

The Development of Aquaponic Props for Elementary School Grade V as an Integrated Thematic Learning Media



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ABSTRACT: The development of integrated thematic learning media is still not much in elementary school. This condition is not in line with the 2013 KTSP approach in Indonesia. For this reason, it is necessary to develop a proper learning media for integrated thematic learning class V elementary school students. Aquaponic is one of the innovative media that is suitable for use in learning. This media can integrate several charge lessons to achieve core competencies in the current Grade V curriculum. The development model used is the Borg and Gall model. The trial steps of this media were carried out to 11 Grade V students of SDN Warungdowo I District Pohjentrek. There are two types of data obtained, namely qualitative data and quantitative data. Quantitative data is obtained from the Post Test value and the questionnaire deployment to the Grade V Students. Qualitative data were obtained from Teachers' interviews and suggestions, criticism, and responses from the validators. The validation carried out by the Material and Media experts was declared feasible. The validation score is 95% by a material expert, 98% by media expert, 100% by the colleagues' teachers, and 98% by the elementary education expert. It means that the feasibility level is excellent. The results showed that aquaponic props is perfectly suitable for the learning media of the respected school.

This research is also supported by the existence of quantitative data from student learning outcomes after using the aquaponic props in learning shows the results of 100% of students can achieve basic competencies that exist in the linked lessons in integrated thematic learning. The use of appropriate learning media in Pancasila and civics education subjects will convey various concepts and facts so that students can use and remember longer the teacher's material. This research aims to develop instructional video media to assist students in learning Pancasila and civic education subjects. This research is development research that adopts the development stages of ADDIE. The results showed that the learning videos developed were easy for students to use and had a very high level of attractiveness, and could improve student learning outcomes.

KEYWORDS: Aquaponic, Integrated Thematic Learning, Elementary School

I. INTRODUCTION

The development of science and technology encourages humans to think more advanced and open. One effort that supports the development of science and technology, especially in the education sector, is creating meaningful learning activities for students. Hence, students have extensive knowledge, a good attitude, and have life skills. This is based on UU Act No. 20 of 2003 concerning the National Education System article 1, which states that: "Education is a conscious and planned effort to realize the atmosphere of learning and learning processes so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation, and state.

The Education Minister Regulation Number 57 of 2014 concerning the 2013 curriculum also explained that "The implementation of learning in elementary / madrasah schools is carried out with an integrated-integrated learning approach. Thematic-integrated learning is a learning content in elementary school subjects/madrasah ibtdaiyah organized in themes. Integrated Thematic Subject Guidelines and Learning Profiles are subjects and the development of subjects into integrated thematic learning containing the background, characteristic of understanding subjects, principles, core competencies and basic competencies of subjects, learning design, learning model, assessment, media and learning sources, and the role of the teacher as a developer of school culture. "

Integrated thematic learning is an approach that deliberately associates several aspects, both in intra subjects and between subjects. With the compression, students will gain intact knowledge and skills so that learning is meaningful for students. The meaning of integrated thematic learning is a learning approach involving several subjects to provide meaningful experiences to students. This means that students will understand the concepts they learn through direct experience and connect with the other concepts they already understand. The use of media when learning can facilitate students to understand the subject matter so that it gets satisfactory learning outcomes. With satisfactory learning outcomes, students can achieve learning goals quickly. In addition,

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the use of learning media makes students not glued to the teacher who presents the material. Following the 2013 curriculum that the teacher is not the only source in the learning process. (Wahyuningtyas & Sulasmono, 2020).

Innovation is an idea carried out in the curriculum and learning as a new way to solve educational problems. From the observation results so far, since implementing the 2013 curriculum in the education area of Pohjentrek Subdistrict at the Elementary School level, there is still no one who made and used media for integrated thematic learning. Media that has been present and used is a media or props of each subject that stands alone. Learning media are still used in different content, according to their respective subjects, there is no integration between the lesson charges in one theme being studied.

The Integrated Thematic Learning Media is vital for students in the learning process because students can associate one charge of the lesson with other lessons in integrative. Hence, students gain a thorough (holistic) learning experience. The media development in this study leads to the integration model, namely the Ketematic Model and The Integrated Model. Integrated Model is a curriculum development model that uses a cross-field approach looking for skills, concepts, and attitudes. This model tries to provide a complete picture of students about the purpose of carrying out activities in the development fields.

Based on the analysis of core and essential competencies, social characteristics, culture, geographical conditions, and the ecosystem theme chosen in Grade V first semester, the researcher choose Aquaponic props development. Aquaponic, an abbreviation of the hydroponic aquarium, is a medium that is easy and close to the lives of everyday students. Aquaponic has several advantages, including organic nutritional circulation produced by fish dirt so that nutritional needs for plants can be fulfilled organically. The aquaponic system can work well if the tank, biofilter, and plant containers can be well configured and balanced. Based on the product that appears in the market, the product still requires land outside the house in meeting light intake on plants. In addition, the form of products and materials used in general do not look aesthetic. (Assaffah & Primaditya, 2020)

As a learning medium, Aquaponic intends to improve the quality of learning in the classroom. It is a scientific media necessary for further development to expand students' understanding of a theory that can be translated into real situations, making students' learning experience more meaningful. By learning from real life through the media of my preaching, it is expected that students can improve students' cognitive abilities in the learning process. The government's hope in the education world is to improve the quality of learning by selecting methods, strategies, approaches, and media utilization to grow students to be critical and oriented to change in the future. The learning activities carried out by a teacher in each institution, and current level of education tend to be done conventionally only rely on material from books without adequate media support facilities and learning resources. This gap that has happened is the need for solutions in solving problems.

Aquaponic can be used as one of the most appropriate solutions in overcoming conventional learning. This media is very suitable for integrated thematic learning because it effectively achieves the essential competencies of several charges in the theme being studied. Learning is usually theoretic. With this media, students are faced with actual conditions. Students are trained scientifically thinking, solving problems critically, and ultimately the cognitive abilities of students to the material being studied are increasingly visible.

II. RESEARCH METHODS

The development of this media uses research and development theory by Borg and Gall. This type of research is different from other educational research because the goal is to develop products based on trials and then revise to produce suitable products for use. Borg and Gall (1983) stated that development research is a process used to develop and validate products used in education and learning. The development steps in this study include

1. Research and initial information collection;
2. Planning;
3. Initial product development;
4. Small-scale trials;
5. Final revisions and product improvements.

III. RESULTS AND DISCUSSION

This research and development produces a decent and attractive product and is more likely to be applied as a medium of learning in class if the product has been validated by material experts, media experts, and integrated thematic teachers and get the assessment of the students.



Image 1. Aquaponic Learning Media

The researcher also produces guidance module for teachers willing to make or use this media perfectly in classroom. This module provides complete guidance on how to make this learning media, how to use this media for Grade V learning, and how to assess student performance afterward.

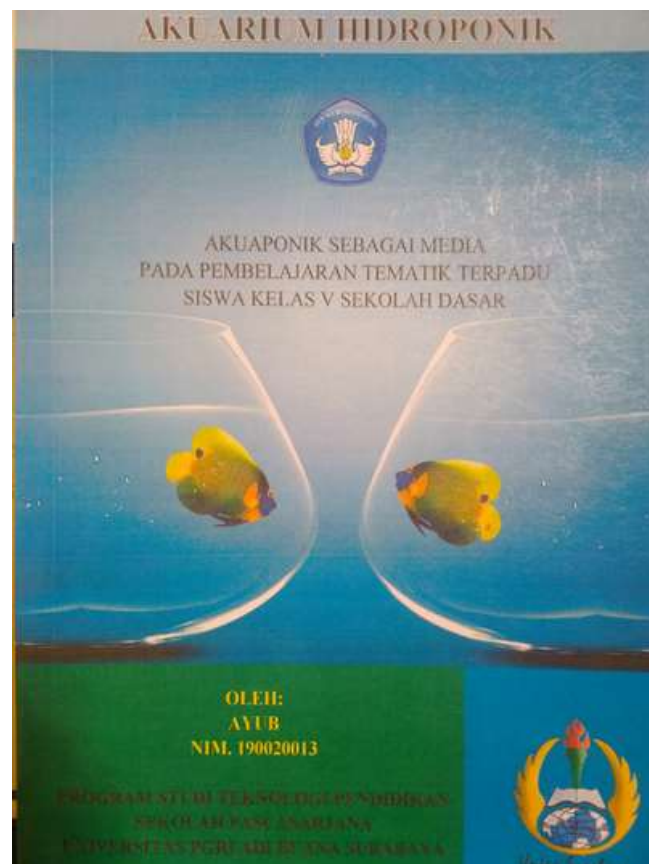


Image 2. Aquaponic Teacher's Guide

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The instruments used in this study were research sheets on my feasibility of learning as learning media. The opinions are compiled to determine the feasibility and minor of learning media developed. The learning media was assessed by material experts, media experts, Grade V elementary school teachers. The researcher also collects responses from students. Score of all aspects in the research sheet was made using the Likert scale:

Table 1. Likert Scale

Score	Criteria
5	Very Good
4	Good
3	Fair
2	Unsufficient
1	Very Unsufficient

Furthermore, the validation questionnaire test results are carried out by comparing the number of ideal scores provided by Validator with an ideal maximum score applied in the questionnaire. The formula used to calculate the feasibility percentage as follows:

$$\text{Percentage (\%)} = \frac{\sum X}{S_{MI}} \times 100$$

Description:

- Percentage = The Score Achieved
- $\sum X$ = number of scores
- S_{mi} = maximum score ideal

The results of the questionnaire test calculation are then set by referring to the validation criteria table or the level of achievement used in the percentage of validation in the following table:

Table 2. Feasibility Level Scale

Score	Percentage Scale	Feasibility Level
5	80%-100%	Very Feasible
4	60%-79 %	Feasible
3	40%-59 %	Fair
2	20%-39 %	Not Feasible
1	0%-20 %	Very Unfeasible

The feasibility assessment of material aspects obtained a score of 57 out of 60 (95%). It is categorized as "very good and feasible" for use in integrated thematic learning in grade V elementary school students. The results of the analysis of material validation analysis can be seen in the image below.

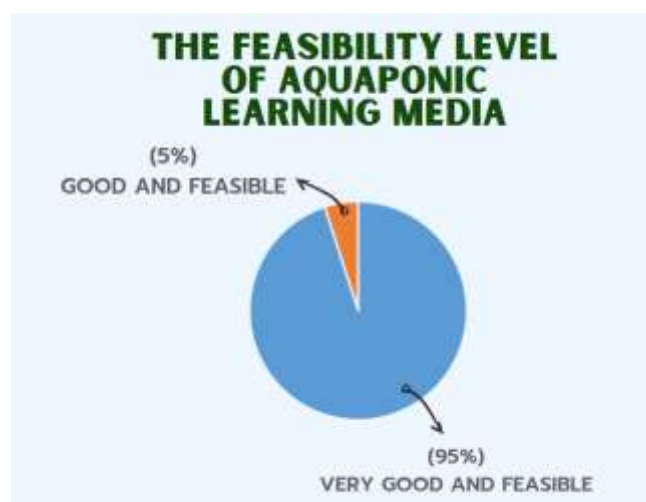


Figure 1. The diagram results from the feasibility level

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The media's feasibility analysis was carried out to determine the suitability of media products developed. Based on the data table assessment and validation by the media expert team, it can be concluded that the feasibility assessment of the media aspects obtained a score of 63 out of 64 (98%). It is categorized as "very good and feasible" to be used in integrated learning for Grade V elementary school. Data from the validation analysis of media experts can be seen in the image below.

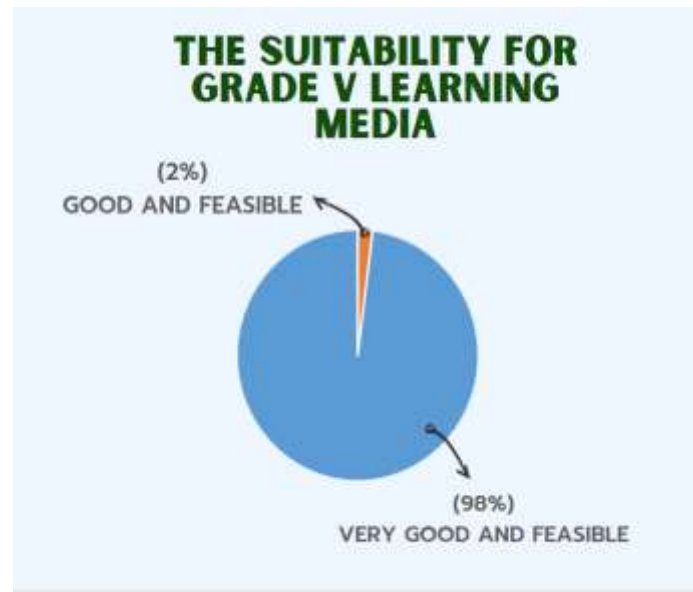


Figure 2. The diagram results of the suitability for Grade V Learning Media

Analysis of the feasibility of material and the media is done to determine the effectiveness of media products developed. Based on the review data table and assessment by colleagues' teachers, the assessment of the feasibility of material and media aspects obtained a score of 65 out of 65 (100%). It is rated as "very good and feasible" for integrated thematic learning in grade V elementary school students of the ecosystem theme. Data from the validation analysis of colleagues can be seen in the image below.



Figure 3. Diagram Results of Feasibility Levels and Effectiveness of Learning Media

Based on the assessment by Elementary School teachers and practitioners about the quality of the material and the media developed through the aquaponic media in learning in Grade V elementary school, students obtained a 64 out of 65 (98%). It is therefore categorized as "very good and feasible" to use in learning. Data from review analysis and assessment of elementary school teacher practitioners can be seen in the image below.



Figure 4. The diagram results of the overall quality of Aquaponic Learning Media

IV. CONCLUSIONS

From the research above, it can be concluded that:

1. The special characteristics of Aquaponic learning media in integrated thematic learning in class V elementary school students developed by researchers is that it uses the development model according to Borg and Gall with the following stages: (a) research and initial information collection; (b) planning; (c) initial product development; (d) small scale trials; (e) final revision and product improvement.
2. The learning media developed by the researcher has been validated and by the Material Team, Media Expert, Primary Education Teacher Practitioners, colleagues teachers, and small-scale student trials with excellent results.
3. The Aquaponic Learning media is proven to improve student's learning experience during the trial session and is appreciated as an innovative learning media to deepen the understanding of ecosystem material in elementary school Grade V.

V. RECOMMENDATION

The results showed that the development of the aquaponic learning media was very feasible to be used as a learning media in class V of elementary school. Thus, there are several recommendations regarding the development of this media:

1. In integrated thematic learning, teachers should develop integrated thematic learning media to provide a better learning experience.
2. To examine media development, one should pay attention to the connection between core competencies and basic competencies of various loads of integrated lessons. The products produced should include all cross material according to the theme being studied.
3. Recommendations for other researchers: There is a possibility that this type of media development can be done for other learning themes. This way, integrated thematic learning can become more innovative in elementary school.

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