



## **Developing an Game-Based Learning System for Students**

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### **A Introduction to Computing Project**

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## CHAPTER 1

### THE PROBLEM

#### 1.1 Introduction

In today's generation, game-based learning has become one of the most popular ways to improve how students learn. Many studies show that when lessons are placed in a game format, students become more active, motivated, and excited to participate. According to several educational researchers, games help improve memory, problem-solving skills, and interest in lessons because they allow students to explore, experiment, and learn at their own pace. Literature also highlights that game-based learning supports different types of learners, especially those who find traditional lessons difficult or boring. Digital games provide challenges, rewards, and instant feedback—features that help students stay focused and engaged. With technology becoming a normal part of daily life, schools are now encouraged to adopt learning systems that meet the needs of modern learners. Because of these findings, game-based learning has been recognized as an effective approach to strengthen understanding, improve participation, and create a more enjoyable learning experience inside and outside the classroom.

Despite the availability of technology, many students still struggle to stay motivated in traditional classroom environments. Lessons that rely mainly on textbooks, lectures, and written activities often fail to capture the attention of learners who prefer interactive or visual experiences. This leads to low participation, difficulty understanding lessons, and poor academic performance. Some students also feel anxious or pressured in a typical classroom setup, making it harder for them to learn comfortably. Teachers face challenges as well, especially when trying to keep students focused and interested during lessons. These problems show that the traditional approach is no longer enough for today's learners, who are used to dynamic and fast-paced digital activities. Without a learning system that matches their interests and learning styles, students may continue to experience boredom, lack of confidence, and reduced motivation. This situation creates a strong need for an educational tool that can make learning more exciting, interactive, and meaningful for both students and teachers.

To address these challenges, the proponents proposed this system because an interactive game-based learning platform can provide a more engaging and effective way of teaching academic subjects. This system offers a fun learning environment where students can answer quizzes, solve puzzles, and complete challenges related to their lessons. Through its interactive design, students receive instant feedback, earn points, and track their progress, helping them stay motivated and aware of their improvement. The platform also encourages active participation and reduces stress, since students can learn at their own pace while enjoying the activities. Teachers benefit as well, because the system allows them to monitor student performance and identify areas that need more support. With its combination of technology, education, and entertainment, the Academic Game Learning System serves as a modern solution to improve interest, understanding, and overall academic performance. It aims to create a learning experience that is enjoyable, student-friendly, and aligned with today's digital generation.

## **1.2 Statement of the Problem**

### **General Problem**

The main problem that led to the development of the Academic Game Learning System is the low level of student engagement and motivation in traditional learning environments. Many students find it difficult to stay focused during lessons that rely only on textbooks, lectures, and written activities. This often results in poor understanding of topics, reduced class participation, and lower academic performance. Because the learning methods do not match the interests and learning styles of today's digital generation, students lose interest easily and do not fully develop their skills. The proponents proposed this system because there is a need for a more interactive, enjoyable, and effective way of helping students learn their lessons.

### **Specific Problems**

- Students spend too much time trying to understand lessons using traditional methods. The slow and repetitive nature of textbook-based learning makes it hard for students to stay focused and absorb information. Many learners struggle because they cannot easily relate to or visualize the lessons. In addition, the lack of interactive activities causes students to lose motivation, which affects how much they learn in each class.

- Teachers encounter difficulty keeping students engaged during lessons. Teachers often struggle to maintain students' attention when the learning environment is not interactive. In many cases, students become bored or distracted because the activities are not stimulating enough. This also makes it harder for teachers to check understanding, manage the class, and ensure that all learners are participating actively.
- Students do not receive instant feedback, which slows down their learning progress. In traditional classroom setups, feedback is often delayed because teachers need time to check activities, quizzes, and assignments. This delay prevents students from knowing their mistakes right away, which makes it harder to improve quickly. And so on, this slow cycle leads to confusion, lower confidence, and difficulty tracking academic progress.

### **1.3 Objectives of the Study**

#### **General Objective**

The main goal of this study is to create a Game-Based Learning system that helps students learn in a fun, interactive, and easier way. It aims to make lessons more enjoyable, improve understanding, and help teachers give learning activities in a modern and engaging platform.

#### **Specific Objectives**

- To make learning more fun by turning lessons into simple and interactive games.
- To help students understand topics better through activities that let them practice and learn at their own pace.
- To give teachers an easier way to check student progress through automatic scores and results.
- To encourage students to stay motivated by using rewards, levels, or points in the learning game.
- To reduce boredom during lessons by using a system that keeps students active and involved.

### **1.5 Scope and Limitations**

## Scope

- The system provides an interactive Game-Based Learning platform where students can learn through quizzes, activities, and simple educational games.
- The system allows teachers to create, upload, and manage learning games based on their lessons or topics.
- The system gives instant scores and feedback to help students understand their mistakes and improve their learning.
- The system includes a reward system such as points, badges, or levels to motivate students to participate and stay engaged.
- The system offers a dashboard for teachers to view student performance, progress, and game results.
- The platform is accessible to authorized users such as students, teachers, and school staff.
- The system provides a user-friendly interface that can be used on computers or mobile devices.

## Limitation

- The system does not replace formal classroom teaching and will only serve as a support tool to make learning more engaging.
- The platform cannot work without a stable internet connection, as all activities and data need to be accessed online.
- The system does not include advanced subjects or complex game designs; it will only focus on basic and simple learning games.
- The system cannot automatically check long written answers; it will only handle quizzes, multiple-choice, true/false, and simple activity types.
- The system will not cover student discipline, attendance, or other school-related records outside the learning platform.
- Only authorized users can access the system, and it cannot be used by those without permission from the school.

## **System Requirement**

The Academic Game-Based Learning System requires both hardware and software tools to work properly. For hardware, the system needs a device such as a desktop, laptop, tablet, or smartphone with at least a dual-core processor, 4 GB RAM, and a stable internet connection to load the games smoothly. If the school will host the system, a server with an Intel Core i5 processor, 8 GB RAM, and 500 GB storage is needed to support users and store data safely.

The system must support the main functions, including student login, game access, scoring, progress tracking, teacher game creation, and admin management. It should load pages in 1–3 seconds, protect user accounts with secure passwords, and offer a simple, mobile-friendly interface that is easy for students and teachers to use.

## Flowchart

