

# HomeSchool: An Interactive Educational Tool for Child Education

Prageeth Kekuluthotuwaage  
Department of Computing,  
Informatics Institute of Technology  
Colombo, Sri Lanka  
dprageethroshane@gmail.com

Pumudu Fernando  
Department of Computing,  
Informatics Institute of Technology  
Colombo, Sri Lanka  
pumudu.f@iit.ac.lk

**Abstract**— Due to the complexity of the modern world, parents are busy with their office work and might not have enough time to focus on their children's education. Furthermore, small children might get bored or easily lose their concentration in education due to traditional teaching methods. The purpose of this research paper is to propose and implement an interactive educational tool for child based education. This research examines the possibility of using a voice and gesture based gamification approach to make educational activities more interesting to the child. A variety of educational activities have been designed in the form of games to cover fundamental learning contents of primary education such as basic mathematics, spelling and pronunciation. An initial testing has been carried out to verify the accuracy of core functional modules including gesture recognition and voice command detection, which provided an overall accuracy rate of 84% for the gesture recognition module.

**Keywords**— *gesture recognition; child education; interactive learning*

## I. INTRODUCTION

The first teachers of a kid's life are his or her parents or grandparents. Therefore, when considering children's education, it has a close relationship with their home and family. Children's education and growth have complex and close connections with their family. Every factor of a family has a vast and practical impact on children's growth. [1].

Due to the complexity of the modern world, parents are busy with their office work and might not have enough time to focus on their children's education. In certain situations parents' level of education might not be sufficient to understand expected educational needs of a child. As a solution for such kind of problems, modern parents are more interested in sending their kids to day care centers or other pre-school educational centers.

Majority of the teachers in such educational centers mostly follow traditional educational approaches such as reading books aloud and giving exercises to convey knowledge to kids. Though these methods might work up to a certain extent, some children might easily get bored and will lose their concentration in education. Therefore, teachers are compelled to put more effort for keeping the attention of the children in educational activities.

From another point of view, the majority of kids in the modern generation tend to use technical gadgets such as smart phones,

laptops and computers from small ages. Such children get addicted to play computer or mobile games, and such games can keep their concentration for hours owing to their interactive and interesting nature. But the majority of those games are designed in a way that inculcates violence and harmful qualities in children.

The main aim of this paper is to propose and implement an interactive educational tool to address the above mentioned problems. Furthermore, this research focuses on the possibility of using computer games in a meaningful way to improve child education. Therefore, the proposed tool will use a gamification based approach to teach core concepts in children's education. Gesture and voice will be used as core mediums of interaction between a child and the functionalities of the tool.

## II. BACKGROUND

### A. Child Education in Modern Era

Children's education and growth have complex and close connections with their family. Every factor of a family has a practical and vast impact on children's growth. Of course, educational model for a family is one of the most important factors in the modern world, where parents do not have enough time to spend with kids to improve their education.

Nowadays, many people use technology and latest tech devices such as smart phones, tablet devices and computers. They use these devices to manage their busy lives as well as to connect with their loved ones. Even though these devices are used by adults, their children are also be able to control them by looking at how their parents use them. Modern day children are more exposed to the advance technology at their early ages. Experiences with the latest technology can surely pave the way for extraordinary learning opportunities. Therefore, tech devices become more user-friendly among children as well. According to Leslie and Dora [2], children who use tech devices have better skills than other kids who are not using those devices. Children who make use of technology show better language skills, intelligence, structural knowledge and problem solving skills as compared to children who do not use technology for their learning [2].

### B. Interactive Education Systems

When educating small kids, it is really hard to make them concentrate on studies. Therefore, different approaches are required to provide them with required primary education.