TRANSFORMING EARLY CHILDHOOD EDUCATION: AUGMENTED REALITY FOR ENHANCED SPELLING SKILLS

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Embarking on a transformative journey to revolutionize education, this research tackles the lack of interactivity in current methods for teaching letter pronunciation and word letter memorization among preschool children. Through surveys and interviews, the study uses a sample population of 120 parents and preschool teachers in Sri Lanka to determine the present difficulties. The research suggests a novel approach to improve letter recognition, letter memorization, language learning, and speech skills in kids ages 3-5 by leveraging the power of augmented reality (AR) technology. Children are taken on an immersive educational journey through the application, which begins with a gameplay mode where they can choose an animal. Once the AR mode is activated, virtual images of animals and floating 3D letters corresponding to their names are displayed. For example, the word "CAT" would be accompanied by a virtual CAT on the floor and 3D letters "C," "A," and "T" floating in the air. Using accompanying pronunciation sounds, children learn the proper letter placement and how to tap on the letters in the correct order. Feedback is given right away and shows how accurate the chosen letters were. The development process incorporates the use of Convolutional Neural Network (CNN) for precise recognition of 3D letters in the augmented reality environment. Trained on a dataset of letter images captured from various perspectives and lighting conditions, the CNN accurately identifies the associated letters. Additionally, Recurrent Neural Network (RNN) is employed to predict pronunciation based on the sequence of taps, leveraging the temporal aspect of the input to generate accurate predictions. This ensures accurate letter recognition and providing immediate feedback on pronunciation. The application underwent evaluation by fifty preschool teachers and parents. A significant number of respondents (86%), when asked about activities that taught letters within words, reported that their children were engaged and satisfied. In addition to teaching and memorizing letters, the application provides an interactive environment where students can learn in real time while associating words with objects. Aligned with traditional learning strategies, the app complemented existing methods. This positive outcome highlights the potential of the application as a valuable tool for enhancing theliteracy skills of preschool children.

Keywords: Preschool Education; Letter Memorization; Augmented Reality

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