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EDUCATIONAL MOBILE GAME DESIGN FOR CHILDREN LEARNING MATHEMATICS

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Thesis submitted to Dean of Awang Had Salleh Graduate School in Partial Fulfillment of the requirement for the degree Master of Science in Information Technology University Utara Malaysia

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Abstract

Children can learn while playing computer educational games. Therefore, it is important that educational games for children are well designed and usable. This study proposes an educational mobile game design for children to learn mathematics. Based on the design, a low fidelity and high fidelity prototypes called PreMath Operations were designed and developed. A usability evaluation was conducted on the prototypes by observing children playing with the games. The result of the evaluation suggested that PreMath Operations prototypes is usable and can help children to learn math while playing. This study provides a design strategy of mathematic educational game for children to learn in a fun and interesting.

Keywords: educational game design for children, edutainment app for mathematics, game design factors.

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Abstrak

Kanak-kanak dapat belajar sambil bermain permainan komputer pendidikan. Oleh itu, adalah penting supaya permainan pendidikan untuk kanak-kanak direka dengan baik dan boleh digunakan. Kajian ini mencadangkan reka bentuk satu permainan pendidikan mudah alih untuk kanak-kanak belajar matematik. Berdasarkan reka bentuk yang dicadangkan prototaip fideliti rendah dan fodeliti tinggi yang dipanggil PreMath Operasi telah direka dan dibangunkan. Satu penilaian kebolehgunaan telah dijalankan ke atas prototaip dengan memerhatikan kanak-kanak bermain dengan permainan tersebut. Hasil penilaian mencadangkan bahawa prototaip Operasi PreMath boleh digunakan dan dapat membantu kanak-kanak belajar matematik. Kajian ini menyediakan strategi reka bentuk permainan pendidikan matematik kepada kanak-kanak untuk belajar dengan cara yang menarik dan menyeronokkan.

Kata kunci: reka bentuk permainan berasaskan pendidikan untuk kanak-kanak, aplikasi berasaskan hiburan untuk matematik, faktor reka bentuk permainan.

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Acknowledgment

First and foremost, all praise to Allah for providing me with the strength, perseverance, and wisdom to have this work done on time.

I would like to express my deepest gratitude to my supervisor, Dr. Husniza binti Husni for her intellectual guidance and kind support given to me during the period of this study, as well as giving necessary advices and guidance and arranged all facilities to make my study (master information and technology) easier.

I dedicate this thesis to my wife Noora Mohamed and my sons (Taha and Manaf) who unremittingly supported me during my years of study. They made this work possible.

I want to express my gratitude and dedicate this thesis to my father and my mother. They are continuously praying and encourage me and expresses confidence in my abilities to complete my study.

I am deeply grateful to my family (Ibrahim, Shymaa and Hayder) for their love and support during my Master studies. I truly could not have achieved this milestone without their support.

I am also grateful to my uncles (Prof. Dr. Riyadh Khaleel and Dr. Nazar Abdulminum) for helping and inspiration and for their praying throughout my study.

I say thank you to the staffs of School of Computing, College of Arts and Science, University Utara Malaysia and those that contributed indirectly towards the success of my studies.

Thank You All.

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CHAPTER ONE

INTRODUCTION

1.1 Overview

During the past years, there has been an increased in the use of digital technology and social networks. These technologies are also starting to play bigger parts in teaching students from pre-school to higher education (Garrison, 2011; Laurillard, 2005). Mobile communication devices are one of the most important and popular technologies among people nowadays. The functions of mobile communication devices have now gone beyond the traditional communication role which they used to play. It could now be used for teaching and learning as well (Mtega, Bernard, Msungu, & Sanare, 2012). These days, children use mobile phones mostly for entertainment purposes; many of them play games regularly. Given the importance that some of these games have in stimulating and promoting children's skills, the researchers are looking into the utilisation of such games in education and learning (Durkin, Boyle, Hunter, & Conti-Ramsden, 2015). Because of the mobile game industry continues to thrive and the increasing demands and growing markets have made it possible for mobile game developers to come up with numerous mobile games (Amory, & Seagram, 2003). Moreover, with the recent technological advances, digital games have become new tools for teaching as well (Frost, Wortham, & Reifel, 2008).

According to Van Eck (2006), learning through games is a method that has been in used in education for decades. Today's generation of students can access technological advancements like computers, mobile phones, digital music and video players, and video games among others. These gadgets can be used as tools for

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The contents of the thesis is for internal user only

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