



Designing Interactive Virtual Reality for Distance Learning from Professional Screenwriter's Point of View

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Abstract. Covid 19 has propelled distance learning to a level never seen before. Virtual reality has become more common to the masses and more commonly used in education. The immersive ability of virtual reality can benefit students to learn without the need to leave the classroom. Storytelling has been entertaining, educating, and engaging people for thousands of years, thus combining storytelling with interactive learning would be beneficial for the students. This research paper will explore steps of combining expected learning outcome with storytelling in designing more entertaining virtual reality interactive learning from a professional screenwriter's perspective. Using qualitative approaches of observation and literature review, this paper views some obstacles of implementing storytelling in IVR and ways to overcome it.

Keywords: Virtual Reality, Storytelling, Distance Learning, Education.

1 Introduction

The conventional mode of instruction and acquisition related to this preparation typically occurred within academic institutions like schools and universities. However, in March 2020, due to the global Covid-19 pandemic, a majority of societies worldwide, including educational institutions, had to shut down. This resulted in a swift overhaul of the learning environment. In order to sustain education, a significant portion of the teaching community had to transition to remote digital instruction. This shift brought about difficulties for the entirety of the teaching and educational community, particularly for hands-on, practical-oriented education according to Johansen [1].

Film program at Universitas Multimedia Nusantara was founded in 2016. As part of the University's vision, the use of new technology is highly encouraged to be explored as part of the teaching process. In 2021, in the midst of global pandemic, Film Program was given a task to create Interactive Virtual Reality module to teach students about basic film lighting equipment. This paper will explore the creative thinking and process in designing an entertaining Interactive Virtual Reality for students.

1.1 Interactive virtual reality and pedagogy

Gamification of learning experience are considered to be powerful instruments for instructing intricate and challenging procedures because they (a) employ action in lieu of verbal explanation, (b) foster individual motivation and contentment, (c) cater to diverse learning styles and aptitudes, (d) bolster proficiency in skills, and (e) offer an interactive environment for making decisions as mentioned by Kebritchi & Hirumi [2]. Being a cutting-edge technology, Interactive Virtual Reality (IVR) offers a deeply engaging and immersive setting that can be tailored to address specific learning requirements. These capabilities of technology hold significant promise in enhancing cognitive and motivational aspects of S.T.E.A.M. education, including factors like learner achievement, cognitive demand, self-confidence, and perceived enjoyment as mentioned by Huang et al., [3].

1.2 Story and plot

In recent times, interactive storytelling has garnered significant interest and examination from both game theorists and industry experts. This heightened attention is understandable, given the historical but swift evolution of interactive storytelling in commercial games as mentioned by Ip [4]. A film script serves as an excellent framework or blueprint for various fields, including interactivity. Its potential applications include: 1. offering a method for creating interactive games, 2. enabling implementation in interactive and potentially immersive training and educational settings, and 3. making it viable for entertainment realms like interactive television as mentioned by Murtagh et al., [5].

2 Methodology

This paper uses qualitative methods by observation and literature review in designing interactive virtual reality module for student learning about basic filmmaking lighting skill. The pre-production (designing stage) took place in January – July 2022, the launching of the IVR film was in December 2022. The title of the IVR film is “Cahaya Cinta Perlahan menyilaukan” (CCPM Film), translated title: “You are the light of my life”. The story and script developed by Perdana Kartawiyudha, a professional script-writer and film lecturer.



Fig. 1. Launching poster of Interactive Virtual Reality film “Cahaya Cinta Perlahan Menyilaukan” (Source: CCPM Film documentation).

2.1 Step 1. Exploring Medium and Equipment

Students will use Oculus Quest 2 for the basic film lighting IVR film. The content can be shot with 360-degree camera or 16:9 video camera. For 360-degree video shot with Insta 360 Pros Spherical VR 8K camera. For the 16:9 camera, Sony Alpha a7S III was used. As for the interactivity, all sources will be edited and combined with Unity software.

2.2 Step 2. Exploring Expected Learning Objective

This IVR is intended to teach students the basic knowledge of film lighting which includes understanding the lighting equipment and basic understanding of how to use the equipment. In order to broaden the audience, the expected learning outcome (ELO) refers to SKKNI (Standar Kompetensi Kerja Nasional Indonesia) or Indonesian National Competency Standard, which applicable throughout Indonesia. Specifically refers to SKKNI no. 154 year 2020, Film Lighting competency. The occupations regulated by SKKNI for film lighting competency are: Key Gaffer, Gaffer, and Assistant Gaffer. As the aim for the IVR is basic skill, therefore the occupation targeted was Assistant Gaffer.

Therefore, the focus of the IVR learning objective is unit: R.09GAFOO.005.1 titled “Ensuring the availability of lighting equipment” with the following competency:

1. Ensuring film lighting equipment to be used.
2. Checking the lighting equipment to be used. Ensuring good condition and usable.
3. Ensuring lighting equipment, lighting stands and lighting accessories are in working order.
4. Documenting logbook and safety packaging of lighting equipment and accessories.

Once the competency needed was set, we specify learning material and assessment accordingly. As for the assessment, we used multiple choice. The first form of multiple choice is question and 3 answer option with one right answer.

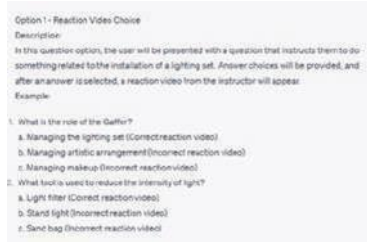


Fig. 2. Questions and answer multiple choice. Translated from Indonesia Language to English Language (Source: Meeting material documentation).



Fig. 3. Multiple choice assessment. (Source: CCPM Film documentation)

In the interactive level, students were asked to select the right equipment based on the visual aid given.



Fig. 4. Questions and answer multiple choice in interactivity zone. (Source: CCPM Film documentation)

2.3 Step 3. Target Audience

It's evident that film marketing in the digital era must shift away from a one-size-fits-all approach. Each film now requires a tailored strategy to engage the specific target audience and suit the genre of the film as mentioned by Kerrigan [6]. As a writer you've

only got about ten minutes to establish this, because the audience members can usually determine, either consciously or unconsciously, whether they do or don't like the movie by that time. If they don't know what's going on and the opening is vague or boring, their concentration and focus will falter and start wandering as stated in Field [7]. The importance of knowing your audience ensured that they would enjoy the content that they consume. The target audience for this IVR film was students of SMK Film, a vocational high school specifically learning about filmmaking. Demographically they were 16-18 years old, mostly male, and lives in major cities.

2.4 Step 4. Narrative Structure and Character

Given the pedagogy needs and the entertainment needs in this IVR Film, we created a non-linear story telling. Storytelling is both linear and nonlinear. When you're writing for interactive games, a detailed scene breakdown helps with the complexity according to Wright [8]. For the narrative part of the IVR Film, Fields Three Acts Structure was selected [7].



Fig. 5. Three Acts Structure (Source: Screenplay: The Foundations of Screenwriting; Syd Field)

Referring to Fields statement that the opening of a film is crucial for the enjoyment of the viewer, we decided to put most of the narrative in the Act I of the IVR Film, therefore we use normal 16:9 video to convey the story. Then for the learning material placed in the middle of Act II with 360-degree video. As Act III the resolution, we used Interactive VR (combined in 360-degree video) for assessment in the learning process.



Fig. 6. Three Act Structure (Source: Screenplay: The Foundations of Screenwriting; Syd Field)

Once the narrative sequence of the IVR film was finalized, then the story and character in the IVR can be created. As mentioned earlier about the target audience, the story and character must be related to their daily life and interests. Therefore, we chose teen-love-drama story as the basis story of the IVR CCPM Film. The synopsis of the CCPM Film: Through the narrative of Fuji (Male, 20 years old), we are introduced to Leica (Female, 18 years old), a freshman at university who is in love with Sony (Male, 22 years old), a bitter senior. Sony opened a job vacancy as Assistant Gaffer for his film production where Sony is the Gaffer. Leica snaps up the chance even though she knows nothing about film lighting and thankfully Fuji (Leica’s school buddy) helped her.



Fig. 7. Characters in CCPM Film. (Source: CCPM Film meeting documentation)

3 Result



Fig. 8. Narrative and pedagogy of CCPM Film. (Source: Personal research documentation)

As we can see in Figure 8, each level is a combination of storytelling and teaching. This would ensure students keep engaging with the learning process through a story that they can relate to. With all the narrative, learning materials and the assessment discussed and locked, the next stage is creating a script in detail for the CCPM Film.



Fig. 9. Script of CCPM Film, opening scene. (Source: CCPM Film documentation)

The script, as can be seen in Figure 9, was written with Final draft software which is commonly used by professional screenwriters. This script described in detail all aspects of CCPM Film from the narrative story, learning material and study assessment.

4 Discussion

Distance learning can be challenging for some students, if we could make it more entertaining, then it would make distance learning enjoyable thus students and teacher can benefit from it. Adding narrative to interactive virtual reality have its challenges, few challenges we encounter: in 360-degree immersive visual, it is very hard to ensure the viewer to focus on one thing or one area (where the action is), it is the reason that we still use traditional 16:9 screen inside the virtual world, specifically for the story part of CCPM Film (Act I). This approach ensures that the audience focuses on the video only.

In other instances, the video uses sound to direct audience attention or encourage the audience to look around.



Fig. 10. 16:9 screen inside virtual reality screen (Source: CCPM Film documentation)

When writing for immersive video, we need to think about where to shoot the film. We need a controllable set environment to shoot, as shooting with 360-degree camera allows the camera to see everything, even things we do not want audience to see. The solution for this that the 360-degree scenes was shot in a close-set studio set-up with minimal sunlight exposure.

Technical knowledge of virtual reality production pipeline for the screenwriter is necessary. Screenwriter must understand what Unity software can and cannot do, to ensure the script can be produced. In this IVR, the decision of creating normal 16:9 video in a 360-degree environment was an example of such knowledge. This paper focuses on the pre-production aspect of IVR production, further discussion about the production and the impact of the narrative is yet to be discussed.

5 Conclusion

Combining narrative with Immersive Virtual Reality Learning is proven to have its difficulty, screenwriters must learn to understand the production pipeline first, before creating the script. Understanding the target audience helps screenwriters to create more relatable stories. We propose the following procedure to create IVR based storytelling as can be seen in Figure 11.

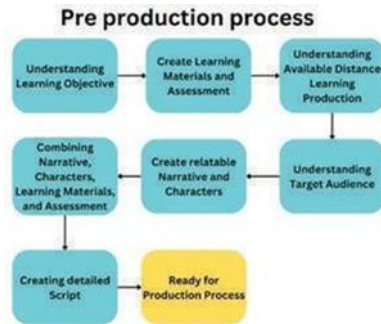


Fig. 21. Preproduction Process (Source: Personal research documentation)

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