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# Letters Learning Game for Young Low Skilled People

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***Abstract***

*Using game in learning becomes one of the most successful approaches in learning nowadays, due to its effectiveness in learning. It is proved that students who learn from game performed better than traditional learning style. Letters web learning game for young over age student is a 2D learning web game, that is suitable for learn young student with low learning skills (over age students) English letters. It improves the student ability to recognize letters' shapes, spelling, and writing in an exciting way. The game is implemented using PHP, JavaScript, HTML, CSS and a Phaser library.*

***Keywords:*** *Game-based learning, traditional learning, browser game, web games*

## 1. Background

Web based games is one type of web applications which become one of the most popular applications now. A browser game is a computer game that is played over the Internet using a web browser [1]. Browser games can be run using standard web technologies [2] or browser plug-ins. The creation of such games usually involves use of standard web technologies to provide a backend. Browser games include all video games genres and themes and can be single-player or multiplayer. Browser games are also portable and can be played on multiple different devices, web browsers, and operating systems [3].

Browser games are often free-to-play and do not require any client software to be installed apart from a web browser or browser plug-in. In some cases a game may be free, but charge for extra in-game features. Multiplayer browser games have an additional focus on social interaction, either between several players or on a massive scale. Due to the accessibility of browser games, they are often played in more frequent, shorter sessions compared to traditional computer games [4]. Since browser games run isolated from hardware in a web browser, they can run on many different operating systems without having to be ported to each platform [5].

Browser games can take advantage of different technologies in order to function. Standard web technologies such as HTML, CSS, PHP, and JavaScript can be used to make browser games, but these have had limited success because of issues with browser compatibility and quality. These technologies, collectively termed dynamic HTML, allow for games that can be run in all standards-compliant browsers [6]. In addition, dedicated graphics technologies such as SVG and canvas allow for the fast rendering of vector and raster graphics respectively [2], while WebGL allows for hardware-accelerated 3D support in the browser [7-8] as shown in Table 1.

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**Table 1. Comparison of Web Technologies used in Web Games [7]**

| | Chrome | Firefox | Internet Explorer | Opera | Safari |
|---|---|---|---|---|---|
| **SVG** | Yes | Yes | Yes | Yes | Yes |
| **Canvas** | Yes | Yes | Yes | Yes | Yes |
| **WebGL** | Yes | Yes | Yes | Yes | Yes |

As described by [9], there are many advantages of web applications such as zero install, reduce business costs, quick and easy updates, availability, *etc*. Online gaming can quite literally make the whole world your playground. The same games are available throughout the world, and anyone can join in. There is a list of some of the advantages of web games [10] such as:

- Relaxation and escape: Gaming can be a amazing approach to rest plus abscond, in prudence, besides can still guidance cultivate our health horizontals furthermore original thinking likewise.
- More realistic gaming experience: In numerous online games, you're playing into factual, thinking beings, instead than a computer's synthetic understanding, which compels for a plus sensible gaming skill
- Free games: Numerous online gaming locations give plain, unrestrained games paid for by publicity.
- Educational benefits: Gaming can be informative furthermore can promote unfurl reflexes. Numerous games are forthwith created to rescue nurture side thinking, flourish your rote also flat acquire you fitter.

The only disadvantage of web games is it can take you away from your works hours and hours.

To clarify, Game Based Learning (GBL) is when games are used to balance the learning of subject matter through game play with specific learning outcomes in mind. Brain-based learning research tells us that being active in and around rigorous learning can help keep students energized in the learning. During the activity, oxygen-rich blood flows to the brain, which increases the ability to concentrate [11].

To progress in a game is to learn; when we are actively engaged with a game, our minds are experiencing the pleasure of grappling with (and coming to understand) a new system. This is true whether the game is considered "entertainment" (*e.g.*, World of Warcraft) or "serious" (*e.g.*, an FAA-approved flight simulator).

The implications of delivering game experiences for education and training are enormous. In the US, nearly 170 million people played computer and videogames in 2008, spending a record $11.7 billion. Harness the power of well-designed games to achieve specific learning goals, and the result is a workforce of highly motivated learners who avidly engage with and practice applying problem-solving skills [12].

The following table (Table 2) concludes a comparison between the game-based learning and the traditional learning in terms of passive training methods such as classroom lectures and online "click through" tutorials, and game-based learning.

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**Table 2. Traditional Training vs. Game-based Learning [12]**

| | Traditional Training (lectures, online tutorials) | Game-based Learning |
|---|---|---|
| Cost-effective | X | X |
| Low physical risk/liability | X | X |
| Standardized assessments allowing student-to-student comparisons | X | X |
| Highly engaging | | X |
| Learning pace tailored to individual student | | X |
| Immediate feedback in response to student mistakes | | X |
| Student can easily transfer learning to real-world environment | | X |
| Learner is actively engaged | | X |

## 2. Introduction

This paper focuses on the implementation of letters texture learning game for inexperienced over age learners. It is a 2D learning web game, that is adequate for learn young student among despondent learning finesses (over age students) English letters. It enhances the student ability to recognize letters', patterns, spelling, including an exciting interaction between the learner and the game.

### 2.1. Problem Statement

There are some difficulties listed below that mentioned by [13] are needed to be solved in this research:

1. How to make the problem reach the student with low learning ability in an easy way?
2. Less of attention of the student.
3. Getting bored and inactive with the teacher.
4. Difficulty of using an active way such as games in learning at the class room due to crowded classes.

### 2.2. System Objectives

1. Let the information reach the mind of the student in an easy and exciting way.
2. Help the teachers in learning by provide a supported tools which not require the presence of the teacher.
3. Take advantages from the audio and vision stimuli of the game to encourage learning.

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4. Take advantages from the high attention and concentrate which the young people give to a game.

5. Made the system available anytime and anywhere.

### 2.3. System Idea

Using game in learning become one of the most successful approaches in learning nowadays, due to its effectiveness in learning which proved through many experiences which show that students who learn from game performed better than traditional learning style. Moreover, no matter which type of questions in the test paper, game learners performed better than traditional learner [14]. The visual and auditory stimuli from computer games motivate students to play. With suitable amount of learning ingredient added to the games, games can be very effective teaching tools.

Compared with the traditional teaching approach, students in the classroom listening to the teacher's explanations, and then carried out the work under the guidance of teachers. However students may somehow feel boring. Hence, the idea of my proposed system is to combine of web/browse game to learning by providing a tool that not require the presence of the teacher with the student. Choosing web games has an advantages which not require any additional software and no installation, just connect to the internet to be reachable.

### 2.4. System Description

My game is considered in teaching only English letters, each letter will be covered at one level, and each level consists of three stages with different learning skills each. The first stage supports the recognition of the letter shape and pronunciation, the second stage supports the writing of the letter, and finally makes sure that the letter becomes familiar to the student through encouraging the learner to choose the right letter from a group of letters in a time limit. The game provides the facility if the learner wants to exist and comeback later to complete the rest.

## 3. The System Design and Implementation

The overall diagram of the proposed system is illustrated in Figure 1. The Figure shows the class diagram of the game and the relationships between its components.

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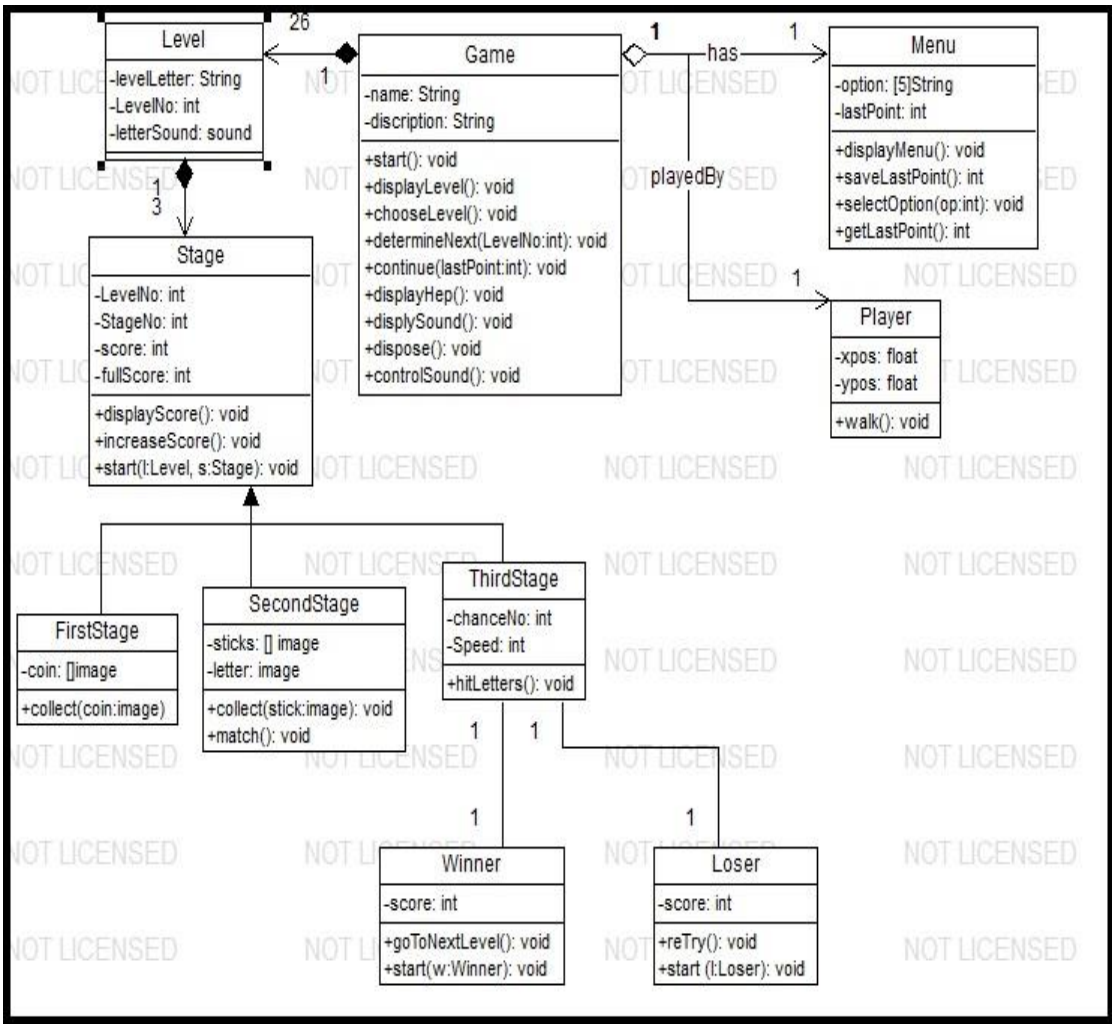


**Figure 1. Class Diagram**

Several programs are implemented to dedicate the proposed gaming system such as:

1. Visual studio program to edit the game code,
2. Tiled program to prepare the layers at first stage of each level,
3. Photoshop CS6 program to design and edit images, and
4. Real Player and online text to speech program to edit sounds of the game.

The following subfigures of Figure 2 show the graphical user interfaces of the proposed game which are executed on a core i3 - 2.20 GHz processor and Windows 7 operating system.

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(a) Starting Game Interface


(b) Listening Story - Part 1 Interface


(c) Listening Story - Part 2 Interface


(d) Choosing Player Character Interface


(e) Level Selection Interface

(f) First Stage Playing Interface

(g) Second Stage Playing Interface


(h) Third Stage Playing Interface

**Figure 2. Graphical User Interfaces**


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(i) Final Stage Playing Interface


(j) Winner Interface


(k) Exit Interface


(l) Menu Interface


(m) Control Sound Interface


(n) Help Interface

**Figure 2 (*cont.*). Graphical User Interfaces**

Many problems are tackled during the testing of the proposed game, which described as follows:

1. Code optimization: Reducing the number of stages is a challenge task. As for example, we have started using 78 stages which make the work really hard because if to correct an error we need to go through many stages and a lot of lines in the code is repeated more and more. Therefore, we have successes in reducing the 78 stages into just 3 stages as depicted in Figure 3. This is achieved by the collection of the things that differ from stage to another and passing them before calling the stage as global parameters.

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**Figure 3. Code Optimization**

2. Design attraction is achieved by the following:

   – At the first stage, it was quite bored to come and play the first stage each time with the same design. So different design is provided (different arrangement of tile) at each time the first stage started as shown in Figure 4.


**Figure 4. Stage 1 Before and After**

   – At the second stage, two types of flowers are added instead of one, one of them match the right place in the letters and the other which the player need to remove it and put it at the waste box. Wrong placements of flowers ignores previous correct placements, leading to increase the time of the game as shown in Figure 5.


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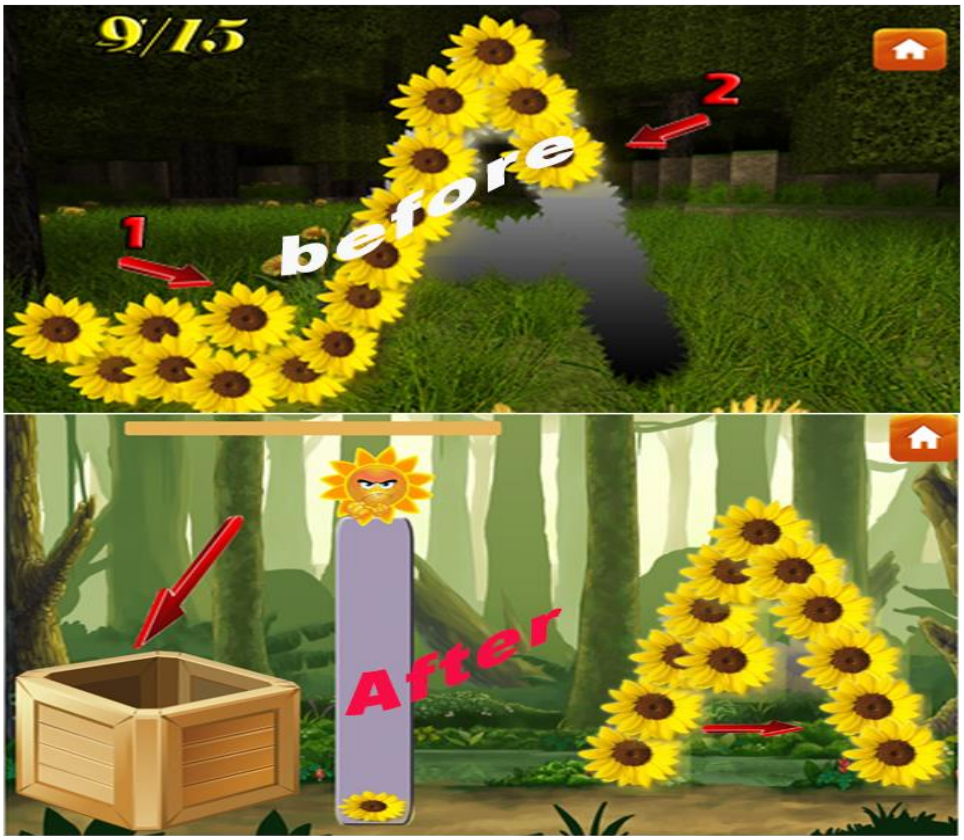


**Figure 5. Stage 2 Before and After**

– At the third stage, the first challenge the player is getting 10 correct from 15 chances allowed. The second challenge is to control the speed of the randomly appearance of letters from the holes, so after each hit the speed will increase and the letter will take less time above the hole.

The game is tested and executed successfully under different browsers such as Chrome, Internet explorer, and Mozilla at any platform.

## 4. Conclusion and Future Work

### 4.1. Conclusion

The proposed game is meant for learning young people with low learning skills through playing, very different from traditional learning. The main objective of this game is to provide a new learning method with an entertainment and motivated environment take an advantage of the nature of young people, because they love play, love exited thing and getting bored of prompting way.

The main reason of choosing web-based games is to reach a large area of people due to the availability of internet and computers everywhere nowadays. In the proposed game, the player learns in 3 stages. The first is for the reorganization of the letter, the second is for learning how to write it, and the last stage is to verify that the letter is correctly recognized by the player.

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### 4.2. Future Work

- Making the game support large scope of learning materials such as lowercase letters, grammar learning, mathematical expressions, *etc*.
- Adding portal gate for parents and/or teachers to get a feedback report for their children or students progress.

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