

# Development of Discovery Learning Based Science Learning Model Oriented Character Education

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**ABSTRACT---** *Development of discovery learning based science learning model-oriented character education. This research aimed to determine the validity, practicality and effectiveness of science learning model development based on discovery learning oriented character education of class IV Elementary School in Pallangga Subdistrict of Gowa Regency. This study applied kinds of Research and Development (R & D) related to Borg and Gall model. Data collection used observation, questionnaire, documentation, interview, validity sheet, practicality and effectivity of product. Data were analyzed by using descriptive narrative and inferential statistics. The results of study indicated that: (1) validity and practicality of discovery learning development based science learning model oriented character of class IV Elementary School in Pallangga Subdistrict of Gowa Regency whit a very valid category or very feasible of used and very practical; and (2) the effectiveness of discovery learning based science learning model oriented students' character education was effective to used at class IV Elementary School in Pallangga Subdistrict of Gowa Regency.*

**Keywords---** science learning, discovery learning, character education

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## 1. INTRODUCTION

Education aims to form students to be good, strong individuals, having noble character, skill and intelligent in carrying out their activities. Education does not only form knowledge but it is carried out through learning by providing good knowledge. This is expected to be realized in a good action or behavior as well. Education has a strategic role as a means of human resources and human investment, which aims in developing a better life. It has also colored and become the moral and ethical foundation in the process of empowering national identity [1].

Learning in schools is one of education form with various subjects. Science learning (IPA) is one of the subjects taught at the basic education level. This science learning is designed so that students can study events occurring naturally in order to they have knowledge, understanding, and analytical skills of the natural environment, developing skills, insight and awareness of technology related to the use for everyday life.

In fact, many students find difficulty in learning science. This can be seen in low learning outcomes and difficulties in completing science tasks independently. Learning outcomes are reflected in the acquisition of scores on daily tests and report cards in which the average of daily test scores and report cards are below 70. Likewise, the science assignments given are difficult to complete, it can be seen from the notes that the dominant tasks are not completed. In addition, the submission of assignments is always delayed at every face-to-face learning. This indicates that students have difficulty completing their assignments. This was found in schools in Pallangga Subdistrict, Gowa Regency, such as SD Tetebatu, SD Inpres Mangalli, SD Inpres Biringkaloro, SD Inpres Pallangga, SD Inpres Pangkabinanga, SD Inpres Tallang-Tallang and SD Inpres Bontoala I and Bontoala II.

Even more the students find difficulty in learning science at elementary schools of Pallangga District, scientific attitudes through character values, such as the personality of children and adolescents in society have led to subjective perceptions in society. There has been a decline in the quality of attitudes and morals of children and adolescents such as lack of discipline, dishonesty, lack of responsibility and independence. This behavior is part of the values of character education.

Character education in the scenario is learning that carried out by linking the teaching material and the cultivation of character values in shaping the personality of students with their application in life. This is stated by [2] that every material presented in learning has meaning with various qualities. This is considered that the implementation of character education in each presentation of teaching materials on each theme has not been optimally implemented. Furthermore, the attitude assessment of core competencies 1 and 2 (KI 1 and 2) related to character education values is omitted in every subject and only assessed in religious subjects, Pancasila and civiceducation as changing of the 2013 revision in 2019. Therefore, it is necessary to maximize the application of character education in every subject including science subjects.

Actually, teachers have made efforts to improve learning difficulties and the formation of these characteristic behaviors through remedial learning and peer tutoring assistance as well as strengthening character behavior. Nevertheless, students still experience learning difficulties and behavior that lacks character. This is due to that there are many things related to learning and approaches so that it is possible to limit the models and learning approaches. Briggs in [3] said that the model was a set of sequential procedures to realize a process, such as needs assessment, media selection, and evaluation.

While the learning approach is a discovery learning approach. According to [4] "Model Discovery Learning is a way of learning to understand concepts, meanings, and relationships through an intuitive process to a conclusion". So that the use of learning models through discovery learning models can overcome learning difficulties and strengthen character values in integrated character education.

Referring to the description above, it is encouraging the researcher to develop a discovery learning based science learning model-oriented character education at class IV Elementary Schools in Pallangga District, District. Gowa. Therefore, the research problems can be formulated as follows: How is the validity, practicality and effectiveness of science learning oriented character education in grade IV Elementary School in Pallangga Districts, Gowa Regency

The aims of this research were as follows: (1) to produce the validity and practicality of the discovery learning based science learning model-oriented character education for the fourth-grade students of elementary schools in Pallangga subdistrict, Gowa Regency; (2) to understand the effectiveness of the discovery learning based science learning model design-oriented character education for the fourth-grade elementary school students in Pallangga subdistrict, Gowa Regency.

## **2. LITERATURE REVIEW**

### ***2.1 Concept of Model Development***

#### **Learning Concept**

[5] stated that learning is "a set of events embedded in purposeful activities that facilitate learning". Learning is a series of activities that are deliberately created with the intention of facilitating the learning process. This is an activity that is intentionally to know and understand something, whether it is new or understanding things that already exist from a new angle. This is in line with the opinion expressed by [6] that "...instruction as anything that is done purposely to facilitate learning". Learning is something that is done intentionally to facilitate learning. Based on the description of the theory, it can be stated that learning is a process of learning activities planned by the teacher related to the curriculum that is implemented systematically using various approaches in achieving learning goals for students.

#### **Learning Model**

The definition of model is expressed by Benny (2009) who stated that the model is something that describes a pattern of thinking. A model usually describes a whole concept that is interrelated. This model can also be seen as an attempt to concretize a theory as well as an analogy and representation of the variables in the theory. Besides, Snelbecker in [7] also said that "the model is concretization of a theory wich meant to be analogous to or representatives of the process and variables involved in the theory". The model is an actualization of theory to equate or represent a process and the elements involved in a theory. Through the characteristics of learning, it provides convenience in recognizing learning models so that the learning model applied in each learning process is clear in achieving the goals of learning.

#### **Types of Learning Design Models**

The learning designs proposed by the experts has various types. Each of these designs has certainly advantages according to the place and target. The learning design models uses of the Dick and Carey [8] design model in which this model reveals in detail and systematically about the development of learning system design. The Dick and Carey model to combined with the educational research and development proposed by [9] that is modified in this study. The use of Education and Development research is an effort to design and implement learning systematically with controlled stages.

## 2.2 Developed Concept Model

Learning outcomes are the basic consideration in applying discovery learning oriented character education. The state of the learning process proves that many students have difficulty solving problems encountered in learning. Therefore, an integrated learning process is carried out between discovery learning and character education. According to [10], the discovery learning model is another name for discovering learning. This discovery learning as a forum in carrying out the learning process in order to students are able to solve the learning problems.

While character education is known as a system of inculcating character values to school members including components of knowledge, awareness or willingness, and actions to implement these values [11]. In addition, [12] stated that the development of character education is not included as core, but it is integrated into subjects, self-development, and school culture. For discovery learning according to [13] is a learning model and is focused on a number of references to carry out learning and has differences at a certain level based on the discovery experience from previous learning experiences. So, repeated experiences can give similar learning outcomes in order to be a reference in continuous learning.

Based on the description of the steps of discovery learning and the model of integrating character education, it can be stated that discovery learning oriented character education is carried out in an integrated manner through discovery learning steps and a model of integrating character education in one learning process.

## 3. RESEARCH METHOD

This type of research used Research and Development (R&D). The subject of this Research and Development (R&D) was class IV students of elementary school in Pallangga District, Gowa Regency, South Sulawesi. Research and Development began in December 2020. The subject of a limited trial was conducted on May 2021 for class IV students of Elementary School in Pallangga District, Gowa Regency, South Sulawesi

Research and Development of discovery learning based science learning models-oriented character education through a combination of learning design model by Dick and Carey and the education research and development model by [9]. Based on the development research steps stated by Borg and Gall, there are five steps to produce learning products that are ready to be used in the field namely preliminary research, model development, model validation, model testing, and model implementation.

Instruments and techniques of data collection in this research were interview guides, observation sheets, questionnaires and student worksheets. This study consisted of two types, namely quantitative and qualitative data. The quantitative data used data normality test, data homogeneity and inferential test. While qualitative data used data reduction, data presentation and drawing conclusions.

## 4. RESEARCH RESULTS AND DISCUSSION

### 4.1 Discussion of Validity and Practicality Results of the Discovery Learning-Based Science Learning Model-Oriented Character Education

Validity and practicality tests were carried out on the discovery learning-oriented science learning model book based on character education and the discovery learning-oriented science learning model teaching guide book based on character education by two experts in the field of model development. The results of the analysis of the assessment of two experts on the learning model product obtained a value of 3.5. So, it refers to the good norm category, which gets a value of  $2.5 < V < 3.5$ , then it was stated valid/feasible. Thus, it is concluded that the discovery learning-based science learning model-oriented character education meets the category of validity/feasibility.

The category of validity/feasibility of the science learning model book based on discovery learning is oriented towards character education using assessment aspects, namely: (a) the feasibility of the development base; (b) linguistic eligibility; (c) the suitability of the material with the theory of discovery learning oriented character education; (d) planning and implementation of character education-oriented discovery learning. The four aspects of product feasibility assessment show very valid results. This means that the model book meets the eligibility requirements for use.

While the category of validity/feasibility in the teaching guidebook of discovery learning-based science learning models-oriented character education used assessment aspects, namely: (a) the benefits/usability of the guidebook; (b) linguistic eligibility; (c) the suitability of the material with the basic competencies and learning syntax; (d) Development of learning assessment; and (e) Learning Implementation Plan. The five aspects of assessing the feasibility of teaching manuals obtained a very valid category. This means that the teaching manual meets the eligibility requirements for use.

The results of the implementation test analysis were carried out to measure the practicality of the discovery learning-oriented science learning model book based on character education, which obtained an average value of 3.64 with a very practical category, so it can be concluded that the product development has met the practicality criteria of the product.

The meaning can be used as a reference from the results of the practicality test is the ease of using the learning steps in the teaching manual, which is very practical and operational, so that it can be used as a guide for teachers in developing teaching themes.

#### ***4.2 Discussion of the Results of the Effectiveness of the Discovery Learning-Based Science Learning Model-Oriented Character Education***

The results of the effectiveness test of the discovery learning-oriented science learning model based on character education were stated effective. This was seen from the effectiveness of the syntax aspect, the effectiveness of the social system aspect, the effectiveness of the reaction principal aspect, the effectiveness of the supporting aspects and the effectiveness of the learning impact.

#### ***4.3 Syntax Aspect***

The effectiveness of the syntax aspect based on the stages of discovery learning as the approach used. According to [14] in applying the discovery learning method in the classroom, there are several procedures that must be carried out in teaching and learning activities in general simulation/providing stimulation, statement/problem identification, data collection, data processing, evidence and drawing conclusions/generalizations. As in the procedure used by integrating character education at each stage of discovery learning, resulting in the effectiveness of the discovery learning-based science learning model-oriented character education.

#### ***4.4 Social System Aspect***

The effectiveness of the social system aspect based on the teacher's responsibility in the learning stages and provides guidance each learning stage. In addition, it can also be seen from how teachers-built interactions with students and interactions between students in the learning process. Likewise, teachers growing and encouraging character values in each stage of learning. So with a discovery learning-based science learning model oriented character education, the teacher was able to students - centered learning, condition but under certain conditions the teacher changes the teacher-centered learning process, such as when character values were not shown by students, the teacher applied individual principles for strengthening character values.

#### ***4.5 Aspects of the Reaction Principle***

The effectiveness of the reaction principal aspect based on the implementation test by doing observations related to the teacher's positive response to students in the learning process, the teacher's efforts in the learning process by helping explore various problems in learning and inviting to make comparisons of various problems to the solutions found. In addition, students were given awareness based on the teacher's reflection in the learning process, as well as providing alternatives to the problems experienced in learning.

#### ***4.6 Supporting Aspect***

For the effectiveness of the supporting aspects based on the implementation test through the use of learning models and teaching guides, discovery learning learning model-oriented character education which is shown from how teachers and students utilized learning resources and media used in learning activities. In addition, the use of teaching guides with reference to the adjustment of students' characteristics in learning, as well as assessments that can evaluate psychomotor, cognitive and affective.

#### ***4.7 Impact Aspects of Direct and Accompanied Learning***

While the effectiveness of the impact of learning model through implementation tests using indicators, namely: (a) scientific attitude through character values and (b) Science knowledge.

#### Test effectiveness in shaping scientific attitudes through character values

The test of the effectiveness of the model in this section was to reveal how the effectiveness of the model developed in answering one of the problems posed in this study was the low scientific attitude of students through character values. To overcome the low scientific attitude of students through character values, researcher used a learning model developed to improve students' scientific attitudes through character values in a better direction by integrating character values in a character education-oriented discovery learning model.

After being tested the effectiveness of the learning model in shaping students' scientific attitudes through character values, the research data revealed that the average value of students' scientific attitudes through the discovery learning group character values developed quite well. The achievement of the category is quite well developed, the value of students' scientific attitudes through character values in integrating character values of discovery learning model in teaching guides that use attitude reflection activities at each stage of learning, effective in shaping students' scientific attitudes through character values over a period of time. Five face-to-face meetings were carried out continuously. This also revealed that the process of reflecting scientific attitudes by using character values was well understood by students so that it became a habit in students' attitudes.

What is produced in this study that the value of students' scientific attitudes through character values using the discovery learning model was assumed to be effective. This was reinforced what Krathwohl put forward in [15] that the formation of attitudes towards values takes place through a gradual and continuous process, starting with accepting values, appreciating values, giving values, organizing values, and ending with characterizing values. This had been done by referring to the teaching guidebook of the discovery learning-based science learning model-oriented character education. Therefore, for success in shaping the scientific attitude of students, it is necessary supported by other factors such as giving examples of good character from the teacher which was also an important factor as a mirror for students to behave.

The researcher believes that if scientific attitudes through character values are integrated in learning using the discovery learning model as one of the scientific approaches taught early in formal learning that begins in elementary school, scientific attitudes through students' character values will be better because of planting Scientific attitude requires habituation with a long enough time. Researcher' beliefs is supported by research results of the study revealed that the character behavior of students can be improved through a variety of interventions. Moreover, researcher believed that students had character potential, so that the instructions and habits applied by the teacher can make it easier for students to improve character behavior.

#### Test effectiveness in shaping knowledge of science

The use of discovery learning-based science learning models-oriented character education by teaching students, after doing trials and being declared eligible, so that at the end of this section, the effectiveness test was carried out on students as subjects. In this section, the test of the effectiveness of the model revealed how the effectiveness of the developed model can help students increase knowledge that is considered low after observing students on science subject matter. Theoretically, student-centered learning used the discovery learning model, the value of student knowledge became better because learning was not just memorizing concepts but there was a close relationship between the material and the real conditions obtained by students.

Based on the results of the effectiveness test of the learning model in shaping students' knowledge of science material, it was revealed that the average value of students' knowledge of science material for the discovery learning model class was complete criteria. With the criteria of complete science knowledge of students in the discovery learning class, it was revealed that the teaching guide of the discovery learning-based science learning model-oriented character education developed by the researcher is good/feasible to be used.

Discovery learning model learning oriented character education was good/feasible to use because it was able to make learning material more meaningful and real for students. In this context, students are able to relate their personal experiences to learning materials. Most of the learning material that refers to the teaching guide of the discovery learning model-oriented character education in the discovery learning model class was considered for their personal experience. Most of the students had heard, seen, and or even been directly involved in most of the material on the theme of always saving energy. Thus, it was easy for students to make connections between personal experiences and the material being studied. The ease experienced by students had an impact on increasing students' ability to remember and understand learning materials because learning materials are real in their lives. This can be seen from the enthusiasm of students in learning in class during implementation, where each student is able to express personal experiences associated with learning materials.

Another thing that causes the value of students' knowledge to be complete by referring to the teaching guide of the discovery learning model-oriented character education that discovery material is able to foster concept strengthening to students, which based on the material studied is able to make students construct their own knowledge without having to memorize because the material is experienced by students and others.

Those conditions were also admitted by the teachers of science subject as research collaborators, who revealed that the discovery learning model teaching guide-oriented character education was very suitable for the needs of students in learning. By using the teaching guide of the character education-oriented discovery learning model developed by the researcher with a combination of material and pictures, students became more enthusiastic in learning and almost all of the material, students have heard, seen or even been directly involved in. So that, it can be concluded that the use of discovery learning-based science learning model with character education orientation is effective in increasing knowledge and scientific attitude of fourth grade students of elementary school in Pallangga District.

## **5. CONCLUSION**

1. The discovery learning-based science learning model-oriented character education produces products that meet the criteria of validity and practicality, so that they are available used to increase science knowledge and scientific attitudes through character values.
2. The discovery learning-based science learning model-oriented character education produces products that meet the effectiveness of criteria, furthermore those are available used to increase science knowledge and scientific attitudes through character values.

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