

Development Of Learning Based POGIL (Process Oriented Guided Inquiry Learning) Concept Control In Improving Student Senior High School 8 Mataram Acid Base Materials

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Abstract: *This study aims to develop devices based learning POGIL (Process Oriented Guided Inquiry Learning) are valid, practical and effective in improving student learning outcomes. Product trials conducted in two high schools in the city, namely SMAN 8 MataramMataram. Data validation of the learning device can be from four experts who get results that decent learning device is used, the data obtained from the assessment practicality practitioners from learners, the results obtained are practical to use. Effectiveness POGIL based learning device obtained an average of learners achieving grades 72.26 to 78.57% of students considered complete.*

Keywords: *DevelopmentOfLearning, Process Oriented Guided Inquiry Learning (POGIL), results of learners.*

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I. Introduction

The chemistry is the study of matter and its changes. Substances involved in a chemical change which elements and compounds. To determine the characteristics of an element and a compound can be ascertained from the chemical properties and physical. The chemical properties are properties that can be indicated through a chemical change while the physical properties are properties that can be observed without changing the composition of substance. Examples of color, melting point, boiling point, density and polarity (Chang, 2005).

The principles of curriculum development in 2013 is a competency-based curriculum that is characterized by the development of competence in the form of attitudes, knowledge, thinking skills, and psychomotor skills that are packed in various subjects (Curriculum Document 2013). The curriculum is a plan that provides guidance or handle in the process of teaching and learning activities (Nana S. Sukmadinata, 2009).

Teachers are required to formulate the learning device in accordance with the carrying capacity of the school and potential learners. Learning device is a means of teachers to prepare his way of teaching and learning activities. Good learning device is a learning tool that, if applied, is able to make learners active in learning activities and understand the material being taught.

One model of learning in accordance with the approach of the scientific or inquiry science in improving mastery of concepts learners are POGIL (Process Oriented Guided Inquiry Learning) who is learning developed by Moog and Hanson aims to help learners improve both the concept and process skills simultaneously (Hanson, 2006). Through POGIL students are able to develop their skills, higher level thinking and metacognition, communication, teamwork, management, and assessment and no longer rely on rote, but developing skills for success in learning (Widyaningsih, 2012).

Most of the material learned in school learning consists of concepts. The concept is very important in the learning process. Mastery of concepts by Dahar (2003), mastery of concepts as the ability of learners in understanding the scientific meaning of both theory and its application in everyday life. Additionally, Sumaya (2004) found: A person can be said to dominate the concept if people really understand the concepts learned so as to explain using their own words in accordance with their knowledge, but does not change the meaning in it.

Based on observations in schools obtain data that is: 1) the completeness of chemical components of the learning device prepared by chemistry teachers such as syllabi and lesson plans, not based on permendikbud 22 2016 about Standard Process Primary and Secondary Education, as an official reference in the preparation of the device. 2) to the control concept is still very poor learners, learners in mastering concepts mostly prefer to memorize without knowing the application of these concepts in everyday life.

Based on the results of interviews with the students obtained the data 1) the learning process in class, teacher of chemistry is to use the lecture method and more summarize the subject matter of textbooks that have

been provided by the school. 2) when their practicum more frequent lab or classroom demonstration performed by the teacher directly and learners just listening and recording tools and materials used.

Based on the problems mentioned above, it is necessary to research on the development of POGIL based learning tools to improve student learning outcomes.

II. Method

This research included in this type of research and development (Research and Development) is commonly abbreviated as R & D research and development (R & D) is a research method that is used to produce a specific product and test the effectiveness of these products (Sugiyono, 2011). The products developed are chemical-based learning tools POGIL. Learning tools developed include: syllabus, lesson plan (LESSON PLAN), and the Activity Sheet Students (STUDENT WORKSHEET). While the research instrument in the form of sheet validation learning tools that include: syllabi, lesson plans, STUDENT WORKSHEET validation sheet, sheet validation test learners 'mastery of concepts, questionnaire responses of teachers, learners' questionnaire responses, instrument about the mastery of the concept of learners.

The stages of software development models Thiagarajan, Semmel&Semmel (4-D) is modified into a three-phase (3-D) that define (definition), Design (design), and the Development (development). In this study, the aim is: (1) validation of the product, (2) test the practicality of the product (the learning device), (3) the effectiveness of the product to achieve goals. After the development of the device are arranged, then consulted with the supervisor and validated by the validator. The next stage researchers revised the software development (draft I) in accordance with the recommendation of the validator. Development of the device revised based on input from the validator further tested in class XI SMAN 8 Mataram IPA4 on as many as 28 students.

The next phase of the research, for data collection, done by given experimental treatment in which classes gain POGIL based learning using learning tools that have been valid. The collection of data about the practicality of the device used learners performed by filling a questionnaire after the course POGIL based learning. While data on the effectiveness of the instruments used in the evaluation of learners performed by administering achievement test.

III. Results And Discussion

POGIL device validation, conducted by the validation team of experts. The validation process involves skilled team of four experts who are considered as an education expert to review some aspects of clarity, in terms of language, clarity of the formulation of indicators, the suitability of learning steps and conformity with learning resources. Validity test results of the expert team of the syllabus obtained eligibility criteria reach an average score of 75.28% means that the value is already included in the criteria are eligible and the decision is the product ready for use in the field for the learning activity because it is in accordance with the objectives which, according Arikunto (2013) value of 75.28 % are in category feasible. In this lesson plan development, learning activities follow the syntax of project-based learning model. LESSON PLAN developed by researchers validated by 4 (four) experts and the results of validation that the average score is the percentage of 80.11% means that the value has been included in the criteria is very feasible based on the criteria in his Arikunto, (2013). The fourth STUDENT WORKSHEET has been validated by a team of experts and obtain the percentage 80.15%. The score indicates that STUDENT WORKSHEET have very valid and eligible for use in the learning process for the effective control of the concept of learners. The development of research instruments also aims to gather information about the progress of learners. Before the instrument developed by researchers is used, it must first be validated by an expert team of learning. The results validate the test questions used to look at the effectiveness of the learning device of the science process skills of students obtained percentage of 74.75%. This suggests that the problem is feasible to use in development research. The following data on the validity of the fourth value validator:

Table 1. Table validity based learning tools POGIL

NO	Rated aspect	Average	CRITERIA
1	SYLLABUS	75.28	WORTH
2	LESSON PLAN	80.11	VERY WORTH
3	STUDENT WORKSHEET	80.15	VERY WORTH
4	QUESTION	74.75	WORTH

Data learner response results obtained through the provision of learners completed questionnaires to the meeting. The data is used as reference to determine the practicality of learning tools are developed. Based on the analysis, the average score obtained from the response of the learner is 87.76% Very practical aspect of the response of learners consists of learning and understanding the material aspects of 87.13%, 88.37% STUDENT WORKSHEET presentation aspects, and aspects of the evaluation by 87.77%. This is because the new learning

models are known by students and has never been used by the teacher in the learning process before. Here is a table recapitulation learner response against the device POGIL

Table 2. Summary of Data Response Against Learners on Second Educational Tool POGIL

NO	SCHOOL	Rated aspect			Average	Category
		Learning and materials	STUDENT WORKSHEET	Evaluation		
1	Senior High School 8 Mataram	87.13%	88.37%	87.77%	87.76%	Very Practical

The average value of the classical achievements of learners in acid-base material is 73.26 to 75.57% of students considered complete. Effectiveness was measured by test learning completeness individually and classical, it demonstrates a real success POGIL based learning software development. This success is due to the development of tools successfully demonstrated the ability of learners mastery of concepts that work well and positively possessed learners also toward the positive direction, especially in the study of students.

IV. Conclusion

Based on data and analysis of the results of research that has been done on the learning device POGIL on acid-base chemistry learning materials based learning concluded that the device is valid and prakti POGIL to use, and effective in improving learning outcomes of students with the classical value of 75.57% of learners completed.

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