

Learn Through Gaming by Using Design Thinking Framework

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ABSTRACT

In recent years the gaming industry has boomed tremendously and it generated a huge revenue even in the pandemic. Parallely education sector faced a downfall, where students can't interact through online mode. So, learning through games is an exciting way to acquire knowledge. The most common games which are used to play nowadays are 2D and 3D games. As a 2D platformer template with nice looking graphics. Various Game engines are available in the market such as Unreal Engine, Unigine, Cry Engine, Godot, etc. The most used game engine by indie developers is unity. Programming language used in unity is c#. In this project learning will be an experience in which students are immersed in a virtual environment, they play as virtual avatars provided in game and assessments will be like missions and it is a real time learning experience with a user-friendly virtual environment. By creating a community and collaborating with teachers, experts and students, in-game missions can be created in a more interesting and understandable manner.

Keywords — Gaming -Education, Game Development -AIML

-2D Plat former -Unity-Learn through Gaming.

INTRODUCTION

This paper is all about the gaming industry and in which field it comes under. The domain or thrust area in which this project comes is AI(game development) and the industry vertical is smart education. Gaming technology has changed not only the way we play, but also how we learn and work. These technologies, which range from game development hardware and software to the latest technologies needed are transforming digital experiences and are offering new ways to engage the students. Games studies has, to date, focused more on the analysis of games as texts than on the agency of players.. Our aim is to clarify the educational dimension of game playing practice (how players learn to play games) and consequently establish principles of game design. By looking at the playing of digital games in terms of a socially-defined learning system, this analysis also contributes to understanding the way in which individual players relate to their social, cultural context and also to the debate on the value of games in education. There are clear implications for game design. Specific problems with play can be brought to light with user testing; in-game tasks can be analyzed in terms of the operations that they require to ensure that the player will have had opportunity to learn these in advance.

Additionally, activity system contradictions can be intentionally designed into games to create opportunities for learning – for example, through structured ‘training missions’ in which new challenges must be overcome. For the majority of students, when learning operating systems, besides continuous memorization and recitation, the programming homework in the course also creates a bottleneck for the students in their learning . Various reasons have caused students to lose confidence in the curriculum, in turn lowering learning motivation, making them want to give up. This study combines the games with course content to design an online multiplayer collaborative learning game, so that when students engage in the games, a desire to win arises through the model of mutual competition. The students can thus learn knowledge relating to the course on their own, and in turn, gain a victory in the next game, improving the learning effects.

Problem Statement

In the modern world education has become a boring task for students, As student interaction is lacking in classes on both online and offline. Understanding the concept in the traditional way of learning is hard as the concepts are theory oriented.

Empathize

According to the literature surveys Games Based Learning is gradually delivering games that are applied in a series of educational contexts. In this paper, we aim to initially investigate the educational games developed for and used in the computer programming domain and review to which level they address the aforementioned difficulties. First C#, Dive into C# and create apps, user interfaces, games, and more using this fun and highly visual introduction to C#, .NET Core, and Visual Studio. With this completely updated guide, which covers C# and Visual Studio 2019, beginning programmers will build a fully functional game in the opening chapter. To use classes and object-oriented programming, create 3D games in Unity, and query data with LINQ. And all by solving puzzles, doing hands-on exercises, and building real-world applications. The interdisciplinary needs of video game instruction, the industry's desire for key soft skills in addition to technical skills (based on informal and formal querying), and the constraints faced in terms of institutional and international differences in curricular structure.

Define

Education nowadays has become uninteresting among the teens and the children due to hours and hours of theory classes where some children find it difficult to cope with the education system. There are plenty of reasons such as classes are being non interactive where the teacher goes on teaching without even organizing a doubt clearing hour or the subject is a blended one where theory and practical sessions are to be taught. One main reason is that the subject does not create much curiosity which makes the children uneasy to learn. When taking a look at the modern education many organizations are trying to make education easier. Ed-tech companies are creating animation videos to make students understand the concepts easier. But it's still lacking interactions because if students get bored, there might be chances of quitting the learning platforms. Although their videos are more theoretical, it's almost equivalent to traditional education. The major contradiction is that these services are really expensive. Example: An ed-tech company charges 3,000 per month totalling to a whopping amount of 36,000/- per year. A layman wouldn't be able to afford these at all. The Union education ministry has advised parents, students and all stakeholders in school education to be careful while opting for online content and coaching being offered by ed-tech companies. The MoE, in its advisory issued, said it has come to the notice of the department of school education that some ed-tech companies are luring parents in the garb of offering free services and getting electronic fund transfer (EFT) mandates signed or auto-debit option activated. According to the advisory, the decision to opt for such services has to be well considered. Curiosity is one main trait of human beings which makes us learn more things in the area which we show more interest in. Here is where learn through gaming comes into play

Ideate

As video games have become one interesting platform for everyone. Learn through gaming can attract more students towards education by creating an interest among the students to learn many new things. By creating a mission-based game to complete subject topics will be interesting to students. It will be a lot more interactive than the animation videos which are offered by Ed-tech companies. Learn through gaming can be achieved by collaborating with teachers and story directors as a conceptual story game. It can be published as a Free-to-Play game where every student can access it for free. To make it possible In-app ads and In-app purchases can help to generate revenue. To create a 2D platformer (Side scrolling) Unity Engine can be used, as it provides all required game physics and it is one of the leading engines used by indie developers. As Unity uses C# programming language, all programs can be attached as components to game objects. A game component consists of properties of how a game object should behave and how it should appear in game (e.g., a Rigid body component consists of properties which have basic physics like mass, gravity, etc). To create visually appealing graphics tools like photo shop and illustrator can be used. A level-based game will be used for completing courses and unlocking achievements, each level will possess a concept or topic from the student subject.

Prototype

This game is based on a single player 2D Platformer (Side scrolling) where it has a virtual game character. Players will play as that character to complete a task and mission based on the subject of the student as which they are willing to learn. When it comes to games where it should be rendered in real-time the game graphics are sacrificed, to make it compatible with the maximum number of devices. In Unity every object imported is considered a game object. To create a playable 2D environment multiple game objects like foliage, rocks, surfaces, sky, etc have been designed photo shop and illustrator is imported into Unity Engine and each imported game object is attached with specific components as per the needs. All the assets arranged in the proper way to create the required 2D environment is followed by the next step adding modifiers and components where each game object should be programmed individually. A player game object can move forward and backward and can interact with other game objects. The main camera is programmed to follow the in-game player character. After programming required game objects and compositing the environment with lighting and particles buttons and joysticks will be added to interact with the game. Every composition will be a scene, navigation from one scene to another is programmed (e.g., Main Menu to Game Scene).

Modules

1. Graphics
2. Texture Mapping
3. Animation

Graphics

Computer graphics can be seen in many different areas of various media and entertainment fields. The topic of computer graphics is huge and can become very technical when dealing with advanced rendering topics. Having an understanding of computer graphics is the key to being able to create the types of visuals that are becoming commonplace across the various industries.

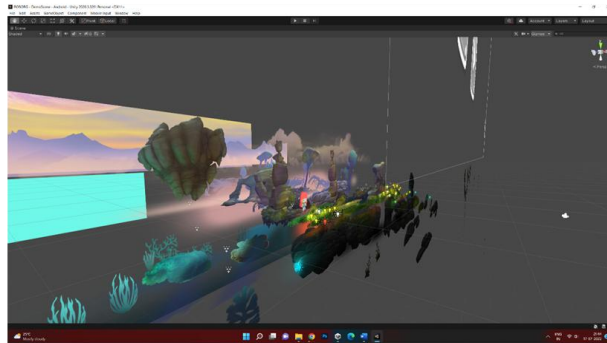


Fig - 1 Graphics

To create a visually appealing graphics of 2D Environment in plat former manner **Vector Graphics** have been used to achieve the look as shown in Fig 1 By staking multiple layers of 2D vectors and by adding shadows and details, 3D output is obtained in compositing.

Texture Mapping

Texturing is a technique that will add another level of artistic control and realism to games. Texturing involves adding images to the surfaces of objects within the game. Graphics cards can quite efficiently wrap any image over any surface as long as it can be programmed how it is to map the image onto a surface.



Fig - 2 Texture Mapping

As shown in Fig - 2 lots of foliage and sprites have been used which should be textured to make it look realistic and appealing. The texture object needs information about how it is to map the image onto a graphics object. For example: the grass sprite used in this game requires a small texture which is repeated over the surface of the grass sprite to achieve a grass look.

Animation

Animation is a method in which figures are manipulated to appear as moving images. In traditional animation, images are drawn or painted by hand on transparent celluloid sheets to be photographed and exhibited on film. Today most animations are made with computer-generated imagery (CGI).

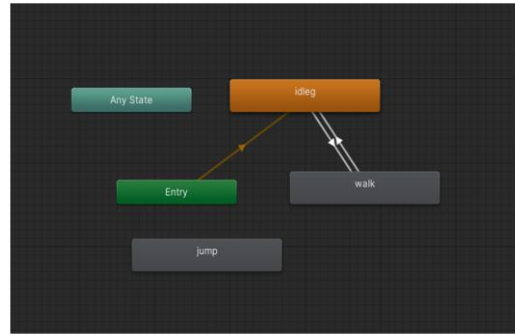


Fig -3 Animation

Computer animation can be very detailed 3D animation, while 2D computer animation (which may have the look of traditional animation) can be used for stylistic reasons, low bandwidth, or faster real-time renderings (Fig -3).

RESULT

The application has been tested successfully. It can move to the next levels as one has completed their tests before each level.

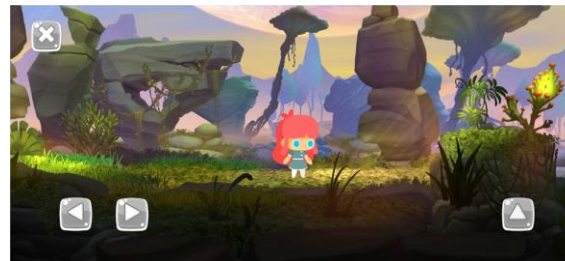


Fig - 4 Working of the application

CONCLUSION

Learn through gaming aims to educate children easily in their own way of understanding to bring out their interest in learning. It makes them enjoy their learning stage without being distracted and to grow them curious on each level.

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