Development Biology Worksheet Oriented Accelerated Learning on Plantae and Ecosystems for 10th-Grade Senior High School Students

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Abstract. The problem that found are learning outcomes student is low on the plantae and ecosystems. Students less motivated and passive learning because learning is teacher center and teaching materials not facilitate student. Therefore, it is necessary to design a worksheet oriented accelerated learning. Accelerated learning approach that can improve motivation and learning activities. The purpose of the research was to produce worksheet oriented accelerated learning on plantae and ecosystems. This research is designed as a research and development by using Plomp model, consists of the preliminary, prototyping, and assessment phase. Data was collected through questionnaires, observation sheet, test, and documentation. The results of the research was worksheet oriented accelerated learning on plantae and ecosystems is very valid.

1. Introduction

Biology Learning aims to develop the competence of students, in order to be able to understand the natural surroundings through the process of finding and doing based on direct experience. Students in Biology learning are expected to develop process skills in the form of attitude and values. Teachers as educators to achieve the goals of learning Biology plays an important role in the success of students.

Based on the results of observation found problems of low student learning outcomes in the material Plantae and Ecosystem, students are less motivated and passive learning because the learning is still a teacher center so that learning becomes monotonous and not fun for students.

The presentation of the material on the worksheet is too succinct, there are still terms that are not understood, and the existing learning activities still do not use fast learning techniques so that they have not been able to make the students actively participate in Biology lessons that affect students' psychomotor competence.

Based on these things, activities that can accelerate students' understanding of the material to understand the concepts that exist. There is a learning model that is assumed to support the material so that learning can be accelerated and easy to remember that is Accelerated Learning. One of the learning models that can be applied to the worksheet is the Accelerated Learning model that has the syntax with the abbreviation MASTER. Accelerated Learning is a learning model that aims to make the learning process students become better and faster. The outcomes of the learning process can be in the form of additional skills, knowledge or new attitudes [1].
Availability of teaching materials in the form of worksheet Accelerated Learning that can guide students, facilitate the way students learn in learning activities so that learning becomes more focused, not monotonous and easy for teachers and students. This study aims to produce a valid Accelerated Learning Biology worksheet and reveal the effectiveness of the worksheet. Expected availability of teaching materials in the form of worksheet Accelerated Learning that can guide students, facilitate the way students learn in learning activities so that learning becomes more focused, not monotonous and easy for teachers and can improve student learning outcomes.

2. Methods
The development of the worksheet is based on the stages of the Plomp model. This worksheet was developed through three stages namely (1) preliminary research phase, (2) prototyping phase, and (3) assessment phase [2]. Formative evaluation is done at every single stage in the form cycle of evaluation-revision.

The trial subject is students in one class of 10th grade of Senior High School numbers 5. Data consist of qualitative and quantitative data. The qualitative data obtained from observations and interviews in preliminary research phase and one to one evaluation in prototyping phase. The quantitative data obtained from the validity questionnaire.

Result of the research processed using the following equation.

\[
\text{Value} = \frac{\text{Obtained score}}{\text{Maksimum score}} \times 100\% \tag{1}
\]

This value is subsequently converted in accordance with validity criteria that can be seen in Table 1.

| Percentase (%) | Level of validity |
|----------------|-------------------|
| 0 – 20         | Invalid           |
| 21 – 40        | Less Valid        |
| 41 – 60        | Enough Valid      |
| 61 – 80        | Valid             |
| 81 – 100       | Very Valid        |

3. Results and Discussion
Worksheet contains a description of the material that consist the Accelerated Learning steps in MASTER syntax which includes motivating, obtaining information, investigating meaning, triggering memory, displaying knowledge and reflection. Worksheet was developed through three stages of Plomp model. In preliminary research phase there are fourth process namely (1) problem analysis, (2) need analysis, (3) concept analysis, and (4) curriculum analysis. In prototyping phase there are process namely (1) self evaluation, (2) expert review, and (3) field tests. Validity doing by expert review. Validity of worksheet includes aspect namely deductive, construct, technical, linguistic.

3.1. Results
Based on preliminary research analysis finds that problem there are known problems. Student questionnaire results indicate that the interest and motivation of students in biology learning is still low, and students are less fond of reading biological materials that exist and there are still shortcomings in the worksheet prepared by the teachers discussion as in the presentation aspect that is less attractive for students because the display is not colored in particular on Plantae and Ecosystem materials. So that teachers want improvements on teaching materials in the form of worksheet that can lead students in learning.
Development on the construct aspect is on the student worksheet that implements Accelerated Learning steps. Worksheet are develop tasted for validity. Results worksheet validation by experts are presented in Table 2.

| Aspect     | Percentage (%) | Criteria     |
|------------|----------------|--------------|
| Didactic   | 90.62          | Very Valid   |
| Construct  | 88.75          | Very Valid   |
| Technical  | 81.25          | Very Valid   |
| Linguistic | 85.42          | Very Valid   |

Based on Table 2 it can be seen that worksheet are develop is very valid. During the validation, expert give some advice to fix the cover, writing, writing color, and image layout.

3.2. Discussion

The result of validity test shows that the Accelerated Learning worksheet developed very valid. Worksheet have suitable with basic competences. Worksheet also accordance with the development of the child. Worksheet emphasizes more on the process of finding concepts, and most importantly in the worksheet there is variation of stimulus through various media and student activities. In line with the results of research by Ozmen and Yildirim [3], worksheet is a sheet containing work or materials that make students more active in taking meaning from the learning process.

Viewed from the construct aspect, Biology worksheet Accelerated Learning is declared valid by validator. This validation results show that worksheet has constructed the Accelerated Learning steps in MASTER syntax which includes motivating, obtaining information, investigating meaning, triggering memory, displaying knowledge and reflection. Strengthening concepts and improving memory in the Trigering of memory phase is expected to go through mind mapping, keyword and acrostic activities. According to Palmer [4], accelerated learning model combined with mind mapping gives a positive effect that can improve student achievement. In accordance with Erland [5], Accelerated Learning can improve students' cognitive, memory, and learning achievement.

Learning activities that are displayed on worksheet also help the students in understanding the concept of the material and will be long remembered by the students because the thing done alone and found itself will be remembered longer. In addition, worksheet can also be used repeatedly both at school and at home. According to Sanjaya [6] worksheet is a learning resource that contains messages related to the subject matter to facilitate student learning.

4. Conclusion

The conclusion of the research that worksheet oriented accelerated learning are develop is very valid. Worksheet was develop steps in MASTER syntax which includes motivating, obtaining information, investigating meaning, triggering memory, displaying knowledge and reflection. Validity of worksheet includes aspect namely didactic, construct, technical, linguistic.

References

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