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## **Serious Games About Indonesia's Heroes Day for Education About Events 10 November 1945**

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### **ABSTRACT**

Heroes' Day is one of important days for Indonesia, is a day that commemorates one of the most important historical events, especially for the Indonesian people. The independence of the threatened Indonesian nation could be defended by heroes who sacrificed their lives against the invaders, where the incident coincided on November 10, 1945. but there are still many young people today who still do not understand the importance of their hero's struggle on that day, and consider Heroes' Day an ordinary holiday. The serious game is one of the game genres that is commonly used to provide learning about a topic by using games as learning media. By utilizing games as learning media, it will be easier for youth to understand the events of November 10 directly. The game is designed as a first-person shooter game developed using Unity with players playing the role of fighters against invaders on November 10, 1945. After playing, players will be given a series of questionnaires that contain events that occurred in the game and provide value to the game application. from the results of the questionnaire, the value obtained from the questionnaire was 69 and the value of the aspects of the game was 3.37.

**Keywords:** 10 November 1945; Education; First Person Shooter; Serious Game; Unity;

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### **1. INTRODUCTION**

Hero's Day which falls on November 10 is one of the big days in Indonesia. Indonesian people celebrate this day as a form of respect for the heroes who fought to defend Indonesia's independence. but today there are still many Indonesian youths who forget or do not know about the importance and severity of the struggle of our heroes on November 10, 1945. The lack of empathy and education for our heroes has resulted in many young people today who underestimate their struggles and consider Heroes' Day just a holiday. as usual. the need for education about the history and struggles of past heroes to increase the youth's sense of nationalism.

The events of 10 November 1945 were one of the first wars that occurred after Indonesia proclaimed its independence from Japan and one of the biggest and toughest battles in Indonesian revolutionary history which became a national symbol for Indonesia's resistance to colonialism. As reported by the guidelines for National Hero's Day, on 10 November 1945 a battle took place in Surabaya which was a major battle between the Indonesian army and British troops. The many warriors who died and the people who became victims at that time as well as the unyielding burning spirit shown by the people of Surabaya, made England feel like roasting in hell and made the city of Surabaya later remembered as a city of heroes.

A serious game is a form of a game that focuses on education rather than the Player's enjoyment. Digital Educational games is Innovation that can enhance Learning and acquiring skill (Manesis, 2020). Cited from (Laamarti et al., 2014) Serious game was first discussed by Abt in his article that described that: "We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement." where he uses a gaming approach to improve education for physical and social sciences, occupational choice and training and problem-solving in government and industry. Quoted from (Siosan et al., 2021) by keeping up motivation and interest is important for any subject to master. In this modern era, using games as an educational medium allows attracting young people to try serious games. Research in (Kasinathan et al., 2019) added that with adding game element into something can give motivation to do some task

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and interest in it. Interest in entertainment such as games is very high and interest in learning by reading books has decreased due to the demand to do everything quickly and briefly, whereas reading books requires time and is not so attractive to today's youth.

## 2. LITERATURE REVIEW

### Serious Games

Serious Games are a form of education that utilizes games that are generally used as entertainment media, used to educate players by playing serious games and getting that education. Many forms of educational media such as books, films, and roleplays which were originally used for entertainment are made into educational media to attract people's interest in learning about a topic that you want to convey to players. Serious games are more concerned with the delivery of knowledge and educative content than are concerned with fun like games in general.. In the test procedure carried out by (Schade & Stagge, 2022) they did a test for 45 minutes for a serious game evaluation. The project timeline is divided into three parts: creation, where they create concepts and carry out prototype testing with 12 testers who are professionals in their fields; adjustment, namely revising the feedback received from the previous section and the prototype is being tested by Seven testers who are professionals in their fields; testing, where the revised prototype will be tested to the general public. The results from the feedback on the test in part three theommeded one to carry out direct tests with the target group, namely general people. both prototypes are suitable for testing this criterion, except for criteria 2 and 5. Here, a high-fidelity prototype is recommended for evaluation. Since simple changes and improvements can only be made on a low-fidelity prototype without great. C.Read (C. Read, 2015) creacreatederious game that is designed for older teenagers, according to them is a point that needs to be considered, namely their social environment, the technology they use, and their system. At an age where they like to have fun, they can be included in game design which can enable them to incorporate their input into the game. The gameplay also needs to be developed to make this serious game genre fresher. Widya Adharyanty Rahayu (Adharyanty et al., 2018) developing game for learning English vocabulary. Based on the results achieved, the percentage of feasibility based on media experts is 76.78% and material experts is 75% to be used as learning media. Firas Layth Khaleel on paper(Khaleel et al., 2020) which examines the impact of gamification on student learning engagement by implementing gamification on learning programming languages. The conclusion received is that there is a positive level of engagement in learning programming languages where it finds a positive effect on learning that has been gamified.

### History Games

History Games are a form of games that use the history of a place or person as the theme of the game. This type of game has the aim of retelling something that happened in ancient times and engineering it in the form of a game by incorporating creative values from the developer. On paper by (Zin & Yue, 2009), the author makes games a form of historical educational media. By utilizing games as learning media, the authors suggest using the HMIEG (History Multimedia Interactive Educational Game) design where the game system and game design have a linear flow from stage 1 to the next stage until the stage in the game is complete.in paper by (Mulyana & Kurniawati, 2020) that analyzing Phenomenography of student' historical thinking ability in studying social history. Its result stated that those who has high motivation in learning will carry out "in-depth". learning attitude By carrying out linear and continuity paths where educational games carry out the integrity of pedagogical elements and game design features that can be used for history lessons effectively. On Paper (Handoko et al., 2022), where they made a puzzle game for learning about the Hindu kingdom in Indonesia, by providing platformer gameplay and compiling images related to the history of the Hindu kingdom. from the results obtained, the response from the player felt that games like this could be used easily, and had a pleasant effect that could be used continuously.

### Unity

Unity is a game development application that can be used for free. This application uses the C# language and is equipped with many features and add-ons that can make it easier for developers to develop games. The output in unity itself can be used for applications. Many developers use Unity as an IDE for developing educational games. On Paper by (Dziak & Plechawska-Wojcik, 2017), The author uses unity 3D to create a serious game for firearm handling skills training. The results of the questionnaire to players are 100% interested in trying firearm handling in the real world, and 95% are interested in playing again if the game adds a new rifle. In paper Augmented (Koca et al., 2019) The author makes AR games using Unity 3D as an educational medium for preschool children. The author uses android to

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display AR about animal images as an introduction to preschool children.

### **First Person Shooter**

First Person Shooter is a game genre where the game camera acts as the player's eyes. The player feels the point of view of the game character, giving an immersive feeling and strengthening the roleplaying element. This genre is commonly used for shooter games. In the paper (Alves et al., 2018) The author develops design guidelines regarding the mental state. First-person Shooter is one of the most popular genres which gives players a sense of arousal and engagement state. The authors created 4 versions of AI that have different states, the purpose of which is to examine the player's mentality when facing the AI. according to them, developers can utilize mental states such as anxiety, boredom, engagement, and frustration to make their games more interesting and engaging. On this paper (Hart, 2019) examines using the first-person shooter camera in games as a cinematic technique in searching scenes and "killer POV" in horror films. By giving a sense of helplessness to the viewer when in the searching scene, it will give a sense of anxiety and immersive in the viewer. In this paper. Hae Kyung Hee writing paper (Rhee et al., 2019) that discussing about the analysis of first person shooter games on games mode and weapons-military-themed. From the view of market perception, First-Person shooter games has massive fans from around the world and especially in korea with second most favored games.

### **History of 10 November 1945**

The events of November 10, 1945 are one of the important histories for the country of Indonesia, and became the biggest battle after the proclamation of independence. According to (Muwafiq, 2022). the battle of November 10, 1945 has three important parts, namely the arrival of British and Dutch soldiers on October 25, 1945, the Yamato hotel tragedy, and the Ultimatum of November 10, 1945. The events of November 10, 1945 were also used as a board game by the author (Indriasto & Solicitor C.R.E.C, 2014) as one of the educational media about the events of November 10, 1945. Based on (Kusuma et al., 2021) the battle in surabaya on 1945 has a people's element where the resistance carried out against invasion of the allies was realized through the participation of all the people of Surabaya in accordance with their roles, ability, profession and expertise as manifestation of the rights and obligations of every citizen in defending the country

## **3. METHOD**

### **Development Game**

This November 10, 1945 event FPS game is desktop-based. Player and enemy characters must be able to shoot to hurt each other. This is one of the important aspects for a First person Shooter. Players and enemies must be able to recognize enemy bullets and be able to take damage from enemy bullets. In unity, there is a component that can detect collisions between two or more objects that have this component. that component is Collider.

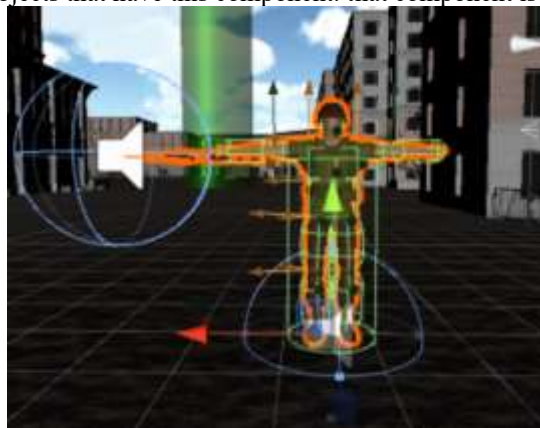


Fig. 1 Enemy Model and its collider

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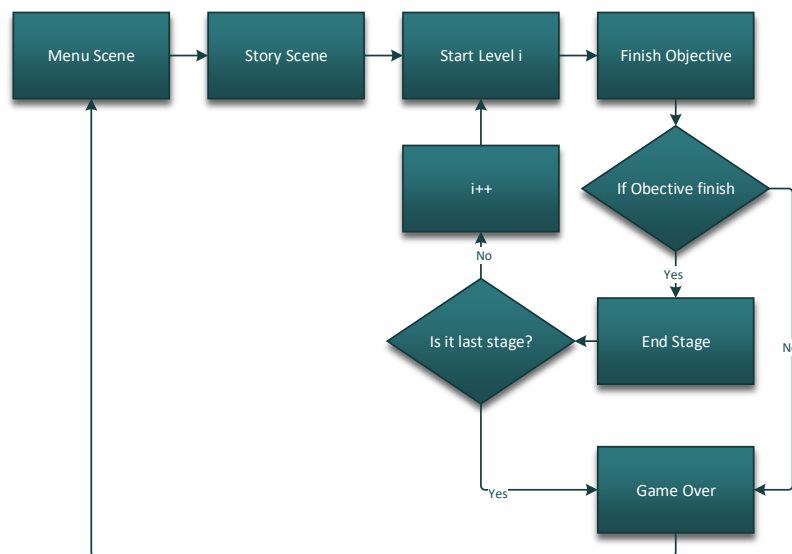


Fig. 2 Flow Game

The following is an explanation of the picture above which is the flow of the November 10, 1945 FPS game:

**Menu Scene**, the initial scene of the game where players can move freely to select game levels, set settings, and as a shooting practice range.

**Story Scene**, Scene where the player will get a narrative about the events of November 10, 1945. Here players will gain knowledge and are expected to focus because in this narrative players will know the objectives for the next stage.

**Start Stage**, Options to start the game, players can interact with objects that will bring players to the selected level.

**Game Over**, the last scene when the player completes all stages or fails to complete the objective.

In games, of course, there is a storyboard, which is a visualization of the idea of the game to be built, so that it can provide an overview of the game to be produced. Storyboard can also be said to be a visual script that will be used as an outline of a game and displayed in each scene.

### **Win Condition and Lose Condition**

Every game has a goal and a challenge for the player so that it gives the player pleasure to play the game. Players are said to win when they successfully achieve the goals or challenges that the game provides. this game has several winning conditions:

Each Level has different win conditions.

**Level 1** adalah elimination mode dimana pemain perlu mengalahkan musuh yang ada dan menyelamatkan kawan yang sedang diserang musuh. Pemain dikatakan kalah ketika mereka dikalahkan oleh musuh.

**Level 2** adalah checkpoint mode dimana pemain perlu menuju ke checkpoint dalam batas waktu tertentu. Pemain kalah ketika tidak mencapai checkpoint dalam batas waktu yang ditentukan atau dikalahkan oleh musuh.

**Level 3** adalah base defence mode, dimana pemain perlu mempertahankan markas pemain dalam batas waktu tertentu tanpa ada musuh yang berhasil masuk ke markas. Pemain dikatakan kalah ketika pemain dikalahkan musuh atau ada musuh yang masuk ke markas.

When the conditions for winning have been reached, the player will receive feedback in the form of a display “Misi berhasil”. And When the conditions for winning are not achieved, the player will receive feedback in the form of a display “misi gagal”

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Fig. 3 Scene “misi berhasil” and “misi gagal”

### Scene Game

Scene Game is a scene where players start playing the game. In stage 1, the player is tasked with killing all existing enemies to be able to complete the stage and move to the next stage.



Fig. 4 Screenshot of stage 1 (Left), Stage 2 (Middle), and Stage 3 (Right)

Next stage is scene level 2. In this stage the player is tasked with going to the Yamato Hotel to take down the Dutch flag that is installed there. Players must run towards the hotel by passing the checkpoints.

Next stage is scene level 3. In this scene the player must defend the weapon barracks at the back. Players must defeat the enemies so they can't get to the barracks.

Story Scene is a scene where players will get a narrative about the events that occur on each stage. The narrative is taken from documentation about the events of November 10, 1945.



Fig. 5 Screenshot of Story Scene

### Testing Method

By expanding from previous research (Abdillah et al., 2018). The form of the test carried out is a Blackbox test, where participants will try the finished application as ordinary users, and they do not know the contents and functions of the application. They will try all inputs and expect the output provided. The test method used in this test is the participant playing the game application. Participants will fill out a questionnaire about the events of November 10,

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1945 twice, before playing and after playing. The expected result is that participants have an increase in the correct answers from the questionnaire from before playing and after playing, especially the history of the events of November 10, 1945. Participants also fill out a questionnaire regarding their opinion about the game they have just played, as an evaluation for the research and as a consideration of plans for the next stage of this research.

#### 4. RESULT



Fig. 6 screenshot of the game

The following are the results of the game that has been developed. the game that has been made is in the form of a First-Person Shooter (FPS) game with the theme of the events of November 10, 1945. participants will use an avatar that acts as a soldier fighting the invaders. the soldier will get various kinds of objectives that must be completed to complete the stage. participants can shoot, load bullets, run, duck as game mechanics. participants have a parameter called health where if the health runs out, the game will be game over. when participants receive damage from the enemy, a red color will appear on the screen as a sign that your avatar has received damage from the enemy. participants will play up to 3 stages to complete the game.

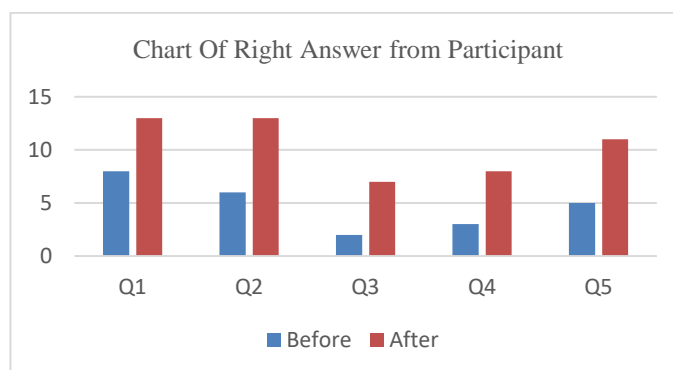


Fig. 7 Chart of right answers of all question

The figure is the result of the questionnaire from the participants. The first participant will fill out a questionnaire as a measure of knowledge about the events of November 10, 1945, before playing the game, participants must answer the questionnaire questions as honestly as possible, after that participants will play the game until completing all stages, after completing all stages, participants will be given the same test to see is there any improvement after playing. Participants will be given a questionnaire about their opinion regarding the educational game on November 10, 1945. The graph above is the result of the correct answers before the participants played the game and after playing the game. it can be seen that there was a significant increase, especially in questions 1 and 2. some participants were less interested in the way the narrative was presented so some information was not included, but they were more

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interested in the game design of the game, and are interested in playing it again if given the opportunity.

**DISCUSSIONS**

The questionnaire has 5 questions and 4 aspects of assessment regarding the quality of the game and the input of criticism and suggestions from Participants. These 5 questions serve to collect data from Participants regarding the feedback received after playing the game and whether it gives positive or negative value to the Participant. 4 aspects of assessment serve to get data from Participants about the game in terms of graphics, gameplay, narrative, and education. The data received will be used as an assessment of the game to find the game's strong points and weak points for future development. Suggestions and criticisms serve to receive direct input from the Participant experienced by the user when playing the game, this input is unique because it is subjective from each Participant.

Participants who have tried and filled out the questionnaire are fifteen people. The following is the data received from Participants.

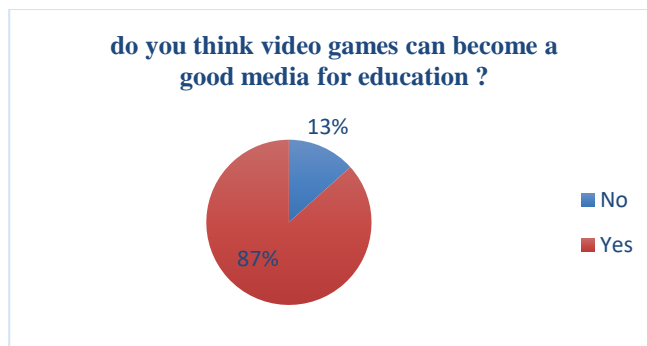


Fig. 8 Chart for participants opinion about game as education media

From the diagram above, 87% of participants answered that video games can be good educational media. while 13% of participants answered no, with the reason that games are usually for fun, it's not compatible with learning and education points usually got overshadowed by the fun of the gameplay. The diagram above gives us a sample of the public regarding their opinion about video games as an educational medium. some disagree, one of the reasons is that games are a medium for entertainment and education is not very effective because people usually look for games for entertainment.

Table 1  
 Result of participants evaluation about the game

No	POINTS				
	1	2	3	4	5
1				V	
2					V
3			V		
4				V	
5			V		
6			V		
7			V		
8				V	
9			V		
10				V	
11			V		
12			V		
13			V		
14			V		
15				V	

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The data received is about the score given by the Participant regarding the game received. The lowest acceptable value is 1 which is multiplied by 20 to 20, and the highest acceptable value is 5 which is multiplied by 20 to 100. from the data received, participants gave the smallest value of 3, where 3 is an okay value. there were 9 participants who filled in value 3, value 4 there were 5 people, and value 5 there was 1 person. so the value obtained is 69.3.

$$\begin{aligned} \text{Average} &: ((3*20)x9)+((4*20)x5)+((5*20)x1) \\ &= 1040/15 = 69,3 \end{aligned}$$

The following is a questionnaire regarding their opinion about the game in this study, there are 4 questions that must be filled in the questionnaire. the results of this questionnaire will be used for evaluation of the game and as a reference for further research.

1.) Does this game help you learn the history of the events of November 10, 1945?

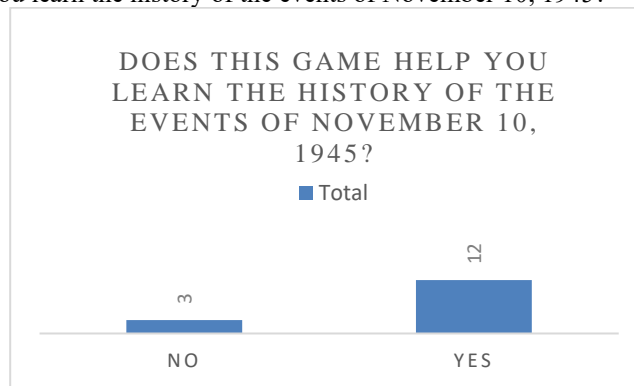


Fig. 9 result of first questionnaire

From the data received, 12 participants considered that the game was helpful in learning the history of the events of November 10, 1945, and 3 participants considered that the game was not helpful in learning the history of the events of November 10, 1945.

2.) Which part of the game makes you interested in playing the game?

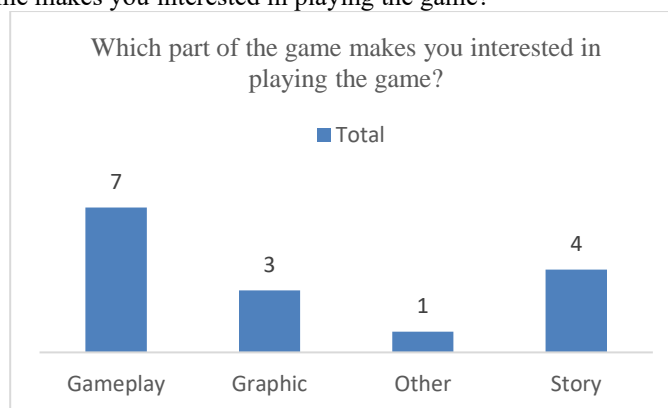


Fig. 10 result of Second questionnaire

From the data above, gameplay is the part of the game that is most interesting according to participants, followed by the story and graphics of the game. other is another part that is not included in the 3 categories above, where other is the ambience of the game and its atmosphere..

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3.) What parts do you think need to be improved to make the game more Interesting?

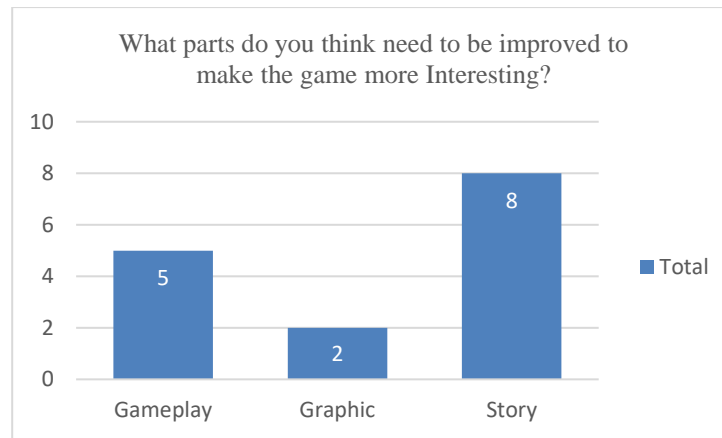


Fig. 11 result of third questionnaire

From the data received, many participants think that the story in this game needs to be improved, followed by gameplay and then graphics. One of the comments we got from participants was that they did not follow the narrative received because the way the story was delivered was too fast, too short, and there were some players who said they were easily distracted by the surrounding environment.

The following is the data received for data assessment on the Aspects in the game.

Table 2  
Data assessment of game aspects from participants

No	Grafik	Gameplay	Narasi	Edukasi
1	4	3	3	3
2	4	3	2	3
3	3	4	3	3
4	3	5	2	3
5	5	4	3	4
6	4	3	3	3
7	3	4	5	3
8	4	4	3	4
9	4	3	3	4
10	3	5	1	4
11	3	4	2	3
12	3	3	3	3
13	3	4	3	4
14	4	5	2	3
15	4	3	2	4
<b>Average</b>	<b>3.6</b>	<b>3.8</b>	<b>2.666667</b>	<b>3.4</b>
<b>Overall</b>	<b>3.36666667</b>			

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The data above is the data received from the participants. there are 4 aspects contained in the questionnaire that need to be assessed by the participants after they play the game. the aspects above are parts of the game which are important aspects to assess whether the game is good or not with additional education specifically for serious games. from the results above, we can see that the highest score is on gameplay where it gets an average score of 3.8 and followed by graphics with a value of 3.6, education 3.4 and the lowest narrative with a value of 2.67. from the above results we calculate the overall average is 3.36. from the above results, we can see that gameplay is the strongest point of this research game, and narrative is the weakest point. although narrative has a low value, the value of education has a higher value than narrative.

We give 5 questions about the events of November 10, 1945, participants must answer these 5 questions twice, namely before playing the game and after playing the game. The results of this question will be a parameter regarding the effectiveness of using the game as an educational media. Here are the results of the answers per question.

- 1.) After the defeat of Japan, on what date did the British army land in Surabaya?
- 2) What block does the british belong to?
- 3) Who led the raising of the Dutch flag at the Yamato hotel?
- 4) Who were the Indonesian figures who took part in the lowering of the Dutch flag?
- 5) What was the cause of the November 10, 1945 Ultimatum?

Table 3

Result of of the questions from participant

No	Q1		Q2		Q3		Q4		Q5	
	Before	After	Before	After	Before	After	Before	After	Before	After
1	Right	Right	Wrong	Right	Wrong	Right	Wrong	Right	Wrong	Right
2	Wrong	Right	Right	Right	Wrong	Right	Right	Right	Wrong	Right
3	Wrong	Right	Right	Right	Wrong	Wrong	Right	Right	Right	Right
4	Right	Right	Right	Right	Wrong	Wrong	Wrong	Wrong	Wrong	Right
5	Wrong	Wrong	Wrong	Right	Wrong	Wrong	Right	Right	Wrong	Wrong
6	Wrong	Right	Wrong	Wrong	Right	Right	Wrong	Wrong	Right	Right
7	Wrong	Right	Right	Right	Right	Right	Wrong	Right	Right	Right
8	Right	Right	Wrong	Right	Wrong	Wrong	Wrong	Wrong	Wrong	Right
9	Right	Right	Wrong	Right	Wrong	Right	Wrong	Wrong	Wrong	Wrong
10	Right	Right	Wrong	Wrong	Wrong	Wrong	Wrong	Right	Wrong	Wrong
11	Wrong	Wrong	Right	Right	Wrong	Right	Wrong	Right	Right	Right
12	Right	Right	Wrong	Right	Wrong	Right	Wrong	Wrong	Wrong	Wrong
13	Right	Right	Right	Right	Wrong	Wrong	Wrong	Right	Right	Right
14	Right	Right	Wrong	Right	Wrong	Wrong	Wrong	Wrong	Wrong	Right
15	Wrong	Right	Wrong	Right	Wrong	Wrong	Wrong	Wrong	Wrong	Right
<b>Right</b>	<b>8</b>	<b>13</b>	<b>6</b>	<b>13</b>	<b>2</b>	<b>7</b>	<b>3</b>	<b>8</b>	<b>5</b>	<b>11</b>
<b>Wrong</b>	<b>7</b>	<b>2</b>	<b>9</b>	<b>2</b>	<b>13</b>	<b>8</b>	<b>12</b>	<b>7</b>	<b>10</b>	<b>4</b>

The following are the results of the participants' performance data as assessed by the progression of their correct answers when solving the problems given to them.

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Table 4  
Table of participants performance

No	Right (Before)	Right (After)
1	1	5
2	2	5
3	3	4
4	2	3
5	1	2
6	2	3
7	3	5
8	1	3
9	1	3
10	1	2
11	2	4
12	1	3
13	3	4
14	1	3
15	0	3

From the results above, it can be seen that all participants have an increase in their correct answers. This proves that the use of video games for educational media has an increase for the game player. these results were also obtained even though there were many complaints from participants about the narrative that could not be captured by participants due to the many shortcomings that have been explained above, and from these results it can also be seen that they can still capture one or two points conveyed in the game.

## 5. CONCLUSION

Heroes' Day is one of important days for Indonesia, but there are still many young people who do not understand the importance of this day which is a commemoration of the events of November 10, 1945 and consider it just an ordinary holiday.

By making a serious game in the form of a first person shooter with the theme of the events of 10 november 1945, it is hoped that it can become one of the learning media for today's youth. from the results of this study, it was found that participants who played this game were interested in playing again because of the first person shooter gameplay, but many of them complained that the narration in this game was not interesting because it was not delivered well. But from the results of the answers to the questions received that there is an increase in their knowledge about the events of 10 november 1945, even with these shortcomings. it is hoped that in future research, researchers can find storytelling techniques that can be used for educational games in the form of first person shooters, or maybe they can be applied to other media. it is also hoped that this research can provide a new look at educational media about history and can be applied to other histories.

## 6. ACKNOWLEDGMENT

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