IMPLEMENTATION OF INQUIRY LEARNING MODEL WITH PROCESS ORIENTED GUIDED INQUIRY LEARNING (POGIL) STRATEGY TO REHEARSE STUDENTS PROCESS SKILL IN CHEMICAL BONDING MATTER

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Abstrak

Penelitian ini bertujuan untuk mengetahui keterlaksanaan pembelajaran dan peningkatan keterampilan proses siswa setelah penerapan model pembelajaran inkuiri dengan strategi POGIL pada materi pokok ikatan kimia. Jenis penelitian ini adalah deskriptif kuantitatif dan rancangan penelitian yang digunakan adalah *One-Group Pretest-Postest Design.* Sasaran penelitian ini adalah siswa kelas X SMA Negeri 1 Driyorejo. Instrumen yang digunakan adalah lembar observasi keterlaksanaan model pembelajaran inkuiri dengan strategi POGIL, dan lembar soal tes keterampilan proses. Hasil penelitian menunjukkan bahwa (1) Persentase rata-rata keterlaksanaan strategi POGIL pada pertemuan I sebesar 96,98% (sangat baik); pertemuan II sebesar 98,29 (sangat baik); pertemuan III sebesar 98,71% (sangat baik); (2) Keterampilan proses siswa mengalami ketuntasan klasikal untuk *pretest* sebesar 0% dan *postest* sebesar 94,6, peningkatan dinyatakan dengan nilai *N-Gain* sebesar 0,702 (Tinggi).
Kata kumci*: Strategi POGIL, Keterampilan Proses, Ikatan kimia*

Abstract

The aims of this research are to know feasibily of learning and improvement students process skillafterthe implementation ofinquiry learning modelwithPOGILstrategyin the subject matterof chemical bonds. The type of this research is descriptive quantitative and design of this research is One-Group Pretest-Postest Design. The subjects of this research is X grade students of Senior High School 1 Driyorejo. The instrument that used were observation sheet of inquiry model with POGIL strategy feasibility, and process skills test. The result of this research showed that (1) Average percentage of POGIL strategy feasibility at meeting I was 96,98% (excellent); at meeting II was 98,29% (excellent); at meeting III was 98,71% (excellent);(2) Students Process skill to experience classically completeness pretest 0% and postest 94,6%, an improvement in stated valueofN-Gain 0,702 (high)
Keyword*: POGIL Strategy, Process Skill, Chemical Bonding*

INTRODUCTION

Educationis one are a that is very important influencein a country. Educational failure implicated in the collapse of a nation, and vice versa educational success can also bring the success of a nation. Government efforts to improve the standard of education continued at the level. The imporvement was carried out in the areas of curriculum. The curriculum is a set of plans and arrangements regarding the

purpose, content, and teaching materials and methods used as guide lines for the organization of learning activities to achieve specific educational objectives[1].

The replacement of curriculum 2013 replacement unit Curriculum Education (KTSP) is renewal in education.Curriculum of 2013 aims use to prepare the Indonesian people to have the ability to live as individuals and citizens who believe, productive, creative, innovative, and affectiveand able to contribute to society, nation, state, and world civilization. The teacher's role is only as facilitator in the learning, capable of educating, guiding, directing, training, and evaluating the learning process.

Chemistryis a subject that is considered abstract and difficult for most students.Chemistry as process/methods of investigation (discovery/inquiry) include ways of thinking, attitudes, and steps of scientific activities to obtain chemical products, start from finding the problem, gathering the facts related to the problem, making assumptions, controlling variables, observating, taking measurements, inference, prediction, collecting and processing data ofobservation/measurement, and to summarize and communication [2].

Based on the results of pre-study questionnaire, conducted in Senior High School 1 Driyorejo gained as much as 80% of students find that chemistry is difficult. That is because the chemistry is considered new and the material being taughta bit confusing. The questionnaire results showed that 62.8% of learning in the classroom using a model of lectures, so that students do not contribute to the learning process, and students become

passive. As much as 55.65% student choice that process skill predict is never taught, so studentsa bit of trouble when asked to predict. As much as63% student choice the subject is difficult to prove a chemical bond in material class X odd semester.

Characteristic of chemical bonds materials in accordance with the basic competencies of knowledge(KD 3) are comparing the process of ionic and covalent bonding formation and covalent bonding with coordinate covalent bonds. As for the basic competency skills(KD 4) that is capable of processing and analyzing the comparis on process of the formation of ionic and covalent bonds, and covalent and coordinate covalent bonds. Based on the above exposure competence and material characteristics of chemical bonds that is most to understand the concept of writing and memorizing it needs a process skills that supportand help. One of the appropriate skills to supportand assist that process skills, because in the process skills applied an activity that leads students to observation, inferenstiation, prediction, classification, and communication.

Science process skills are defined as the adaptation of the skills used by scientists to construct knowledge, to think about the problem and make inferences [3]. Process skills are not always for learning activitie sthat do not use the experiments but could also for learning activities done by lab activities or experiments. *"The importance of teaching science process skills is to allow students to describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge and communicate their ideas to others"[4].* Process skills

make students learn more actively in building an explanation of the knowledge gained and then communicate the results of their knowledge. To achieve these objectives, the students are faced with a problem that they are sensitive to the problem [5]. Therefore, the need for a model of learning that can train the skills of the students so that students are able to solve problems.

It is one of the reasons that is necessary to apply science process skills to make students more active and creative. Various process skills, ie basic science process skills(basic skills), starting from observing, classifying, predicting, measuring, infering, and communication [6]. Integrated Skills science (integrated skills), from the identification of variables to the most complex, the experiment [7]. To support theskills of the students and the material being taught the need for an appropriate learning strategy, which is a POGILs trategy.

POGIL strategy is a series of learning activities that emphasizes the process of critical thinking and analysis to seek and find the problem in question. POGIL strategy is one of the lessons are designed to teach student show to examine problems or questions in the form of facts. "*In guided inquiry method, teachers and learners play a crucial role in asking questions, developing answers and structuring of materials and cases* [8]. It can make the learning process that was once often centered on the teacher (teachercenter) with POGIL strategies students can build their own knowledge. "*Guided inquiry activities help students to develop their individual responsibility, cognitive methods, report making,*

problem solving and understanding skills [8]. Phases in POGIL strategy are orientation, exploration, concept formations, application and closure [9]. With the POGIL strategy students aremore responsible for the knowledge they found, andare able tosolve the problems being faced.

Based on the above explanation above researcher intends to conduct research with the title "Implementation of Inquiry Learning Model with Process Oriented Guided Inquiry Learning (POGIL) Strategy to Rehearse Students Process Skill in Chemical Bonding Matter".

RESEARCH METHODS

The targets of this research is the students. Where samples were taken at random from the population of class X in Senior High School 1 Driyorejo. The design of this study is One Group Pretest-Posttest Design[10]. The design is as follows:

$$\boxed{O_1 \ X \ O_2}$$

Note :

O_1 : *Pretest*, to determine the skills of students before the process is applied POGIL strategy.

X : Treatment that the implementation of the learning process using POGIL strategy.

O_2 : *Postest*, to determine the skills of the students after application POGIL strategy.

Learning instrument used in this study are:(1) Syllabus; (2) RPP; (3) worksheet. The instrument used in this study include: (1) Observation Sheet

feasibility inquiry learning with POGIL Strategy; (2) Process Skills Test.

Data collection method sused in this study is the observation and test methods. Observation methods used to observe feasibility POGIL strategy during the learning process. The test method used to determine the extention of competence of the students' skills before and after the process of skills training in chemical bonding material. The test is given at the beginning (pretest) and final (post-test) learning.

This research was done in 3 meetings. The first meeting is used to process skills pretest and practice the skills of the students by using work sheets ionic bond. The second meeting is used to rehearse students to use the skills worksheets covalent bonds. The third meeting is used to rehearse students to use the skills worksheets coordinate covalent bonds and posttest student process skills.

Skills assessed the process of observing, inferentiation, prediction, classification, and communication. The data analysis techniques used are descriptive quantitative analysis.

RESULT AND DISCUSSION

The result of implementation of inquiry learning model with POGIL strategy to rehearse student process skill on chemical bond matter is:

Feasibility Inquiry Learning with POGIL Strategy

Implementation of feasibity inquiry learning with POGIL strategy observed by three observer.The following is a chart feasibility inquiry learning with POGIL strategy during three meetings:
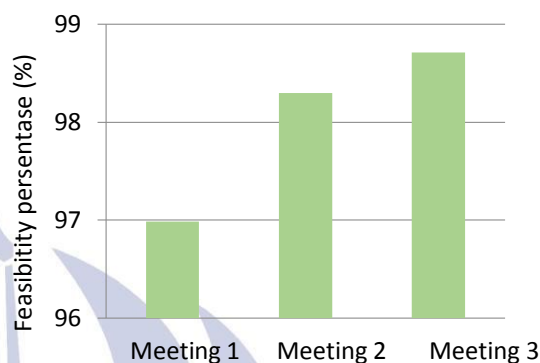
**Figure 1.Feasibility inquiry learning with POGIL Strategy**

Based on the Figure1, the feasibility inquiry learning with POGIL strategy has increased a teach meeting which are meeting I, II, and III. It can be shown by the average percentage of feasibility POGIL strategy at the first meeting is 96.98% with a very good criterion; second meeting is 98.29% with a very good category; and the third meeting is 98.71% with very well category. It shows that learning strategies to train POGIL process skill sstudents have done very well so feasibility POGIL said effective learning strategy.

Process Skills

Data obtained from the process skill test instruments. Tests performed twice,before learning pretest and posttest after learning. The test used is an essay test which provided images and phenomena then students are asked to observation, inferentiation, prediction, classification, and communication.

Process skills of observation, inferentiation, prediction, classification and communication. The communication process skills in writing in the form of giving conclusions regarding the material being taught.

The following is a chart the pretest and posttest:
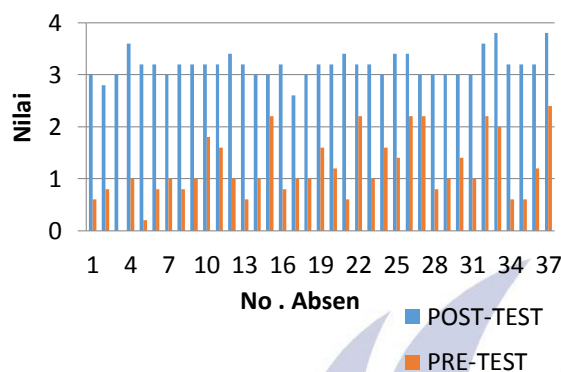
Figure 2. Process Skills Assessment

Based on the Figure 2, it can be seen that although there are some students who do not meet the expected value of process skills that ≥3,00 with good category, but it can be seen that all students undergo improvisation process skills. Students experience with classical completeness percentage of 0% for the pretest and posttest amounted is 94.6%. Improvement process skills is expressed by the N-Gain value. N-Gain value can be divided into categories, high, medium, and low. Classically improvement process skills of students meet high category with a score gain of 0,702. With an explanation of the 37 students there are 54.054% of students receive high category and there are 45.946% of students got the medium category.

Here'sa table of the average value of each component on the process skills pretest and posttest:

Table1. Value Process Skill Each Component

Process Skills Component	Average	
	Pre-Test	Post-Test
Observation	1	2,243
Inferencetion	1,081	2,541
Prediction	1,568	3,892
Classification	1,351	3,486
Communication	1	3,838

Based on the Table 1, Process skills for observation classical component at pretest is 1 and postest is 2,243. From these data it can be seen that for observation component in the classical incomplete, this is due to the students it is difficult to understand the pictures provided on the material the covalent coordination bond so that almost all answered one of the images that describe the covalent coordination bond, whereas in the learning process teacher already give guidance and rehearse students for materials and components. Process skill for inferensiation classical component at pretest is 1,081 and posttest is 2.541. From these data it can be seen that for components inferencetion in the classical incomplete, this is due to the student's difficult to explain from the observation images questioned previous explanation of the image covalent coordination bond whereas in the learning process of teachers already provide guidance and rehearse students for materials and components. Process skills for prediction in the classical component at pretest is 1,568 and postest is 3,892. Process skill for classification in the classical component at pretest is 1,351 and postest is 3,486. Process skills for communication in the classical component at pretest is 1 and postest is 3,838. It can be seen from the data for process skills prediction, classification and communication component in the classical experience of completeness, this is due to the learning process of the teachers have been trained students for these components, so that students are easy to understand. But overall skills of the students have increased in five

components. It shows that the process skills trained already performing well.

CLOSURE
Conclusion

Based on the analysis of research and discussion, it can be concluded that the feasibility POGIL strategy to train students in the skills of chemical bonding material done very well, it is proved by the average percentage in the first meeting of 96.98% with a very good category; second meeting at 98.29% with a very good category; and the third meeting of 98.71% with very good category. Student process skill to experience classically completeness pretest 0% and postest 94,6%, an improvement in stated value of N-Gain 0,702 with high category.

Suggestion

Based on the research that has been done researcher, researchers submit suggestions relating to the results of this research to other researchers are expected to train other process skills components to further support the skills of the students.

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