Usability Testing in Virtual Reality Based Interactive Film "Cahaya Cinta Perlahan Menyilaukan"

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Abstract

"Cahaya Cinta Perlahan Menyilaukan" is a virtual reality based interactive film produced by the Film and Animation department at Multimeda Nusantara University. This film was developed as an alternative way of learning vocational skills, especially in a film production environment. This film has two episodes and three difereent interactive levels to learn basic film lighthing. This study was conducted during the interal film premiere using a post survey questionnaire. The questionnaire contains a usability measure to determine how easy it is to experience the interactive film. Using two categories by Nielsen (1996) such as memorability and learnablity to measure usability, 44 attendees filled the survey. The overall result from the survey is beneficial to improve the succeeding version of the film.

Keywords

Virtual Reality, Interactive Film, Usability Test, Learning Lighting, Film Education, Cahaya Cinta Perlahan Menyilaukan

Pendahuluan

Virtual reality is one example of innovative technologies that gained more popularity in 2016. Histories recorded that this technology initially emerged in the 19th century, where at that time a stereoscopic

google was developed for science and military reasons (Jerald, 2015). In 1950, Morton Heilig was among the first pioneers who developed a Virtual Reality experience in his experiment called *sensorama* (Bucher, 2017). The common technology to produce a Virtual Reality content is divided into two different styles: using computer generated images as a three dimensional object and a live 360-degree action captured using a 360-degree camera (Williams et al., 2021). This paper will be focussed on the second style where a professional 360-degree camera was used to develop the overall content.

A 360-degree video camera is a specialized panoramic camera which has a minimum one or two superwide lens (fish-eye) to capture a double back and front 180-degree environment at the same time (Afzal, 2017). Viewers for this content will be able to experience the whole environment of a certain place, location and/or experience. Virtual reality or known as VR, have been used in many different sectors, including health care, property, entertainment and especially education. Many experiments such as in content development and the use of the technology have drawn educators to utilize it as a tool for a new way of learning possibilities. VR in education is capable of eliminating borders, in physical spaces and sometimes cultural-social barriers (Adanin, 2020).

VR implementation in teaching and training sectors is getting more popular in recent years. ICEF Monitor (2015) found out that distance learning and virtual education brought approximately 1.1 billion dollars in revenue to the US in 2015. This number is expected to grow to 2.5 billion by 2020 (ICEF Monitor, 2015). A number of researchers have reported the benefits of using VR in educational contexts, such as improving learning outcomes (Lin et al., 2017), increasing student motivation and engagement (McMillan et al., 2017; Sattar et al., 2019), and increasing knowledge retention and awareness (Pérez-López & Contero, 2013). In Indonesia, a national scale project has been developed to implement VR technology as an alternative tool to enhance vocational education (Tinarbuko, 2022). The ongoing project aims to help student on the vocational high schools to learn more skillful set using VR

technology, with the hopes to enhance class practicum in more inclusive and accessible.

"Cahaya Cinta Perlahan Menyilaukan" (You're The Light of My Life) is a Virtual Reality based Interactive Film. This film was developed in order to bring an alternative way of learning vocational skills, especially in a film production environment. This film has two episodes where two stories were developed in order to learn about basic lighting. *"Cahaya Cinta Perlahan Menyilaukan"* or known as CCPM film has three levels, where on each level several different skill sets/competencies of film lighting were being simulated and explained. There are three different breakdown of immersion levels in the film. Level 1 is a 16:9 traditional content in a VR environment where the story introduction of the characters and their issues were exposed. Level 2 is a 360-video non interactive experience in a small film studio set to learn about the name and type of lighting equipment. Whereas in level 3 is an interactive gaming experience designed for concluding the overall experience of learning basic lighting. Each episode took about 10-12 minutes to finish, in total two episodes plus credit title is 25 minutes' experience.

This film was launched on December 6th, 2022 at Multimedia Nusantara University. A number of people were invited during the launching, including the list of executive producers from the Ministry of Economic Coordination as well as the equipment and training provider GIZ and Festivo. Structural staff from the university, lecturers, students and production crews had a chance to experience the first time of this VR based interactive film.

Figure 1: A screen capture from the landing page of the film
(Source: Personal research documentation)

On that occasion, a usability test was also conducted. Usability testing is an activity to assess how easy user interfaces are to use.   Nielsen (1996, p.12) identifies five attributes by which to measure the usability of a system:

- Learnability: How easily can users accomplish basic tasks and begin to work?

- Efficiency: How quickly can users perform tasks once they have learned the design?

- Memorability: How easily can users reestablish proficiency after returning to the design after a period of time?

- Errors: How many errors do users make and how easy is recovery from errors?

- Satisfaction: How pleasant is the design to use?

Usability testing enables educators, trainers, and developers to understand how a user interacts with the system and identify usability issues (Sanders, 2010). In the case of this film, which was produced for a specific targeted audience/user like a film student and beginner film crew. In supporting the implementation of VR technology on a larger scale of training and education program, usability testing could provide significant data to better improve the succeeding version of the film.

The purpose of this research is to test the usability of the VR experience using two of Nielsen's (1996) five attributes, specifically memorability and learna bility. This study aims to get to know the first impression of the general audience/participant/user on the first ever launching of the film. By conducting this study, we hope to gain knowledge on how the film gets accepted by the general audience and help us to better improve the experience for the upcoming version of the film.

Metode Penelitian

This research uses quantitative methods via on site surveys. Participants were asked to fill the questionnaire after experiencing the VR content. There were two types of questionnaires to measure memorability and learnability. Memorability was measured using closed questions (Yes

or No, Finish or Not Finish) with the additional question on what level the user stopped and reason why they stopped. Learnability was measured using Likert scale (1=strongly disagree, 5=strongly agree) from five statements about the overall film experience.

The usability testing was conducted on site during the film premiere at the main campus of Multimedia Nusantara University, South Tangerang, Banten. The film premiere was selected for the usability testing because this event was the first time ever, the general audience experienced the film. This event was also special because all the stakeholders involved on this project were invited to experience the film. In total 44 attendees participated in the usability test. Almost 82,5% of the participants came from the University, a mix between students and lecturers. And the other 17,5% were from some invited institutions such as from the donors and trainers.

Pembahasan

During the premiere, there were four Virtual Reality Headsets prepared for the usability testing. With the help of five facilitators during the test, participants were asked to sit on a chair where they experienced the overall film for at least 25 minutes.

Figure 2: A facilitator is putting the VR headset to the participants during the usability testing.
(Source: Personal research documentation)

After experiencing the VR content, all the participants were guided to access a computer where the questionnaire via Google form needed to be filled out. In order to find answers on the memorability aspects. Three questions have been developed, such as:

1. Did the participant finish or not finish the full film?
2. *If not finished, did they remember on which level? And*
3. *For what reason didn't the finish the experience?*

Those three questions were developed in order to seek impressions in the overall experience of the film. Whether the audience finished or not finished the film in terms of technicality or in terms of the contents experienced throughout the films.

In the aspects of learnability, there are other questions developed to seek answers on how easy the interface is on each level of the film. The questions were developed as simple as possible and asking about each interface on each levels. The questions are:

4. The overall interface of the project is easy to understand.
5. The landing page (main menu) interface of the project is easy to understand.
6. The level 1 interface of the project is easy to understand.
7. The level 2 interface of the project is easy to understand.
8. The level 3 interface of the project is easy to understand.

On each questions likert scale was applied to measure the learnability, see this table below:

No	Scale	Score
1	Strongly disagree	1
2	Disagree	2
3	Neutral	3
4	Agree	4
5	Strongly Agree	5

Table 1. Likert scale for learnability test
(source: personal research documentation)

On the memorability test, from the total number of 44 participants: 72,7% of the finished the overall film. Whereas the rest of 27,3% participants did not complete the overall film. An astounding 93.8% of these participants remembered where they had paused the film, leaving only 6.3% who couldn't recall their stopping point. Notably, 57.9% of participants decided to exit at Episode 1, "Leica's story," while 42.1% opted to stop at Episode 2, "Sony's story." Additionally, 52.6% of the 44 participants completed level 3's 360 film interactive question 3, whereas 15.8% halted their progress at level 3's 360 film interactive question 2. Interestingly, each of the three levels—level 1, level 2, and level 3—had an equal participation rate of 10.5%.

The reasons behind the incomplete film viewings among the 44

participants were diverse. A substantial 26.7% attributed their cessation to dizziness, while 13.3% reported physical discomfort as their primary reason for stopping. Other factors included boredom, difficulty comprehending the content, excessive duration, distractions, the non-appearance of question three after waiting, and the absence of questions altogether. A small portion of participants experienced technical issues such as malfunctioning content, accidental joystick presses, program crashes, and freezes, accounting for 6.7% of the discontinuations.

In terms of learnability, the assessment assessment was conducted via the film interface and button-based questions. Impressively, 68.2% (30 out of 44 participants) strongly agreed that they comprehended the use of buttons and interfaces throughout the project. An additional 25% (11 participants) agreed with this understanding, while a minority of 6.8% (3 participants) expressed neutrality on the matter. When specifically addressing participants' grasp of buttons and interfaces on the home page (including Synopsis, characters, and guide), 65.1% (28 participants) strongly agreed with their comprehension, while 32.6% (14 participants) simply agreed, and 2.3% (1 participant) remained neutral.

For level 2, 73.8% from 44 participants strongly agree that the use of buttons and interfaces on Level 2 (non-interactive 360 film) is easy to understand. Instead of that, we found only 9 participants agreed and 2 participants said it was neutral. Last, at level 3 31 participants or 72.1% strongly agree that the use of buttons and interfaces on Level 3 (non-interactive 360 film) is easy to understand. Whereas 10 participants (23.3%) said they agree, 1 participant (23.3%) said neutral, and 1 participant (23.3%) strongly disagreed.

Memorable Test Results	Percentage
Completed overall film	72.7%
Did not complete overall film	27.3%
Remembered where they paused	93.8%
Did not remember where they paused	6.3%
Exit point: episode 1 - Leica's story	57.9%

Exit point: episode 2 - Sony's story	42.1%
Completion of level 3's 360 film interactive question 3	52.6%
Halted progress at level 3's 360 film interactive question 2	15.8%
Participation rate in level 1, 2, and 3	each at 10%

Table 2. Memorability Test Results
(Source: Personal research documentation)

Reasons for Incomplete Film Viewing	Percentage
Dizziness	26.7%
Physical Discomfort	13.3%
Other reasons (boredom, comprehension difficulty, malfunction, joystick press, etc).	6.7%

Table 3. Reasons for Incomplete Film Viewing Results
(Source: Personal research documentation)

Scale Userface Interface & Butons	Strongly Agree	Agree	Neutral	Strongly Disagree
Throughout the film	68.2%	25%	6.8%	-
The home page (Synopsis, characters, and guide)	65.1%	32.6%	2.3%	-
Level 1 (16:9)	74.4%	20.9%	4.7%	-
Level 2 (non-interactive 360 film)	73.8%	21.4%	4.8%	-
Level 3 (interactive 360 film)	72/1%	23.3%	2.3%	2.3%

Table 4. User Interface Learnability Test Results
(Source: Personal research documentation)

Based on the explanation explanation and table above, we find a significant majority of participants (72.7%) successfully completed the entire film, indicating a relatively high engagement level. Also, we found an impressive 93.8% of 44 participants were able to remember where they had paused the films, suggesting good engagement and attentiveness. There was a notable preference for exiting at different episodes (57.9% at episode 1 and 42.1% at episode 2), indicating varying levels of interest in the content. At level 3's 360 film interactive question 3 saw a relatively high completion rate (52.6%), while 15.8% halted at question 2. This suggests varying engagement and difficulty levels across different interactive elements. It's interesting to note that each of the tree levels (1,

2, and 3) had an equal rate of 10.5%, which may imply consistent user engagement across the different levels.

On a memorability test result, these findings show that the incomplete viewing varied, starting from dizziness affecting 26.7% and 13.3% citing physical discomfort and other factors highlighting the complexity of viewer experiences. In addition, we also found that the majority of 68.2% of 44 participants in testing the user interface and buttons strongly agreed that the design of button positions and interface usage is effective. Although we found that there were 25 percent who only agreed. On the home page interfaces, most strongly agreed that it is easy to understand. Then among the three levels displayed most can understand well with the appearance of the user interface and buttons.

Kesimpulan

The findings highlight the importance of considering user experience factors such as engagement, comfort, and was the very first aspect that is essential to be tested. More aspect need to be tested for a more diverse user/audience to this film. There are several areas where improvements can be made to increase user satisfaction and retention, according to the result that leads to the feeling of headaches, stopping the overall experience. Usability when designing interactive film content. The overall usability testing went pretty smooth, some technical difficulties were mitigated properly. Such as in the aspect of electrical power, sitting and ensuring malfunctions that occur while operating the programme.

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