Universiti Teknologi MARA

EduMath: Gamified Mathematics Learning for Preschool Children

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ABSTRACT

This study explores the development of EduMath, a gamified mobile application designed to enhance preschool children's mathematics learning. Learning mathematics plays a very important role in developing mental power and skills to think analytically and most often learning mathematics in the traditional manner does not give sufficient attention to the understanding that a child has when he is acquiring knowledge of mathematics. Since the introduction of digital platforms into the learning process of children, there is an urgent necessity to enhance educational tools. EduMath tries to bridge this gap, delivering gamification elements, including points, and leaderboards, to make children involved into a dynamic process that can be called pleasant. The principal goal of such project will be to ensure that learning is interesting, encourage the active involvement and positive attitude toward math. Coming up with high quality, reliability and sustainability of the project, the Agile developmental model was used in order to enable the project to be able to be tested and very gradually improved in order achieve what the user needs are. The design of the app is simple, effective, and very easy to use, which is the key to the preschool children, aged 3 to 5, and ease of operation by children and teachers. The characteristic target of the system is to enhance children performance and their educational as well as personal development. The results show the prospects of using mobile technology and game-based learning to improve how children learn and spend their time studying mathematics, which has enormous potential to be used both in education institutions and in individual education.

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CHAPTER 1

INTRODUCTION

This chapter will discuss a background study, problem statements, objectives, scope and significance of the research.

1.1 Background

According to Hu (2024), mathematics education is important in developing cognitive and analytic skills through children's growth processes. In the exploration of mathematics, children can develop cognitive skills such as problem-solving, logical thinking, and decision-making at an early age. But the complexity of education now makes it difficult for children to study the subjects, such as the theories, the formulas, and the basic calculations, due to the traditional method. Most of the means of instruction at school still use textbook pages and worksheet paper. These methods often rely on text materials and explanations that make children struggle to understand the concepts. Hu (2024) states that despite knowing children aged 3 to 6 are in the phase of visual cognition where they need interaction, like visual information from the environment, such as pictures, videos, and colourful objects, to capture their attention and make the concepts more tangible, many educational approaches still rely heavily on text-based or passive learning methods that may not effectively support their cognitive development. The use of visual aids in teaching, even in a topic like mathematics, can go a long way toward enhancing understanding and interest. Studies have shown that most children respond positively to such visual stimuli, using them as an effective means of staying involved in learning and making the subject more enjoyable to learn.

In today’s digital age, recent studies also show that most children nowadays use technology to entertain themselves, particularly through playing games. It is one of the favourite activities that provide an exciting and leisurely environment. These games