

**BREAK FREE: THE IMPACT OF PUZZLE ADVENTURE GAME  
USING WORKING UNDER PRESSURE STRATEGY**



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**



BREAK FREE: THE IMPACT OF PUZZLE ADVENTURE GAME USING  
WORKING UNDER PRESSURE STRATEGY

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This report is submitted in partial fulfilment of the requirements for the  
Bachelor of Information Technology (Game Technology) with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
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2021

## DECLARATION

I hereby declare that this project report entitled  
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is written by me and is my own effort and that no part has been plagiarized  
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I hereby declare that I have read this project report and found  
this project report is sufficient in term of the scope and quality for the award of  
Bachelor of Information Technology (Game Technology) with Honours.

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SUPERVISOR : \_\_\_\_\_ Date : 3 SEPTEMBER 2021  
(TS. DR. MUHAMMAD HAZIQ LIM BIN ABDULLAH)

## DEDICATION

To my beloved parents, lecturers and friends who have encouraged and supported me,  
thank you for making it possible for me to finish this project.



## ACKNOWLEDGEMENTS

I would like to thank Ts. Dr. Muhammad Haziq Lim Bin Abdullah for giving assistant to complete this project successfully. I am thankful to my lecturers and friends who help and guide me completing my project development.

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Thank you for everything.



## ABSTRACT

Puzzle adventure game is a game where it focuses more on puzzle in adventure game. Dealing with pressure can lead to stress and it is crucial to cope with it. This study focused on students skill on dealing with pressure situations through a puzzle adventure game at the same time enhancing their soft skills. Testing was conducted for players to experience pressure situations through puzzle adventure game and questionnaires were given to collect data. Moreover, interview will followed up after they completed the questionnaire in order to get justification based on their answers in questionnaire and observation. In testing, most participants struggling with the time pressure in the video game as it affected their performance. However, the time pressure was argued to be the motivation to solve all puzzles and a good mechanic to visualize pressure situation in the video game. These results shown both time pressure and puzzles in the game were a combo that trigger certain skills in dealing with pressure situations. Through this study, it will lead to the perception of the impact of the pressure situation to the community and how to deal with it using working under pressure strategy.

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## ABSTRAK

Permainan *puzzle adventure* adalah permainan di mana ia fokus kepada unsur teka-teki dalam permainan pengembaraan. Menangani situasi yang tertekan boleh membawa stres dan adalah penting untuk mengatasinya. Kajian ini fokus kepada kemahiran pelajar dalam menangani situasi yang tertekan melalui permainan *puzzle adventure* pada masa yang sama, meningkatkan kemahiran insaniah. Sesi percubaan dijalankan untuk pemain alami situasi yang tertekan dalam permainan *puzzle adventure* dan borang soal selidik akan diberikan untuk mengumpul maklumat. Tambahan pula, sesi temuduga akan dilakukan untuk mendapat justifikasi atas jawapan mereka berdasarkan borang soal selidik dan data pemerhatian semasa mereka bermain permainan tersebut. Kebanyakan peserta bergelut dengan situasi yang tertekan semasa bermain oleh kerana ia menjejaskan prestasi mereka. Walaubagaimanapun, mereka menyatakan bahawa tekanan masa yang wujud di dalam permainan merupakan motivasi untuk menyelesaikan semua teka-teki dan merupakan mekanik yang bagus untuk menggambarkan situasi yang tertekan di dalam permainan video. Keputusan menunjukkan bahawa tekanan masa dan unsur teka-teki di dalam permainan video dapat menonjolkan kemahiran tertentu dalam menangani situasi yang tertekan. Melalui kajian ini, ia akan memberi pemahaman berkenaan impak situasi yang tertekan terhadap komuniti dan cara untuk menanganinya dengan menggunakan strategi bekerja dibawah tekanan.



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**LIST OF ABBREVIATIONS**

<b>3D</b>	-	<b>Three Dimensional</b>
<b>FYP</b>	-	<b>Final Year Project</b>
<b>GDD</b>	-	<b>Game Design Document</b>
<b>GDLC</b>	-	<b>Game Development Life Cycle</b>
<b>PC</b>	-	<b>Personal Computer</b>
<b>UE4</b>	-	<b>Unreal Engine 4</b>
<b>VR</b>	-	<b>Virtual Reality</b>
<b>MCO</b>	-	<b>Movement Restriction Order</b>



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## CHAPTER 1: INTRODUCTION

### 1.1 Project background

Break Free is a puzzle adventure game where the players are required to solve the puzzles as they have to survive and escape from the hidden tomb. There will be 3 levels of puzzle that player need to solve. By solving the puzzle, player will be able to get key to unlock next level. Moreover, while player solve the puzzle, they need to be aware of the sound that will be played at certain interval to tell player they have little time to go back to the safe room. Otherwise, they will die and re-spawned to the safe room. This project focus on students around 15 to 30 years old.

This game is inspired by Enigma Escape of VRChat which is a VR multi-player game where players need to work together in order to escape and players need to use the randomized dice to unlock certain doors in which the symbol on the randomized dice needs to be matched with the symbol on the door to get to the keys to escape. On the other hand, Break free is a single player game and players need to solve the puzzle in each rooms in order to escape the tomb.

## 1.2 Problem Statement

There is no exception as everyone has to deal with pressure both in their personal and professional lives. It often happens outside of our control such as unexpected events and changes. Not to mention, COVID-19 pandemic largely affect student due to academic workload, environmental pressure and separation from institution in which pressuring them and lead to stress. Worst case, they might decided to give up right away and eventually, cannot help themselves but to panic and become ineffective rather than try to cope with it. Hence, which is why this project will be developed to see whether the players able to keep their composure on how to handle the pressure while performing given task.

## 1.3 Objectives

- i. To identify working under pressure strategy for puzzle game development.
- ii. To develop puzzle game based on identified strategy.
- iii. To evaluate the puzzle game through player's performance.

## 1.4 Goals and Genre

The goal of this project is to study the impact of the pressure on player while playing puzzle adventure game as it consists of three different types of puzzle. In addition, they can also experience the pressure thus, developing critical thinking and soft skills.

Genre of the game is a puzzle game where player have to solve the puzzle by going through each rooms to progress and escape the tomb.

## 1.5 Game features

This project targets students, focusing on age around 12 to 30 years old. The rule of the game is simple where player have to complete all puzzles in each room in order to win the game. As players try to solve the puzzle, they have to deal with time limit. It is a major part of the game play to see how player perform and solve the

puzzles while being under pressure. Moreover, there will be traps to make it challenging for player to complete the puzzle and at the same time to survive.

## 1.6 Conclusion

In conclusion, this chapter describes the whole idea of this project and expected to achieve all the objectives stated especially to study the impact of the pressure on students while playing a puzzle adventure game. In addition, using video game especially for this purpose is enjoyable and suitable to envision pressure situations for students in a more interactive way.

In the next chapter, literature review will be explained and also give a view of how the proposed game is different from other games as well as the development process.



## CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

### 2.1 Introduction

Pressure lead to stress among student is crucial especially when they deal with the academic workload be it assignments, projects, exams and tight schedules of classes. Not to mention, students have to divide their time between study, family and their needs. There are a lot of ways to deal with pressure and it depends on how one can cope with it without feeling too overwhelm or panic. Strategy and skills are needed in order to fight the feeling and not let the pressure situations have control. Rabi Afram (2013) mentioned that the puzzle is a significant element in creating conflict in single player games while adventure game setting creates the world that the player is going to explore and experience. Moreover, video games have been successfully applied to identify innovative ways to deal with real-world problems (Marchand and Henning-Thurau, 2013). Hence, this project proposed a puzzle adventure game in order to study how players deal with pressure situations as they perform their task and achieve the goal.

#### 2.1.1 Literature Review

In the literature review, there are three (3) findings:

*i. Video games are beneficial tools to visualise pressure situation among students*

Haak et. al (2009) demonstrated that different kind of game content able to measure the pressure situations among students. For example in their study, the car driving simulation able to detect stress level during the trial among students. In other studies, M. A. de Jong (2011) stated that the use of video games is potential to improve pressure situations especially for motor skills among students. For example,

participants experience moments of high and low threat pressure or anxiety in a 3D puzzle game while performing DSP task in which to proceduralised the motor skills. However, Porter and Goolkasian (2019) mentioned that the fighting and puzzle video game had an effect of stress outcome. This happen when participants who received threat instructions believed the game was more demanding before and after the game, and they believed they were less skilled after playing the game could contribute to the stress level. Therefore, a game developer is crucial to design an appropriate game content to measure pressure situations among student to avoid the increasing of stress level.

- ii. *Escape game is potential to explore the impact of pressure situations and analyse human's performance, critical thinking and soft skills among students.*

Room escape games are meant to not only serve as an entertaining way but they also aimed at testing and developing the players' analytical, observational, organizational and communication skills, as well as critical thinking, creativity and ability to cooperate with others and function effectively as a team (Heikkinen & Shumeyko, 2016). In addition, Jansen (2018) stated that an escape room setting can be a sufficient setting to identify choking under pressure such as that pressure in an escape room causes people to perform worse than they beforehand attended in which no pressure presented. Ouariachi & Elving (2020) demonstrated that the sense of urgency and risk motivated players to engage with escape game's content and completed the tasks. For instance, escape game is puzzle-solving and it required critical thinking since players need to use different approaches to knowledge to advance in the escape game. In previous study by Nicholson (2015) also stated that designers of escape rooms need to consider how they are conveying a sense of player agency and adventure throughout their experience. Hence, escape game is a decent choice to induce pressure situation as well as investigate what kind of pressure that affects human's performance.

- iii. *Time pressure element is important to be parted of game mechanic in video game that can measure player performance.*

Young et. al. (2011) applied time pressure in a first person shooter game to produce a different form of stress and found out that quicker decisions would result

in fewer cause-effect instances being observed thereby creating a detrimental effect on performance. For example, participants were required to make a decision which one is the correct one under time given in order to progress to the next level. On the other hand, the addition of time pressure would manipulate the level of cognitive challenge within the game because the player is not only required to complete more actions per time unit, but to maintain immersion (Cox et. al., 2012). Jansen (2018) highlighted that people performed worse under high levels of time pressure than in situations with moderated time pressure in general. Ouariachi & Elving (2020) stated that the time pressure allowed players to feel the urgency to take action in real life understanding that it was not too late to slow the pace of climate change as long as they acted quickly. In fact, Pater (2020) demonstrated pressure situations by using escape games in which usually involved very simple information, since players had a limited capacity for processing large quantities of information under time pressure and without clear guidance. As a result, implementing time pressure is indeed an effective way to observe how player perform their task/playing video game while feeling overwhelmed/being under pressure.

## 2.2 Genre

This game genre is a puzzle game where it focuses mainly on puzzle-solving. This game is designed with a series of puzzles for players to solve in each room and make a progress in order to reach the victory. Moreover, the sub-genre for this game are puzzle adventure as player solve and escape room

## 2.3 Existing games

### 2.3.1 Comparison of existing games

- i. Fun Escape Room Puzzles: Mind Games, Brain teasers

Fun Escape Room Puzzles: Mind Games, Brain teasers (as in Figure 2.1, 2.2 and 2.3) is an escape room game where player have to unlock 100 doors and solve all puzzles and riddles. The puzzles consist of mini brain games such as hidden object puzzle, math logic, cracking codes, brain quizzes and water games in order to unlock the door. This game can be downloaded at Google Playstore

and available only for Android. This game is available for multiplayer mode where players can compete with their friends online; first to unlock the 100 doors, win.



**Figure 2.1: Fun Escape Room Puzzles: Mind Games, Brain teasers (Source: Google Image)**



**Figure 2.2: Breaking Code (Source: Google Image)**



**Figure 2.3 Finding hidden objects (Source: Google Image)**

ii. The Room

The Room (as in Figure 2.4, 2.5 and 2.6) is a 3D puzzle game that features number of physical mechanism where player basically have to figure out how to solve the puzzle boxes. This game is available on Android, IOS, Nintendo Switch and PC. The goal of this game is to unlock each puzzle box. In addition, this game mechanic is unique as player have to use a special lens to see hidden symbol by manipulating the view in order to align certain symbol. As player made a progress by solving the puzzles, they will discover the storyline of the game through notes that they found.



**Figure 2.4: The Room (Source: Google Image)**