

# The Development of Ecosystem Education Game Product to Improve Learning Motivation Of 5<sup>th</sup> Grade Students in Elementary School

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**Abstract**-This study aims to: (1) the development of ecosystem education game product that appropriate for the 5th grade elementary school and (2) the usability of ecosystem education game product to improve the learning motivation of 5th grade students. This study used a procedural research and development model by Alessi & Trollip. The design research and development consists of three stages: Planning, Design, and Development. The results showed that there was a potential increasing motivation after using an ecosystem education game product, so that it was appropriate to be used as a learning resource for students 5<sup>th</sup> grade elementary school. Based on the observation sheet obtained an increasing motivation on average from 6.25% to 100%. Its mean showed a high increasing motivation after using the ecosystem education game product.

**Keywords:** Education Game Product, Subject Ecosystem 5<sup>th</sup> Grade, Improve Learning Motivation.

## I. INTRODUCTION

Learning media have the ability to increase learning motivation of learners (Hujair AH. Sanaky, 2013: 207). Motivation is the power, both from within and from outside which encourages a person to achieve certain goals. In the initial stage the researcher conducted a pre-survey on September 1, 2018 with a 5th grade students at SDN Mungkur Uyam. Based on the preliminary survey results, the researcher found some obstacles that students are less motivated in learning activities including:

1. Learning activities used to lecturing method, then question and answer method between teacher and students, also group discussion methods.
2. The teacher in delivering the material has used Slide Power Point, but the teacher is still having difficulties in developing learning media beside power point, the media that is used still from various of downloading resources on the internet.
3. The teacher has been able to make an optimal use of the learning media as adequate infrastructure in the school.
4. The teacher has several obstacles in the delivery of material in the class with the few number of students, there are 24 students and 2 students with special needs, because there is only one teacher in the class.
5. The Class learning is still less effective, that can be seen from the learning outcomes of some students who have not reached the standard criteria minimum also known as KKM.

Based on 5 problem findings above the researcher focus research on findings to increase learning motivation and results study based on indicators of KKM. The use of educational games is not a new thing to do because the game chosen so far uses direct activities in the classroom, commonly by giving a few puzzles from the sub-themes that will be studied. The selection of educational games is done to make learning more interactive and entertaining. Even so, the education should be challenging and fun, not boring, and then the selection of game media is one of the right alternatives thing.

The selection of learning media using educational games emphasizes the active involvement of students in the learning process, thus making learning fun with direct involvement and practicing through in-game practice questions to find their own knowledge. Development research that has been carried out by Handriyantini, 2009:1 “regarding educational games for elementary school students can help stimulate student's thinking power in increasing concentration and solving problems”.

Based on the background of the problem described above, the researcher chose "Ecosystem education game development as media learning to increase learning motivation for the 5th grade students at SDN Mungkur Uyam". The Problem as follow: how to develop appropriate ecosystem education game products for 5<sup>th</sup> grade students at SDN Mungkur Uyam and how the use of ecosystem education game products to be able to increase learning motivation of 5th grade students at SDN Mungkur Uyam?

The aim of this research is to produce appropriate ecosystem education game products for the 5th grade students at SDN Mungkur Uyam and to find out the use of ecosystem education game products in improving learning motivation of 5th grade students at SDN Mungkur Uyam.

II. METHOD

1. This type of research uses development research or known as R&D (Research and Development). The development model used by researchers adopted the design and development model developed by Alessi & Trollip. This design and development model has three attributes, including planning, design, and development.
2. This research and development was carried out at SDN Mungkur Uyam. This research was conducted on the "Ecosystem" Thematic study at elementary school based on curriculum 2013. The development research was conducted from November to December 2018.
3. The research subjects were selected as many as 24 5<sup>th</sup> grade students at SDN Mungkur Uyam.
4. The procedure of this study adopts the design and development model developed by Alessi & Trollip (1) Planning: includes defining boundary fields/scope, identifying student characteristics, determining learning resources, and brainstorming, (2) Design: consists of making ideas for learning content and describing preliminary programs making prototypes, flowcharts, storyboards and (3) developing: includes preparing text, writing program code, making graphics, producing audio & video, combining parts, preparing supporting materials, conduct alpha tests, make revisions, conduct beta tests, make final revisions, approve clients, and validate the program.
5. Data obtained in this study are qualitative and quantitative method. Qualitative data obtained from the results of interview needs analysis used for the benefit of product development. Quantitative data is obtained from media experts and material experts (alpha test) also from students (beta test). Instruments and data collection techniques in this study are Observation, Interview, Questionnaire, and Documentation.
6. The data analysis technique is to find the average score obtained on the validation sheet conducted by expert lecturers on the application of ecosystem educational games. Scores are obtained by using 4 levels of modified Likert Scale. Then the results of the average score of the questionnaire are converted using the scoring reference criteria (Mardapi, 2008: 123). as in the following table:

Table 1. Score Criteria

Range	Score	Category
$X \geq \bar{x} + I \cdot SBx$	4	Very feasible
$\bar{x} + I \cdot SBx > X \geq \bar{x}$	3	Feasible
$\bar{x} > X \geq \bar{x} - SBx$	2	not feasible
$X < \bar{x} - I \cdot SBx$	1	Very not feasible

Table 2. Conversion of Criteria

No	Interval	Category
1	$3.00 < X \leq 4.0$	Very feasible
2	$2.50 < X \leq 3.0$	Feasible
3	$2.00 < X \leq 2.5$	not feasible
4	$0.01 < X \leq 2.0$	Very not feasible

Table 3. Score Criteria

No	Criteria	Range
1	<i>Very low motivation</i>	15-26.25
2	<i>low motivation</i>	26.26-37.50
3	<i>average motivation</i>	37.51-48.75
4	<i>High motivation</i>	48.76-60

Table 4. Conversion of motivation level

No	Interval	Category
1	0-25	<i>Very low motivation</i>
2	26-50	<i>low motivation</i>
3	51-75	<i>average motivation</i>
4	76-100	<i>High motivation</i>

Explanation:

- $\bar{x}$ : average score for all students
- $I$ :  $(1/2) \times (\text{ideal highest score} + \text{lowest score})$
- $X$ : score achieved by the students
- $SBx$ : standard deviation

7. To determine whether there is an increasing student motivation, N-gain or normalized gain is analysis done. According to Hake (1998), N-gain or normalized gain is the ratio of actual gain to maximum gain, then the equation is written as follows:

$$N\text{-gain (g)} = \frac{\text{skor post test} - \text{skor pre test}}{\text{skor maksimum} - \text{skor pre test}}$$

8. The results of the N-gain calculation obtained are then converted into the N-gain level category (Hake, 1998: 68). As in the following table:

Table 5. Category of N-gain

N-gain	Category
$g < 0.30$	Low
$0.30 \leq g \leq 0.70$	Medium
$g > 0.70$	High

### III. RESULTS AND DISCUSSION

Based on the evaluation of validated material experts, the average score of 4 was obtained for the category "Very Valid".

Table 6. The average experts' score

Item	score	Category
The average score of expert on learning aspect	4	Very valid
The average score of expert on content	3.7	Very Good

Based on the expert's assessment the aspects content of the material show scored 3.7 is in the "Very Good" category and is declared validity to be tested on the next stage.

Table 7. The average experts' score

Item	score	Category
The average score on the aspect of display	3.7	Good

Based on the media expert's assessment of all validated display aspects, the average score was 3.7 with the "Very Worthy" category and declared validity to be tested on the next stage.

Table 8. Recapitulation of student questionnaire data before using the ecosystem

students	Able to finish the task	Happy while study	Study too long	Want to study like today
24	5	3	24	0

Based on the results of recapitulation of student questionnaire data before using the ecosystem education games, the indicator table 8 shown the ability to complete the task from the teacher, only 5 students completed the task from the teacher, while 19 students have not yet completed the assignment from the teacher. Indicator 2 is about fun learning. Data obtained on indicator 2 is only 3 students who feel learning is fun and the rest don't feel that way. The indicator 3 regarding the time of learning that seemed long was obtained by the data that all students felt the time to study in class felt long. For indicator 4, shown the desire of students to repeat the same learning, data were obtained that no students would repeat such learning. And for the 5 indicator, that is understanding of learning objectives, the students shown less understand the learning objectives.

Table 9. Recapitulation of student questionnaire data after using the ecosystem

students	Able to finish the task	Happy while study	Study too long	Want to study like today
24	24	24	24	24

Based on the results of the questionnaire data recapitulation of students after using the ecosystem education game (table 9), data obtained by indicator 1, shown the ability to complete the task from the teacher, all students completed the task given by the teacher. Indicator 2 is about fun learning. Data obtained on indicator 2 are all students who feel learning is fun. The indicator 3 regarding the time of learning was obtained by the data that all students felt that the time to study in class felt short. For indicator 4, shown the desire of students to repeat the same learning, data is obtained that all students want to repeat such learning in next time. And for the 5 indicator, that is understanding the learning objectives, shown all students who have embrace the learning objectives.

To measure whether or not there is an increasing motivation to learn with ecosystem education games, data collection was carried out through classroom activity observation sheets. This observation sheet contains three indicators that show symptoms of motivation in students. The indicator consists of following teacher instructions, diligently working on the assignments given, and actively seeking solutions to problems. The observation sheet was filled by two observers consisting of one teacher and one student. The recapitulation of the observation sheet data can be seen as follow:

Table 10. Observers assessment on students' motivation

Observer	Freq. of students' motivation	
	Before (%)	After (%)
1	12.5	100
2	0	100
Average	6.25	100

Based on the calculation results of the observation data of the two observers, it can be concluded that before using the ecosystem education game students did not have motivation during the learning process. Whereas after using the ecosystem education game, students have motivation during learning process.

To find out whether there is an increasing motivation after using the ecosystem education game, the N-gain score is calculated by formula as follows:

$$N\text{-gain (g)} = \frac{\text{skor post test} - \text{skor pre test}}{\text{skor maksimum} - \text{skor pre test}} = \frac{100\% - 6,25\%}{100\% - 6,25\%} = 1$$

From these calculations, obtained an N-gain value of 1. Based on the N-gain score conversion in chapter 3 (formula method) it is known that the N-gain calculation if > 0.70 and is categorized as "high". From these calculations it can be concluded that there was a high increasing motivation after using the ecosystem education game.

#### IV. CONCLUSION

The design and development of ecosystem education game products through three stages, consists: planning, design, and development. This research produced an ecosystem education game with .exe format containing eight videos and 20 interesting ecosystem education games. Educational games are designed based on lesson plans in the 5th grade elementary school and accordingly to 2013 curriculum as ecosystem thematic approach. This game product validation tests by material experts and media experts who are declared validity and ready to use as educational games learning media at SDN Mungkur Uyam.

The use of ecosystem education games as learning media is able to increasing the learning motivation of 5th grade students at Mungkur Uyam. Based on the observation sheet obtained an increasing motivation on average from 6.25% to 100%. That showed a high increasing motivation after using the ecosystem education game.

## V. ACKNOWLEDGMENT

The design and development of educational game learning media should be designed in accordance with the needs of student characteristics. The need for the use of media in learning used to conduct the learning process have more value, because basically the media helps students to understand the lessons presented and the media can also create an interesting and enjoyable learning atmosphere, which mean increase students' enthusiasm in learning process.

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