

Development of Learning Device with Model Inkuiri Guided to Improve Cognitive Outcomes of Students in Grade IV SDN Wonokusumo VII/46 Surabaya

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Abstract:- This research aims to find out: (1) produce a science learning device based on high quality guided inquiry in elementary School; (2) learn the results of the learner's cognitive learning after being used guided learning devices that have been developed: (1) defining stage; (2) design phase; (3) Development stage; and (4) the deployment stage. These research instruments include: 1) Expert assessment of the developed SCIENCE-based learning devices and Associates ' observer to teacher and student activities; 2) Test problem, then analyzed by analysis of the validation test data and test results of the study. The results of the research are; (1) Science Learning device oriented inquiry guided which include: a) syllabus, b) Learning Implementation Plan (RPP), d) Student Teaching books (BAS), e) evaluation Sheet, F) Observation sheet teacher and student activity and g) Student response sheet, indicates that this learning device meets the very valid, practical, and effective criteria used; (2) Development of learning-oriented inquiry device is effectively used in science learning. Effective indicators in this study were seen from the increase in pretest-posttest learning results and the difference in the results of pretest-posttest.

I. INTRODUCTION

IPA Learning is a field of science that learns about nature that is oriented not only on the product or results but also emphasizes on the process of how a concept can form, so in studying IPA, students will relate to how to find out about nature systematically. Studying IPA is not only a mastery of the knowledge set in the form of facts, concepts, Principles but also a process of discovery. SCIENCE Learning is a learning consisting of products, processes, And attitudes as a reference or limitation to determine the extent to which students ' competency in SCIENCE learning, each teacher determines a standard of value. It is intended for teachers to know the extent to which students understand learning, so hope can achieve balance between attitudes, knowledge and skills achieved to build soft skills and hard skills.

Learning activities conducted in schools should be made enjoyable so that students are more active so that they can learn well and obtain optimal learning outcomes. The teacher's ability to implement learning is one of the factors that can affect students ' successful learning. Learning that involves students, will make students better understand the

learning materials delivered by teachers The learning experience applied to students must be *student centered*.

The low cause of SCIENCE learning outcomes in elementary school is the model, approach, strategy and learning methods that are less varied so that the activities of learners in the learning process are minimal. The frequent methods of teaching are lectures, records, and works. The learning process lasts only one direction where the teacher explains the material and the formula, giving examples of the problem, and providing homework (PR), So that learners in the learning process become the recipient of passive information. This is what makes learners less active to learn IPA, So that the learning outcomes obtained by learners are not maximums. In addition to the ability of every learner who varies in understanding a lesson there is a rapid understanding of the ability and there is also slow also influence on the achievement of SCIENCE learning results.

Although it has implemented a scientific approach in the learning process but has not seen the increase in the results of SCIENCE studies obtained, Chosen teaching method is not yet precise and still puts the teacher as a learning Resource (*teacher centered*). Consequently most learners have a fairly low cognitive knowledge outcome. Therefore, A teacher is required to be able to understand and possess adequate skills in developing learning devices By translating different learning models.

Based on some considerations, the author is interested in choosing one of the learning models that can be applied in the class Inquisition is guided by remembering: 1) still low-power learners, in this case the results of learning learners are still lacking; 2) Based on the observation results gained that students ' learning involvement during the learning process in the classroom is still low, that is about 33% of learners who are active in the learning process, while the other students as much as 67% are fun with their own activities; 3) Learners have difficulty remembering and understanding SCIENCE lessons, students can declare concepts but cannot apply them; 4) The lack of improvement in the quality of SCIENCE learning so that teachers are demanded creative in developing learning devices by presenting various strategies, appropriate learning methods and models.

In the implementation of teaching and learning model in the classroom, there are several principles that need to be a concern for a teacher. With regard to these principles, learning that uses the Learning inquiry model is expected Can run optimally according to what has been planned. According Hartono (2014: 65), There are some key principles that every teacher must look for in the use of the Learning Inquiry model, namely:

➤ *Intellectual Development Oriented*

The main objective of the Learning Inquiry model is the development of thinking skills. Thus, the learning model of teaching, in addition to learning outcomes, is also oriented to the learning process. Therefore, the success criteria of the learning process using the guided inquiry model is not determined from the extent to which learners can master the subject matter, but how far the students are doing searching and discovering a meaning through the thought process.

➤ *Principles of Questioning*

The role of teachers that must be done in the use of teaching and learning model is as the Inquisition. The ability of learners to answer every question, including part of the syntax of instructional learning, is guided.

➤ *Principles of Interaction*

The learning process is the process of interaction, whether the interaction between teachers and students, teachers with the environment, and learners with the environment. Learning as an interaction process puts the teacher into an environmental regulator that directs learners to develop affective attitudes, cognitive, psikomotrik

➤ *The Principle of Learning to Think*

Learning not only remembers some facts, but also the thought process (learning how to think), i.e. the process of developing the whole brain potential, both left and right brain, intelligence, emotion, spritual and intellectual. According Asrori (2009: 221) said that based on the ability possessed by the brain in absorbing, managing, and conveying information, then individual learning can be grouped into three learning styles: 1) Visual learning style, 2) auditory learning style, and 3) Kinaesthetic learning Style.

➤ *Principles of Openness*

A meaningful principle is the learning that provides a variety of possibilities as a hypothesis that must be proved truthfully. In this case, the teacher's job is to provide space to give learners opportunities to develop hypotheses, and publicly proves the truth of the hypothesis proposed.

During the guided inquiry process, a teacher can ask a question or encourage learners to ask their own questions. The question is openended, give learners the opportunity to investigate themselves and they search for their own

answers (but not just one correct answer). According Trianto (2013: 168), The skills required to implement guided learning inquiry are as follows:

➤ *Ask Questions or Concerns*

A guided inquisition activity begins when a question or problem is submitted. To ensure that questions are obvious, the question is written on the board, then learners are asked to formulate hypotheses.

➤ *Formulating Hypotheses*

Hypotheses are temporary answers to questions or solutions of problems that can be tested with data. To facilitate this process, teachers ask learners the idea of possible hypotheses. Of all the ideas that exist, selected one of the hypotheses relevant to the given problem.

➤ *Designing and Conducting Experiments*

Students define several activities to conduct experiments that correspond to the hypotheses implemented.

➤ *Collecting Data*

Hypotheses are used to guide the data collection process. Data generated from experiments made can be tables, matrices, or graphs.

➤ *Data Analysis*

Learners are responsible for testing the hypotheses that have been formulated by analyzing the data obtained. An important factor in testing the hypothesis is the ' correct ' or ' wrong ' thinking. Upon obtaining the conclusion of the experimental data, learners can test the hypothesized hypothesis. If it turns out that the hypothesis is wrong or rejected, learners can explain according to the process of the guided Inquisition he has done.

➤ *Make a Conclusion*

The closing step of the inquisated learning is to make a temporary conclusion based on the data the learners obtain.

II. METHOD

This research is included in the type of research and development that aims to produce a valid, practical and effective learning tool that is worthy of use in elementary school. By using the Teaching model learning, the effectiveness, practicality, and efficacy of learning devices developed can be described as follows.

The population of this study is elementary school student of grade IV SDN Wonokusumo VII/46 Surabaya City Odd semester 2018/2019. Trial design using pretest-posttest with control group design (Samsudi, 2009). Analysis of the data used includes prerequisite tests for analysis and product effectiveness testing.

III. RESULTS AND DISCUSSION

The results of the trials that have been done are then used to see the extent of the learning device quality that have been developed meet valid, practical and effective criteria. In addition, as far as the achievement of learning outcomes using inquiry-based learning is also seen.

Based on the analysis of the learning device validation results, it can be concluded that learning Inquiry model study device consisting of A) syllabus, b) Learning Implementation Plan (RPP), c) Student work sheet (LKPD), D) Student teaching book (BAS), e) Evaluation sheet, f) Observation sheet of teacher and student activity and g) student response sheet According to expert assessment has fulfilled the criteria of validity, with the category very valid.

The result of the validation indicates that the developed Silabus has an average score of 4.44 with a reliability of 88.89%. Thus, the syllabus is well-developed for use in science learning with the model inquiry guided by the sound material albeit with a minor revision. The necessary revision is the learning step adjusted to the model of the inquiry and refers to the activity of students.

The result of the validation indicates that the developed Learning Plan (RPP) has an average score of 4.2 with a reliability of 84.00%. This RPP measures are developed referring to the rules according to Permendikbud No 22 year 2016. Thus, the RPP is developed worthy to be used in science learning with the model inquiry guided by the sound material albeit with a minor revision. The revision required is the learning step adjusted to the model of guided inquiry and change in learning objectives.

The Validator's assessment results show that the developed LKPD has an average score of 4.35 with a reliability of 86.96%. Thus the LKPD was developed in good category and worth using even with a slight revision. As for the revision done is the steps on the guided inquiry more defined and improved layout so that it has high attractiveness.

The Validator's assessment results show that the LKPD that has been developed and revised can be used in learning the next sound material, The development of LKPD can be a reference for other teachers/developers to develop the LKPD that is oriented towards the guided Inquiry model.

From the results of the result of the validation of learning results test result shows the average result of validation of learning results is about 1 average 4.5 With a percentage of 90%, a matter of 4 average 4.54 categories with a percentage of 90.9%, A matter of 5 average 4.4 with good category with percentage 88.2%. This value indicates that the study result test (THB) can be used in learning with a slight revision. Subsequently after the revised, the THB was assessed as eligible. Thus, the test instrument developed with valid and qualified categories of THB is

categorized as good in the content aspect and language for all items of the matter, so it can be used in learning. Results of study result test validation can be used as test instrument of cognitive learning results of students as a measure of student concept mastery, although slight revision. The revision required is the level of need to be perfected so that children can think high.

The validity of the learning device with a guided inquiry model has a score of 4.2 with excellent categories. Student book legibility of 81.82% so that it can be categorized as moderate thickness. LKPD readability amounted to 86.96% so it can be categorized as high legibility. The implementation of the sound material science learning with the model of inquiry guided at each meeting has a score of 84% can be categorized as high. The constraints faced by researchers during the learning process in the I test were less active students in conducting discovery activities and working on the LKPD, At the beginning of the meeting especially at the time of learning, students are not familiar with the Inkuri model so that teachers need to train first. All obstacles that arise during learning activities can be solved well at the next meeting. Students 'response to learning Inkuri-guided models generally expressed pleasure. Students are keen to follow the next learning with the same model. Student activities dominant in the learning science of sound material with the model of learning inquiry guided discussions with the group, doing cooperation, observation, and collecting data with a percentage of 100% means students are active in learning activities. Student learning results after the learning activity increased by 100%. So all students complete after working on Posttest.

In Test I, it can be suggested that in general there are no unresolved constraints. Some of the obstacles that arise are as follows: (1) Less active students in conducting learning activities and working on the LKS at the beginning of the meeting especially during the learning process; (2) Students have never known hypotheses and predictions that are components in inquisable learning so that teachers must first explain the term; (3) Time constraints in the learning process.

Some of the learning constraints that arise during the learning activities, among others, have to first study the teacher introducing hypothesized terms and predictions. Then the need to motivate students to inspire learning so that learning of a guided inquired model can be meaningful to all students. Problem of time constraints when practicum activities can be addressed by familiarise yourself with the experiment To study the concept of SCIENCE by preparing tools, materials and practical design well before learning activities so that in the implementation does not take too much time. Teachers are more extra in guiding and directing students to create problem formulation, hypothesized and experimented so that students can understand clearly and in his or her meetings become accustomed. Therefore teachers often remind them that they will account for their work in each group and will be assessed objectively.

Based on the results of analysis and discussion of the results of the device development research and implementation of learning Inquiry model to improve cognitive learning outcomes of elementary school students, obtained the following findings:

- Learning device qualifies as valid based on:
 - The validity of the learning device with a guided inquiry model has a score of 4.1 with excellent categories.
 - Student book legibility of 70% so that it can be categorized as moderate thickness. LKS readability amounted to 80% so it can be categorized as high legibility.
- Learning devices are practically qualified based on:
 - The implementation of theme learning to play with objects around me with the model of inquiry guided at each meeting got a score of 99.2% and 93% can be categorized as high.
 - The constraints faced by researchers during the learning process in 1 trial are Students in conducting the discovery activities and working on the LKS at the beginning of the meeting, especially During learning, students are unfamiliar with the Inkuri model, so that teachers need to be trained first. All obstacles that arise during learning activities can be solved well at the next meeting.
- Effective learning devices are based on:
 - The student's response to the learning of a guided Inkuri model generally expresses pleasure. Students are keen to follow the next learning with the same model with a percentage of 96.43%.
 - Students ' activities that are dominant in the learning theme play with objects around me with the model of learning inquiry guided discussions with the group, doing cooperation, conducting observations, and collecting data with a percentage of 100% means students are active in learning activities.
 - Student learning results after the learning activity increased by 100%. So all students complete after working on Posttest.

IV. CONCLUSION

Based on the results of the research and discussion, it can be concluded that learning devices models of guided inquiry developed worthy to improve the learning outcomes of elementary school students.

V. SUGGESTION

Based on the results of research conducted by researchers, there are some suggestions as follows:

- In the learning process using guided Inkuri, teachers should be able to manage time effectively to make learning can walk according to the objectives specified.
- Introducing the first inquiry to the students before beginning the study.

- Teachers can develop learning device development and apply it in learning in accordance with guided Inquisition model.
- Teachers can develop learning devices with other models according to material.

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