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A Comparative Review of 2.5D vs 3D Multiplayer Online Battle Arena Game Experience

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ABSTRACT

The popularity of Multiplayer Online Battle Arena (MOBA) games has grown rapidly and these games are now one of the most popular game genres worldwide. The experience of playing a MOBA game can be explored from both a 2.5D isometric perspective and a 3D third-person perspective. 2.5D MOBA games are currently more popular than 3D MOBA games. This study examines this situation from different perspectives. A comparative review was made to determine the distinction between 2.5D and 3D game perspectives. The findings revealed that 3D MOBA games provided a better gaming experience than 2.5D MOBA games. The 3D MOBA game genre is a venture that is valuable for game researchers and game developers for continuous exploration and development.

Keywords: MOBA Game, Game Experience, Game Perspective, 2.5D, 3D, Isometric Perspective, Third-Person Perspective, League of Legends Game, Smite Game

INTRODUCTION

Games are a part of the human experience that can be found in all civilizations. The primary purpose of a game is to provide an enjoyable experience, with the occasional goal of achievement or reward thrown in for good measure. The definition of a video game is determined by its platform. Video games can be divided into two categories: platform games and mobile games. Role-playing games and action-adventure games are two examples of genres based on the gameplay and purpose of video games (Vince, 2018). Multiplayer Online Battle Arena (MOBA) games have grown in popularity as a result of enjoyable gameplay. MOBA games are a subgenre of video games and are classified as real-time strategic video games in terms of gameplay and purpose (Cannizzo & Ramrez, 2015). The requirement for each player to handle the placement of structures and manipulate many units in real-time strategy games distinguishes them. Resource collection, base construction, in-game technology advancement, and indirect control of units are all common features in typical games (Adams, 2007). MOBA games that are classified as PC platform video games include League of Legends and Smite. Furthermore, MOBA games can also be classified as mobile platform video games, such as Honor of Kings. MOBA games are classified as online multiplayer versus multiplayer games in terms of video game mode. This allows most players to experience immersion in the game. On the other hand, as a multiplayer online game, each battle requires multiple players to play online simultaneously, which makes the MOBA game experience a huge improvement in terms of social context.

The League of Legends eSports championship was founded in 2013, and the number of viewers has been increasing steadily, according to the League of Legends eSports viewing data. This is in line with the highly anticipated League of Legends 2021 World Championship match held on November 6, 2021, in Reykjavik, Iceland, which was watched by a record 73.86 million peak concurrent viewers. This is evident that this game successfully attracted the attention of game lovers around the world. In addition, the Edward Gaming

squad from China won the season's eSports title. It is notable that League of Legends is steadily growing and gaining in popularity. The global digital media market has been steadily expanding, with gaming accounting for the majority of income. The global online gaming sector earned around $21.1 billion in sales in 2020, representing a record 21.9% increase over the previous year. The global COVID-19 outbreak, which compelled many individuals to stay at home and turn to digital entertainment and new ways to communicate with others, contributed to this increase. There are currently an estimated 1 billion online gamers globally, with China, South Korea, and Japan having the largest population of online gamers. The number of people who play online games is expected to reach 1.3 billion by 2025 (Clement, 2022). Figure 1 illustrates the number of unique viewers of the League of Legends eSports championship finals from the year 2018 until 2021. The histogram reveals that the number of viewers for the tournament has tripled since the beginning of 2019, from roughly 30 million. The number of players in League of Legends, on the other hand, has been consistent at very high levels for a long time, according to the data from the Riot website in 2021 (League of Legends).

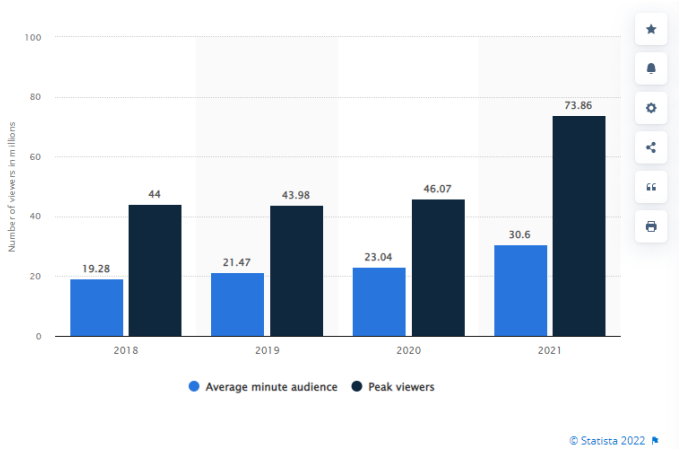


Figure 1. Number of viewers of League of Legends World Championship finals from 2018 to 2021 (in millions)

(Source from Gough, 2022)

Gameplay and user interface design of MOBA games are equally significant aspects of the overall game experience. Due to the unique gameplay of MOBA games, most of them are developed from a 2.5D isometric top-down perspective (Studio, 2019). A 2.5D graphic is another name for an isometric graphic. In most cases, 2.5D games are generated on a 2D plane and then displayed in 3D. The great majority of MOBA games on the market are developed through this approach. Various studies on MOBA gameplay and mechanics have been undertaken in recent years. However, there are only a few studies on the impact of MOBA games (Bailon, 2019). Therefore, this research focuses on MOBA games and their perspective. In order to improve the experience of playing MOBA games, the study will assess the gameplay experience of MOBA games from both 2.5D and 3D perspectives.

RELATED WORK

According to the MOBA game leaderboard acquired from Gamesight (2022), it was revealed that top MOBA games, such as League of Legends and Valorant, were built on a 2.5D game perspective. Only MOBA games, such as Smite, were created in a 3D game perspective with less heat (Gamesight, 2022). It is apparent from the leaderboard that 3D MOBA games fall behind 2.5D MOBA games in terms of popularity and variety (Gamesight, 2022) despite having all kinds of hardware, such as hardware drivers for 3D graphics rendering capacity that have significantly improved, whether on a mobile phone, PC, or PS platform. As a result, many well-known games (e.g., Super Mario Bros.) have been rebuilt in 3D (Tencent,

2018). A number of big 3D games (e.g., PUBG and Battlefield) have been launched recently. However, the majority of them are still 2.5D games with a large player base compared to 3D games.

A change in the game perspective can affect game mechanics (Beat Suter, 2018). The character setup in MOBA games, such as attack style and skill release, is partially controlled by the perspective. Similarly, the game map design in MOBA games is centered on the game perspective. Visual limits restrict character design and the building of new maps. Jing Li (2020) stated that the victory percentage can be low if the MOBA game is played without a suitable perspective. According to an analysis of the ARAM mode in the popular MOBA game League of Legends, when the game variables were only the game perspective and the players who were all equally skilled, the difference in the win rate between the two teams on the map was more than 6%, and the map became perfectly symmetrical (Jing Li, 2020). The findings of the study reveal that the game's perspective has a significant impact on the game's success rate and the player's overall experience with the game (Jing Li, 2020), as shown in Figure 2.

Figure 2. ARAM mode (a perfectly symmetrical map mode) in a popular MOBA game League of Legends (Source from Jing Li, 2020)

Therefore, it is notable because a better game perspective will enhance the MOBA game experience. A good vantage point gives the player more room to move around in the game. In a MOBA game, the player's operational vision and fluency are influenced and constrained by the game's perspective. As a result, this study aims to scrutinize the gaming perspectives.

GAME EXPERIENCE

According to Collins (2021), a "game" is a skill, knowledge, or chance-based activity or sport in which the player follows predetermined rules in order to defeat an opponent or solve a challenge. The prior events, information, and feelings that make up someone's life or character are referred to as "experience". "An ensemble made up of the player's senses, ideas, feelings, actions, and meaning-making in a gameplay scenario" is the definition of game experience (Mayra, 2005). One of the most important goals in game development is the playing experience. As a result, the game can be enjoyable, challenging, and successful (Liljedahl, 2010). In other words, the game experience notion comprises the entire package of what the game is and how it affects people. The player's understanding of the game, its presentation and style, and its interactivity are influenced by their gaming experience (Lynn, 2012). The game experience is ongoing; unlike a game review written when it is launched, the experience is always being written, even if the game was released 30 or 40 years ago. Furthermore, each game system offers a unique gaming experience. The key to a positive gaming experience is to emphasize what game the player is playing (Lynn, 2012).

GAME PERSPECTIVES – 2.5D vs 3D

Game perspective refers to the player's role or point of view in the game (Garcia & Janet, 2020). Unlike literature, the camera and who is in the game establish the game's perspective. It can be divided into the following types of viewpoints based on the numerous perspectives of the game: first-person, second-person, third-person, top-down, isometric, and more. While exploring the 2.5D perspective in greater depth, it is

critical to examine and identify the problem of camera projection. In movies and games, camera projections create all visual areas. Parallel projection is used in a 2.5D perspective. Parallel projection can be divided into two categories. They are axonometric and oblique projections (Mohan, 2022). The focus of this study is on axonometric projection. Axonometric projection is can be further divided into three sections: isometric, dimetric, and trimetric. Isometric projection is the most common projection, which is angled so that all three axes form identical angles at 120-degree intervals. As a result, all three axes are foreshortened equally. Due to anti-aliasing and square pixels on most computer monitors, dimetric projection with a 2:1 pixel ratio is increasingly frequent in video games (Sabhadiya, 2021). The viewpoint is rotated slightly in axonometric projection to display more facets of the surroundings that are apparent in a top-down perspective or side view, creating a 3D illusion. The foreshortening of all three dimensions is caused by an object inside an angled location of the game plane.

Orthographic and perspective projections are the most common projection types for 3D gaming views. Perspective projection is based on orthographic projection, and the procedure for perspective projection is more difficult. When the human eye looks at a scene, objects in the distance appear smaller than objects closer by, according to the principle of 3D perspective projection (Wiki, 2021). The 3D projection dynamics can be envisioned by the 2D projection where the objects are viewed through a camera viewfinder. The behavior of the projection transformation is controlled by the camera's position, orientation, and field of view. There are many sophisticated methods to depict the distance of view on the image through 3D gaming perspective projection.

2.5D perspective is sometimes known as pseudo-3D perspective, and there are several similarities between them. 3D models, 3D mapping, rendering, and lighting can be used for both perspectives. On the other hand, for the 2.5D perspective, the early systems for simulating and producing 3D graphics were insufficiently powerful, and the hardware could not handle computationally complex 3D computer graphics procedures. As a result of the pseudo-3D projection, shadow and visuals are simplified. However, the curve of the visuals can still be seen through the player's image, which defines the 2.5D perspective. Later on, as technology advances, both CPU and graphic cards will be able to give a lot of support for 3D graphics processing. Many 2.5D games have been upgraded to 3D games. At the moment, there is quite a number of 2.5D games on the market. Due to the gameplay and rule-setting, the majority of them use a 2.5D isometric perspective (Jester, 2020). To sum up, 3D perspective games are more like an upgrades in terms of technology, gameplay and even rules of 2.5D perspective games

METHODOLOGY

For a better game experience, a comparative analysis was performed to determine the difference between 2.5D and 3D game perspectives. The game League of Legends was created in 2.5D perspective, while Smite was produced in 3D perspective. These games were selected for this study due to their widespread popularity in their respective game genres (Gamesight, 2022).

FINDINGS AND DISCUSSION

The comparison of MOBA games is presented in Table 1 based on 2.5D and 3D game viewpoints. In this table, the amount of people playing these two games is significantly different. Even when two MOBA games in the same genre have opposite characteristics, the amount of people who play them is ten times different. Another factor considered is that League of Legends was published early with a large number of followers.

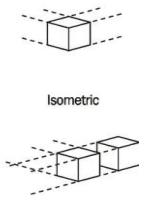
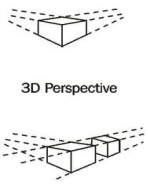
The most significant and evident difference between League of Legends and Smite is the gameplay (Smurfs, 2017). Players control their characters by right-clicking in League of Legends, a top-down shooter. This

gives players a fantastic view of the arena and allows them to see everything on the screen. In contrast, Smite is a completely different game. Smite has a third-person 3D view from behind the player's back, and this is where the gameplay differs significantly. In Smite, the player controls the character by hitting the WASD keys on the keyboard and attacks by clicking. The character cannot be moved by clicking on the ground (Smurfs, 2017).

Both 2.5D and 3D MOBA games have a similar main environment foundation and game map architecture (i.e., towers, bases, and wild areas). However, 3D MOBA games provide better environmental detail. The terrain in a 3D MOBA game is extremely complicated, particularly in the wild areas, where there are lots of vegetation, buildings, and walls (Smite, 2021). As a result, the entire 3D MOBA environment map is larger than a typical 2.5D MOBA environment, which has lower requirements for game environmental detail.

According to the previous literature analysis, the majority of existing MOBA games take place in a 2.5D environment. The camera in a MOBA game is set at a specific angle, and the scene is displayed at a specific height on the Z-axis. Players cannot modify the camera projection angle with their controls while playing the game. Meanwhile, there are several 3D free perspective MOBA games on the market. Players in this type of MOBA game can change the camera's perspective at any time. Although the game mechanics are still MOBA standard, the number of individuals playing 3D MOBA games is small. They are also in a highly "unpopular" position.

Table 1. Comparison of 2.5D MOBA and 3D MOBA games

	2.5D (Isometric Perspective)	**3D (Third-Person Perspective)**
Definition and Characteristics	Sometimes referred to as an angled top-down perspective, where isometric drawings allow for 2D objects to have the appearance of 3D depth	The camera allows the player to see the character that is controlled. The camera is behind the player so that the player often sees the back as the player moves through the world.
Projection	Axonometric projection (isometric projection)	Orthographic and perspective projection
Hardware	Hardware requirements are relatively low	Required higher graphic hardware renderer
3D Model	Yes	Yes
Fixed Angle	Yes	Adjust freely according to the needs of the gameplay
Sketch map		
Example MOBA Game		
Game Title	**League of Legends (2.5D)**	**Smite (3D)**
Developer	Riot Games	Hi-Rez Studios
Release Date	October 27th 2009	March 25th 2014
Players	100 million active monthly players	7 million active monthly players

Mini-map		
Skills	Range of skills shots and auto target abilities	Most skill shots due to the viewing angle
Difficulty	Considered easy to learn and play	Easy once the player is familiar with the playstyle

CONCLUSION

This article reviewed the game experience of 2.5D and 3D MOBA games. In this article, the researchers searched via several game related articles, game official website and forums. For literature on MOBA games, game experience, and game perspective. Through a series of literature analyses, MOBA games from different game perspectives have a large gap in the aspects of gameplay, game design, and more. As a result, the perspective of the game has an impact on the MOBA game's experience.

FUTURE WORK

MOBA games are worth exploring further in terms of multi-perspective gameplay. In 2.5D MOBA and 3D MOBA games mentioned in this article, it can be found that game characters, game environments, gameplay, and more factors are affected by the change of the game perspective. Different game experience is a further consequence due to these changes. In future research, researchers can continue to analyze MOBA games with different game experiences brought by different perspectives, and further analyze whether the change of perspective can improve the game experience through game prototype testing. Studies can be done regardless of the MOBA genre. The relationship between the game perspective and the game experience from different types of games can also be analyzed, thus diversifying the research in this area.

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