

Effect of VR on Video Games Story Telling

Sanxing Wang *

Qingsen school, Beijing China

* Corresponding author email: Robinwang@thsi.edu.cn

Abstract. Now days, more and more virtual reality games appear on market, many of them present with strong storytelling elements. The narrative type of video games in the story development, character shaping, let the audience resonate. However, the articles about story telling in virtual reality games is not enough. This article has concluded about what is storytelling and what makes it effective to players experience; emergent storytelling, immersion and environmental storytelling has been took out and discussed in detail, Paper also discussed about what virtual reality have changed video games and how these changes affect storytelling in video games. Main feature of virtual reality like Interactivity and locomotion tracking been discussed. Different storytelling had been evaluated under virtual reality background. Especially, at the end of the article, this paper summarizes the full text and prospects the related content.

Keywords: Virtual Reality; Story Telling; Videogame; Immersive Experience.

1. Introduction

VR is an under developing technology that have huge potential on future games, locomotion tracking and viewport that follows players reality movement, VR brought gaming immersive experience to a new level. However, most successful games today also have a great story telling, which also makes game more immersive and attractive [1]. Among all those elements that makes storytelling in video games unique and important is emergent narrative and environmental storytelling. Emergent narrative is a storytelling method that only exist in games, it allows player to choose how the story goes and how it is told. Environmental storytelling usually describes the background story of the scene while rendering the mood of the scene. These two aspects are very objective and important to evaluate the capabilities of a new technology on storytelling to video games. But there are very few articles discuss about this topic, thus in this article, how can VR changes story telling in games will be discussed. There are three important sections of content to be discussed for explaining this topic. First of all, understand what is storytelling in video games is very crucial. Second, new features of VR must be introduced. Headset and controller are analyzed separately because they both bring features that does not exist before. At last, to evaluate what is it like for different storytelling under VR environment.

2. Story Telling

2.1 Storytelling in Video Games

Story telling, or narrative keeps changing throughout human history, From ancient myth to video games. However, there's several things different about storytelling in video games, and they are important for understanding of why VR is the game changer of story telling.

Video game story telling in many aspects, are like films. Such as development of story, building characters to make audience feel empathy. But there's one thing makes video games story telling different from films, which is emergent narrative. According to Ruth Aylett's article Narrative in Virtual Environments - Towards Emergent Narrative, he describes Emergent narrative as something very paradoxical because at the end of a story, what player have experienced is definite and linear. Just like what were been described, after the story been finished, it has to be a line narrative, but in video games, player themselves through their decisions and actions are able to create their own stories. However, it's impossible to construct a completely free game, Designer have to use some tricks to

decrease possible story line to a certain amount. Few examples were provided by a speech down by an Oculus employee whose Colum Slevin, such as provide choice point with only two options. Or use physiological skills, such as use different font to guide player to choose [2]. Back to the comparison with film, just like what is concluded by figure 1 below, they both have a constructed linear story line at end and they both use camera to tell stories, but the key differences game designer can give player the ability to direct stories.

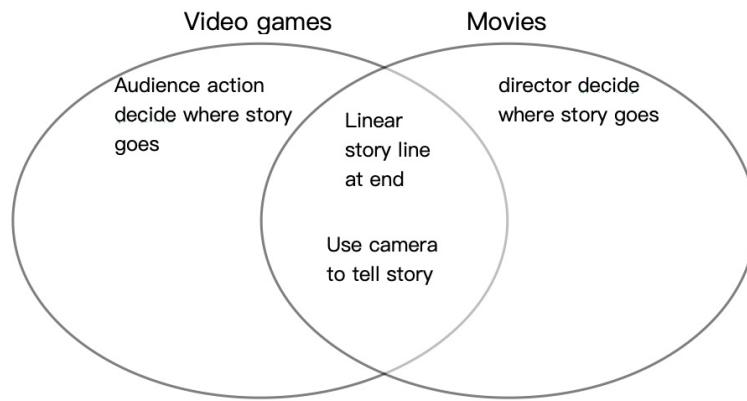


Fig 1. Comparison between movies and video games storytelling

When constructing a character in video games, especially for protagonist, it's not necessary to give them strong personalities. Because they act as players wish, the borderline between player and protagonist are actually very vague.

Ruth suggests a very interesting mechanism that makes user feel they are the protagonist which is pre-briefing, which means through makes some connection between protagonist and its worlds history, makes player feel they are really part of the world. This means it's not a great idea that makes player feel like they are not the player they control; immersion is also a great difference in video games.

2.2 Key Factor Makes Story Telling Works

A great game does not necessarily need a good story telling, but a good story telling might shape a great game. This is because some benefits story telling provides to games.

One of the valuable benefits is immersion, according to an article from Bormann Daniel and Greitemeyer Tobias called Immersed in Virtual Worlds and Minds: Effects of In-Game Storytelling on Immersion, Need Satisfaction, and Affective Theory of Mind, good storytelling will provide a mutual enhancement of immersion and needs satisfaction. This means storytelling is a great benefit for players to players, it makes them feel more like they are playing the game, which makes players feel more satisfied [3].

Another benefit is motivations, good story telling provide players motivations to keep playing this game. Player is willing to discover stories under a great story telling experience. This benefit works extremely well on a story telling type called environmental storytelling; instead of telling the stories through very straight forward ways. It hides details in the level, for example in a third person action game with middle age dark fantasy called dark soul III (2016), Environmental story telling takes a great part of its story telling. There's plenty of secret hidden in the environment, which is clue for background story of this game, The background story is mainly about an inner war of the court which explains why everywhere player can go are basically broken. Those details might be the pattern of a broken flag and dead knights' armor on the ground, which might tell that this place was occupied by which force during the inner war. Through these types of hidden secrets in the games, players naturally want to discover more those secrets and the whole picture of the story back ground get more and more clear. In figure 2 below, there's a scene that include a lot of dead knights that defend this place with dragon, which implies close relationship between the court and dragons. Figure 2 depict what inner war look like.



Fig 2. Dragon's training ground



Fig 3. Army flag of lothric

3. Features VR brought to Video Games

There's a lot of comments on internet about VR and why it's a game changer for video games. But very few of them objectively describe the reason for it. Which is what function VR has brought to video games [4]. To conclude, the advantage of VR mainly comes from its hardware, (What was displayed to players were still a screen and a controllable controller) But the controller and that so-called "screen" changed a lot, which brought a huge difference for video games.

3.1 Interactivity of Game in VR

Interactivity, which is a very important thing when the discussion is about degree of freedom in a video game. Few examples question when people try to evaluate a video game's interactivity might be: is every object in this game interactable? How many objects can respond to interactions. In traditional games, an interaction with an object is a simple process, but under a VR environment, it becomes a process [5]. Take pick up object as an example, in games without VR, a protagonist will play an animation of pick-up object, then the object will be added to the player's inventory. But in VR, a player will have to move their controller to the location of the object, then press the trigger of their controller. Which is a lot like what people do in real life when we try to pick up an object; then the object is added to the inventory of players. This example shows the essence of interactivity of a VR game, it follows humans' real life habits.

Another important thing about interactivity in VR is the interactive between objects, such as allowing players to use tools to complete different tasks.

For example, in a viral VR game called Half Life: Alyx, at the beginning of the game, players are provided with a marker and a window. Some queries players will try to use that marker to write on that window, which works, players are able to use that marker to draw, or write anything they want on that window. Just as the picture displays in Fig. 4, a pre-calculus teacher even teaching complementary and supplementary angles through this game during quarantine.

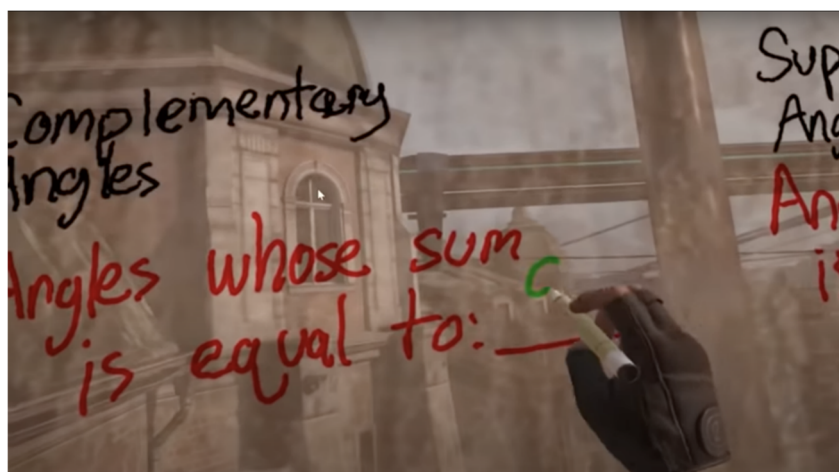


Fig 4. Screenshot of a YouTube video about a math teacher teaching in Half life Alyx

3.2 Locomotion Tracking

Just like what was stated in previous section of the paper, VR provided a different visual experience. Camera moves as players position move, which provides a sense of synchronization between player and protagonist [6]. According to a speech done by Colum Slevin. There's 6DOF in total for head movement of their product. Which means player are able to move their head in 6 different ways and all of them can be recognized by oculus quest. This function significantly makes synchronization between player and protagonist more effective, because players movement directly reflect on the movement of camera. Compare to traditional first-person game, which usually use relatively smooth movements of camera, the camera is more natural and vibrant in VR games (Fig.5).

Locomotion tracking is not only used on headsets, it's also used on controllers. The controller's locomotion tracking is limited by an area around the headset, its position will be presented through headset, which tells player where are those controllers this means player can have full control over the protagonist in games. In traditional games, most action done by protagonist are animations. But in VR games, they reflect action of player in real world, which obviously enhance immersive experience of the games. According to John Heil article the sense, excerpt from perception and cognition, He conclude that human cognition is result from sensory perception. Which means the more real sensory perception player get from games, it's more likely they get a more immersive experience.

As what was mentioned, locomotion system actually provides a more immersive experience for users because it provides a more realistic sensory experience for players, which turns in to cognition.

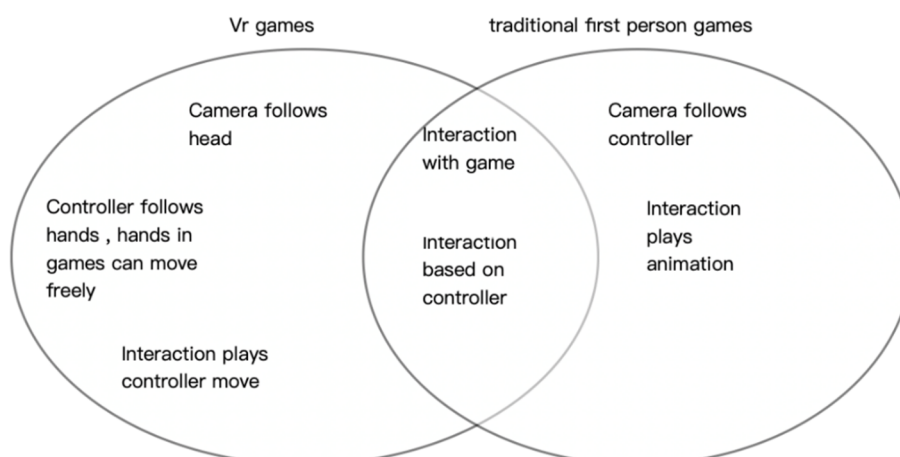


Fig 5. Comparison between traditional fps with VR game

4. Different Story Telling in VR

Even though VR is a very powerful technology for storytelling, but it actually performs quite different under different storytelling methods. Some time it largely affects how the story was told, some time it has limited effect. This chapter will explore effects of VR under different storytelling environment.

4.1 Story Telling in Multiplayer Game

Through ignore the story telling that involves whole story line going, there's actually a lot of time player don't realize story is going, they are kind of similar to emergent storytelling that players decision create narrative. But just like an example provided by Ruth Aylett's article, he uses a football match as an example of emergent narrative [7], because all the event happens in that match is decided by players of the game, but if we consider this from players perspective, at any moment of the game, players won't realize they are completing a story, they only facing decisions. This is a great difference between multiplayer game and single player game; under the pressure and intense gaming experience, player struggles to realize they are participating in a store. Back to the football game example, when each player playing the game, such as when one team try to attack, their strategy changes based on their opponent's reaction, thus they have to make decision with unknown result. Only at the end of the match, people can really get to know the whole process of the game. Thus, only at the end of story, player'll realize that they've completed something. This uncertainty is actually important to make player keep playing. Under VR environment, more decision might appear without noticing or a strategy created by player to win the game. For example, in cs: VR, player are able to make some move that player can't do in original Cs:go; such as raise the gun over the bunker and shooting. In VR environment, Player'll put more sympathy on protagonist, thus as they are at some point of the game, they might feel stronger feedback when they make those decisions. But under the intense playing environment and competition between players in multiplayer games, its effect might not be that active.

4.2 Environmental Story Telling in VR

environmental story telling is always one of the most important narrative Methods in video games, it provides fluent storytelling experience, meaningful details for player to discover and enrich background stories. But what was brought by VR to environmental storytelling is revolutionary [8]. It can provide more details that can't be seen by players before; among 6dof VR headset provided, three of them already exist in most of first-person game, which is camera rotation, but rest of them barely appears in most first-person game, which is the horizontal and vertical movement of camera. Also, the controller allows player to pick up more object than non- VR games, because some of the object can be graded are just serves as environment storytelling instead of have real functions. This provides players more freedom when protagonist stand in certain place and player wants to look around, player basically able to push their camera to anything they want to take a closer look. For example, also in half life: alyx there's a most basic enemy called headcrab, from its normal standing stage, it just like a cooked turkey with four wings instead of two [9], But in VR environment, player is able to grab that headcrab and see the bottom of it, player is able to see the inner structure of headcrab and some organ of it, some of the organs are clearly design to occupy another body, which is accord with the headcrabs living bings parasitic nature. Through this detail, player might imagine how headcrab parasite other creature and enhance the horror of this enemy. This example demonstrates how game designers use the model of one enemy's dead body to illustrate some background information to players. Without VR, it'll be harder to fluently demonstrate this to player. in conclusion, VR is very important to environmental storytelling.

4.3 Emergent Storytelling in VR

Just like what was been discussed in 2.1, what makes video games storytelling different from other genres is it can do narrative in emergent ways, it allows players decision direct how the story goes. However, is still very important to illustrate how VR impact on emergent storytelling. Under the high movability of VR controller, more actions are available for players, when it combines with old already exist mechanisms, it often creates some unexpected result. According to an article called: Creative Player Actions in FPS Online Video Games: Playing Counter-Strike, it analyzes an intense and complex communication system in CS: GO, and players created a lot of complex tactics in games. Today, there's another VR game called pavlov VR, which is basically a VR based CS: GO, however, since it's in VR, many simple actions that used to be a simple button on console such as reloading, now require player to really plug a magazine in their gun [10]. But the one who are able to interact with magazine and guns are not only the owner themselves, is actually every player in games. And communication expands to not only the same squads can hear it, but every player near the player who is speaking. Thus, some player sneak behind their enemies and steal their magazine and force enemy to surrender. These types of videos went viral on internet. This example demonstrates the diversity of decisions players are capable to make in VR. Which means more types of story narrative possibilities appears, this brings player with more free and more immersive experience.

5. Conclusion

VR is still a new technology waiting to be developed more deeply, but its potential had already shown why it will change how storytelling progress in future games. This article describes two important traits of storytelling in video games, which is emergent narrative and environmental storytelling. Then, new features brought by VR is introduce by providing effect of its console and headset. Finally, those two important traits have been analyzed under VR environment and the change were been estimated. Result turns out that VR have significant effects on storytelling since of immersion and produce new features with already existed mechanisms. Further research can be more focus on other new born VR technology's effect on games, such as VR treadmill, which is a treadmill that allows player to use their legs to run or walk to any direction. Smell generator is also an interesting device for immersive experience, it allows player to smell what is in game, it mixes different fragrance essence together to achieve this function. The effect of VR on game mechanism is also a great topic to be research. It allows designer to invent new features for games.

References

- [1] Craig A. Lindley Story and Narrative Structures in Computer Games. Gotland University, Sweden 2005.
- [2] Ferguson C, Van D, Oostendorp H V. On the role of interaction mode and story structure in virtual reality serious games. *Computers & Education*, 2020, 143:103671.
- [3] Lebowitz, J., and C. Klug. Interactive storytelling for video games: A player-centered approach to creating memorable characters and stories. 2012, 181:183-190.
- [4] Aylett R. Narrative in Virtual Environments - Towards Emergent Narrative. Fall symposium technical report, 1999.
- [5] Lee W K, Chang R. Evaluation of lag-related configurations in first-person shooter games. 2015 International Workshop on Network and Systems Support for Games, 2015:1-10.
- [6] Claypool K T, Claypool M. On frame rate and player performance in first person shooter games. *Multimedia Systems*, 2007, 13(1):3-17.
- [7] Etter D, Kamen C, Etter K, et al. Modern Warfare: Video Game Playing and Posttraumatic Symptoms in Veterans. *Journal of Traumatic Stress*, 2017, 30(2):182-185.
- [8] A F R, B. Are online role-playing games more social than multiplayer first-person shooters? Investigating how online gamers' motivations and playing habits are related to social capital acquisition and social support - ScienceDirect. *Entertainment Computing*, 2019, 29:1-9.

- [9] Wang J, Shi R, Xiao Z, et al. Effect of Render Resolution on Gameplay Experience, Performance, and Simulator Sickness in Virtual Reality Games. 2022, Software, Japan.
- [10] P Vankúš. Efficacy of teaching mathematics with method of didactical games in a–didactic situation. Quaderni Di Ricerca in Didattica, 2005, 15:90-105.