Journal of Applied Engineering and Technological Science
Vol 4(1) 2022: 478-487

EDUCATIONAL GAME AS AN EFFORT TO ACCELERATE LEARNING AFTER THE COVID-19 PANDEMIC

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Received : 07 November 2022, Revised: 08 December 2022, Accepted : 08 December 2022
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ABSTRACT
The Covid-19 pandemic that occurred forced us to carry out the learning process through the internet network (online or online). Learning carried out online creates many problems, so it is considered ineffective and causes learning loss. Various methods have been taken to overcome this learning loss, including collaborating with various parties and issuing various regulations. In addition, teachers are also required to provide a new spirit in creating and innovating to provide effective, efficient, and competitive learning media. One way is to do educational game-based learning. Educational games are considered adequate for overcoming learning losses because learning media with educational games require players to participate in determining outcomes, have an entertainment side, and can increase creativity and problem-solving skills. The planned research method stages for collecting the required data are observation, interviews, and literature study. As for the development of educational games in this study, the prototype development method will be used. This study's result is that the Educational Game design has produced output that meets the needs. In future research, when this design is implemented, it is hoped that it will be an alternative medium for accelerating post-pandemic learning.
Keywords: *Accelerated Learning, Game Education, Learning Loss, Learning Media, Pandemic*

1. Introduction

The Covid-19 pandemic resulted in a slowdown in almost all aspects of life, including education (Aeni, 2021; Pokhrel & Chhetri, 2021). The Covid-19 pandemic forced the entire community to limit the space for activities, including learning and teaching activities (Nation, 2020). The learning and teaching process, which was initially carried out face-to-face, had to be carried out via the internet network (online or online). Changes made suddenly cause the learning and teaching process to cause many problems so that it becomes less effective (Harfiani & Setiawan, n.d.; Kurniasari et al., 2020; Prawanti & Sumarni, 2020). Because the process of learning and teaching is less effective, resulting in a loss of learning (Arifa, 2021; Sintema, 2020).

(Nation, 2020) predicts that there will be a loss of learning after the covid-19 pandemic. This prediction was proved correct (Subedi et al., 2020), who researched the impact of the learning and teaching process in Nepal, and found that many problems occurred when the learning and teaching process was carried out online that the learning and teaching process was considered less effective. The same thing also happened in Indonesia, the research conducted by (Prawanti & Sumarni, 2020) regarding the assessment of online learning and its impact on students, parents, and also teachers, while the results of this study says that online learning in schools experiences many problems, so learning becomes less effective.

The government has taken various ways to overcome this loss of learning, including collaborating with various parties and issuing various regulations to assist teachers in conducting learning during a pandemic so that it becomes more effective and efficient (Arifa, 2021). Teachers are expected to be able to provide new enthusiasm for creating and innovating in the learning process during this pandemic. One of the efforts that can be made to overcome these problems is that teachers are required to be able to provide learning media that are effective, efficient, and competitive (Prawanti & Sumarni, 2020).

(Ibarra et al., 2019; Rivai et al., 2017; Sandrone & Carlson, 2021) said that educational game-based learning media is considered effective because game-based learning media requires players to participate and contribute to determining the game's outcome. Research (Windawati

& Koeswanti, 2021) also said educational games could improve learning outcomes. Similar research was also conducted (N.A, 2014) and (Muniroh, 2021). From the two studies, it was found that learning outcomes carried out using educational game media were able to improve learning outcomes and had a positive effect on creativity, activity, and problem-solving skills.

Based on the things disclosed in the previous paragraphs, this research will develop educational games to accelerate learning after the Covid-19 pandemic. Educational games will be developed using the prototype method to achieve the objectives of making this educational game. At this stage of developing educational games, it will still pay attention to the curriculum of the ongoing material. This Educational Game is expected to be able to overcome learning losses so that learning and teaching activities can quickly recover and run as they should.

2. Literature Review

2.1. Previous Research

(Ibarra et al., 2019) In his research, he developed game-based teaching media for mathematics. This game-based teaching media was developed using the programming language HTML5, JavaScript, MySQL, and the phraser.io framework. After being successfully developed, this game was evaluated by 29 teacher students at the Faculty of Mathematics and Statistics, University of São Paulo (Brazil). The results of this study say that as many as 75% of users can complete all tasks without problems, and 24% of users can only complete two tasks. This could have been caused because the user did not read the instructions.

Subsequent research was conducted by (Rivai et al., 2017) to design educational games to help teachers and students in the learning process so that it is not monotonous in the classroom Arabic subjects. From the results of the research presented, it is proven that the educational games developed can help the learning process for teachers and students.

Research conducted by (Windawati & Koeswanti, 2021) with the title Android-based educational game development to improve student learning outcomes in elementary schools proves that educational games are an effective learning media. These results were found by conducting validity according to expert opinion. Using the ASSURE development method, this validation test produces high assessment criteria on the material and very high on the media, so this educational game is feasible. It can be used as a learning medium to improve student learning outcomes. Based on these studies, this research entitled "Educational game as an effort to accelerate learning after the Covid-19 pandemic" is feasible.

2.2. Learning Media

The word media is taken from the Latin word "*medius*" which means "middle", "intermediary", or "introduction". Learning media can be understood as an intermediary tool that aims to make it easier to understand a learning process. Meanwhile, according to (Arsyad, 2016), Learning media is a tool that conveys or delivers teaching messages. From the understanding of the experts who followed, (Teni Nurrita, 2018) concluded that learning media is a tool that can help the teaching and learning process so that the message's meaning becomes more straightforward and educational, or learning objectives can be achieved effectively and efficiently.

(Miftah, 2013) in the research quoted Rowntree's statement regarding the function of learning media. There are six functions of learning media, 1) arousing learning motivation, 2) repeating what has been learned, 3) providing learning stimulus, 4) activating student responses, 5) providing direct feedback, and 6) providing appropriate training. The role of learning media is an integral part of the learning process itself. The presence of media in the learning process helps students (students) better understand the topic being studied. Learning media must facilitate students' needs so that the presentation must be adapted to the learning objectives set.

(Harahap & Siregar, 2018) His research describes several types of media and their advantages and disadvantages. Among them are props; the advantages of this media can be trusted because it looks natural and easy to remember, while the weakness of this media is easily lost. Furthermore, Photo/Picture Media, the advantages of this learning media are that it is easy to disseminate and stimulate interest. At the same time, the disadvantages require additional tools

and are only effective for small groups. Next is game-based learning media. The advantages of this media include involving the user as a determinant of the final result and increasing creativity, activity, and skills in problem-solving. At the same time, the drawback of this media is that it requires additional tools and unique expertise to make teaching media. With all the advantages of game-based learning media, this learning media is considered adequate and efficient (Ibarra et al., 2019; Muniroh, 2021; N.A, 2014; Rivai et al., 2017; Sandrone & Carlson, 2021; Windawati & Koeswanti, 2021).

2.3 Education Gaming

Game Education is a combination of two words, namely game which means an activity carried out by one or more players with specific rules so that there are winners and losers to have fun, filling free time or refresh. While education means Education, so Educational Games can be interpreted as educational learning media, encouraging users to think creatively and carry out activities to achieve the learning objectives themselves.

According to (Noemí & Máximo, 2014), the educational game is interactive content, where this media provides entertainment and training. With current technological advances, games with educational goals can be applied in various fields, not only in education but also in health, marketing, and so on.

Games in learning are considered capable of motivating and requiring user involvement to improve visual skills, interaction and collaboration and do not rule out the possibility of users being able to apply game values in the real world. According to (Laato et al. 2020) educational games currently available on app marketplaces do not directly affect student achievement. These educational games are not in line with the education curriculum. Then, (Laato et al., 2020; Zirawaga et al., 2017) suggest that for educational games to be effective, the educational games that are built must be in line with the curriculum.

2.4 Prototyping

The prototype method used in this study refers to (Pressman, 2002), which starts with identifying client needs. A quick design is carried out, from the results of the fast design will later be tested and evaluated. The description of the flow of the prototyping development method can be seen in Figure 1.

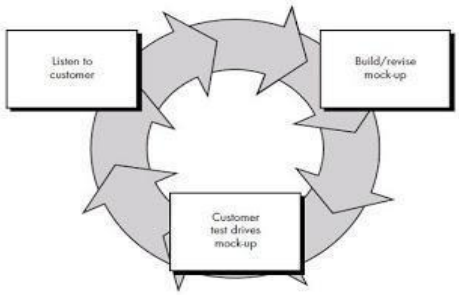

Fig. 1. Prototype Model

The prototyping method consists of 3 stages, namely:

Listen to Customer

At this stage is the identification of user needs. This process is carried out so that the author can obtain information about the problems experienced by the user. This information becomes a reference in software development at a later stage.

Build and Revise Mock-up

After the first stage has been completed, the next stage is designing a prototype, while the stages of designing a prototype are as follows:

- The design of the proposed system's processes, inputs, and outputs.
- UML (Unified Modeling Language) design to specify what is required and how it is realized.
- Interface Design and features needed by the User.

After completing the design, the next stage is coding.

Customer Test Drives Mock-up

At this stage, testing and evaluation of the prototype will be carried out. Suppose the results of testing the prototype do not meet the user's needs. In that case, the developer will repair the prototype again until the prototype becomes a final system and is accepted or follows user expectations.

Some of the advantages of the prototyping method are 1) Customers/users are actively involved and participate, 2) the quality of the system built is by existing needs.

3. Research Methods

This research begins with a literature study by collecting, reading, and understanding related references. Furthermore, designing a system will be developed on the information obtained from the client. After the system has been successfully developed, the system will be tested by the client. If the system is acceptable, then the final stage is to implement the system and draw conclusions. The research workflow can be seen in Figure 2.

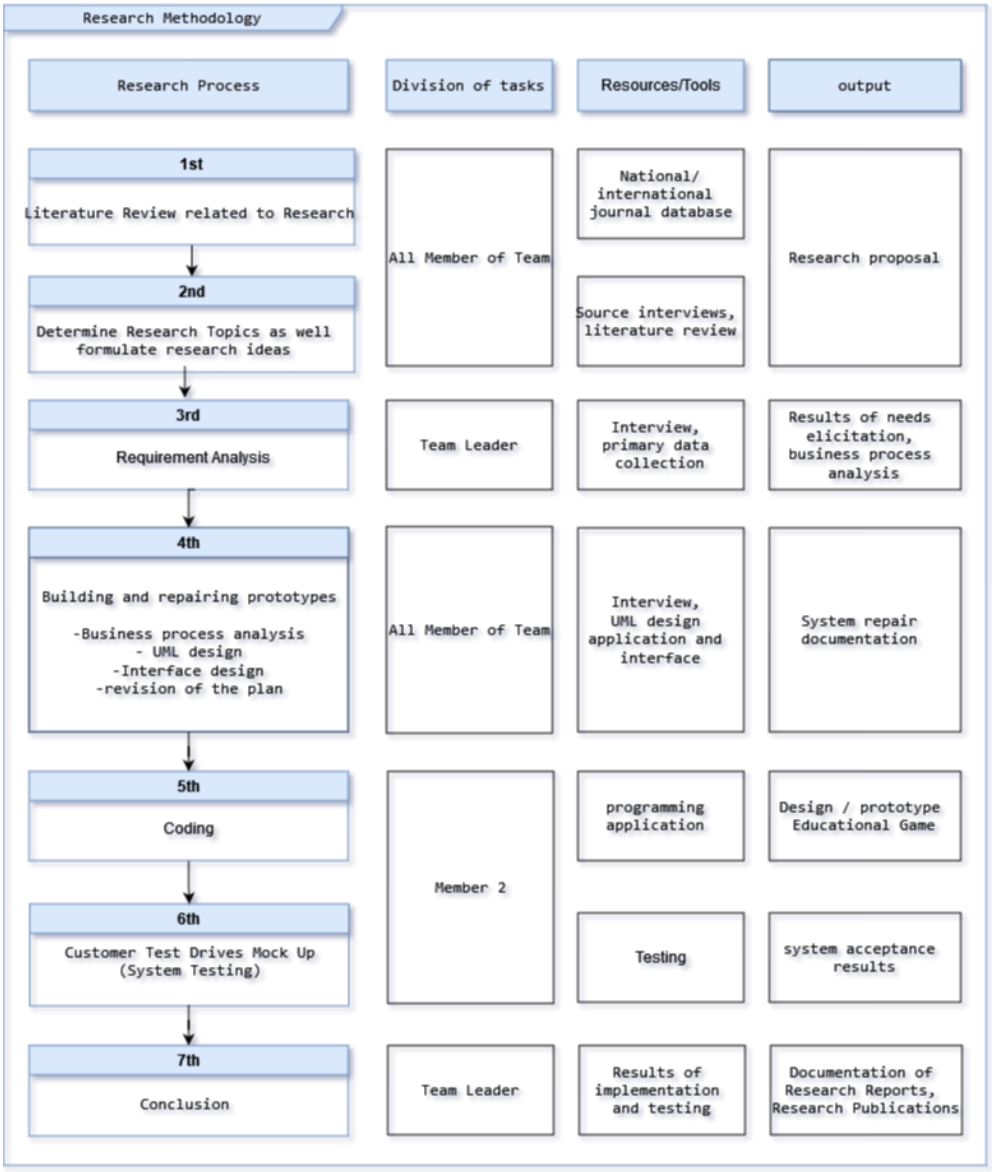

Fig. 2. General Research Workflow

Stage 1: Literature Review

At this stage, a literature search was carried out related to the case of educational game development. This stage aims to help formulate research ideas, see the latest technology, and the obstacles faced and solutions for what will be done from this research.

Stage 2: Determining Research Topics and Formulating Research Ideas

At this stage, the ideas/research topics, problems, urgency, solutions offered, goals, benefits, and risks or obstacles that might be faced in this research are determined so that this research can run smoothly and meet the objectives.

Stage 3: Requirements Analysis

This process is carried out to obtain information about user needs. The information obtained will be used as a reference in the prototype development at a later stage. The method used to obtain information about user needs is through an interview/discussion process (online or offline).

Stage 4: Design and Evaluation

This stage is a system design process made from flowcharts, interface designs, storyboards, and prototypes based on needs. At this stage, it will also improve the design if there is a discrepancy with user needs. After the design is appropriate, it will proceed to the next stage.

Stage 5: Conclusion

At this stage, the researcher will conclude and provide suggestions from the analysis stages in building the system.

4. Results and Discussions

4.1 Requirements Analysis

At the needs analysis stage, an interview was conducted with Ms. Maimun Rahmadina, S.Pd. The team conducted an ISU analysis using the USG method from the interview results to determine which subjects should be made of teaching media first. (Utari & Wahyuni, 2020), The results of the ISU analysis can be seen in table 1.

Table 1 - ISU Analysis

No	ISU	Score of USG			Total	Rank
		U	S	G		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Religion and manner education	4	5	5	14	2
2	Pancasila and civic education	5	5	5	15	1
3	Indonesia Language	3	3	3	9	3
4	Mathematics	2	2	5	9	4
5	English Language	2	2	3	7	5

Still in the needs analysis stage, then a use case is made. Based on the use case, it is continued the design of the storyboard, the interface, and the design of hero. The use case results can be seen in Figure 3.

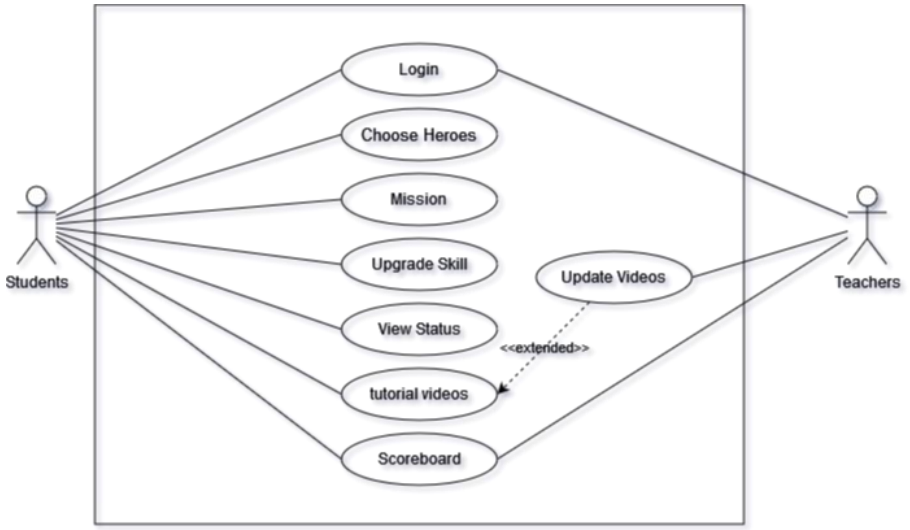

Fig. 3. Use Case Game Education

Based on Figure 3, the educational game being developed has two actors: teachers and students. In games developed by users as student actors, they can select heroes, complete

missions, upgrade hero skills, view hero status, view videos supporting teaching materials, and view the scoreboard. In comparison, the teacher actor can update the video and see the scoreboard from students, which can later be used as a reference in the assessment.

4.2 Design and Evaluations

The initial stage of the design is to make a storyboard as an introduction, while the storyboard design that has been approved is as follows:

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02 March 2019, the first positive case of Covid-19 in Indonesia.
The Covid-19 pandemic caused many losses, including in the field
   of education. However, there are future generations of the
  nation who choose to rise and recover more quickly. They are
                known as GOLDEN GENERATION.
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After the storyboard design is completed, the teaching material is mapped with scenarios from the game. Two game scenarios will be developed. The first is scenario A, a game looking for pairs of cards. For example, a statement must be paired with an example of that statement. Scenario B is a game that chooses one of 3 correct answers. The content in the game is by the curriculum. The researchers mapped the material and types of games. Details can be seen in table 2.

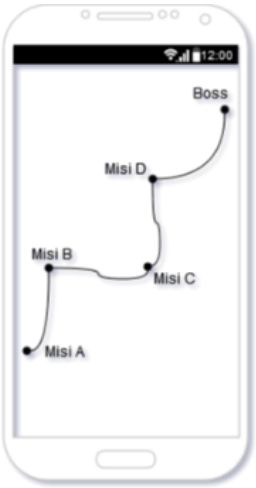
Table 2 - Material Mapping to Game Scenarios

No	Material Title	Scenario Game
1	The position and function of Pancasila for the nation and state of Indonesia	Scenario A (Card Pairs)
2	The position and function of the 1945 Constitution in the National Legal System	Scenario B (Answer Options, choose one of three answers)
3	The order of laws and regulations in the Indonesian National legal system	Scenario A
4	The 1908 National Awakening in the Struggle for Independence	Scenario A
5	The 1928 Youth Pledge within the framework of Unity in Diversity	Scenario B
6	National enthusiasm and commitment to strengthening the Unitary State of the Republic of Indonesia	Scenario B

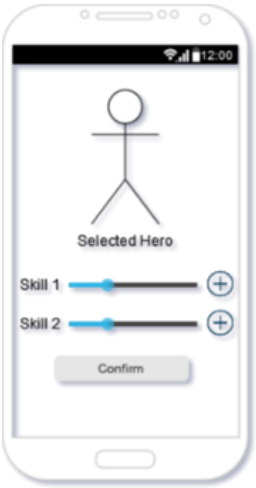
After the mapping stage is completed, the interface and hero designs are carried out. The results of the interface design and hero design can be seen in Figure 4.

(i) Login

(ii) Choose Heroes



(iii) Mission Path



(iv) Status and Skill Upgrades

(v) View Videos

(vi) Scoreboard

(vii) List Video (teacher)

(viii) Design Hero dan Boss

Fig. 4. Interface Design and Hero Design

The final stage is prototyping. The results of several prototypes can be seen in Figure 5.

(i) Login **(ii) Choose Heroes**

(iii) Mission Path **(iv) Status and Skill Upgrades**

Fig. 5. Final Prototyping

From the needs analysis stage until the prototype has passed the evaluation stage, corrections will be made if the results are not appropriate. There are several iterations of this process. The details of the iterations and the evaluation results by the user can be seen in table 3.

Table 3 - Details of Iteration and Evaluation Stages

No	Stage	Total Iterate	Evaluation
1	Requirements Analysis	2	Valid
2	Interface Design and Prototype		
	Login	2	Valid
	Choose Heroes	2	Valid
	Mission Path	1	Valid
	Status and Skill Upgrades	1	Valid
	View Videos	1	Valid
	Score Board	2	Valid
	List Video	2	Valid
	Design Hero	1	Valid

5. Conclusion

The conclusion is found that the Educational Game that has been developed has produced output that meets the needs. In future research, when this design is implemented, it is hoped that it will be an alternative medium for accelerating post-pandemic learning.

Acknowledgment

Thanks to the Ministry of Education and Culture for the financial assistance, the Research and Community Service Agency for the Politeknik Caltex Riau, and the Teknik Informatika study program for assisting the facilities prepared for this research.

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