SMART E-LEARNING ANDROID APPLICATION FOR KIDS USING MACHINE LEARNING ALGORITHMS

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Abstract: Current teaching methods have raised the ire of many parents and leading thinkers, as children are not designed to sit for long periods of time in school desks. The children need excitement, independence, and the ability to learn through play and interaction. Therefore, we are designing an eLearning platform for kids, so that they can learn basic skills such as alphabets, digits, shapes, colors, animals, birds, and flowers. Additionally, the application will include stories, poems, and general information. Children ages 3-6 years can benefit from this tool. It can be accessed for free, saving money and saving time since it can be accessed anywhere and anytime. Founded on a strong theoretical foundation, this program helps kids develop a wide range of cognitive and psychomotor skills such as drawing, writing, recognizing basic numbers, shapes, and colors, as well as logical thinking. The system uses a special algorithm to detect and guide kids to correctly write letters, without parents' assistance.

Keywords: e-learning app, Machine learning, Smart grading system

I. INTRODUCTION

It is important for children to develop their reading and comprehension skills at a young age. Each child's reading and comprehension abilities depend upon the training and background that the child receives. To help their little kids gain knowledge and become successful in their future education and career, parents must invest more time and money on materials and tools that can help them learn and become successful. Learning and teaching were more formal in the early days and took place in classrooms. However, with the evolution of technology, kids' ways of learning have changed dramatically.

Traditionally, teachers and students used a blackboard to teach and learn, but today advanced technology supports teaching and learning at any level of learning, right up to a college degree. Since the dynamic approach to teaching and learning in recent years, there has been a lot of homeschooling for kids. Additionally, over 1.2 billion children around the world have been deprived of school time due to the Covid-19. Thus, education has undergone a radical transformation, with the development of e-learning, where learning is conducted via digital means. Researchers have shown that online learning helps students retain information longer, and takes less time, suggesting that the change the Coronavirus caused might be here to stay. Our study examined how to keep kids' attention continuously while supporting their self-learning skills. We achieved this by developing an android application that incorporated all the underlying features discussed below.

II. MODULES / FRAMEWORKS USED

A) ANDROID STUDIO

Android Studio is the official Integrated Development Environment (IDE) for developing Android applications. In May 2013 Google announced Android Studio as an all-in-one IDE for developing Android apps at the Google I/O conference. With Android Studio, we are able to build apps using the Gradle build system, and we can test them on a fast and feature-rich emulator. Android Studio offers us a consolidated environment in which we can develop for all Android devices. Android Studio provides extensive testing tools and frameworks. It supports C++ and NDK, and it allows us to make changes to the resource code of a running app without restarting it. It allows easy integration of Google Cloud Messaging and App Engine, as well as support for Google Cloud Platform.

B) ML Kit API

Android and iOS developers can integrate Google's machine learning expertise into their applications using the ML Kit mobile SDK. Machine learning can be implemented in just a few lines of code regardless of whether you're an expert or a beginner. In order to get started, you don't need to have any previous experience with neural networks or model optimization. ML Kit, on the other hand, offers convenient APIs that help you integrate TensorFlow Lite models into your mobile apps if you're an experienced machine learning developer.Text must be represented by enough pixels in input images for ML Kit to recognize it accurately. Latin text should ideally have characters that measure 16x16 pixels each. Each character should be 24x24 pixels for Chinese, Japanese, and Korean text (only supported by cloud-based APIs). The larger the character, the smaller the accuracy benefit. This is true for all languages.

III. METHODOLOGY

A) Approach

Drawing, writing, listening, and recognizing situations were observed among the children. During the study, we also observed their attention span, as well as the characteristics of objects that catch their attention most. In order to stay

current with mobile technology, agile methodology was utilized in order to deliver high-quality, working software products. Due to its ability to accommodate changes at any time, agile methodology is ideal for research-based products. Having all the requirements divided into user stories makes understanding what needs to be done and the relationships between each task very easy.

B) Creating the system

Children's development in one learning domain influences their development in other domains, for instance, their language skills affect their ability to interact socially. Hence, all areas of development should be considered interconnected. By connecting learning domains, it allows children to acquire a more complete understanding of the natural world. For instance, a child learning numbers may also recognize and recognize natural objects (animals, fruits, etc). Children generally love vibrant colors, vibrant backgrounds, and nice sound clips. Each child is different. They develop skills and competencies at their own pace. This app uses fun different backgrounds, sound clips, and games to teach letters, numbers, and shapes. There are some children who may have developmental delays. This app allows kids to practice with what they don't know well. The attractive look of this app ensures they will not get bored, as shown in the following section.

C) Drawing

There are many factual reasons why art is important in children's development beyond what we feel and believe. Children learn new skills for self-expression when they create art. Art expands their understanding of the world around them. In addition to developing the right side of the brain, art develops key skills that benefit children's development. For a child, drawing is a way of expressing themselves without inhibition and of being amazed at the world around them. Humanity cannot exist without it. It also helps children improve their writing skills. While kids find it difficult to write correctly, the difficulty can be minimized by allowing them to draw whatever they want before writing. Kids learn shapes from drawing, how to hold a pencil, and how to think and be creative with it.

D) Writing

Having to write more than a few words can be exhausting for young children. It takes time to build the necessary muscle strength to do a lot of writing. For this reason, many children balk at the idea of writing more than a few words.There are a number of complex concerns involved in teaching children to write letters correctly. How to hold a pen, what to write, etc are just some of the concerns parents have to consider. In other words, improving children's writing skills is important and a challenge for parents to cope with. We have identified the necessity of teaching a child the correct way to write a particular letter. This approach has been used for This app as well. Children should be allowed to trace the letter on dotted lines after they have written that letter well. Once they have written that letter well, they will be given a free surface to write the letter they know.

It is technically challenging to write online letters. Some letters are composed of 1 line, while other letters have more than 1 line (multi-line). As an example, the letter C is written with a single line, whereas the letter A uses two lines. Each stroke should follow a correct direction, and the tool should be able to recognize it as incorrect even if the shape is correct.

C) Shapes

When kids learn shapes, they'll begin to see them everywhere. Shapes are used in everything from buildings to furniture. Several methods can be used to teach a child how to recognize shapes: showing, doing actions using the shapes, and asking questions about the shapes. The shapes that have been used to teach shapes to the kids are Circle, Triangle, and Square. The recommended shapes for kids in this age group are Circle, Triangle, and Square. Additionally, This app offers kids the opportunity to learn about Circle, Triangle, Square, Rectangle, Pentagon, and Hexagon in this section.

V. RESULT

We developed this tool to facilitate self-learning by preschoolers. Drawing, writing, counting, basic shapes and colors as well as conceptual reasoning are some of the skills kids can learn through the program. It is based on a strong theoretical foundation. Using a special algorithm, it identifies and guides the kid to write a letter in the right direction without the guidance of parents. It comes with kids-friendly navigation. We developed the tool as an Android app and tested it with focus groups. It is designed specifically to keep kids attention with its backgrounds, sounds, and colors. In the process of examining these features, we considered how they apply to manual learning tools since they illustrate drawing, writing, shapes, number manipulation, with children's interactive features like interactive interfaces, sounds, etc. The environment provides an appealing and interesting environment that can stimulate the curious mind of the child. Our app presents a useful tool that parents can use to support their young children's learning needs in a practical way.

Fig. 1 Frontpage / categories

Fig. 2 Alphabets

Fig. 3 Drawing

VI. CONCLUSION

By developing web-based learning resources in school education, we develop an app that takes a user-centered approach. School teachers, student parents, and school kids evaluated the approach in three different contexts, and further development of this approach in different school contexts is needed through constant cycles of design, implementation, and evaluation. To permit continuous improvement, it also provides re-entry points into the analysis, design, implementation, and evaluation phases. In the development phase, developers may revise objects that are essential for the learning process. Alternatively, they may return to the analysis stage to examine the context of use, influencing factors, or learning goals. Likewise, the results indicate the importance of an in-depth analysis of user needs, as well as regular and early evaluation of prototypes. Learning from technological resources in the classroom is a pedagogical approach to building educational resources for schools. We developed an Android-based based E-learning solution to address the pre-school learning gap using a content-based E-learning solution.

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