UNIVERSITI TEKNOLOGI MARA

THE IMPACT GRAPHICAL USER INTERFACE IN GAME DESIGN ELEMENTS OF A MOBILE AUGMENTED REALITY (MAR) PLATFORM WITH A GAME-BASED APPROACH ZAPWORKS TOOL TO IMPROVE DIPLOMA STUDENTS' DESIGN SKILLS IN CREATIVE MULTIMEDIA TECHNOLOGY (CMT) OF HIGHER EDUCATION

FASEHAH BINTI ABDULLAH

Thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy
(Arts and Design)

College of Creative Arts

April 2024

ABSTRACT

Qualitative thematic analysis for graphical user interface as in game design elements of a mobile augmented reality (MAR) platform to discover and analyse 12 respondents' responses as primary data collection and meta-analyses from previous researchers and current MAR game designs as secondary data collection. The significance of this research is to assist AR beginners or students at the Diploma in Higher Education level to create a positive impact when designing their initial MAR games based on their understanding and practical design skills at the Body of Knowledge (BOK) level. The main problems of this research it is essential to analyse appropriate fundamental graphical user interfaces as in game design elements for mobile augmented reality games, especially students at the Diploma level in Higher Education, in order to complying with MQA Programme Standard. The research aimed to bridge the gap between elements such as interactivity, functionality, bugs and errors, and selection of design elements in generating MAR games using AR development tools such as AR Toolkit and ZapWorks platforms, especially for amateurs, and this aimed to align with the research objectives of this research. Qualitative thematic analysis was performed using purposive sampling to obtain primary and secondary data with the assistance of NVivo instruments, including primary data collected from four different batches focus groups due to most of private institution combines all different batches in one class with same assignment brief and rubrics, and additionally, secondary data from meta-analyses and systematic reviews conducted by previous researchers and established MAR games. The results of the data collection revealed that the most suitable AR development tool that can help students improve their design skills when creating MAR games is ZapWorks. In addition to that, the results show that the design sample of the graphical user interface consistently utilised only four GUI elements, including 2D graphic design, 3D models, text, audio or sound, and video elements. Meanwhile, the data collection results revealed that the design sample for suitable criteria in game design elements consistently utilised only three design elements, namely level, point, and score. The conclusions drawn from these findings will serve as fundamental guidelines for students and particularly educators when incorporating these findings into their lesson plans (Course Learning Outcomes, CLO). Moreover, this evaluation instrument can be utilised in the Creative Multimedia Technology (CMT) BOK to assess Game Art areas for beginners at the Diploma level in MAR game creation. For future recommendations, this course be implemented in MOOCs and micro-credentials are innovative learning platforms for online students. Next, highlighted in the new enhancement of Bartle theory for AR beginners' guidelines to create MAR game such as Achievers and Killers in levels, points, and scores for game design elements, and additionally, incorporating elements for Explorers and Socialisers in text, video, audio, sound, and video within the graphic user interface.

Keywords: Graphical user interface in game design elements, MAR games, AR beginners, AR development tools, BOK, and Higher Education.

ACKNOWLEDGEMENT

First and foremost, I want to thank Allah SWT for providing me the strength to finish my thesis in the time allocated, despite the many difficulties I have encountered during my PhD during the previous four years.

Second, I would like to express my gratitude to my supervisor, Assoc. Prof. Ts. Dr. Azhar Bin Abd Jamil, and my co-supervisor, Dr. Mohamed Razeef Bin Abdul Razak, for their guidance, belief in me, patience, and moral encouragement in completing my thesis.

Finally, I am grateful to my wonderful parents and family especially to my beloved sisters for constantly motivating me to accomplish my thesis. Special appreciation to my colleagues, students, personal therapy, best friend, and friends who assisted me greatly, either directly or indirectly. I had a lot of emotions during my PhD journey, and I will preserve all the memories in my heart.

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1.1 Research Background

This the dissertation thesis employed qualitative thematic analysis for mobile augmented reality (MAR) game design to analyse and evaluate from respondents' response as primary data and meta-analyses from previous researchers and existing MAR game design as secondary data collection by employed qualitative thematic methods. This statement aligns with De Araújo et al. (2022) stated that this research exhibits a method to reveal the information gathered from players so that the game designer may implement established indicators to enhance choice-making and then optimise the game design of the analysed game.

According to Asimakopoulou et al. (2022) clarified thematic analysis was implemented to discover and analyse patterns in the information gathered. Elsharkawy et al. (2022), the responses were analysed through a thematic review of the content.

Thematic analysis is described as an approach for analysing, finding, and accessing to better information (elements) inside personal information (Braun and Clarke, 2006). The findings of this investigation are anticipated to assist game creators in more efficiently investigating new possibilities from an entertainment standpoint (Ri et al., 2022).

Lazim and Abd Rahman (2015), as a developing country, Malaysians' awareness of AR technology is only approximately 40% recorded and acknowledged. Despite Malaysia's insufficient information and technology, the findings show that participants are eager to learn more about AR technology.

According to Perkins (2020), the smartphone, which is in the pockets of 3.2 billion people, or almost 45% of the global population, is by far the most common augmented reality gadget.

People may download applications to reorganise furniture in their homes, visualise fashion purchases, try out new cosmetic looks, or play games that capture virtual objects in their area with a few clicks.

With potential applications ranging from video games, sports, and entertainment to education, healthcare, and emergency planning, smartphone alternatives could