IOSR Journal of Research & Method in Education (IOSR-JRME)
e-ISSN: 2320–7388, p- ISSN: 2320-737x Volume 10, Issue 4 Ser. II (Jul. – Aug. 2020), PP 01-07
www.iosrjournals.org

The Development of Student Worksheets Based on Discovery Learning for Students in Fifth Grade Elementary Schools

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Abstract: *The purpose of this study was to develop and describe the feasibility of developing worksheets based on Discovery Learning for fifth-grade elementary schools. This type of research is research and development refers to Borg and Gall theory. The population of this research is the fifth-grade elementary school educators and students in Enggal District, Bandar Lampung, Lampung Province, Indonesia. The data collection tool uses a questionnaire instrument in the form of a Likert scale. Student Worksheets Product was validated by media experts with a value of 93.0 which mean it is on very good categories, material experts 96.1 which mean it ison very good categories, linguists score 90.0 which mean it ison very good categories, and test practitioners received an average value of 83.5 which mean it ison very good category. Based on the results of these studies indicate that the Student Worksheets product is valid and theoretically feasible to be used for fifth-grade students in Elementary School.*

Keywords: ***Worksheets, Discovery Learning, Learning Outcomes.***

Date of Submission: 25-06-2020 Date of Acceptance: 15-07-2020

I. Introduction

The development of the world in the 21st-century is marked by the use of information and communication technology in all aspects of life. The rapid development of the world and global changes in various aspects of life that come so quickly become a challenge for the nation in preparing the nation's future generations. In this modern era, education plays an important role in creating a nation generation that can keep pace with the pace of development of science and technology. Education is the main factor determining the quality of a nation, hence the progress of a nation can be measured by the progress of education in creating quality human resources in the 21st-century.

Education has become a field that has an important role in creating Human Resources in the 21st-century now. Efforts in realizing 21st-century skills are needed by humans who are not only intelligent in thinking from memorization activities but also thinking intelligence in the form of habituation processes to solve problems and think. 21st-century education requires students to process the information they learn through the activities of analyzing, assessing, and creating. According to Bialik (2015: 5), the abilities that students must-have in the 21st century are Creativity, Critical Thinking, Communication, and Collaboration.

Students must be able to use the information obtained to create something new, be able to make opinions that make sense, communicate the knowledge gained, and work together with other students to build more optimal abilities. Teachers should be demanded to be skilled facilitators in providing learning experiences. According to Sagala (2011: 75), teacher's skills in teaching and learning include: 1) the skills of opening and closing lessons, 2) explaining skills, 3) questioning questions, 4) strengthening skills, 5) skills using instructional media, 6) skills to guide small group discussions, 7) class management skills, 8) skills for creating variations, and 9) individual and small group teaching skills.

The expected learning process is students are actively involved and creatively express their opinions and ideas as a result of contextual integrated thematic learning applied to the learning process, so that there is synergy between teachers and students that seen in the activities of students in concrete and holistic thinking to achieve learning outcomes optimal both implicitly and explicitly in thematic learning. Students must be able to use the information obtained to create something new, be able to make opinions that make sense, communicate the knowledge gained, and work together with other students to build thinking skills in increasing their knowledge.

The ability to think at a higher level is important in its implementation to add insight into the affective, psychomotor, and cognitive aspects. Information obtained from teaching materials is expected to be able to make students active and challenged to develop their abilities in the learning process. But in reality, on the

contrary, the field in general students still seem passive and monotonous in the learning process, both between educators and students. Based on observations and interviews with fifth-grade teachers at Elementary School 1 Rawalaut, information was obtained that the learning process in class was only in the form of explanations of concepts and theories derived from textbooks as the only source of the material. Besides, the learning process seems monotonous, have not shown yet the activeness of the learning process. This has an indirect impact on the achievement of learning objectives so that the Basic Competencies obtained by students have not yet reached the Minimum Mastery Criteria.

The teacher has not carried out learning activities that have been prepared using various teaching materials and learning resources by the characteristics of the material for students. Referring to these problems, a solution is needed by implementing learning that can actively involve students in terms of activities and discover learning concepts. So that it can shape/lead to higher-order thinking skills through learning outcomes. The concept of discovery in the current learning model is more commonly known as Discovery Learning. The process of discovering new and meaningful knowledge, learning cannot be done without direct 'doing' activities. Direct involvement of students can include brain work and handwork. The Discovery Learning model tries to lay the foundation and develop scientific thinking, students are placed as learning subjects, the teacher's role in learning using Discovery Learning models is the learning guide, and learning facilitator.

According to Suryosubroto (Samsul 2016: 115) shows that one of the teaching methods widely used in schools that have been developed is the discovery method. According to Budiningsih (2010: 43), the Discovery Learning model is to understand concepts, meanings, and relationships through an intuitive process to finally conclude. Meanwhile, according to Sardiman (2012: 145) in applying the Discovery Learning model the teacher acts as a guide by providing opportunities for students to learn actively, as teachers must be able to guide and direct the learning activities of students by the objectives. This has the potential to be a distinct advantage in the development of teaching-learning materials based on Discovery Learning. Teaching material developed refers to the stimulation of students to learn independently, be creative, and think more deeply.

In developing and supporting the success of the learning process, it is necessary to have the role of teachers, students, and the media or learning tools. It is needed in the learning process, where the learning process is essentially the occurrence of interaction between the teacher and students. One of which is a learning medium is teaching material. There are many types of teaching materials available such as books, modules, and Student Worksheets. It also impacts on children's motivation to follow the learning process because it uses innovations in learning. One of the teaching materials that can support student learning activities is the Student Worksheets. According to Chappell (Utami 2016: 315) states that Students Worksheets are part of teaching materials that can be used to develop thinking skills, ask and answer questions, make connections, and assess student learning outcomes improvement.

Student Worksheetscan be useful in many ways such as academic achievement. In the case of developing teaching material, the teacher's role is very important in determining the right strategy for the material and the conditions in its application. The learning model based on Discovery Learning is based on two independent understanding strategies that are the discovery of directed Discovery Learning (guided discovery) and pure Discovery Learning discovery (without any guidance or direction).

In pure Discovery Learning, each group in the class may make a different discovery. For teachers who apply this discovery must be tolerant of noise, while the discovery of directed learning (guided) is slightly different from pure Discovery Learning, the teacher has less exposure than pure learning findings. Here all students do the same and almost the same activities. This has the potential to become a distinct advantage in the development of Student Worksheets based on Discovery Learning. Developed Student Worksheets refer to the stimulation of students to learn independently, be creative, and think more deeply. Optimizing intelligence is expected to make learning more meaningful and enjoyable. So that it can raise enthusiasm for learning and self-confidence which will lead to an increase in students' abilities and knowledge.

The experiences and habits of independent and active learning have a big influence on students' knowledge and thinking. First, a person's habits in solving their problems (problem-solving). Second, a person's habit of creating new products that have cultural values (creativity) (Chatib, 2013: 132). So it is very appropriate if the development of the Student Worksheetsbased on Discovery Learning is intended to optimize the knowledgeability of students through the concept of finding and concluding material.

II. Research Method

This type of research using research and development refers to Borg & Gall's theory (1989: 782) about Research-Based-Development according to the purpose of research that is research procedures with the aim to develop and validate the educational products developed. Research and development are carried out not until all stages, because of limited resources. The research population of students and educators in the fifth grade of elementary schools in Enggal, Bandar Lampung has implemented the 2013 curriculum, and the sample was determined by purposive sampling of 12 educators and 6 students. The data collection tool for the development

worksheet of students based on Discovery Learning uses a questionnaire, that are the validation of material, design, and language experts, as well as practitioner tests. Tests for students also use a questionnaire to see the attractiveness, convenience, and usefulness in the Student Worksheets developed.

III. Research Results And Discussion

Based on the results of the development of Student Worksheets based on Discovery Learning for fifth-grade students of Elementary Schools in Enggal, Bandar Lampung, it is done by using the response of educators and students to see the feasibility and attractiveness of Student Worksheets based on Discovery Learning products that will be developed. The results of the research from the stages of this research development are as follows:

Research and Information Collection: Information gathering was carried out by observation and interviews with school principals and fifth-grade teachers of the State Elementary School in Enggal, Bandar Lampung. The results of observations and interviews obtained information that (1) The average learning outcomes of fifth-grade students are still low at 54.2%, which mean students have not yet completed/fulfill the Minimum Mastery Criteria. (2) The teaching materials that used have not helped students understand the material and find new concepts while learning. (3) Educators have difficulty making Student Worksheets that apply the concept of discovery by the Basic Competencies and indicators. (4) Teaching materials used by students have not helped the learning activity become more active and enjoyable. (5) Students find difficulty understand the contents of existing teaching materials. (6) The lack of Student Worksheets based on Discovery Learning in Public Eementary Schools in Enggal, Bandar Lampung.

Planning: Planning is done by analyzing the results of information gathering. The product to be developed is a learning tool consisting of a syllabus, Lesson Plan, Student Worksheets, and assessment instruments. Furthermore, the authors systematically compile the basic competencies, indicators, and learning objectives developed in this study. The theme and sub-theme determined is "Our Friends' Environment" in the fifth-grade of Elementary School.

Initial Product Format Development : The steps in floating the Students Worksheet products based on Discovery Learning are as follows. Learning tool products based on Discovery Learning that developed are learning tools in fifth-grade in sub-theme 1 'Human and Environment'. The following are the initial product prototypes of the learning tools arranged Syllabus, Lesson Plan, and Student Worksheets (Cover, Preface, Table of Contents, Mapping of Basic Competencies, Instructions for Use, Description of Material and Activities, Evaluation, Bibliography) and Test Instruments.

Product Testing: This trial is the stage of testing the Student Worksheetsthat was designed. Evaluations are designed through expert validation, and students' responses go through limited class trials.

a. Material Expert Validation, Design Expert, And Linguist

Reviewed from the feasibility of the material, every aspect assessed in the Student Worksheetsthat was developed was good enough to fulfill the eligibility criteria because the material used was based on Core Competency and Basic Competence, the linguistic aspects were considered to have fulfill the good linguistic criteria. Furthermore, in the aspect of presenting the pictures that used in accordance with the level of students' knowledge, attracting students' interest, the cover that used also represents the theme taken. The evaluation aspects are didactic, construction, and technical requirements. Based on the analysis of the results of the validation of media experts, the Student Worksheets that developed can be said to be valid and can be implemented, although there are still a number of things that must be revised in accordance with expert suggestion, including the Student Worksheets must contain more illustrations, pictures on the contents of the Student Worksheets should use a real picture. The design results in the form of prototypes were further validated by experts. Design validation is carried out by experts that are material expert lecturers, evaluation experts, linguists, and practitioners.

Table 1. Results of Validation by Experts

No	Validator	Value
1	Material Expert	96,10
2	MediaExpert	93,00
3	Linguist	90,00
Average		**93,03**

Based on table 1. The results of the validation test of 3 experts that are (1) the expert material test obtained an average score of 96.10, (2) the media expert received an average score of 93.00 and (3) the validation of the test linguist received an average score 90.00 in a validation test of 3 experts categorized as very feasible to use.

b.TestPractitioners

After going through the validation test which is declared valid and feasible, then the practitioner test on the Student Worksheets according to the teacher's response. Product trials are intended to determine students' responses as users of the Student Worksheets . The test sample was 12 educators in the fifth-grade for the Public Elementary School in Enggal, Bandar Lampung. The test was conducted by distributing questionnaires to respondents after the students were given learning treatment using the Student Worksheets . The results of the questionnaire survey aimed to determine the quality of the Student Worksheets based on the language, material, and design requirements of the Student Worksheets. Based on the results of the validation obtained an average value of 83.5 and are in the very good category. Questionnaire data filled in by students were then analyzed descriptively using a qualitative approach based on the percentage of poor (K), good enough (CB), good (B), and very good (SB) given. the questionnaire shows the level of eligibility of the Student Worksheets is very high.

c. Attractiveness Test, Ease and Use of Student Worksheets

The test results obtained the value of the attractiveness of the use of the Student Worksheets based on the average value of attractiveness, ease, and usefulness of the Student Worksheets in learning. Overall, an assessment of the usefulness of the Student Worksheets according to students' responses shows the use of the Student Worksheets is considered attractive, easy, and very useful in learning. This shows the recognition of students that the function of the Student Worksheets can help students to learn the material more easily in an effort to increase understanding of the concepts being learned. the questionnaire shows the level of eligibility of the Student Worksheets is very high.

Table 2. Student responses

No	Rated aspect	Average
1	Attractiveness	91,3
2	Easiness	85,8
3	Usefulness	88,0
Total		**256,1**
Average Score		**88,37**
Criteria		**Very Good**

Based on table 2. It shows the results of the students' responses to the Student Worksheets product based on Discovery Learning using a questionnaire filled out by students with aspects assessed that are attractiveness with a score of 91.3, ease with a score of 85.8, and benefits with a score 88.0. The overall average score was 88.37 in the "very good" category.

Product Revision: Based on the trial results of theStudent Worksheets based on Discovery Learning, the next step is the improvement and refinement of the Developed Student Worksheets. The data obtained from the validation results show that the product fulfill the theoretically feasible criteria and can be used by students for learning on theme 8 subtheme 1 in fifth-grade. The results of the recommendations are described as follows.

a. **Material Expert Revision**

The results of Suggestions from material experts can be seen in the following table

Table 3. Suggestions From Material Experts

No	Before revision	Suggestions for revision	After revision	Information
1	The writing section does not fulfill the guidelines	The grammar fulfill the General Guidelines for Indonesian Spelling and the guidelines for writing Scientific Papers	Writing refers to the criteria of the General Guidelines for Indonesian Spelling and Scientific Writing	Section contents and concept map in page seven
2	Learning objectives are not yet right	Revising the learning objectives by referring to the ABCD concept (audience, behavior, conditional, and degree)	Learning objectives are made referring to the ABCD concept	Learning objectives section in page eight
3	Images are less variable	Image layout in variations.	Images and illustrations are reproduced	Pages two, nine, twenty-two, and twenty-five

b. Revised Design Expert

The results of the description of the design expert's Suggestions can be seen in the following table

Table 4. Suggestions from design experts

No	Before revision	Suggestions for revision	After revision	Information
1	The cover design is less attractive	Improve the cover page to make it more interesting for students	Cover is given an interesting and appropriate background and image	Cover section
2	The choice of words not quite right	Add development words to the cover of the Student Worksheets	The words used in each sentence are appropriate	Cover section and introduction
3	Images are not adjusted according to conditions	Images are selected based on real conditions	Use real images	Page twenty-five, twenty-six, and thirty-one.

c.Revised Linguist

The results of the description of the Suggestions from linguists can be seen in the following table

Table 5. Suggestions from linguists

No	Before revision	Suggestions for revision	After revision	Information
1	Punctuation is not appropriate	Improve the use of capital letters and punctuation	The punctuation used is in accordance with the General Guidelines for Indonesian Spelling	Pages nineteen, thirty-five, thirty-seven, and thirty-nine
2	Slobbery writing	Examine the spacing of each word especially on the learning objectives	Spacing between sentences and the distance between titles have been adjusted	Product contents section
3	The letters used are not in accordance with the conditions	Pay attention to the choice of font used	Use capital letters and conditional types	The cover title and product contents section

d. Revised From Practitioner Experts

The results of the description of expert practitioner suggestions can be seen in the following table.

Table 6Expert Practitioner Suggestions

No	Before revision	Suggestions for revision	After revision	Information
1	Some punctuation is still wrong	Use proper punctuation	Punctuation adapted to language rules	The preface, purpose, and contents of the product
2	There is an incorrect preposition	Don't use conjunctions in front	Remove conjunctions in front of sentences	In page one on product contents
3	Slobbery writing	Check the spacing of each word again	Spacing between sentences and the distance between titles have been adjusted	Product contents section
4	The letters used are not in accordance with the conditions	Pay attention to the choice of font used	Use capital letters and conditional types	Product contents section
5	The use of images is less precise	Use more realistic images	Adjust to the material	Page twenty-five, thirty-five, and thirty-seven.

Results Discussion of Student WorksheetsBased on Discovery learning*:* The development of the resulting Student Worksheets aims to help the learning process at school. The Student Worksheets also functions as a reference in learning activities on human and environmental material, it is expected that students can have knowledge, insight, and skills that suitable with the learning objectives. Thus, the development of this Student Worksheets that provides more benefits as teaching material in the learning process. Construction of student worksheets based on Discovery Learning based on the concept of guided Discovery Learning. The inductive discovery strategy is based on a thought process where students deduce from what is known to be true for a particular thing, will also be true for all things that are similar in general.

Thus the Student Worksheetsthat is developed is a stage of presenting fact statements that acknowledge supporting conclusions so that students can practice their thinking skills in finding solutions to problems found.

Development research is focused on developing student worksheets on the use of natural resources in fifth-grade students in Indonesia.

Previous studies in this study were carried out by looking directly at the field and conducting observations, interviews, and distributing questionnaires to teachers and fifth-grade students in Public Elementary School 1 Rawalaut. Planning, based on research and gathering information related to the theme to be developed, that are choosing Core Competencies and Basic Competencies for fifth- grade in even semester with the theme of the utilization of natural resources in Indonesia, and formulating indicators and learning objectives. Presentation of material packaged into student worksheets and evaluation based on indicators to achieve learning objectives. This Student Worksheets based on Discovery Learning with the theme of utilizing natural resources in Indonesia is organized into 6 lessons where each learning consists of several interrelated subjects.

Furthermore, student worksheets that are generated then tested for eligibility through expert validation and practitioner testing. In general, the results of validation from media experts and learning material experts stated that the student worksheets were good and could be used as learning materials for fifth-grade students in elementary schools around the city of Lampung. The test results of the Student Worksheets with sub-theme "Human and Environmental" in learning were declared feasible. Thus the resulting student worksheets are ready to be implemented for the sake of real learning. According to research conducted by Sintia (2015: 15), this study states that developing student worksheets using Discovery Learning models that are interesting, easy, useful, and effective for use as learning media.

The stages of this research development begin from analyzing potentials and problems, collecting data, product design, design validation, design revisions, product trials, product revisions, and usage trials. Developed Student Worksheets present theories, present problems, and questions related to the material to achieve learning objectives. Based on questionnaire data, in general, the test results obtained an average value of attractiveness, convenience, and usefulness of the Student Worksheets according to students that are equal to 88.5. This value is converted into the quality of the Student Worksheets is very good for use in learning. This means that the Student Worksheets is good or appropriate for use in learning.

When compared with the results of a research according to Liansari (2015: 20) states that the results of this study aim to develop and test the feasibility, practicality, and effectiveness of Student Worksheets based on Discovery Learning and smart cards of human reproductive material for Eleven in Senior High Schools. The validity of the Student Worksheets and smart cards by material experts, media and field practitioners are 100%, 83.3%, 76.4%, 100%, 80.5%, and 77.7% respectively. That shows the product is valid. Practicality tests with an average of positive answers on Student Worksheets and smart cards respectively 87.6% and 95.52% indicate that Student Worksheets are practically used. The product is effective because the learning outcomes of students' aspects of knowledge, attitudes, and skills are 2.79; 3.41; and 3.43 greater Minimum Graduation Standards 2.67.

Limitations on Developing Student Worksheets Based on Discovery Learning: The limitation in this research is that the development of the Student Worksheets is only limited to one sub-theme, so it is considered to be less comprehensive in fulfill students' needs. Besides, the competency test presented in the Student Worksheets based on Discovery Learning with the theme "Environment is Our Friends" refers to indicators of achievement of learning objectives. But the disadvantage is the competency test in this material has not been presented in each of the basic competencies of each lesson. This research was conducted to focus on assessing the use of Student Worksheets based on Discovery Learning in learning. Meanwhile, learning materials are not the only determinant of learning success, it is necessary to further study the effect of using learning methods and techniques designed to achieve learning objectives. This research was conducted at the feasibility level of the Student Worksheets only to the theoretical feasibility. Then the R&D research steps were completed only at the fifth step due to there is a policy regarding social distancing in the midst of covid-19 pandemic currently.

IV. Conclusion

Based on the research results of the development of student worksheets based on Discovery Learning, it can be concluded that Student Worksheets Products based on Discovery Learning is valid and theoretically appropriate for use in learning in fifth-grade. Theoretically feasible, this is proved from the steps or procedures of the Student Worksheets by the 2013 curriculum that will be used, then the validation of experts from the 3 experts is tested, the material expert is 96.10, the media expert is 93.00, and linguists 90.00., with an overall score of 93.00 stating that the Student Worksheets based on Discovery Learning developed in the "very feasible" category.

Then do the usability test by educators obtained 83.5 which states that the Student Worksheets based on Discovery Learning that was developed in the category of "very feasible" and the response test conducted by students on the Student Worksheets product based on Discovery Learning that was developed in the aspect of attractiveness, convenience and usefulness get a score of 88.37 in "very interesting" category. Therefore from

the development of the DiStudent Worksheets based on Discovery Learning it is appropriate to use and be implemented based on the validation of 3 experts, practitioner tests, and student responses.

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Fina Taniya. "The Development of Student Worksheets Based on Discovery Learning for Students in Fifth Grade Elementary Schools." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 10(4), (2020): pp. 01-07.