



PWD'S Learning App

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Abstract: The goal of the proposed project is to create a mobile application specifically designed to meet the educational needs of people with impairments, with an emphasis on pupils who are blind or deaf. The program consists of two modules: a Basics of Coding module for deaf users and an English Learning module for blind users. The English module includes gamification features like levels and streak systems to increase student engagement, a voice-controlled interface to enhance interaction, and customized learning algorithms to modify the complexity of the lessons based on performance. In contrast, the Coding module makes use of a visual user interface that is accessible to students who are deaf. It does this by teaching coding principles through visually appealing material and by integrating game-like elements and individualized learning algorithms. Prioritizing inclusiveness and accessibility, both modules guarantee a flawless mobile user experience. To improve the learning process, additional features like progress monitoring and user profiles are included. Based on user input, the program will be updated and improved continuously to ensure that it continues to be relevant and successful in fostering diversity and skill development in education.

Keywords— PWD, Gamified Education, Hearing Listening and Blind problem.

I. INTRODUCTION

The proposed project aims to develop a mobile application tailored to the educational needs of individuals with disabilities, with a specific focus on blind and deaf students. The application comprises two modules: an English Learning Module designed for blind users and a basic Coding Module tailored for deaf users. The English module offers a voice-controlled interface to facilitate interaction, personalized learning algorithms to adjust lesson difficulty based on performance, and gamification elements such as levels and streak systems for engagement. Conversely, the Coding module utilizes a visual UI accessible to deaf students, presenting coding concepts through visually engaging content and incorporating personalized learning algorithms and game-like features. Both modules prioritize accessibility and inclusivity, ensuring seamless user experience on mobile platforms. Additional features include user profiles and progress tracking to enhance the learning journey. Continuous updates and improvements will be implemented based on user feedback to ensure the application remains effective and relevant in promoting skill development and inclusivity in education.

1.1 Objective

The objective of this project is to create a mobile application that addresses the educational needs of individuals with disabilities, particularly focusing on blind and deaf students. Through two specialized modules an English Learning Module for blind users and a Basics of Coding Module for deaf users the application aims to provide accessible and inclusive learning experiences. The English module utilizes a voice-controlled interface to facilitate interaction, while the Coding module employs a visually accessible UI. Both modules incorporate personalized learning algorithms and gamification elements to engage users and adapt to their learning abilities. The overarching goal is to empower individuals with disabilities by providing them with an effective and engaging platform to develop language and coding skills, fostering inclusivity and promoting educational opportunities for all.

II. LITERATURE SURVEY

Title:

Mobile Application for Disabled People [1], Sohail Abid, Shahid Abid, Tafzeel Ahmed. 2009. In their research, the authors propose leveraging smartphones to enhance the quality of life for disabled individuals. Their primary objective is to assist and uplift disabled people by utilizing smartphone technology. To achieve this, they've developed a specialized application designed specifically for disabled individuals. This app provides enhanced security and ensures swift communication between disabled individuals and their parents or guardians. Unlike other existing methods, their proposed approach is more reliable. By emphasizing quick response, reliability, and parental involvement, their solution aims to positively impact the lives of disabled individuals, contributing to an improved living standard and a sense of safety.

Title:

Text-it-Loud!: Real-time Captioning and Transcribing App for Inclusive Teaching Learning of Hearing impaired.[2], Dr. Kartick Chandra Pramanik, 2023. The paper presented an Android app "Text-it-Loud!", that primarily aimed at assisting the hearing-impaired students in classroom learning. The application converted the speaker's verbal content into text and rendered it in an elegant way as real time screen caption with the aid of "Toast" messages. Also, it provided the option of generating transcript of the session when required. The novelty of the application lies in its ability to run in the background and present the captions on top of any other application screen running in the foreground. Thus, Text-it-Loud! proves to be a viable hearing assistive technology for teaching-learning of hearing-impaired students.

III.IMPLEMENTATION

The proposed mobile application architecture presents a comprehensive approach to delivering educational content and features in an inclusive and adaptive manner. The system supports both iOS and Android platforms, offering specialized modules in English language learning and introductory coding.

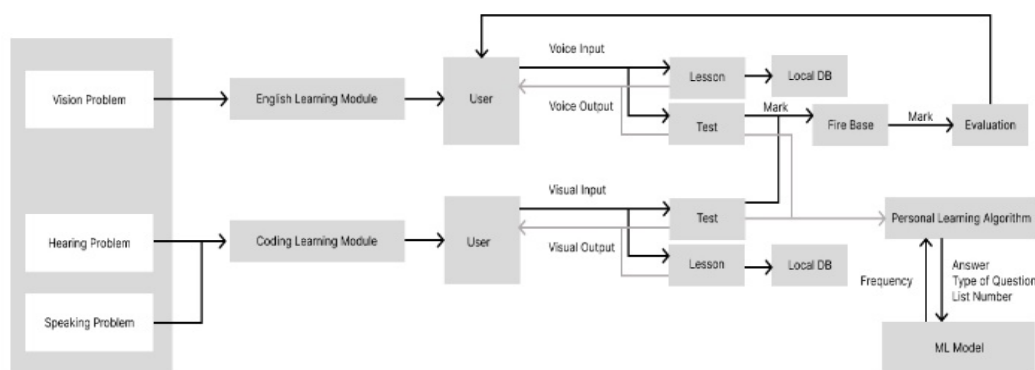


Fig. 1. System Architecture

A local database maintains a repository of all learning modules, allowing for offline access to curriculum content and user progress data. Integration with Firebase facilitates the secure storage and retrieval of test marks and evaluation results, providing scalability and accessibility across multiple devices. The personalized learning algorithm is a key component, utilizing input from the local database and Firebase to customize the difficulty level and content of subsequent lessons based on individual performance and learning needs. User interface elements are tailored to accommodate students with disabilities, such as voice-controlled navigation and auditory feedback for blind users, and visually accessible UI components for deaf users. This architecture combines local and cloud-based storage, adaptive learning algorithms, and accessible UI features to create an inclusive, secure, and effective educational platform. The below figure is the decision tree utilized in our personalized learning algorithm. This tree is instrumental in guiding the algorithm's decision-making process to tailor educational content to individual learners. Each node within the tree represents a specific condition, while the leaf nodes correspond to different classes: class 0 signifies the need for increased frequency, class 1 indicates a decrease, and class 2 denotes no change required. The red lines depict branches that do not satisfy the current node's condition, whereas the green lines signify branches that satisfy it. By analyzing these decision paths, our algorithm determines whether to adjust the frequency of current questions for optimal learning outcomes, thus enhancing the personalized learning experience for each student.

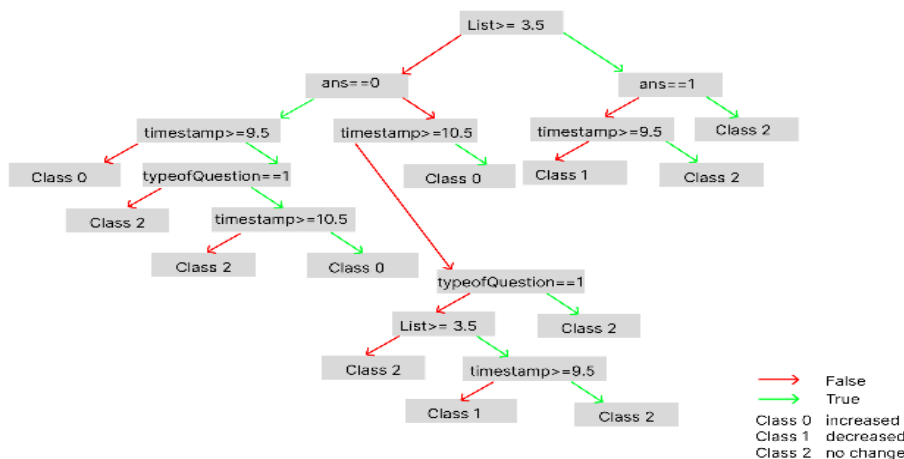


Fig. 2. Decision Tree

IV. RESULT

- Accessibility for Visually Impaired Students:** By allowing access via voice commands and providing audio feedback, your app ensures that students with visual impairments can engage with the content effectively. This inclusive approach enables them to learn English and track their progress seamlessly.
- Personalized Learning and Progress Tracking:** Incorporating personalized learning algorithms and progress tracking mechanisms empowers each student to learn at their own pace and level. This tailored approach maximizes learning outcomes and ensures that students receive content relevant to their needs and abilities.
- Streak System:** The inclusion of a streak system adds a gamified element to the learning experience, motivating students to maintain consistency and engagement with the app. This can boost motivation and foster a sense of accomplishment as students progress in their learning journey.
- Engaging UI Elements for Students with Hearing and Speaking Impairments:** The use of attractive UI elements with animations caters to the needs of students with hearing and speaking impairments, making the learning process engaging and interactive. Visual cues and animations enhance comprehension and retention of coding basics.
- Tests Based on Previous Performance:** The incorporation of tests based on students' previous performance ensures that learning materials are appropriately challenging and tailored to their individual needs. This adaptive testing approach promotes continuous improvement and mastery of concepts.

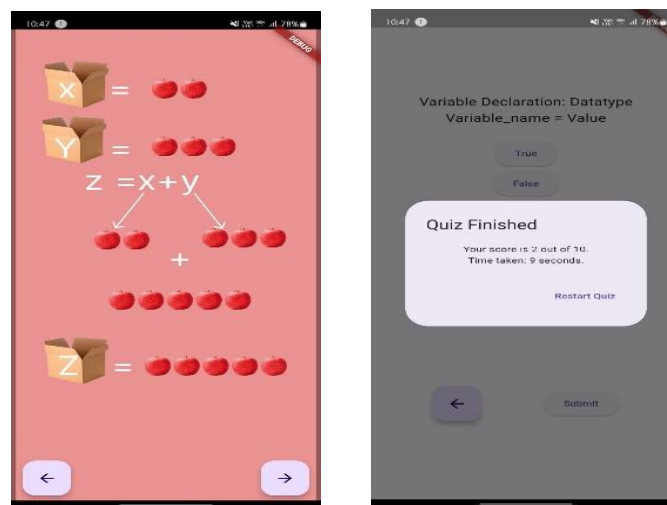


Fig. 3. Screenshots

Overall, your app embodies inclusivity, personalization, and engagement, making it a valuable resource for students with disabilities seeking to learn English or coding fundamentals. It leverages technology to create an accessible and supportive learning environment where all students can thrive and succeed.

V.CONCLUSION

In conclusion, the project presents a robust educational platform designed to provide an inclusive and effective learning experience for users. By integrating local and cloud-based storage solutions, personalized learning algorithms, and user-friendly interfaces tailored to the specific needs of blind and deaf students, the application ensures offline access to educational content, secure storage of user data, dynamic generation of learning levels, and intuitive interaction for users with disabilities. The project's architecture lays a strong foundation for future enhancements, including multimodal learning, adaptive feedback mechanisms, community engagement features, real-time progress tracking, integration with learning management systems, expanded content libraries, language localization, augmented reality integration, feedback mechanisms, and accessibility improvements. These enhancements will further enhance the effectiveness, inclusivity, and engagement of the educational application, making it a valuable tool for learners of all backgrounds and abilities. Overall, the project demonstrates a commitment to innovation, accessibility, and continuous improvement in the field of education technology. By addressing the diverse needs and preferences of learners, the application aims to empower individuals to achieve their learning goals and unlock their full potential.

VI.FUTURE ENHANCEMENT

- Language Localization:** Implement support for multiple languages to make the educational content accessible to a broader audience. This could involve translating the interface, lessons, and exercises into different languages to accommodate users from diverse linguistic backgrounds.
- Feedback and Survey Mechanisms:** Implement mechanisms for collecting feedback and conducting surveys from users to gather insights on their learning experience and preferences. This feedback can inform future updates and improvements to the application.

- c. **Expanded Content Library:** Continuously expand the content library to cover a wider range of topics and subjects beyond English learning and coding basics. This could include advanced topics, specialized courses, or interdisciplinary learning pathways to cater to diverse learning interests and goals.

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