than static gameplay, which helps maintain children's interest and engagement over time. Dynamic games provide varied experiences and challenges, supporting problem-solving skills and active learning. In contrast, the video section is designed to allow children to watch content in a safe and controlled environment. All videos are carefully added, managed, and monitored by the supervisor, ensuring that children are exposed only to appropriate and educational media.Additionally, the platform includes the option to add short interactive quizzes after videos to reinforce learning outcomes, assess understanding, and provide immediate feedback, encouraging knowledge retention and active engagement.

The inclusion of multiple user roles further strengthens the platform's safety and reliability. Parents and supervisors play a critical role in monitoring and guiding children's activities, which helps reduce exposure to inappropriate content and supports healthy usage habits. This layered supervision model makes Bright Mind more trustworthy compared to platforms that focus only on entertainment without effective parental or supervisory control.

The challenges feature proved to be especially effective in motivating children to develop good daily habits. By turning positive behaviors into fun tasks, the platform increases engagement and helps children build discipline and responsibility in an indirect and enjoyable manner.

In conclusion, Bright Mind successfully achieves its goal of providing a safe, educational, and entertaining platform for children. The project demonstrates how technology can be used responsibly to support learning, creativity, healthy habits, and balanced digital usage in a secure environment.

Chapter 7

Conclusion and Recommendations

7.1 Conclusion

The Bright Mind platform was successfully developed as a safe, educational, and entertaining digital environment for children. It integrates learning, creativity, and content safety, providing age-appropriate activities such as story writing, drawing, dynamic games, and interactive videos. Some videos include optional short quizzes, which reinforce learning outcomes and encourage active engagement. The platform's design with clearly defined user roles — children, parents, supervisors, and administrators — ensures proper supervision, content management, and a secure experience. Parents receive detailed reports of their children's activities, including videos watched, games played, stories written or read, drawing activities, and completed challenges, allowing them to monitor usage patterns and guide engagement in an age-appropriate manner. Features like daily time limitations for games and videos, dynamic game content that can be updated by supervisors, and supervised video management contribute to balanced usage and child well-being. Overall, Bright Mind achieves its goal of fostering learning, creativity, and positive daily habits in a secure and engaging way.

7.2 Recommendations

Based on the development and testing of Bright Mind, several recommendations are proposed to ensure optimal use of the platform and maximize its benefits for children's learning, creativity, and digital well-being.

Parents are encouraged to actively use the platform's detailed reporting system to monitor their children's activities, including videos watched, games played, stories written, drawing activities, and completed challenges. By reviewing these reports, parents can guide and support their children's engagement in a productive and age-appropriate manner, reinforcing positive habits and balanced usage.

Supervisors should regularly manage and update platform content, including educational videos, dynamic games, and children's story submissions, ensuring all materials remain appropriate, engaging, and aligned with educational goals.

Children should be encouraged to engage with all sections of the platform — story writing, drawing, games, videos, and challenges — to promote cognitive and creative development in a safe and controlled environment.

Strict adherence to the daily time limitations for games and videos is essential. Once the allocated time is reached, access is automatically disabled, enforcing commitment to healthy digital habits and preventing overuse.

7.3 Future Work

Although Bright Mind successfully achieves its current objectives, several enhancements can be considered in future development to further improve its educational value, accessibility, and user engagement. One important extension is supporting multiple languages instead of limiting the platform to English only. Multilingual support would allow children from different linguistic backgrounds to benefit from the platform and significantly increase its accessibility and reach.

Future work could also include expanding the supported age groups . By introducing additional age groups, the platform can provide more personalized and developmentally appropriate content, ensuring that activities, games, videos, and challenges match children's cognitive abilities and learning needs at different stages.

Another potential improvement is the addition of a dedicated language learning section, where children can learn new languages through simple lessons, interactive activities, games, and videos designed according to specific age groups. This feature would support early language development and encourage cultural awareness.

Future versions of Bright Mind could also introduce live interactive sessions supervised by educators or supervisors. Examples include live story-writing sessions that guide children through the process of creating stories, as well as live drawing sessions that teach new creative techniques. These sessions would promote real-time interaction, collaboration, and guided learning.

Additional enhancements may include personalized learning paths based on each child's interests and activity history, allowing the system to recommend suitable content automatically. Advanced analytics for parents and supervisors could also be developed to provide deeper insights into learning progress and engagement levels.

Finally, expanding content categories and continuously adding new educational games, challenges, and creative activities would help maintain long-term engagement. These future improvements would support Bright Mind's growth as a comprehensive, safe, and adaptive educational platform for children.

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