

# Coding Champs based on Unity Game Engine

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**Abstract**—Over the past years, there is a lot of increase in learning of block-based programming that helps in early learning and thinking and deploying of programming for small kids. Block-based programming is very good and effective for kids of age group between six to fifteen years and also the Visual IDE helps the age group children to quickly grasp the logic, coding the program and solve the given problem. This proposed system helps in exploring the learning of code based programming using coding champs between the groups of age of six to fourteen years. The overview of the children is that they are too happy to learn programming using coding champs. The children feel that this programming language is easy and fun-loving. The children feel that they should enroll in more apps like these and should take part in programs like these if the schools offer which might help them to excel more in block or code base programming. The things told and found in these proposed systems are not totally accurate and therefore more details are needed to find in-order to conclude it[1].

**Keywords**—Block Programming, School, Children

## I. INTRODUCTION

This proposed system describes the process involved in making the prototype of the 3D game with the help of blender. Using Unity and blender together, there is a 3D game where the objective for the user is to learn easy coding based on the game. This proposed system discusses the game overview, including the description and game play, and focuses on the game design, describing how the prototype of the game is implemented and the programming functions and the libraries used in the design. The game is designed for android as well as web environments. In this, there are multiple built in functions that unity 3D game engine provides. The final product of developed game is that it is fun and enjoyable. With this game, the main targeting audience is the kids who wants to learn coding but don't know where to start with help of this game they will get to know about concepts of coding and they will get idea how coding functionality works. They will get used to coding concepts and learn where to apply that concepts in real word coding problems.

## II. COMPARATIVE ANALYSIS

Parameters	Coding Champs	Other Similar Apps
Techniques	Game based coding technique .Here the children learning will get help in understanding the code instead of understanding it in a coding way.	Live or real time based coding technique. Here children sometimes get to learn things in some live class manner and real time coding.
Type Of Coding Thought	Code Based and Block Based. Various blocks of code will be added in order to make the code error free	Code Based and Block Based. Various blocks of code will be added in order to make the code error free
Extra features Added	Teaches Vocabulary. Variety of new words and data types will be taught here.	Teaches Hard Coding . Variety of coding languages are taught here.

Table 2.1- Comparative analysis of Coding games

This proposed system provides various levels based on which the user or the children playing the game will have to cross each level and reach the next level. This is helpful in making a child understand the importance of coding and helping them achieve new levels every time they put the right inputs in the blocks

In games that are currently available on market They provide story modes like completing the whole story at once and all your topics will be clear of the code and also some games provide level based understanding but more importantly they teach students to hard code. This might be

helpful sometimes but they might not know the way they code

### III. LITERATURE REVIEW

It is found that children are not involved in learning theory as much as compared to interactive learning. It is mostly seen that the understanding of the coding while playing the game has better responses in the children as compared to that of the theory ones. In the market mostly games like these are developed for the age group of 6 to 14 years as the minds of the children are sharp during that period and they tend to learn more things easily and might develop coding skills[2].

And according to these games it is found that these games are more effective on the children who haven't learned programming yet. These games are made user friendly such that almost every child can play it. All the games that were developed mostly teach about the normal C++ or C programming levels like if-else, loops, arrays etc. These coding games help the children to improve their creative thinking skills and also the sense of the things that are good or bad for them[3].

### IV. PROGRAMMING TOOLS USED

In this proposed system, the easiest and most user-friendly tools are used which helps to develop the game easily and helps to store the user's data too.

#### A. What is Game Engine

A Game Engine is a software framework which helps in creating a variety of objects and video games without any effort. Game Engine also provides a variety of features such as motion management, collision detection, graphics, rendering, physics of the game and many more such features. Main advantage of a game engine is that it helps us to drag and drop some options and use it as per our own needs by doing trial and error methods. Some of the game engines are unity, unreal, gamebryo, XNA studio, RPG maker etc. We have used the combination of Unity and Blender to code our project.

#### B. Unity

Unity is the most used game engine in the 21st century. It allows many features together and is flexible enough to make almost any game you want to make. With cross-platform features, Unity is powerful and helps in making variety of games. Many famous games like Pokemon Go, Hearthstone, Cuphead, and plenty more are written using C# scripting API and built-in Visual Studio integration. Unity also offers JavaScript as a scripting language and MonoDevelop as an IDE to those who want an alternative to Visual Studio. Having features like 3D and 2D animation the developers find it easy to code and make animations. Nearly anything can be animated in Unity.

Unity also helps us to find a developer option so that a developer can upload their project well on internet and help them to find earnings from it.[4]

Unity is so widely used these days as it offers you to create or transfer the game on various platforms such as Windows, Androids, Tizen and on IOS. This cross platform features make unity a so called pro game engine in the market.

World class monetization and retention services for mobile games and dedicated, easy to use 3D and 2D tools and workflows.

#### C. Blender

The Blender Game Engine is a discontinued component of Blender, a free and open-source 3D production suite, used for making real-time interactive content. The game engine was written from scratch in C++ as a mostly independent component, and includes support for features such as Python scripting and OpenAL 3D sound[5].

Blender is a free software used to create 3D objects and integrate it with various other game engine such as unity unreal and etc. It is also an open source suit so it makes it unique in its own way. It supports variety of options of 3D modelling such as rendering, modelling, motion tracking. [6].

#### D. C#

C-Sharp furnishes different programming improvement and plan ideas. It is a more purpose based and multi-worldview programming language. It gives numerous highlights of the programming, for example multiple-objects, object-situated (class-based) and so on[7]. C# is a very well known language for coding games and in AI so the use of this language basically makes the task easier for the coding team.

### V. GAME MECHANICS AND DESIGN

#### A. Project flow

In this proposed system, the user will be asked about which mode he/she wants to play and then the game will move on to that mode. The user will be asked to create the code after the level he/she plays and in the end the user will get a result based on the level he/she completes and simultaneously he/she will get ranks based on the score the user gets.

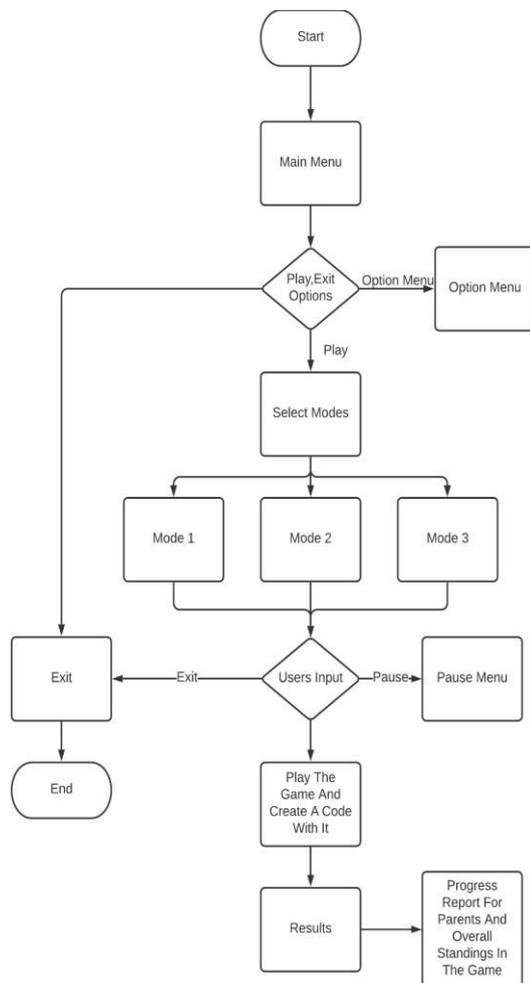


Fig 5.1 Flow chart of coding champs

B. Game Mechanics

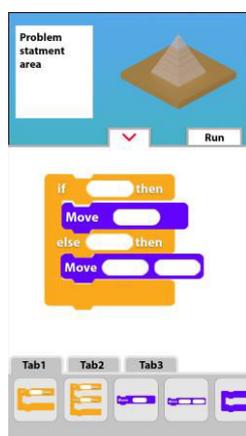


Fig 5.2 Basic Game UI Structure

earned with performance of user they will get score depending on how efficient their code is and how much test cases that code is able to solve. To keep parents updated about their kids' progress on the app there will be a page for them to get updated about their progress in that they will be able to see the time taken to solve a particular level and how often they are practicing on the game.

In the main game screen there will be a section from which they can choose a block and drag it on the coding area, the coding area will contain full code blocks. After successful completion of code they can press play and they can see how their code is executing and where they are going wrong. To grab user attention on the game there will be minimalistic graphics and low poly isometric 3d models so that the performance of the game is also maintained. There will be story kind of path way that user will follow and according to that the difficulties of the game will increase, at start there will be very simple levels so that user can get comfortable with the game and they can idea of game ui.

C. Game availability on platforms

When it comes to game availability on the different devices and platforms this game will be available on android, ios and webgl because of unity anybody can make multiple builds of the game with the same code base. The same code can be used for creating builds on every platform and in future it can also be used to deploy smart tv and education smart boards also so that users can learn at their own device and at their school and tv also.

VI. CONCLUSION

The taking in recommends that children from youthful ages of 6 to 15 years of age appreciate the programming and can lead straightforward programming projects. Additionally this recommends that this sort of games ought to be remembered for the tutoring days to make intelligent learning. Little kids are ordinarily drawn in by the activities and games. The data that we have said in this paper are not convincing yet it's anything but a beginning for a few understudies, educators and so on. Thus in short this game will assist little youngsters with learning new things dependent on the game.

REFERENCES

text, function drag and drop, Block coding, it this it uses block coding as a game mechanic where user can choose different blocks of function and according to that the game will function. There will be scoring system which can be

There are many ways to teach coding concepts like simple

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