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English Spelling Game Design as Learning Media

Ikhwan Baidlowi Sumafta, Ardhitya Septian Gilang Ardhana, Moch Rangga Dizzy Pringgayuda, Muhammad Alfandi Nurcahyono*

Information Technology, Politeknik Negeri Madiun, Indonesia
Correspondence: E-mail: ibsumafta@pnm.ac.id

ABSTRACT

In this digital era, the ability to use technology is a must that everyone must own, especially educators or teachers, so that they can provide teaching or material by utilizing technology. Understanding various foreign languages in the era of globalization in the 21st century is needed by all groups. So it is necessary to teach from an early age about learning and understanding foreign languages for children, especially learning English, an international language. Based on the background and previous research, it is necessary to have a learning media in the form of a game for learning English, especially in understanding spelling, so that students both at an early age and in elementary school students can be more motivated and enthusiastic in remembering the good and correct spelling of English.

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1. INTRODUCTION

In this digital era, the ability to use technology is a must that must be owned by everyone, especially for teachers or teachers so that they can provide teaching or material by utilizing existing technology. Suhardiana (2019) stated that in today's digital era where the internet and technology play an important role in the development of teaching, it is difficult to ignore the contribution and existence of technology to teaching. One technology that can be used as a learning medium is the use of multimedia. Multimedia is a medium that can display audio and visual so that learning can be packaged in a very interesting way. Game is one of the interactive multimedia that can provide stimulation to players to be able to continue playing with a level of difficulty that can give gamers a sense of curiosity. The use of games as learning media can make it easier for children to memorize the names of animal cubs in Javanese (Fata *et al.*, 2010). Presentation of material in the form of images, audio video, and colored text can stimulate students' interest in learning so that students can more easily understand the material presented (Adzkiya *et al.,* 2021).

Understanding of various foreign languages in the era of globalization in the 21st century is needed by all groups. So it is necessary to inculcate from an early age about learning and understanding foreign languages for children, especially learning English which is an international language (Nurpratiwiningsih *et al.,* 2018). Delivery of learning material can not only be done by conventional methods in the form of using textbooks which can cause students to be less interested in participating in teaching and learning activities so that students cannot absorb the material properly, but can also be done by using educational game tools that can attract participants' interest. students in participating in teaching and learning activities so that they can eliminate the boredom of students and the concentration of students' learning so that they can absorb learning material better (Apsari et al.,2020). Setiawan said that in general young students are not fluent in speaking so that in pronunciation and learning English they experience difficulties, it is necessary to develop learning media in the form of games so that they can increase students' motivation and learning enthusiasm in learning English. Based on the background and previous research, it is necessary to have a learning media in the form of a game for learning English, especially in learning writing spelling so that students both at an early age and elementary school students can be more motivated and enthusiastic in learning good and correct spelling of English writing.

2. METHODS

This research was developed using the Luther method, which is a multimedia development method that is carried out in six stages. The stages in the Luther method include Concept, Design, Material Collecting, Assembly, Testing, and Distribution (see **Figure 1**). (Prayogha *et al.,* 2022; Satwika *et al,* 2019; Renaldi and Aziz, 2021; Adnan *et al.,* 2017).

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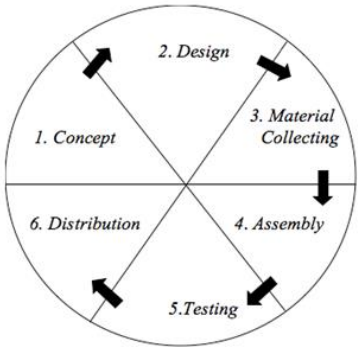

Figure 1. The stages of the Luther method.

3. RESULTS AND DISCUSSION

3.1 *Concept*

The concept of designing an English spelling game as a learning medium is as follows **Table 1**:

Table 1. Application planning concept.

Title	:	Math or Maht
Purpose	:	English spelling learning media
Platform	:	Website
Genre	:	Quiz
Player	:	Children aged 7-10 (elementary school students)
Graphics	:	2 dimensions
Features	:	There are 4 (four) levels with different game themes, interesting graphic design, backsound according to each game background

The design concept of this English spelling game has the purpose of being a medium for learning English spelling by using a website platform, carrying a quiz genre, intended for children aged 7-10 years or Primary School children by using 2 (two dimensional) graphics and there are 4 (four) game levels with different game themes. (Dondlinger, 2007); (Duke, 1980); (Humphrey, 1965).

3.2 Design

3.2.1 *Storyboard*

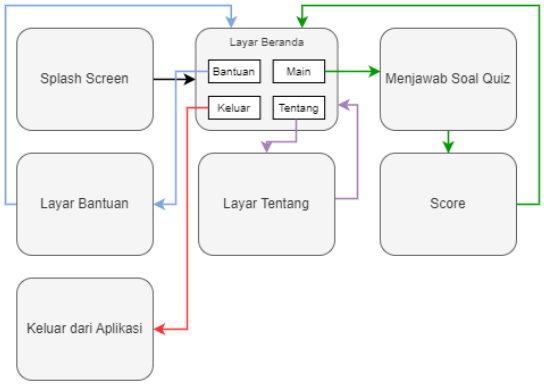

Figure 2. Application flow storyboard.

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In the storyboard (**Figure 2**), it is explained that at the beginning of the application running, a splash screen will appear and then the application will display the main home screen. On the main menu there are 4 (four) menus including help, play, about, and exit. On each menu shows in each direction of the menu screen. (Ermi and Mäyrä, 2005).

3.2.2 Gameplay

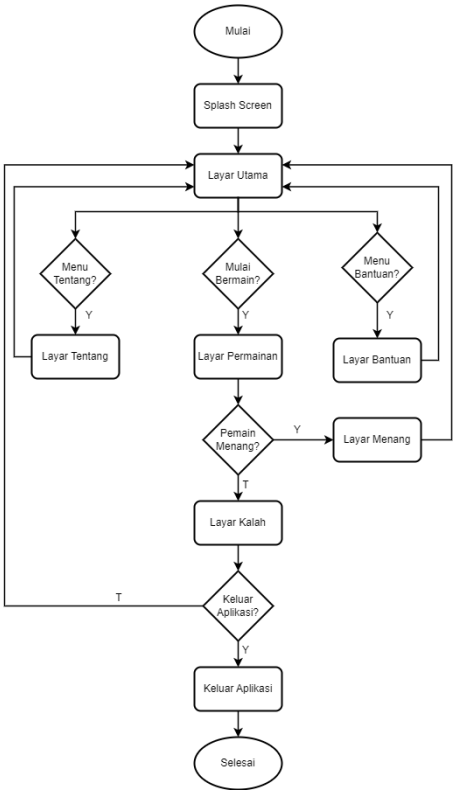

Figure 3. Gameplay flow of the game.

In the gameplay flow of the game (**Figure 3**), it is described that at the beginning of the running application, a splash screen will appear, which will then appear on the main screen of the application. On the main screen of this application the user can select the help menu, about, or the user can start the game. When the player starts the game, the game screen will appear where the user must answer the questions that appear according to the chapter being played. Each user answers the question correctly, then it will be continued to the next question and when the user has answered all the questions correctly, the winning screen will appear and all the correct answers will be displayed according to the chapter being played, but if the user answers incorrectly then the game will immediately stopped and the user can return to the main screen or directly exit the application. (Elverdam *et al.*, 2007; Jenkins, 2004).

3.2.3 Interface Design

In this section, the display layout of the application will be described starting from the initial display, the about us display, the how to play display, the display when the game is played, and the display when the player wins or loses (see **Figure 4-12**).

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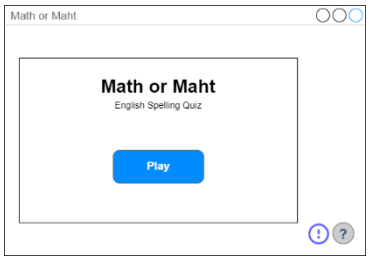

Figure 4. Main screen interface design.

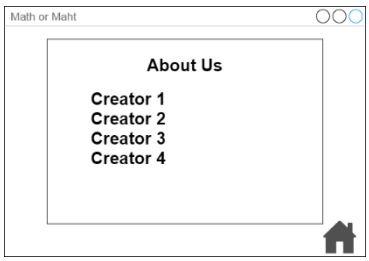

Figure 5. About us interface design.

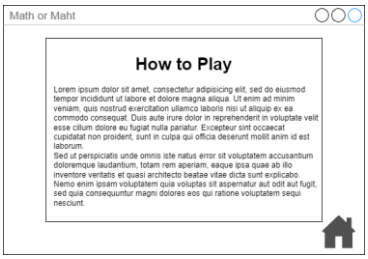

Figure 6. How to play interface design.

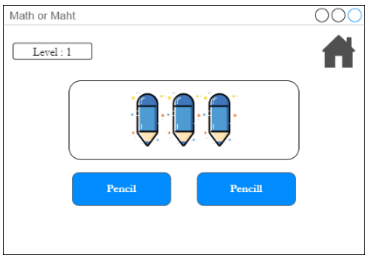

Figure 7. Game interface design chapter 1.

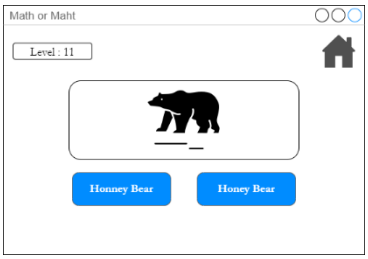

Figure 8. Game interface design chapter 2.

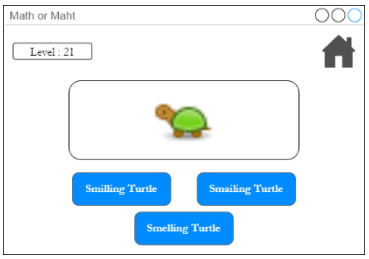

Figure 9. Game interface design chapter 3.

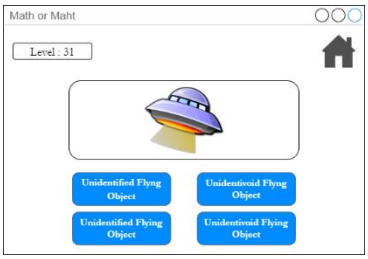

Figure 10. Game interface design chapter 4.

Figure 11. Interface design when winning.

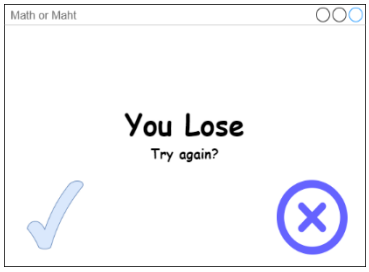

Figure 12. Interface design when you lose.

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3.3 Material Collecting

Material collecting is the stage of collecting materials or materials needed in application development including characters, backgrounds, buttons, audio, and other supporting materials.

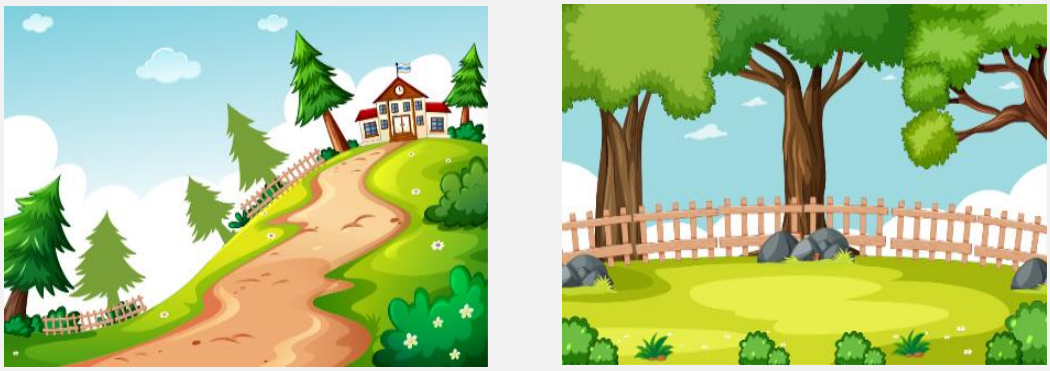

Figure 13. Game background design.

Figure 13 shows the design of the game background display, there are two background designs, namely the design for the main screen and the design for the about and how to play menu screens.

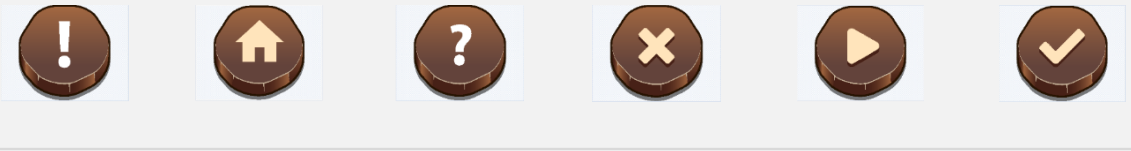

Figure 14. Game button design.

Figure 14 shows the game button design, where there are several buttons that will be used in the game including the about, home, how to play buttons, no buttons, play buttons, and yes buttons.

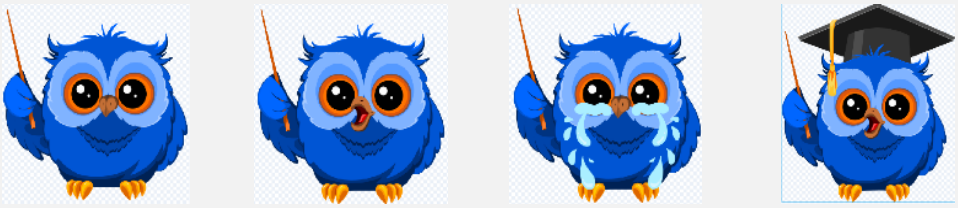

Figure 15. Character design in the game.

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In **figure 15** there are character designs used in the game, there are four character designs including characters when playing, characters when they are on the main screen, characters when the player loses, and characters when the player wins.

3.4 Assembly

The assembly stage is the stage of making an application based on concept design, design, and material collection. The making of this English spelling learning media application uses the Scratch application (Robertson et al., 2008). Implementation of the design in **Figure 16** (see also **Figure 17-26**):

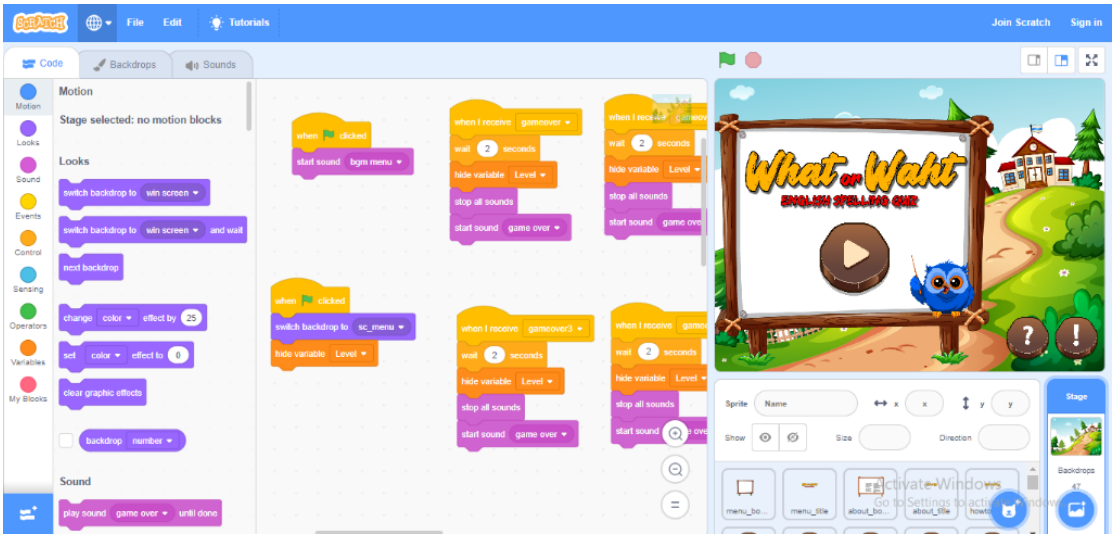

Figure 16. Application development using Scratch.

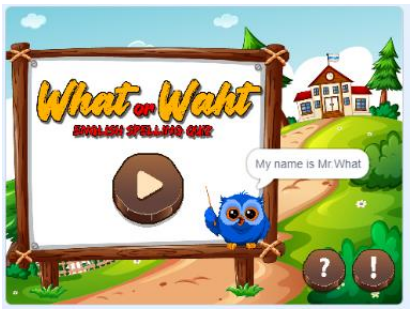

Figure 17. Display of the main menu in the game.

Figure 18. Display game chapters *2.*

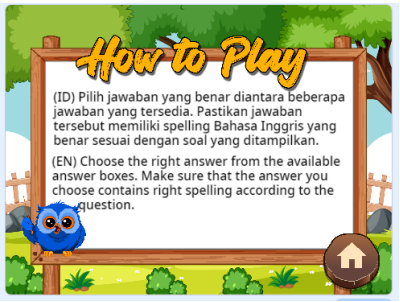

Figure 19. How to play screen display.

Figure 20. Display game chapters *4.*

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Figure 21. About us screen display.

Figure 22. Lost player screen display.

Figure 23. Display game chapter 1.

Figure 24. Winning player screen display.

Figure 25. Display game chapters *3.*

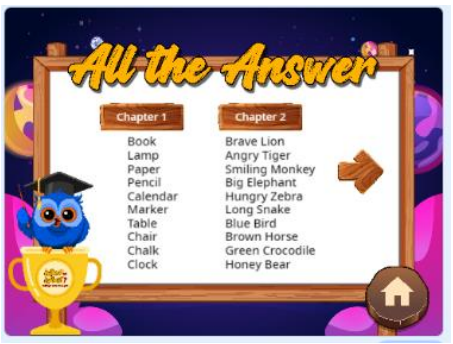

Figure 26. Screen display of all answer.

3.5 Testing

3.5.1 White-Box Testing

White-box testing is a test that aims to find out the flow and workings of the application and to find out the logical complexity of a program (Wicaksono, 2017). **Figure 3** shows a flowchart of the application being developed and serves as a reference to be able to describe cyclomatic complexity as shown in **Figure 27**.

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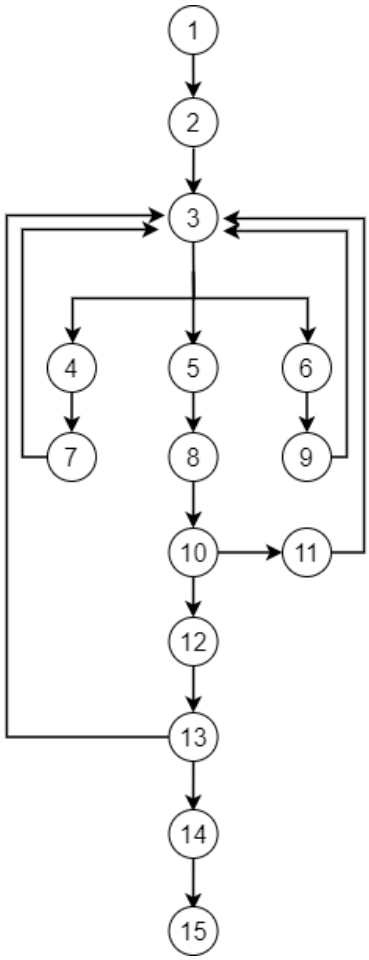

Figure 27. Cyclomatic complexity flowchart.

In **Figure 27**, the cyclomatic complexity is obtained by calculating:

V(G) = E – N + 2
V(G) = 18 – 15 + 2
V(G) = 5
From the results of cyclomatic complexity calculations, V(G) < 10 is obtained, which indicates that the developed application meets the feasibility testing requirements of cyclomatic complexity and there are 5 (five) independent paths which can be described as follows:
Path 1 : 1-2-3-4-7-3
Path 2 : 1-2-3-6-9-3
Path 3 : 1-2-3-5-8-10-11-3
Path 4 : 1-2-3-5-8-10-12-13-3
Path 5 : 1-2-3-5-8-10-12-13-14-15

3.5.2 Application feasibility test

The application feasibility test was carried out by giving questionnaires to respondents and seeing the conclusions of the answers from respondents about whether the application made was feasible to be used as an alternative English spelling learning media. This test was carried out by three teachers and 15 parents of students at MI Al-Falah Beran Ngawi. Each respondent will be asked to fill out a questionnaire regarding five things related to the suitability of learning materials, convenience as a learning medium, attractive background

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screens, interesting game characters, level of difficulty in game gameplay (Browne, 2010). Measurement of answers to the questionnaire uses a Likert Sakal and the calculations are in accordance with those carried out by (Adenansyah & Nurhidayat, 2019).

The Likert scale looks at the items stated in several alternative responses (SS = strongly agree, S = agree, N = neutral, TS = disagree, STS = strongly disagree). Each of these data has a value (SS = 5, S = 4, N = 3, TS = 2, STS = 1). The alternative response is modified into: SL = very feasible (scored 5), L = feasible (scored 4), CL = quite feasible (scored 3), TL = not feasible (scored 2), STL = very unfeasible (scored 1) .

The initial calculation of the Likert Scale starts with the formula:

$$H = T \; x \; Pn \tag{1}$$

H = total number of formula calculation results
T = total number of respondents who voted
Pn = choice of Likert score numbers

To determine the final feasibility value, the interval (range of distances) and the percent interpretation must be known. interpretation of the feasibility percentage can be obtained by the formula:

$$index\ persen = \frac{total\ skor}{Y}\ x\ 100 \tag{2}$$

Index persen = number interpretation percent
Total skor = total from the initial calculation of the Likert scale
Y = the highest value that can be obtained

To determine the interval (distance range) is obtained by dividing the highest percent interpretation divided by the number of existing Likert scales, so that a distance interval calculation of 100 / 5 = 20 is obtained. The value of 20 is the distance interval from the lowest percent interpretation of 0% to the highest 100%. Interpretation of percent based on intervals can be seen in **Table 2**. The results of calculations with the Likert Scale method of the application feasibility test results can be seen in **Table 3** to **Table 7**.

Table 2. Criteria for interpreting scores based on intervals.

Percentage	Meaning
0% - 20%	Very Unworthy
20,1 % - 40 %	Not feasible
40,1 % - 60 %	Decent Enough
60,1 % - 80%	Worthy
80,1 % - 100 %	Very Worth it

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Table 3. Calculation results of the likert scale for question 1.

Question	Evaluation	Number of Respondents (T)	Number (Pn)	Yield (T x Pn)
What is the level of suitability of the material in the game with the material in English subjects?	Very Worth it	1	5	5
	Worthy	8	4	32
	Moderate	6	3	18
	Decent Enough	2	2	4
	Very Unworthy	0	1	0
Total score				59
	Percent interpretation = (total score/Y) x 100 = (59/90) x 100 = 65.56 % (Eligible)			

Table 4. Results of the 2nd question likert scale calculation.

Question	Evaluation	Number of Respondents (T)	Number (Pn)	Yield (T x Pn)
What is the level of suitability of the material in the game with the material in English subjects?	Very Worth it	0	0	0
	Worthy	10	4	40
	Moderate	4	3	12
	Decent Enough	4	2	8
	Very Unworthy	0	1	0
Total score				60
	Percent interpretation = (total score/Y) x 100 = (60/90) x 100 = 66.67 % (Very Eligible)			

Table 5. Results of the 3rd question likert scale calculation.

Question	Evaluation	Number of Respondents (T)	Number (Pn)	Yield (T x Pn)
Is the background and theme of the game interesting to play?	Very Worth it	4	5	20
	Worthy	6	4	24
	Moderate	6	3	18
	Decent Enough	2	2	4
	Very Unworthy	0	1	0
Total score				66
	Percent interpretation = (total score/Y) x 100 = (66/90) x 100 = 73.33 % (Very Eligible)			

Table 6. Results of the 4th question likert scale calculation.

Question	Evaluation	Number of Respondents (T)	Number (Pn)	Yield (T x Pn)
Can the characters in the game attract students to play the Math or Maht game?	Very Worth it	1	5	5
	Worthy	10	4	40
	Moderate	6	3	18
	Decent Enough	1	2	2
	Very Unworthy	0	1	0
Total score				65
	Percent interpretation = (total score/Y) x 100 = (65/90) x 100 = 72.22 % (Eligible)			

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Table 7. Results of the 5th question likert scale calculation.

Question	Evaluation	Number of Respondents (T)	Number (Pn)	Yield (T x Pn)
Is the Math or Maht app easy to use?	Very Worth it	7	5	35
	Worthy	5	4	20
	Moderate	6	3	18
	Decent Enough	0	2	0
	Very Unworthy	0	1	0
Total score				73
	Percent interpretation = (total score/Y) x 100 = (73/90) x 100 = 81.11 % (Very Eligible)			

From the calculation of the feasibility of each question, the average application feasibility can be drawn as follows::
(65,56% + 66,67% + 73,33% + 72,22% + 81,11%) / 5 = 71,78%
The average application feasibility result was obtained at 71.78% with the application feasibility level being feasible. So based on calculations with a Likert scale, the Math or Maht application is feasible.

3.6 Distribution

After testing the application with the White-Box method and testing the feasibility with a Likert Scale and finding that the Math or Maht application is feasible, the final step is to distribute the application through media that users can use to install the application. The Math or Maht application is distributed by directly distributing the application to all students because this application is still a limited distribution.

4. CONCLUSION

From **Table 3** to **Table 5** calculations, overall a value of 71.78% is obtained with a decent eligibility index. As for the order from the largest to the smallest value, (1) the Math or Maht application is easy to use (81.11%), (2) the background and theme of the game are interesting (73.33%), (3) the game characters can attract students' interest. to play the application (72.22%), (4) The Math or Maht application makes it easy to learn English spelling (66.67%), (5) The material in the game is in accordance with the material in English subjects (65.56). Based on this sequence, it is found that the Math or Maht application is easy to use with an interesting background and game theme as well as game characters that can attract students' interest in playing the application, but it is less helpful in facilitating English learning and lacks compatibility with English subject matter.

AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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