

## Interactive Spelling Application for Preschoolers: A Journey Towards Playful Language Exploration

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### Abstract

In the realm of early childhood education, fostering effective spelling skills can be a challenge for both parents and teachers. Traditional methods often fall short of captivating pre-schoolers, hindering their engagement. Addressing this, this research endeavours to create an Augmented Reality (AR) spelling application, presenting an innovative solution to enhance the educational experience. This research introduces AR technology as a means to craft interactive and immersive learning environments, specifically aimed at boosting children's recognition and recall of individual letters within words. The core objectives encompass the identification of obstacles impeding language acquisition in early education and the development of a mobile app leveraging augmented reality to elevate spelling prowess. The research participants, comprising parents and preschool teachers from Sri Lanka, contribute through surveys and interviews. 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. This application integrates with the help of ARCore to showcase virtual 3D objects and the 3D letters forming the target word. To enable letter recognition, Convolutional Neural Networks are harnessed within the AR environment. A pre-trained Recurrent Neural Network model predicts letter pronunciation based on user interaction with the 3D letters. Ultimately, this research illuminates the potential of augmented reality to revolutionize childhood education. By offering a pragmatic avenue to enhance language and spelling learning, augmented reality technology can bridge the gap between conventional methodologies and engaging, effective pedagogy.

**Keywords:** *Augmented reality, Childhood education, Mobile application*