

Development of Learning Model “PODE” (Predict, Observe, Discuss, Explain) in the Primary School

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Abstract: This study aims to determine: 1) how is the ability of teachers to develop learning tools, 2) how the formulation and develop the Learning Model PODE in improving science process skills and character of elementary school students. 3) how to implement model-based learning PODE. This study is designed in the form of descriptive order identifies exactly what the implementation PODE model learning in primary schools. The use of descriptive method aims to obtain an overview of the implementation of PODE model study in depth, detailed and intact. Type of data collected is qualitative data, where the data is taken from direct observation by researchers on the implementation PODE model learning in the classroom. The results of the research are: 1) The ability of teachers to create learning tools such as syllabus, lesson plans, worksheets and achievement test categorized as good; 2) The device was developed based science learning syntax PODE model that begins with the preparation of briefing through workshops learning device; 3) Implementation of limited learning is seen that the syntax models PODE accomplished overall. The effectiveness, practicality and validity of its implementation has not been seen since the research project a new look at how the response of students and teachers in implementing this model

Keywords: Predict, Observe, Discuss, Explain (PODE), Science.

1. INTRODUCTION

The Predict, Observe, Discuss, and Explain (PODE) models are the modified Predict, Observe and Explain (POE) models first developed by White and Gunston in 1995 in his Probing Understanding. Predict, Observe, and Explain (POE) models are a model of learning using experimental methods that begin with the presentation of the problem, in which learners are invited to provide temporary allegations of the possibility that it occurs, followed by observation or direct observation of a problem and then proven by doing experiments to find the truth of the initial predictions in the form of explanations (Jose S. Hilario, 2015, Teowasong, et.all.2010, Famakinwa Adebayo, Bello Theodora Olufunke, 2015; Sema Nur Güngör and Muhlis Özkan, 2106; Kdk Angga Prabawa, Ni Kt Suarni, I Gd Margunayasa, 2014).

The difference of PODE model of development with previous POE model lies in the development of the discussion stage where students after getting the observation result they discuss with other groups or groups. In the discussion stage there are several things that can be done: (a) clarification of ideas through discussion activities, students can reconstruct if they do not match their friends or become more sure if their ideas are accepted by others, (b) construct new ideas if the idea is not able to answer (c) evaluating new ideas with new observations or problems (d) directing students to develop their social skills (Nana, Sajidan, Muhammad Akhyar, Dewi Rochsantiningsih, 2014; Nana, Dewi Rochsantiningsih, Muhammad Akhyar and Sajidan, 2016 , Israel Kibirige, Joseph Osodo, Kedibone Magdeline Tlala, 2014; Nita Nuraini, Pughu Karyanto, Suciati Sudarisman, 2014, Burçin Acar Şeşen, Ayfer Mutlu, 2016).

The problems studied in this article are how to develop the Predict Observe, Discuss, Explain (PODE) learning model to develop the science process skills of elementary students in more detail can be described as follows: a) how the ability of

teachers to develop learning tools, b) how the formulation and developed PODE Model Learning tool in improving the science process skills and character of elementary students. c) how to implement the learning based on the PODE model.

2. LITERATURE REVIEW

One model that requires students to be creative and active and to reduce the role of teachers in the learning process is the Predict-Observe-Explain model. This model is more demanding for students to be active and creative in the learning process, while the teacher only acts as a mediator for students who encounter difficulties or problems in the learning process (Saowapak Teerasong, et.all. 2010).

The Predict-Observe-Explain Learning Model is one of the learning models that explores the initial knowledge of the students and provides an opportunity for each student to play an active role in the learning process. In addition, the Predict-Observe-Explain learning model refers to a constructivist understanding, in which the student will build knowledge in his own mind based on the direct experience encountered during the learning process (Burçin Acar Şeşen, Ayfer Mutlu, 2016). According to Jose S. Hilario (2015) "Predict-Observe-Explain learning model is one of the efficient models to create student discussions about the concept of science. This learning model involves students in predicting phenomena, performing observations through demonstrations, and finally explaining the results of their previous demonstrations and forecasts. "

According to Liew (2004) the benefits of the POE learning model are as follows. (1) POE learning model can be used to explore students' initial ideas. (2) Generating good discussions between students with students and students with teachers. (3) Provide motivation to students to investigate concepts that have not been understood. (4) Awakening the students' curiosity to a litter. The Predict-Observe-Explain model is also in line with Piaget's development theory that children at elementary school age are still at the stage of concrete operational development, so this model is very suitable to be applied to elementary students. This model is also very well applied to science subjects, let alone seen from the initial observations made by students less enthusiastic in this subject and the value of students in this subject was relatively below the value of KKM is 65.

Science is a subject related to nature around humans. To learn the science can not just by giving material only. IPA must be studied through observation or practicum to see firsthand the phenomenon. If students can find out for themselves the phenomenon, they will easily understand the phenomenon that occurs and of course they will be able to remember it in a relatively long time. Therefore Predict-Observe-Explain learning model is very appropriate to use in science subjects (Kdk Angga Prabawa, Ni Kt Suarni, I Gd Margunayasa, 2014).

3. RESEARCH METHODS

This research is designed in the form of descriptive to explain exactly what is the implementation of learning model of PODE in elementary school. The reason researchers use descriptive method to get an overview of the implementation of PODE model learning in depth, detailed and intact. In this descriptive research, the type of data taken is the type of qualitative data, where the data is taken from direct observation by the researcher about the implementation of PODE model learning in the classroom.

The approach chosen in this study tried to combine evaluative with action (action). Field development trials are conducted with the aim of knowing the draft ability. This activity is focused on obtaining feedback by observers that are useful for the improvement and refinement of the device development draft. Trial engagements include the implementation of PODE model learning, and posttest implementation; (2) product trial. Implementation of this trial, teachers implement learning in accordance with the model developed. Learning activities take place, researchers make observations and record things important during the learning process both student and teacher activities; (3) actual learning; (4) evaluation and reflection. The evaluation stage is the provision of a formative test that is posttest. The reflection stage is implemented after the learning activities are completed with the aim to discuss various problems or shortcomings at each stage. The result of reflection is then used as a reference in product revision; (5) product revisions. After getting input from experts and science teachers who have revised the product to improve the product before the final product is used.

The trial focused on process evaluation is also focused on evaluation of results involving teachers and grade V students in the Primary Inpres Primary School of BTN. Pemda and SD Negeri Mapala.

Data analysis was done with descriptive statistics and quantitative analysis, descriptive statistics directed to describe how PODE model implementation applied by teacher. While the quantitative analysis to see how big the results achieved by

using learning tools model PODE. From the results of this analysis sehigga expected to provide input to learning tools developed, then a material revision of product development model PODE prepared.

4. RESEARCH RESULT

In this section will be described the results of research in the form; (1) Library Studies, conducting field surveys, and developing questionnaires. In this activity, partner schools are used in 3 schools: Primary Inpres of BTN Regional Government, SD Negeri Mapala, and SD Inpres Toddopuli I. (2) Developing PODE model development tools, Preparing instrument of learning process and character skill of students and FGD Early Model and Model Finalization.

1. Introduction Study Stage:

a. The result of teacher ability analysis make learning device.

Analysis of the ability of teachers to make learning tools that include: Syllabus, Learning Plan of Implementation (RPP), Student Worksheet (LKS) and Test results of learning as outlined in questionnaire assessment teacher. The results of data analysis of 5 teachers who provide assessment of learning tools are shown in Figure 1.

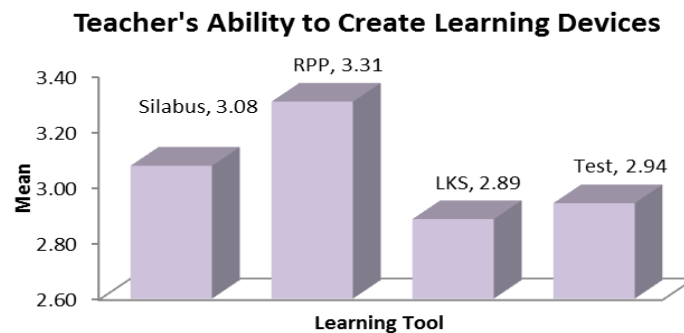


Figure 1 The ability of teachers to make learning tools

In Figure 1 above that the ability of teachers to make learning tools in the form of syllabus obtained an average score of 3.08 indicating that the device is in good category. The Learning Implementation Plan obtained an average score of 3.31 indicating that the device is in either category. Student Worksheet obtained an average score of 3.89 indicating that the device is in either category. The Test Results obtained an average score of 3.94 indicating that the device is in either category. Based on these data it can be concluded that the teacher is able to make learning tools.

b. Results of teacher knowledge analysis of PODE learning model.

Analysis of teacher's knowledge on PODE learning model. Results of data analysis of 21 teachers who responded to the questionnaire shown in Figure 2.

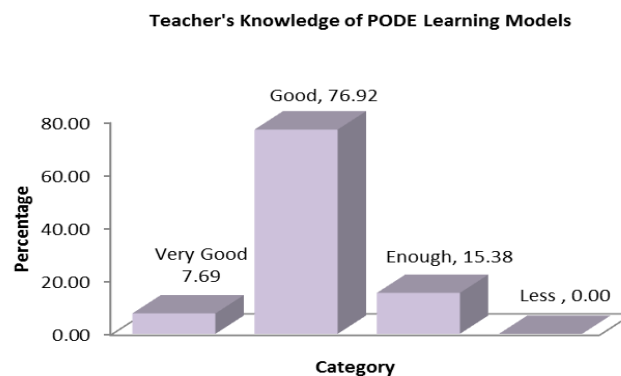


Figure 2 Teacher's ability to model learning

In Figure 2 above, the average percentage of teachers' ability in the overall learning model has a value of sufficient category of 15.38, good category of 76.92, and a very good category of 7.69. Based on these data it can be concluded that

the ability of teachers to model learning is generally good, in this case that teachers understand about learning theories and principles of learning that educate specifically the model of learning PODE.

2. Phase Drafting of the Product:

a. Format Selection

The selection of learning device format is intended to design or design the contents of learning, strategy selection, learning methods and learning resources developed. The result of the format selection as follows:

1) Learning Implementation Plan (RPP)

The Learning Implementation Plan is designed based on the developed syntax of the PODE learning model. The principle analysis in preparing RPP is:

- Taking into account the model, and the method of learning. In device trials are used with discussion methods, frequently asked questions, demonstrations, and practicum.
- Encouraging the active participation of learners: to create an active role of learners in the learning process, the RPP is designed in clear work steps regarding the activities of teachers and learners.
- Engagement and integrity: RPP is determined by considering the relevance and integrity of SK, KD, indicators and learning objectives, learning materials, learning activities, assessments, in a single unity of learning activities.
- The RPP should describe the procedure, within the organizational structure of learning to achieve the Basic Competencies set forth in the content standard and also elaborated in syllabus form.
- In this case a teacher should pay attention to the arrangement of indicators in RPP, teachers should involve 3 aspects (cognitive, affective, psychomotor).

2) Student Worksheet (LKS)

At this stage LKS is developed and designed in the form of demonstration / practicum activities accompanied by exercise questions. This LKS contains guidelines accompanied by the concept space as a place where learners write down their observations, conclusions and answers as a solution to the problem. LKS Components Include Competency Standards, Basic Competencies, Achievement Indicators, Demonstration / Practical Guidance. Through this LKS, learners are expected to help in understanding the lessons through observation activities, solving problems through their own way, and the help of friends or teachers.

b. Initial Learning Tool Design Results

Activities in the initial design include the initial design of PODE learning model tools including: Learning Implementation Plan (RPP), Student Activity Sheet, and Test Results Learning. The resulting learning tool is Draft 1.

3. Device Trial Results

Descriptive analysis aims to determine the implementation of PODE Model device and the extent to which the level of student learning outcomes after following the learning process consisting of two meetings. Data is processed using Microsoft Office Excel 2007 program, to see student learning result after using Model Predict, Observe, Discuss, and Explain (PODE) in SD. Presidential Instruction of BTN. Local government and elementary schools. Mapala Country.

Student learning outcomes SDI Unggulan BTN Pemda with 35 students for posttest average 83.04, mean 85.00 standard deviation 6.79. The result of SDN Mapala with 37 students for the average posttest of 75.98, mean 80.00 standard deviation 9.23. More details can be seen in the histogram of Figure 3.

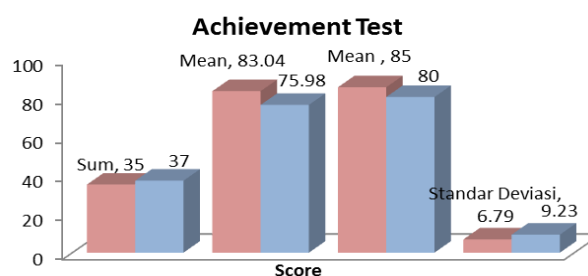


Figure 3. Average Posttest Value

Based on observation observer observation data about the implementation of RPP of 2 meetings. The summary of observations on the implementation of RPP can be seen in Table 1 as follows:

Table 1. Summary of Observation Results of RPP Implementation at SDI Featured BTN Local Government

Aspects observed	Mean	Category
Preliminary activities	1.44	Made Entirely
Core activities	1.31	Partially Conducted
Closing activity	1.56	Made Entirely
Class situation	1.75	Made Entirely
Mean	1.52	Made Entirely

Based on Table 1 shows that the implementation of RPP is at an average of 1.52. This indicates that all the components observed in the implementation of the PODE Model RPP are fully implemented. The results of observation of the implementation of RPP can be seen in Figure 4 as follows:

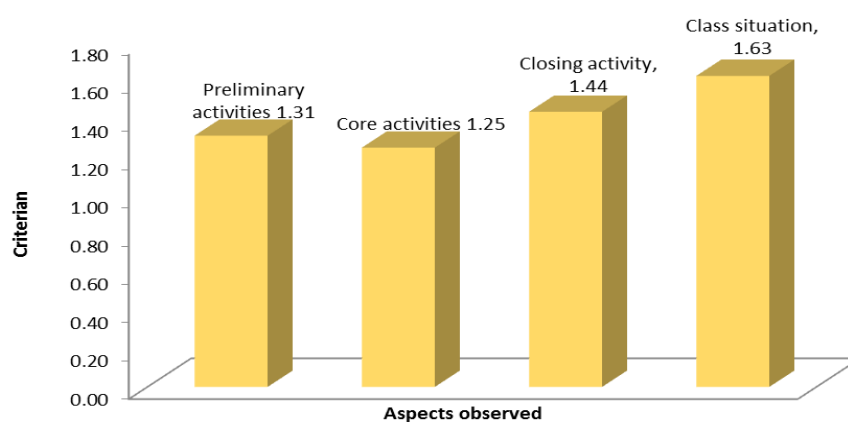


Figure 4 Implementation of RPP in SDN Featured of BTN Pemda

Table 2. Summary of Observation Results of RPP Implementation at SDN Mapala

Aspects observed	Mean	Category
Preliminary activities	1.31	Made Entirely
Core activities	1.25	Partially Conducted
Closing activity	1.44	Made Entirely
Class situation	1.63	Made Entirely
Mean	1.41	Made Entirely

Based on Table 2 shows that the implementation of RPP is at an average of 1.41. This indicates that all the components observed in the implementation of the PODE Model RPP are fully implemented. The results of observation of the implementation of RPP can be seen in Figure 4 as follows:

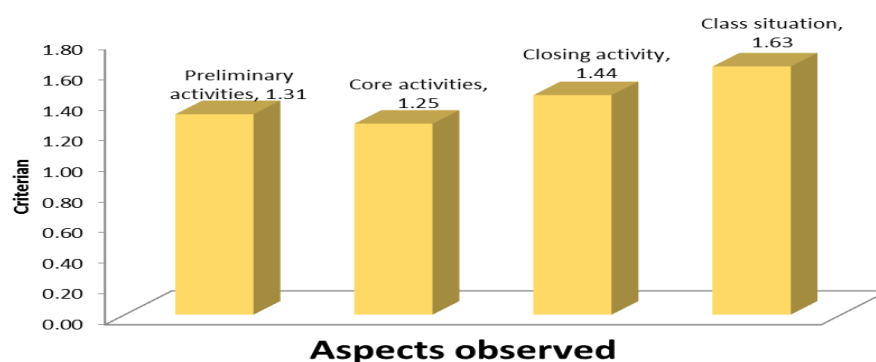


Figure 5 Implementation of RPP in SDN Mapala

Based on the results of the survey of the ability of elementary school teachers in Makassar in making learning tools (syllabus, RPP, LKS, and Test Results Learning). The range of ratings given is 1 to 4. Number 1 = Less, number 2 = Enough, number 3 = Good, and number 4 = Very Good. In view of the ability of teachers to make learning tools, based on the questionnaires syllabus made it include: 1) reviewing competency standards and basic competencies; 2) identify the subject matter / learning; 3) developing learning activities; 4) formulate indicators of achievement of competence; 5) determine the type of assessment; 6) determine the allocation of time; and 7) determine the source of learning, is at the average value of 3.35 is with good category.

The ability of teachers to make RPP, based on the questionnaire of the ability of teachers to make learning tools include: 1) write the identity of learning implementation plan which includes: a) education unit, b) subject, c) class / semester, and d) meeting; 2) write competency standards; 3) write down basic competencies; 4) develop indicators of achievement of competence; 5) formulate learning objectives; 6) determine the learning materials; 7) write down prerequisite materials; 8) determine the allocation of time; 8) determine the learning method to be used; 9) formulate learning activities; 10) make assessment of learning outcomes; and 6) determine the media / tools / materials / learning resources, is at the average value of 3.51 is with very good category.

The ability of teachers to make LKS, based on the questionnaires the ability of teachers to make learning tools include: 1) formulating basic competencies. To formulate basic competencies, we can do by lowering the formula directly from the applicable curriculum; 2) determine the assessment tool. Assessment we do to the work process and the work of learners; 3) compile the material. To compile the material of LKS, there are some important and important things to note, we need to know that the material of LKS is very depend on the basic competence to be achieved, the material of LKS can be supporting information, that is general description to be studied; 4) pay attention to LKS structure. The structure of the LKS consists of six components, namely title, instruction manual, competence to be achieved, supporting information, tasks, and assessment, are at the average value of 3.28 i.e. with good category.

The ability of teachers to make test results Learning, based on the questionnaires the ability of teachers to make learning tools include: 1) develop assessment tools in accordance with the purpose of learning to achieve certain competencies as written in the RPP; 2) carry out assessments with various techniques and types of assessments, in addition to formal assessments conducted by schools, and announce the results and their implications to learners about the level of understanding of learning materials that have been and will be studied. 3) analyze the assessment results to identify difficult basic topics / competencies so as to know the strengths and weaknesses of each learner for remedial and enrichment purposes; 4) leverage input from learners and reflect on it to improve future learning, and can prove it through notes, learning journals, instructional designs, additional materials, and so on; 5) use the results of the assessment as a material for the preparation of the lesson plans that will be done next, at the average value of 3.40 that is with very good category.

So, in general the ability of teachers in making learning tools (Syllabus, RPP, LKS, and Test Results Learning) although in the good category still needs to be improved. From the conversation with the teachers also revealed that during this time teachers rarely make learning devices themselves, but only using existing learning tools.

However, based on surveys and temporary observations found in the field today are still many of the teachers have not been able to perform their basic duties in accordance with established professional standards. And the low ability of teachers in conducting a quality teaching-learning process has a direct impact on the quality of students produced. Implementation of the process of teaching and learning activities that are not qualified by a teacher will not be possible to produce quality learning outcomes. There are still many teachers in schools today who do not yet have adequate skills to carry out their main tasks especially those related to teaching and learning activities in the classroom. Both are related to the ability of teachers in planning, implementing, assessing, and evaluating learning activities. Indication of the inability of teachers to carry out their professional duties can be seen from the many teaching devices owned by teachers is not the result of their work. Most teacher learning tools can be obtained from various ways such as through the internet, book publishers, or professional friends that allow them to get it. Not all teacher learning tools are appropriate to the situation and condition of the learners so that when they implement it, learning tools cannot bring the maximum impact on the success of learners in the learning process.

A good teacher is a teacher who has professional skills and also has excellent personal and social skills as well. As required in the National Education Standards (2005) requiring four competencies for a teacher, namely: (1) personality,

(2) professional, (3) education, and (4) social (Arikunto, 2006: 1). These four skills are measures of teacher productivity assessed by the principal, fellow teachers, learners, and parents of learners. If the teacher's performance is good, then the product that will be produced will also be good. Teacher work productivity, in fact is strongly influenced by the competence of teachers concerned.

Based on the description and discussion of the findings, it can be recommended that further training or workshop on learning device development should be conducted, so that this research has been held in the workshop of learning device making. This workshop activity of learning device development is aimed to improve the competence of elementary school teachers in Makassar. This activity is expected to meet the target of teachers able to make good and quality learning devices.

From the results of the workshop activities can be concluded that: 1) Teacher workshop participants can develop syllabus, RPP, LKS, and Test Results from SK, KD provided; 2) The results of the assessment of teacher-made learning tools and the results of the analysis of the questionnaire analysis show that the teachers' knowledge of the syllabus, RPP, LKS, and Tests of Learning results become better after the training is given.

Analysis of the learning outcomes of science study of grade V students in the SDI of BTN Local Government and SDN Mapala. Student learning outcomes SDI Unggulan BTN Pemda with 35 students for posttest average 83.04, mean 85.00 standard deviation 6.79. The result of SDN Mapala with 37 students for the average posttest of 75,98, mean 80,00 standard deviation 9,23. These results have become a reference that learning outcomes using PODE model devices can be done in primary schools.

Classroom learning process conducted by Predict, Observe, Discuss, and Explain (PODE) models will result in better learning outcomes than in classroom learning with lecture and question and answer methods. This is because in the classroom with PODE learning model, giving opportunity to students to be able to observe directly and real to the material being studied so that students can participate actively. In the journal entitled "The Grade 1 Student's Mental Model of Force and Motion Through Predict-Observe-Explain (POE)", concluded that POE learning strategy is a strategy that can provide new knowledge to students significantly and can increase student participation to be more active and creative so as to improve learning achievement significantly (Khathanvy, & Yuenyong 2009).

The advantages of this PODE learning model are: (1) active students in learning process, (2) students construct knowledge of existing phenomena, (3) stimulate learners to be more creative especially in proposing prediction, (4) generate good discussion between students with (5) explores the students' initial ideas, (6) arouses students' curiosity about a problem, (7) learning is real and can be done outside the classroom as in the laboratory, and (8) through direct observation students will have the opportunity to compare between theories (conjecture) with reality. While the weaknesses are: (1) learning requires a considerable time allocation, (2) the subject matter is sometimes difficult to be submitted completely.

5. CONCLUSION

Based on the results of research conducted

1. The ability of teachers in making learning tools in the form of Syllabus, RPP, LKS and test results of learning instruments are categorized good
2. Learning tools IPA developed based on PODE Model syntax that begins with debriefing through workshop activities of preparation of learning tools
3. The limited application of learning shows that the PODE model syntax is done entirely. Effectiveness, practicality and validity of the implementation have not been seen because this new research activity to see how the response of students and teachers in applying this model.

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