The effectiveness of mobile learning role play game (rpg) maker mv in improving students’ critical thinking ability

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Abstract. The aim of this research were to improve students’ critical thinking and to know students’ responses in applying mobile learning RPG-based maker MV in Ecosystem learning. This research is experimental research by using quasi-experimental design with Randomized control-Group Pretest Po
test. The data was taken qualitatively by using observation results during students’ learning, students’ response questionnaire in experiencing mobile learning RPG based maker MV, and quantitative data of students’ critical thinking ability. The research findings showed (1) applying mobile learning RPG based maker MV had medium level, (2) Mobile learning RPG maker MV had improved students’ critical thinking, and (3) Students’ result after using this application of Ecosystem learning system in a good level or in the highest score.

1. Introduction

After the researchers took the data through observation and interview with a Biology teacher in SMP Negeri 1 Cirebon to see their learning processes. The students’ learning activity was not quiet and their learning processes did not develop students’ critical thinking. Students felt difficult to analyze some information. They got information directly or from the book, and the students felt difficult to ask and answer the questions from the teacher. The students were not able to think of ideas or resolving the problem.

Gathering an information from the teacher was not easy. They needed to comprehend the information and learn the teacher explanation. Todays’ era was a technology era. Every students had smartphone. Technology can help students’ learning process. In education, the use of technology, information and communication as a media in the teaching learning process is known as E-Learning. Mobile Learning is one of the alternatives in learning that can be used anytime and anywhere. There were many benefits of using this media like saving costs, reducing distance and time, supporting long range learning, and reducing the use of paper.

According to the first observation in SMP Negeri 1 Cirebon, most of the students used their mobilephone as a media. The use of mobile phones for the students can be as a learning methods. One of them was the mobile learning game model: Role Play Games (RPG) Maker. RPG Maker is a Role-playing 2D software game creator that people can use/run without any special skills required. [5], [6].
The use of RPG-based mobile game learning gave the positive effects in the learning results. Based on the background above, the researchers wanted to study the effectiveness of learning and students’ critical thinking ability through multimedia macromedia-based flash entitled “The Effectiveness of mobile learning RPG Maker MV in ecosystem to improve students’ critical thinking”.

The aim of this research were to know the effect of RPG Maker MV in students’ learning and students’ response learn the courses through this application.

2. Methods
This research used qualitative and quantitative experiment methods. This research focused on the effect of RPG maker MV in students learning. The relationship was a casual relationship that focused on the cause and effect relationship. There were two variables; first was an independent variable and then a dependent variable. This research was an experimental research and quasi experimental design with Randomized control-Group Pretest Posttest.

In the teaching learning process the experimental and control classes used the same reciprocal learning, discussion, and question and answer. The difference was the experimental class used mobile learning RPG Maker MV, and the control class used charta media.

N-Gain was used to get the influence score from using mobile learning RPG maker MV application in the experimental class and the score of the used charta media in the control.

This research was divided into several steps. First was a literacy study, field study, constructing research problems, test validity, pretest, teaching and learning process through mobile learning application RPG maker MV, as well as observing the learning process, post test, data analysis, research findings, and conclusion [12].

This research was conducted in SMP NEGERI 1 Cirebon. The research began in the Genap semester academic year 2018/2019. The sample of this research was 80 students from two classes. One class was the experimental class through mobile learning application RPG maker MV, and the other class was the control class through charta media. The research instruments were observation, tests, and a questionnaire. The data was taken qualitatively by observing students during the learning process and the students’ questionnaire response in applying mobile learning RPG maker MV, and quantitative data was taken from the results of students’ critical thinking test. The data analyzed used a concept analysis format. Descriptive analysis used a statistical formula, while the inference statistic data was analyzed to test a hypothesis.

3. Results and Discussion
Considering the result of the research, the researchers concluded that based on the observation that the application guide students to deeper understanding and improve their critical thinking during their learning. It can be seen in Table 1.

Table 1. Descriptive Statistics N-Gain

|                | N    | Minimum | Maximum | Mean |
|----------------|------|---------|---------|------|
| N Gain Experimental | 39   | 31      | 77      | 6182 |
| N Gain Control    | 37   | 00      | 40      | 1054 |

According to data analysis, the experimental class had a minimum score N-Gain of 0.31, a maximum score N-Gain of 0.77 and an average score N-Gain of 0.61 with medium criteria. It means that mobile learning RPG Maker MV in ecosystem learning had medium. Meanwhile, the control class had a minimum N-Gain of 0.00, a maximum score N-Gain of 0.40, and an average score N-Gain of 0.10 with low criteria. It means that the effect of charta media in ecosystem learning had low criteria.

Applying mobile learning RPG maker MV in the experimental class was much better than the use of charta media in the control class. This application was an independent and interactive learning media, so it was easy for the students to understand the material. It was stated in previous research that
mobile learning RPG maker MV application was a multimedia programme and animation to create unique applications, interactive animation in web pages, cartoon films, business presentations, or teaching learning process [8, 2, 4, 13, 11].

Biology ecosystem learning used mobile learning application to help students memorize information for long term. The use of interactive animation was effective rather than static animation during the learning process. It was proved in previous research. The research was conducted [14]. Stated that students who learn using computers, weather individually or in a group had good results rather than students who did not get any control class or the class used conventional learning.

Students’ critical thinking ability data came from the pre-test in the beginning, the posttest in the last meeting, and was analyzed in quantitative descriptive. The results of analyzing students’ critical thinking score precentage with each category indicator can be seen in Table 2.

Table 2. Students’ critical thinking ability percentage of each indicator aspect

| Aspect Indicator | Control Averages | % | Category | Experiment Averages | % | Category |
|------------------|------------------|---|----------|---------------------|---|----------|
| 1                | 10.4             | 52 | Fair     | 15.3                | 76.6 | Good    |
| 2                | 10.4             | 52 | Fair     | 14.8                | 74.2  | Fair    |
| 3                | 10.4             | 52 | Deficient | 14.9               | 74.61 | Fair    |
| 4                | 10.4             | 52 | Deficient | 15.1               | 75.66 | Good    |
| 5                | 10.4             | 52 | Deficient | 14.9               | 74.3  | Fair    |

Indicators aspect information
1. Give simple explanation
2. Construct basic skills
3. Conclude
4. Give next explanation
5. Set strategy and tactics

According to table 2, critical thinking aspects ability indicator in the control class had a score of 52% within the low category, meanwhile in the experimental class indicators aspect gave simple explanation was 76.6% within the good category. Indicator aspect set strategy and tactics had 74.3% at a fair level. Based on the data above, it can be concluded that the improvement of students’ critical thinking ability in the experimental class was much better than charta media. To test the hypothesis on the difference in learning activity improvement and students’ critical thinking ability using mobile learning application RPG maker MV, the class did not use any teaching media. The researchers used an independent sample T test SPSS 20 for windows. The results of the independent sample T test can be seen in Table 3.

Table 3. Independent samples T test

| Variabel Penelitian | Levene’s Test for Equality of Variances | t-Test for Equality of Means |
|---------------------|---------------------------------------|-----------------------------|
|                     | F | Sig. | t | df | Sig (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
| VARIABEL PENELITIAN | Equal variances assumed | 22.714 | .000 | 11.987 | 74 | .000 | 22.800 | 1.902 | 19.010 | 26.590 |
|                     | Equal variances not assumed | 11.730 | 43.081 | .000 | 22.800 | 1.944 | 18.880 | 26.719 |

The results in Table 3 showed that t-count was 11.987 on the other hand t-table (0.005;93) was 1.663, so it can be concluded that t-count was higher than t-table. It means that there were significant
differences between the experimental class and the control class that used charta media. It showed that the use of mobile learning RPG maker MV was much better than charta media. Based on the explanation above, it can be concluded that the improvement of students’ critical thinking ability in the experimental class was better than the control class that used charta media. It happened because mobile learning RPG maker MV has complete content that can fulfill ecosystem material such as videos, games, animation, and also a process of organism dependency. So, students are able to construct, apply, analyze, synthesize, and evaluate information gathered from mobile learning RPG maker MV application highlite. The pictures of videos, animation, and games can be seen in Figure 1.

![Figure 1. Videos, animation, and games](image)

According to the previous research, [15] stated that the use of multimedia could enhance students’ critical thinking and explaining history ability. On the other hand [4], [13] stated that the use of mobile learning RPG maker is effective in improving learning passion and students’ critical thinking ability [16]. Students’ response data in applying mobile learning RPG maker MV was obtained from the students’ quitionaire. Students’ response percentage can be seen in Table 4.

| Percentage of students’ response per indicator | Criteria       |
|----------------------------------------------|----------------|
| 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
| 63   | 73.68| 100  | 63.16| 100  | 55.3 | 53.9 | 0    |
| 38   | 26.32| 0    | 34.21| 0    | 31.6 | 44.7 | 100  |
| 0    | 0    | 0    | 2.632| 0    | 10.5 | 1.3  | 0    |
| 0    | 0    | 0    | 0    | 2.6  | 0    | 0    | 0    |

Students’ response indicator:
1. Response in Ecosystem learning using Mobile learning RPG maker MV.
2. Learning activity.
3. The advantages of animation picture.
4. Time effectiveness in learning using Mobile learning RPG maker MV.
5. Media in learning biology.
6. Understanding the topic.
7. Able to apply in daily life.

Research finding showed that the students gave positive response in learning activity using Mobile learning RPG maker MV in the ecosystem topic. It can be seen that the total number of students who strongly agree in every item was around 70%, agree was around 28.77%, and disagree was 1.05%. The total scores of each response item was 2280. Meanwhile, the highest score was 2101. It means that that data was in a good criterias. The results showed that students’ response was good in the learning activity Mobile learning RPG maker MV in the ecosystem topic. This can be seen in Figure 2.

The questionnaire results showed that after following this activity using this method, they felt it was easier to understand biology (especially the ecosystem), they were motivated to learn more, the class atmosphere was fun, time was more effective, the ecosystem concept was easier to master and apply in daily life, and animation could eliminate the feeling of limitation in their learning. [10], [15], [17].

4. Conclusion
After conducting the research, the researcher concluded that applying mobile learning RPG maker MV had medium level learning effects. Applying this method in ecosystem learning could improve students’ critical thinking, as seen from the average score of 75 received by the experimental class students. On the other hand, the class which did not get any control class had an average score of 52. The students’ response in applying mobile learning RPG maker MV in ecosystem learning was a good criteria.

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