DESIGN AND IMPLEMENTATION OF A MATHEMATICS E-LEARNING WEB APPLICATION GAME

BY

ANDREW TEMILOLUWA

MATRIC NO: 248253

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**CHAPTER ONE**

# **INTRODUCTION**

# **1.0 BACKGROUND OF STUDY**

Games are usually played during leisure to stave off boredom. They may also help in training the mind. Such games are called “Mind development games”.

Mind games are created for the sole purpose of mental growth. They challenge the limits of the human mind and stimulate mental growth through the use of puzzles. The can serve as a great way to increase the retentiveness and quality of human learning. In other words, they are a means of exercising the brain.

Today, brain games are no longer a unique concept for improving your mind skills. It has become the need of the hour for the present time.

Over the years, your brain cells gradually lose their ability to remember things. In order to keep your memory sharp and husky, play mind development games as they will benefit you a lot in this regard.

They will improve your IQ level, logical reasoning skill, analytical skill, cognitive ability, retention power and most importantly improve your reflexes.

# **1.1 EXISTING SYSTEM**

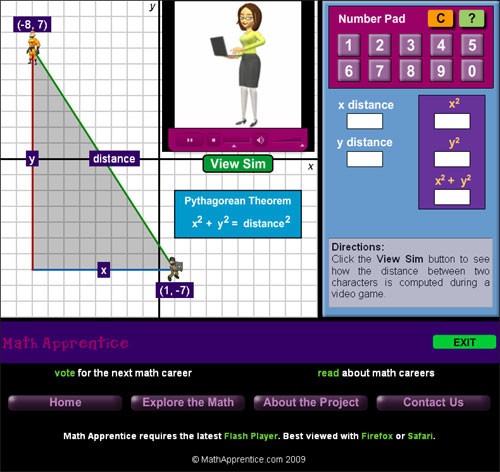
Currently, there are thousands of teaching related to various subjects in school. Educational games can easily be categorized into short-form to long-form.

1. Short-form games provide focused concepts and the tools to practice. They can be completed within a classroom time period and are often available to schools as part of collections to be selected as curricular needs arise.
2. Long-form games are more grounded in research and align more naturally with new common core standards, focusing on higher order thinking skills. These games require anywhere from a few hours to a few weeks to play and encourage a much deeper level of student experimentation.

# **1.2 PROBLEM OF EXISTING SYSTEM**

The root problem is that many developers prioritize teaching over creating fun and engaging experiences. Education-focused games often rely on written explanations and hint systems to compensate for its flawed design. Another common error of these educational experiences is that they cover a large conceptual space instead of focusing on specific concepts/skills.In short, "teaching games" set out to recreate the classroom experience in game form, meaning they carry over all of the flaws and shortcomings that come with the contemporary classroom experience.

If there is poor design, the game will not be fun, and then students will not play it. Additionally, if the game is too heavily focused on educational aspects: will result in lukewarm reactions from patrons. This is especially more critical in mathematical games.



**1.3 STATEMENT OF THE PROBLEM**

Giving players unnecessary hints or pushing the player a certain direction communicates to the players that he is dumb, even though in reality the game is just flawed. In educational games which awkwardly inject new concepts every level, players cannot dive deep enough into gameplay to hone their skills and achieve mastery.

# **1.4 PROPOSED SYSTEM**

The proposed system will design and implement a mathematical-based game e-learning web application game that will be user-centered, fun to play, engaging and yet deliver its educational benefits.

As educational game designers, we need to make sure we are following established game design knowledge to make quality learning games. One design mantra some e-learning developers ignore is to **respect** the player. Another important mantra is to have focused, tight gameplay which interesting dynamics may emerge from. This means to respect the player's intelligence by allowing him to explore and play the game as he likes. The recommendations for many developers is to not over “gamify”.

# **1.5 ADVANTAGE OF PROPOSED SYSTEM**

The main advantage of the proposed system is the development of a greater interest in active learning by the students. It will make learning a lot easier, fun and efficient.

# **1.6 AIM AND OBJECTIVES**

# **1.6.1 AIM**

The aim of the project is the design and implementation of a mathematics e-learning web application game.

# **1.6.2 OBJECTIVES**

The objectives are to:

1. Develop a fun learning game.
2. Encourage learning through the game.
3. Make learning easier through the game.
4. Serving as an aid to classroom learning.
5. Satisfying the user.

# **1.7 SIGNIFICANCE OF DESIGN**

The project will make learning among students fun and increase their overall confidence in their knowledge. The game provides an aid in learning and also as a means of erasing boredom. It can also help in improving understanding of topics in school by providing a wider concept.

# **1.8 SCOPE OF DESIGN**

The project is a small-scaled, beginner-level one with simplified goal of aiding classroom learning. It is aimed at secondary school students and consist a set mini-games. The objective of the game is to test aid the user’s calculative abilities.

# **1.9 LIMITATIONS, TIME, FINANCES AND CONSTRAINTS**

As a result of the importance of classroom learning, the game will not serve as an alternative but rather as an aid. The development time might be a bit long as a result of a lack of sufficient programming experience and knowledge. The development cost is not expected to be high since the project is a small one. The main constraint will be the need to acquire more knowledge additional programming languages.

# **1.10 DEFINITION OF TERMS**

* **Teaching game –** Refers to a game that aids in the learning process of an individual or explains an entirely new concept.
* **User-centered** – Focused on the satisfaction of the user.
* **Gamey** – Having a fun feeling similar to that of a typical game.
* **Active learning** – Participating in academic activities with the aim of learning,
* **Mantra** – A guideline or watchword.
* **Mind development games –** Similar to teaching games, aimed at developing the mind.

# **CHAPTER TWO**

# **LITERATURE REVIEW**

# **2.0 INTRODUCTION TO EDUCATIONAL E-LEARNING GAMES**

In recent years, instructors have been confronting a technological training revolution driven by the use of digital technology to deliver instruction. The value of games as a vehicle for teaching concepts while inspiring students is now well accepted at almost all levels of education. The challenge is that many professors lack the opportunity, experience, or understanding to utilize digital games within their classrooms. Instructors cannot be expected to embrace games as a tool for learning unless they have a sound understanding of the potential of games and the confidence in their abilities to employ them.

In the classroom, e-learning is fast paced and fun, which supports creative energy and student participation. E-learning experts state “forty years of research says yes, games are effective learning tools. People learn from games . . . and they will learn MORE from a game than from other forms of learning”.

# **2.1 CONCEPTUAL REVIEW**

# **2.1.1 MATHEMATICS E-LEARNING PLATFORMS**

E-learning simply refers to learning through electronic media, especially the internet. There are many examples of e-learning for math, and many more ideas are coming through the pipeline. In the next 10 years, there will be even more ways of learning math on the internet.

# **2.1.2 EXAMPLES OF MATHEMATICS E-LEARNING PLATFORMS**

Photomath, for example, is an app for the iPhone that allows the student to take a picture of a math problem. Then the program solves the problem, listing the steps, which helps the student understand the correct way of completing it.

Learn Alberta is another website that uses interactive elements to make math more fun. An example of one of their programs is their game that helps students learn fractions. It allows the student to make smoothies based on the correct fraction needed. There are many games of a similar nature on the internet, as well as fun videos, that attempt to make the subject more interesting for students.

# **2.1.3 DESCRIPTION OF HOW MATHS E-LEARNING GAMES WORK**

A lot of math e-learning games try to incorporate elements that come from video games. It has been shown through research that the most popular video games are interactive and involve employing creative strategies to be successful. It is these elements of a math e-learning games interactive that make it so popular with students.

An example of a maths e-learning game is “Water Rafting: Cube Roots”. Students get a chance to hone their number sense skills with this eighth-grade math game all about cube roots. In this fast-paced learning adventure, Water Rafting: Cube Roots, learners will practice quickly determining the cube roots of various perfect cubes while racing their opponents to the finish line.

# **2.1.4 ADVANTAGES OF MATHEMATICS E-LEARNING GAMES**

Games play an important role in active participation of learners and support various learning goals. Maths e-learning games have positive effects on cognitive skills such as logical skills, practical use, problem-solving, reasoning, creative thinking and overall achievement. There are a few studies that have examined the effects of playing mathematics games on the development of problem-solving skills and academic achievements of students. Mathematics e-learning games make learning and solving mathematical concepts easier and a lot more fun.

Integrating maths games into classrooms in schools have supported the development of problem-solving skills and academic achievements of students. According to teachers and students, mind games positively contributed to problem solving skills and enhanced the learning of subject matter more effectively by practicing learnings with fun.

# **2.1.5 HISTORY OF E-LEARNING GAMES**

# **2.2 THEORETICAL REVIEW**

# **2.3 EMPIRICAL REVIEW**

# **2.3.1**

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