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Designing a Female Hero Educational Game using Adobe Animate and the ADDIE Method

Asha Sembiring[1], Alon Jala Tirta Sagara [2], Wan Ahmad Jaafar Wan Yahaya[3]
[1]Informatics Engineering, Telkom Institute of Technology, Purwokerto, Indonesia,
[2]Software Engineering, Telkom Institute of Technology, Purwokerto, Indonesia,
[3]Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Gelugor, Malaysia

ABSTRACT

Many do not know that heroes in Indonesia are not only men but women who also participate in the struggle and act as heroes in Indonesia. Female heroes are also very instrumental for Nusa and the Nation. Technology development is now increasingly advanced. For example, mobile phones are owned by every group, such as children, teenagers to the elderly. Mobile phones can also be used as entertainment media such as games that can increase children's interest in learning who tend to like animated images and can increase knowledge, so education is not too saturated. This study aims to develop an educational game that can introduce national female heroes using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) method. This development method focuses on iteration and reflection, so continuous improvement can be made that focuses on feedback. Using a questionnaire, software testing techniques focused on functional specifications and usability testing on a Likert scale. Blackbox testing can provide an overview of the program & combined state and perform functional testing. Likert scale questionnaire testing can produce as expected. The result of the research is an educational game introducing the heroine, which is expected to be used to introduce the national heroine to children and students.

Keyword : ***ADDIE; Adobe Animate CC; Blackbox; Educational Games; Heroine; Likert Scale***

Corresponding Author:
Asha Sembiring,
Informatics Engineering
Telkom Institute of Technology, Purwokerto, Indonesia
Email : ashasembiring@gmail.com

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1. INTRODUCTION

The title of National Hero is conferred upon Indonesian citizens who actively participated in the struggle for Indonesia's independence or demonstrated exceptional accomplishments contributing to the advancement of the Unitary State of the Republic of Indonesia. It is noteworthy that heroes in Indonesia encompass both genders, with women playing crucial roles and making significant contributions to the nation. As Indonesian citizens, it is incumbent upon us to acknowledge and value the contributions of these heroes who fought for Indonesia's independence, as their efforts have paved the way for our current state of freedom.

To commemorate the services of these heroes, there is a pressing need for historical learning materials, particularly those that highlight the stories of national female heroes. Given the rapid advancement of technology, such as the ubiquitous use of cellphones among diverse age groups, including children, teenagers, and the elderly (Tahel et al., 2019), these devices serve not only as essential tools but also as sources of entertainment, including gaming (Tresnawati et al., 2020). Leveraging learning media, particularly through games, has the potential to stimulate interest and motivation in educational activities, yielding positive outcomes for students (Binti Solikah, 2017).

By adopting this approach, we can enhance children's enthusiasm for learning, particularly those inclined toward animation. This involves employing various learning methods, including interactive approaches utilizing animation, thereby enabling them to acquire knowledge that was previously inaccessible (Amir, 2018). In pursuit of this objective, the author has developed an interactive animated game to facilitate comprehension and inject an element of engagement into the learning process. During

this research, the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) method has been applied to craft interactive applications (Amirulloh et al., 2019).

2. LETERATURE REVIEW

In previous research taken from several journals with a range of years 2017 - 2021. Previous research was also compiled on the topic of educational games and the ADDIE development method. There are several differences in each research, such as existing problems, research case studies or research methods. The following are previous research journals:

The first previous research (Sandri et al., 2019) which aims to increase the high desire to learn using Digital GameBase Learning brings together educational content with computers or video games can be used for all lessons and educational levels can be used, easy to understand and enjoy. The method for developing this learning media uses ADDIE with blackbox testing which results in that the buttons and functionality in the game can run well. This research also uses questionnaire testing which can be concluded that children are more interactive and very enthusiastic in learning through games.

The second research (Harjanta et al., 2018) which has the aim of producing seven portraits of collage artworks of Indonesian heroines as subjects, and aims to display the characteristics of collage art using pasting techniques, and produce works with different color combinations from each work. The first work to the seventh work has the heroine Cut Nyak Dien, Dewi Sartika, Siti Walidah, Martha Christina Tiahahu, R.A Kartini, Rasuna Said, and Nyi Ageng Serang, each work uses used magazine media and patchwork on plywood with a size of 80 x 110 cm.

In the third study (Nugroho et al., 2018) researchers made a game that was able to provide knowledge about the election of the governor of jateng based on android 5 with the Digital Game Base Learning system with the ADDIE model resulting in an application that was able to provide an attractive interface and compatible and easy to use and the system was able to work well on the android operating system, with blackbox testing.

In the fourth study (Sahfitri et al., 2019) discusses a learning media for elementary school students by creating animations to understand the parts of the human body, as an animated character design, of course, requires a character that is unique and easy to recognize. Testing in this study using White Box testing which results in that this system has met the requirements and Blackbox testing can produce a match between the expected results. The survey results that have been conducted on the animation of recognizing body parts, this animation can be used to help users in the teaching and learning process.

In the fifth study (Sahfitri et al., 2019)which designed an interactive animation application that introduces letters and numbers using the ADDIE development method. The testing method used by researchers using White Box, the application that has been made has met the requirements and Blackbox results in that the functionality in the application can run as expected. In the evaluation of the application was tested at Ps. Sunday South Jakarta with a test score of 82.6%. The resulting concept is better. This application can be used as a learning media to recognize letters and numbers for students. In the sixth study (Dafit et al., 2021) which aims to improve the way students learn so as not to feel bored when the teacher gives an explanation that attracts students to be interested in history, especially the history of the State of Indonesia. Researchers made an android-based educational game application for grade 4 SD. Researchers designed the application using the Unity application and CorelDraw X8 as a graphic design editing material. This game takes data using questionnaires and blackbox testing. The results of the data obtained by researchers from questionnaire testing were 88.72% of a 100% scale and the results obtained by researchers from testing the game can be used on several androids that run well.

3. METHOD

In the 1990s, Mollena and Reiser developed the ADDIE (Analysis-Design-Develop-Implement-Evaluate) technique (Hero Mega Surya, Rufi'i, 2019). A quick and straightforward procedural method called ADDIE is used to develop training and educational materials quickly or continuously (Pembelajaran et al., n.d.). The five steps of this approach are analysis, design, development, implementation, and evaluation. It is a sequential procedure (Cahyadi, 2019). This study employs the ADDIE method development process, which begins with analysis and continues through design, development, implementation, and assessment (Eva Nida Luthfiana, 2021). The process of defining the content or what future users of a system or game will learn takes place during the analysis stage. The development system is preceded by the design stage of the process. The development stage is when previously completed design stages that were established in compliance with software design guidelines are correctly realized. These phases involve putting all the information system ideas or designs that were

developed at a previous stage into practice by applying them to an application with the chosen tools. The last phase of assessment This is being done to assess whether the application being developed is appropriate and meets expectations. Blackbox testing is used in the testing of this application as Black box testing is a type of software testing that concentrates on the functional requirements of the program; usability testing is the subsequent test method(Galih Pradana et al., 2019). To enable potential users to use the educational game that was created, the author of the study provided an explanation to the students before they filled out the questionnaire. The questionnaire included questions with Likert scale calculations that covered various aspects of the design and functionality of the Srikandi application. The study involved data collection from grade 4 students at SDN 105319 Limau Mungkur.

The following are the stages of the ADDIE method:

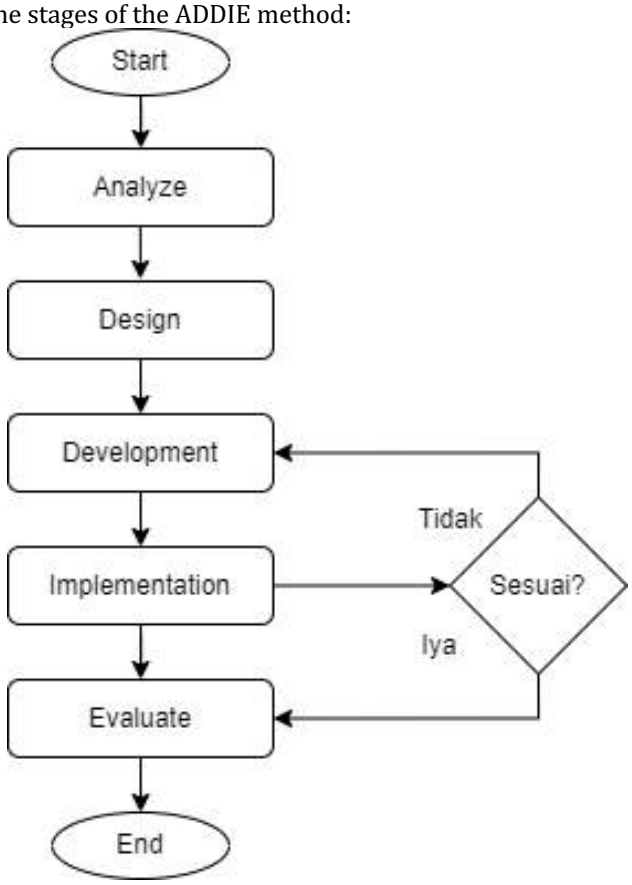

Figure 1. Flow diagram of the ADDIE methods

3.1 Analyze

In this step, we continue the stages of analysis into the challenges young children have when they are introduced to female heroes; however, the analysis's findings have not yet produced any educational games that do this (Hero Mega Surya, Rufi'i, 2019). Researchers will examine the requirements for software analysis, specification analysis, application users, and animation applications (Sri Purwaningrum, Ilmawati fahmi Imron, 2022).

3.2 Design

Multimedia design is used in this step; the process begins with the creation of a multimedia flowchart algorithm, which is subsequently explained. Next, a design framework for the application's initial display is created (Oktariyanti et al., 2021).

a. Making game design requirements using flowcharts.

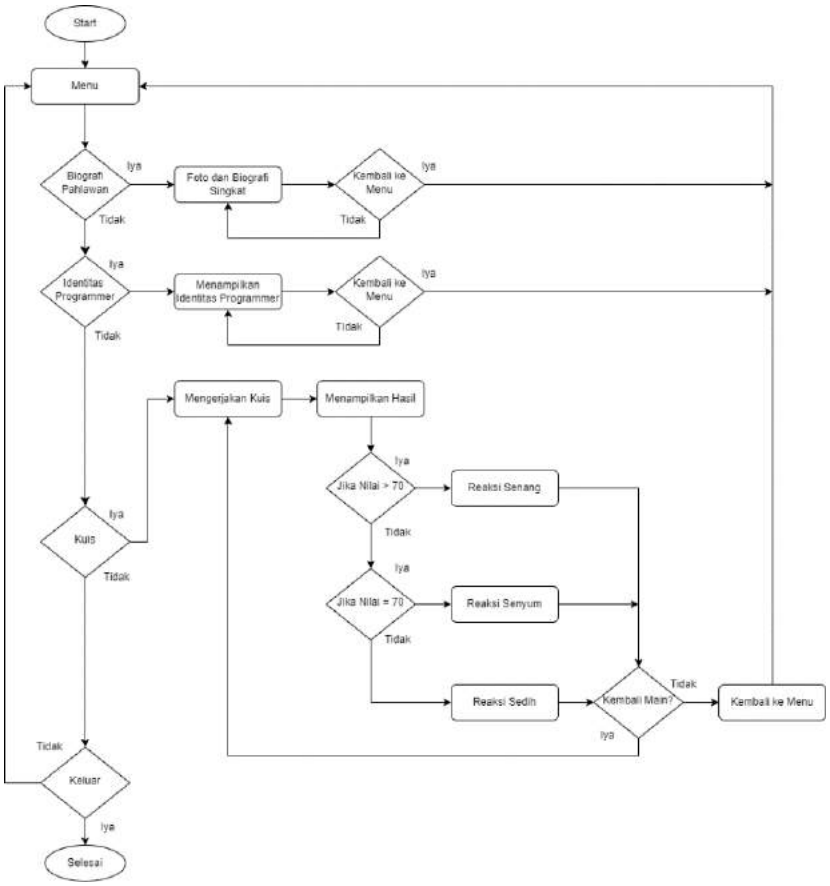

Figure 2. Flowchart diagram for the game

4. RESULT AND CONCLUSION

4.1 Development

In this step, namely developing the Figma design that has been designed, animation, hero biography, as well as a collection of questions on the quiz menu contained in the previous step using the Adobe Animate CC application to create an interactive educational animated game. At this stage there are several stages, namely:

a. Design each game slide.

The design of each slide is created in the Figma application, which can be seen in Figure 3. The design created will be developed in the Adobe Animate application.

Figure 3. Game display design

b. Create games with the Adobe Animate CC software program.

1. Application Initial Display

The initial display of this application in Figure 4 contains a picture of Raden Ajeng Kartini and "SRIKANDI" as the name of the application along with the settings button and start button. To enter the main menu, click the start button.

Figure 4. Initial appearance of the Heroine Game

2. Main Menu Display

In the main menu display in Figure 5 there are four buttons for studying biography, quiz, puzzle and drag and drop.

Figure 5. Main Menu Display of the Srikandi Application

3. Biography display

In the biography display in Figure 6 there is a brief explanation about the female hero starting from the year of birth, services as a hero to the year of her death.

Figure 6. Biography display

4. Quiz display

Before the user takes the quiz, the user is expected to enter a name to be able to continue with the quiz questions. After entering the name there is a display in Figure 7 which means the quiz can start

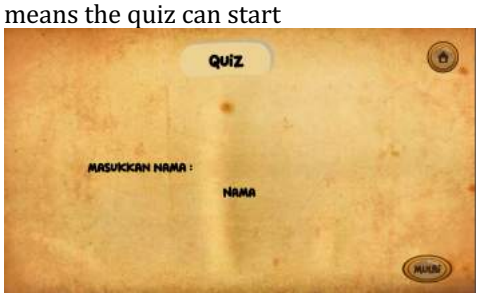

Figure 7. Initial appearance of the quiz

Figure 8. Display of Quiz contents

5. Puzzle View

Display on the puzzle menu, in this menu the user can arrange the puzzle, if the puzzle is not arranged correctly then the next button will not appear and cannot continue to the next puzzle question.

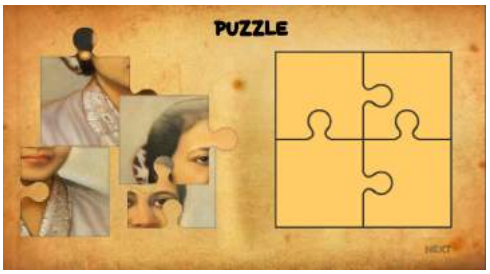

Figure 9. Puzzle View

6. Drag and Drop View

In the Drag and Drop display there is a brief explanation about the services of female heroes which will be dragged and dropped according to the services of each hero.

Figure 10. Drag and Drop display.

4.2 Blackbox Testing Results

Testing was carried out using the black box method with the aim of finding out whether the Heroine Game can function and run according to previous expectations. The results of black box testing can be seen in Table 1.

Tabel 1. Blackbox Testing Discussion Results

No	Parameter	Test result		
		Laptops A	Laptops B	Laptops C
1	Open the application	Succeed	Succeed	Succeed
2	Pressing the start button	Succeed	Succeed	Succeed
3	Press the Biography button	Succeed	Succeed	Succeed
4	Press the Quiz button	Succeed	Succeed	Succeed
5	Press the Puzzle button	Succeed	Succeed	Succeed
6	Press the Drag n Drop button	Succeed	Succeed	Succeed
7	Pressing the Settings button	Succeed	Succeed	Succeed
8	Pressing the Home button	Succeed	Succeed	Succeed
9	Pressing the Next button	Succeed	Succeed	Succeed
10	Pressing the Back button	Succeed	Succeed	Succeed
11	Press the Sound On button	Succeed	Succeed	Succeed
12	Pressing the Sound Off button	Succeed	Succeed	Succeed
13	Volume sliders	Succeed	Succeed	Succeed
14	Press the exit button	Succeed	Succeed	Succeed

4.21 Questionnaire Test Results

The next test is usability testing. In this test the researcher took data from 4th grade children at SDN 105319 Limau Mungkur, the test was carried out by giving questionnaires to 25 students as respondents, before filling in the questionnaire, the author explained running the Srikandi educational game, so that potential users could use the educational game created, Questionnaire questions cover design and performance aspects of the Srikandi application. In usability testing, researchers asked several questions listed in Table 2.

Table2. Questionnaire Questions

No	Questions
1	Is the Heroine game interesting?
2	Is this game easy to use?
3	Is the language used in this game easy to understand?
4	Can the questions in the Srikandi game be done?
5	Is the biography material in the game easy to understand?
6	The game display isn't boring?
7	Can this game help you understand the learning material?
8	This game can increase interest in learning?
9	In-game Buttons work well?
10	Pressing In-game Buttons is usable and easy to understand?

Weighting is given to each question, then the average value is calculated as shown in Table 3.

Table 3. Questionnaire Testing Results

No	Questions	Number of Answers					Total Mark	Presesntase
		SA	A	N	DA	SDA		
1	P1	20	5	0	0	0	120	96%
2	P2	10	11	4	0	0	106	85%
3	P3	16	7	2	0	0	114	91%
4	P4	11	11	3	0	0	108	86%
5	P5	11	12	2	0	0	109	87%
6	P6	15	6	4	0	0	111	89%
7	P7	15	9	1	0	0	114	91%
8	P8	18	6	1	0	0	117	94%
9	P9	15	9	1	0	0	114	91%
10	P10	11	12	2	0	0	109	87%
Average value								**90%**

To make it easier to read the table on the Likert scale test results, the test results were created in diagram form in Figure 11.

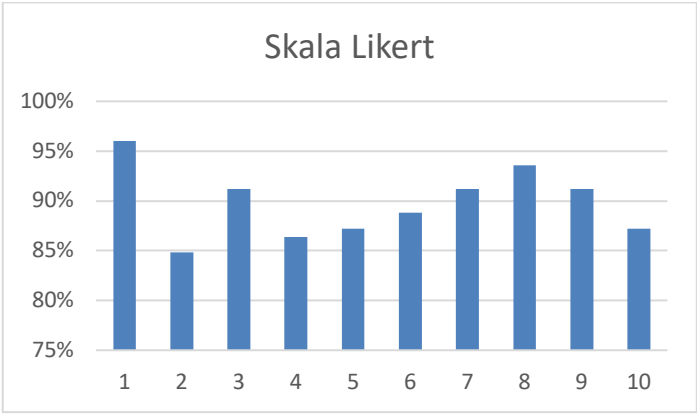

Figure 11. Likert Scale Diagram

Based on the calculation results from research that has been carried out on the Heroine Game. Figure 4.1 explains that P1 has the highest percentage with a score of 120 which produces an average score of 96% of students interested in the Heroine game, while the lowest percentage score is found in P2 with a score of 106 which produces an average score of 85%.

5. CONCLUSION

Based on the author's research findings, it can be inferred that the educational game Srikandi was made with Adobe Animate. This program generates a game with four primary menus: Drag and Drop, Biography, Quiz, and Puzzle. Additionally, the functionality of this application was tested using the black box method, and the weighting of respondents' scores was determined using the Likert scale. According to the results of the black box testing, the application ran smoothly on all laptops, and the Likert scale test yielded an average score of 90% for the entire question.

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