

University Teknologi MARA

**Enhancing Physical Exercise with
Gamification by Using Arduino**

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ABSTRACT

This research was conducted to improve people's lifestyle that has been misleading to unhealthy way. There are some paper reveals that people nowadays had less exercise because of something that cannot be prevented such as bad weather condition or with busy work life. Based on research conducted by Farezza (2017), obesity rate for our country is more than half population. Hence, to tackle this problem, a solution must be come up to keep maintain our health despite any obstacle that will come anyway. So, another research has been conducted to find out what sports that people used to do during their break time especially teenagers. Most teenagers like to spend their time by playing video game either on their personal computer or mobile phones. After that, a solution had arisen from those researches and find out that it is better if this sport can be related to exercise by connecting exercise bike and game with arduino leonardo. Then, a very simple game has been constructed to test the functionality of it by using unity3D.

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CHAPTER 1 – INTRODUCTION

1.1 Introduction

This chapter is where the requirement study begins. It will explain what the actual problem that currently happened is in daily life. Nowadays, everything that exists in this real world, there is a group of people will make it approach in more interesting ways. Technology advancement is the cause of this situation and most people like to relate or make it into some game. Game based learning is what people keep addicted until some of them make it as their main income such as through tournament like e-sports tournament.

1.2 Problem Statement

This study would like to encourage people to participate in physical activity despite their busy life from study to work.

Study found that Malaysia has more than half of population facing an obesity problem with a 13.3 per cent for obesity while 38.5 per cent is for overweight (Farezza,2017). It means that they lack of physical activity participation. This is due to many common barriers that people face nowadays such as lack of time, lack of motivation or energy or frequent work or leisure travel (Breaking Down Barriers to Fitness, 2017). Exercise can be done both outdoor and indoor. Due to barrier as mentioned, some of people do an exercise indoor or at gym rather than outdoor. Much equipment has been ready to use for indoor exercise such as treadmills, exercise bicycle and more. However, Branch (2017) mentioned that riding a exercise bike solo can bring boredom.

Therefore, this study attempts to input some fun elements in terms of gamification on the exercise bicycle to get rid of their boredom and to encourage them to do exercise indoor.

1.3 Objective

The objectives of this project are:

1. To investigate connecting a speed detector for exercising cycling into a game.
2. To develop an interactive game that can be controlled by exercise bicycle.
3. To test the functionality of the prototype in the game.

1.4 Scope

The target users for this project are elementary school students from 10 years old and above who already learned how to pedal and workers and students who have lacked of time to do outdoor exercise. Then, from system perspective is exercise bicycle for pedalling, speed detector tools to detect speed from pedal, if the pedal meter is high, then the bicycle will run faster on this game project.

1.5 Significance And Benefits

Gym owner can attract more people to use their facility. Meanwhile, user will gain new experience when playing exercise bicycle at home or gym and it can help user with exercise without knowing it because they immerse to the game. Other than that is it can help user get rid of boredom when exercise alone. Furthermore, it will help user exercise while playing games and probably will reduce their weight and get healthy.