

IMPROVEMENT THINKING SKILLS AND SCIENTIFIC ATTITUDE USING THE IMPLEMENTATION OF “GROUP-INVESTIGATION COOPERATIVE LEARNING” CONTEXTUAL ORIENTED AT ACID, BASE AND SALT TOPIC IN JUNIOR HIGH SCHOOL .

Harun Nasrudin, Utiya Azizah

Chemistry Department Mathematics and Science Faculty
the State University of Surabaya
harunnasrudin@yahoo.com

Abstract

To increase the quality of thinking skills and scientific attitude in science, contextual oriented using “Group-Investigation Cooperative learning” was implemented. A classroom action research in three cycles has been done to know the improvement thinking skills and scientific attitude in science learning. Students who were studying science at Junior High School seventh Year Student. There are some important points can be drawn from the result of analysis: (1) Implementation of “group investigation Cooperative learning” contextual oriented in science, can be done by teacher well and relevant with model’s syntax was implemented are preparation, topic selection, cooperative planning, implementation, analysis and synthesis, presentation of final product, and evaluation by teaching material; (2) Implementation of “group investigation Cooperative learning” contextual oriented can improve students activeness in learning science. Teaching-learning process centered to students, as indicated by the improvement of students interactions and teacher’s-students interactions by teacher ask questions 12,8%, teacher responses 17,3%, discussion within students 9,1%, teacher’s-students discussion 10,9%, doing investigation (theory/observation/experiment) 13,5%, presentation of final product 12,6%, and volunteer (student express their opinion and responses) 12,9%; (3) Implementation of “group investigation Cooperative learning” contextual oriented can improve thinking skills and scientific attitude students in learning science, as indicated by the student’s achievement mastery for first cycle is 43,6%, the second cycle is 61,5%, and the third cycle is 74,4% and scientific attitude significant; (4) Most of students are willingly to joint to this teaching-learning activity, and the improvement of students cooperate in essential concepts finding so learning not boring. Students can be done analysis and evaluation investigation result with their ideas, observation environment theirself, make report investigation and presentation of final product.

Key words: thinking skills, scientific attitude, group investigation cooperative, contextual learning

Introduction

The quality of education in Indonesia is not encouraging. One indicator of the quality of teaching and learning is student achievement. Based on the result of national exam in junior high school at east java shows that 35.567 students are unsuccessful. In general, the percentage of successful student at east java only 93.34. The affect factors in unsuccessful student are English, science and mathematics lessons. Furthermore, the average yield national exam for junior high schools only 5.15. (Gardiner, 2005)

The minimum of mastery learning standard to science lesson in SMP 2 Taman Sidoarjo is 65 and the minimum of classical mastery learning is 85%. But, the survey results in SMP 2 Taman Sidoarjo shows that student achievement in science subjects acids, bases and salts are still less satisfactory. This can be seen from the results of student learning that is the average value of daily tests for the materials amounted to 60.11 and mastery learning classical students at 65.75%. This data is supported by the fact that most students said this material is the most difficult to learn, by reason of the material is abstract. This fact is also strengthened by the results of interviews with science teachers researcher who teaches chemistry, said that during the time in learning acids, bases and salts are given only by the method of discussion and recitation, there has never been a demonstration or experiment activities associated with everyday life. This impact is less active in student learning and result in low learning results.

Science is a knowledge that developed from observation and experimentation. Therefore, general science concepts more appropriate if taught with methods of observation and experimentation/demonstration, so that students can follow how the scientists work, do experiments to obtain conclusions that are then used to formulate scientific theories are valid for a period long. Therefore, an approach that allows students to find themselves or to establish concepts that are learned through everyday environment, prevent misconception, and provide an opportunity for students to apply concepts they have learned to new situations is a contextual approach (Contextual teaching and learning). Another factor are much examples of acids, bases and salt in daily life.

One type of cooperative learning-oriented contextual approach that is group investigation. According to Arends (1997), in the implementation of group investigation, the class divided into groups with 5-6 members of a heterogeneous student. Furthermore, students choose a topic of investigation (contextually), conducting in-depth investigations of selected topics, and presented the report inquiry to the entire classmates. To facilitate student inquiry, the design of inquiry set forth in the form of Student-worksheet Sheet.

Process skills and thinking skills are developed through the questions that provoke the development of these skills. Affective development of students, such as curious, cooperation, diligently, open, tolerance, discipline, responsibility was carried out by the experiment in groups. Process skill uses to develop student knowledge and ideas. In addition, to develop the thinking skill and scientific attitude, the students are investigated and transfer complex information by individualized or group. Because, Learning is much more than memory. For student to really understand and be able to play knowledge, they must work to solve problems, to discover thing for themselves, to wrestle with ideas “ (Slavin, 2000:224).

In this research, the learning model is implemented can improve thinking skills and scientific attitude is group investigation cooperative learning oriented contextual approach.

More fully, the learning steps of the group investigation cooperative learning should be applied contextually in this study are as follows:

1. **Preparation:** teachers prepare materials designed for learning in groups and in accordance with the contextual approach.
2. **Topic selection:** student chooses specific subtopic within a general problem area usually delineated by the teacher. Students then organize into two- to six-member task-oriented groups.
3. **Cooperative planning:** the teacher presents the material in accordance with the outline of what students will learn in a group. Furthermore, teachers and students plan specific learning procedures, tasks and goals consistent with the subtopics of the problem selected.
4. **Implementation:** Student carry out their plan formulated in step cooperative planning. Learning should involve a wide variety of activities and skills and should lead students to different kinds of sources both inside and outside the classroom. The teacher closely follows the progress of each group and offers assistance when needed. At this stage the students to use Student Worksheet Sheet.
5. **Analysis and synthesis:** Students analyze and evaluated information obtained and plans how it can be summarized in some interesting fashion for possible display or presentation to classmates.
6. **Presentation of final product:** Some or all groups in the class give an interesting presentation of the topics studied in order to get classmates involved in each other's work and to achieve a broad perspective on the topic.
7. **Evaluation:** In cases where groups pursued different aspects of the same topic, students and teacher evaluate each group's contribution to the work of the class as a whole. Evaluation can include either individual or group assessment, or both.

This research aims to: (1) describe the steps of the group investigation cooperative learning model oriented contextual approach in teaching (2) describe the activities of students and teachers in contextual teaching and learning process through a model of group investigation cooperative learning; (3) describe mastery of learning indicators after implementation group investigation cooperative learning model oriented contextual approach in teaching and (4) describe students' response to the process of learning that have been implemented.

Based on the data of student activity, mastery learning, and students' response to the process of learning can describe the students thinking skills and scientific attitude in group investigation cooperative learning model oriented contextual approach in teaching was implemented. This advantage article is support the knowledge about increase thinking skills and scientific attitude in learning process science to construct student character. Thinking skills in learning acids, bases and salts are doing investigation, analysis problem, compile the result of investigation, presenting the result of investigation, and discussion within student. The scientific attitude can improve such as curious, cooperation, diligently, open, tolerance, discipline, responsibility was carried out by the experiment in groups

Research Method

The subjects of this research were the students of class VII-B SMP 2 Taman Sidoarjo who are learning the subject matter of acids, bases and salts. Research design is action research classroom, which consists of three cycles, which is a meeting (face to face) of the subject acids, bases and salts. Each cycle contain the following three stages:

1. Action Planning Phase

Researchers develop teaching material and research instruments. The prototype teaching material consists of Lesson Plan, Student-Worksheet Sheet which contains the identity, matter introduction, and items test of both theoretical and applied, worksheets for laboratory activity includes the titles of experiment, outcomes activities, matter introduction, tools and materials, field observations, calculations, conclusions, discussion, observations, and literature. The research instrument composed of doing teaching by lesson plan observation sheet, the student and teacher activity in learning observation sheets, students' respons

2. Implementation and Observation Phase

The teacher presents information according to the scenario group investigation cooperative learning oriented contextual approach. During the learning steps, observation and evaluation of learning is done using the observation sheet. At this stage of the research instruments were also evaluated.

3. Evaluation and Reflection Phase

During the trial, evaluation of all activities in the learning process is done, which includes learning interaction patterns, classroom atmosphere, students' responses to teaching material used, legibility, attractiveness, depth of material, difficulties, obstacles, and student learning achievement. The instrument is also conducted for evaluation, so it can be used as measure of adequate. In reflection, we can obtain a picture of the results of the implementation of teaching material and instruments used.

Based on the results of observation and evaluation, the various limitations, obstacles and difficulties found during the implementation used as consideration to make improvements in a plan at the next cycle, both to repair the structure and implementation of the teaching material and research.

Results and Discussion

Learning process that implements the group investigation cooperative learning oriented contextual approach in teaching acids, bases and salts in SMP Negeri 2 Taman Sidoarjo, the main role of teachers as facilitators and teachers are not the only source of information. This is reflected in **Figure 1**, where only 17.4% the time used by teachers to present information with media. Details of these activities is to inform the indicators of the lesson, to give apperception, reveals the general problems and the topics selection, explain the important concepts of the lesson that supports the task in worksheet and waited for the preparation of students to work in cooperative groups.

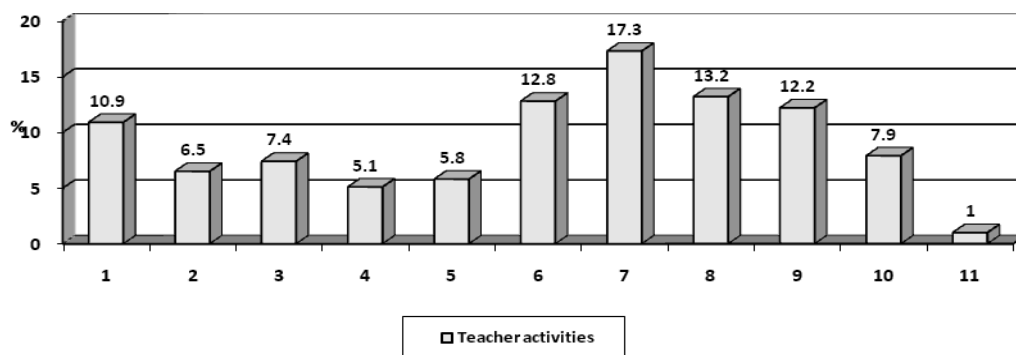


Figure 1.
The Mean of Percentage Teacher Activities in Three Cycles

Activities:

1. presenting information with oral
2. presenting information with media
3. motivating students
4. determining the general problems
5. organize students in cooperative groups
6. asking questions
7. responding the student questions/ideas
8. observing the student activities
9. guiding the student activities with *scaffolding*
10. guiding the preparing investigation reports by student
11. no categories above

In addition, most of the activities teachers used to motivate students, organize the students in cooperative groups, asking questions, responding the students questions/ideas, observing the student activities, guiding the student activities with scaffolding, and guiding the preparing investigation reports by student.

Teacher activities affect students' activity, where students not only listened silently teacher or a friend but an active student learning in the classroom. Based on the percentage of time in learning activities in **Figure 2**, there was a sharp increase in the percentage of students' learning activities (student centered) when compared between cycles, ie from 88.1% (first cycle) to 91.1% (second cycle) and 93, 2% (third cycle) and only 9.2% of the time used to listen to the explanation of teachers or friends.

If the student activity data for the first cycle, second cycle and third cycle are obtained in **Figure 2** are compared, students apparently used the time to do these activities has increased from 88% (first cycle) to 91.1% (second cycle) and 93, 2% (third cycle). Student activities that increase is doing the investigation, analyze and evaluate the results of the investigation. This shows that the implementation group investigation cooperative model oriented contextual approach in teaching acids, bases and salts in SMP Negeri 2 Taman Sidoarjo, have been able to improve thinking skills and scientific attitude through the process of investigation, analysis and evaluation of the results of the

investigation. So that the students have been able to act as little scientists. In addition, to present the report investigation (12,6%), discussion within students (9.1%), teacher's-students discussion (10.9%), and volunteer (student express their opinion and responses) (12.9%) can not be improved though, it is the dominant activity in learning.

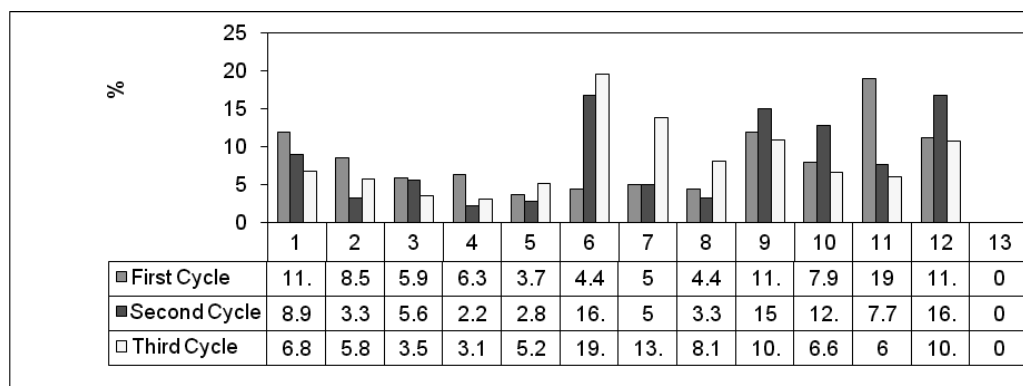


Figure 2.
The Percentage of Student Activities

Activities:

1. noting the explanation of teacher/students
2. reading (student book or worksheet)
3. writing relevant to the learning activities
4. selecting a task in accordance with general problems
5. planning the procedure solving task
6. doing investigation (theoretical/observation/experiment)
7. analyzing the result of investigation
8. preparing investigation reports
9. presenting the report of investigation
10. discussion within students
11. teacher's-students discussion
12. volunteer(student express their opinion and responses)
13. No categories above

Simak

Baca secara fonetik

The student activity in the learning process to support student success in achieving the intended learning indicators to measure the cognitive abilities of students, where the average value of students increased significantly from 60.1 (first cycle) to 65.1 (second cycle) and 74.4 (third cycle). This affects the student mastery learning, the previous student mastery learning 43.6% (first cycle) increased to 61.5% (second cycle) and 74.4% (third cycle) (**Figure 3**). The condition, also supported by students' response that the teacher has often provide feedback or clarification of the concept to students.

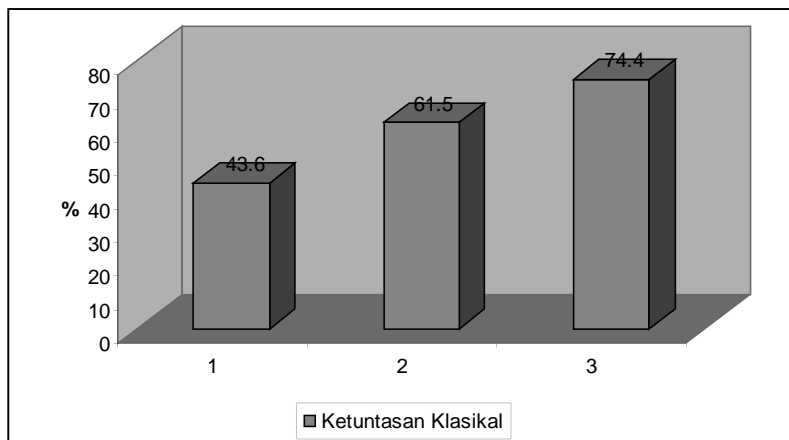


Figure 3.

The percentage of student mastery learning

Descriptions:

1. first cycle; 2. second cycle; 3. third cycle

In addition, the percentage of time used by students learning to do the activities supported by students' responses to learning activities (**Figure 4**) that the majority of students claimed to have conducted the investigation according to procedures, assist in understanding the concept of a group of friends (interacting with friends), expressed opinions, view according to the concept itself a natural event, compiling and presenting of the investigation report. From these results indicate that in the learning activities of most of the time have used students to do activities that support learning activities.

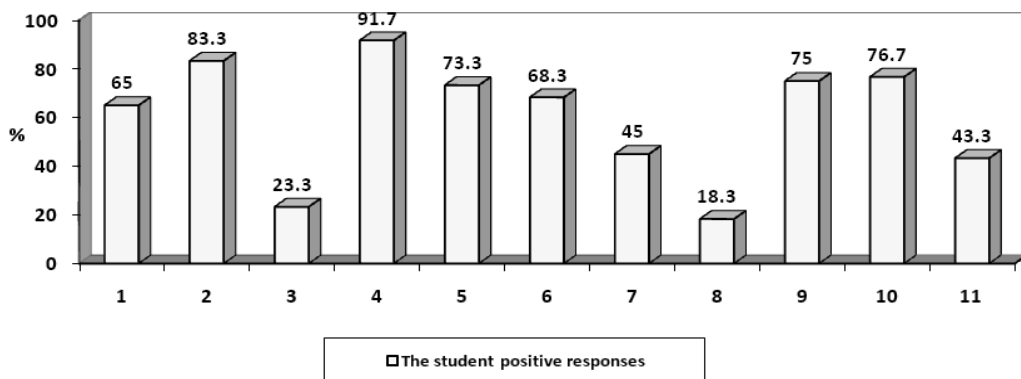


Figure 4.

The Student Positive Responses Siswa to the Learning Activities

Descriptions:

1. teacher use the media when presenting information;
2. teacher organize students in group;
3. choose their own tasks according to the general problem;

4. doing investigation according to the procedure;
5. helping a friend to understand the concept;
6. expressed opinions;
7. view according to the concept itself a natural event;
8. discussions with teacher about lesson;
9. teacher gives feedback;
10. compiled report of investigation;
11. present report of investigation.

Based on the questionnaire can be explained that the majority of students claimed to have conducted the investigation according to procedures, assist in understanding the concept of a group of friends, view according to the concept itself a natural event, compiling and presenting of the investigation report. This indicates that the students have learned based group investigation cooperative oriented contextual approach. This suggests that group investigation cooperative oriented contextual approach has been to enhance motivation to learn. According to Brophy (in Omord, 1995) students who are motivated studies tend to find meaningful activities for him. However there are still activities that are sometimes or rarely performed by the majority of students are selecting their own task in accordance with general issues, and discussions with teachers about the matter.

Students commented positively to learning is teaching how to implement the group investigation cooperative model oriented contextual approach to good and enjoy, and to increase cooperation among students in finding the essential concepts in lesson so that learning is not boring and challenging. In addition students can analyze and evaluate the results of investigations by their ideas. While the negative comments from some students are learning requires a long time, since it is generally scheduled lesson time the school for science-chemistry only one SKS, and learning takes 2 credits of each meeting.

Conclusion and Suggested

Based on the results obtained, conclusions can be formulated as follows. Implementation the group investigation cooperative model oriented contextual approach in the learning of acids, bases and salts:

1. Can be implemented by teachers well and relevant with model's syntax was implemented are preparation, topic selection, cooperative planning, implementation, analysis and synthesis, presentation of final product, and evaluation by teaching material.
2. Can improve student activeness in learning science. Teaching-learning process centered to students, as indicated by the improvement of students interactions and teacher's-students interactions by teacher ask questions 12.8%, teacher responses 17.3%, discussion within students 9.1%, teacher's-students discussion 10.9%, doing investigation (theory/observation/experiment) 13.5%, presentation of final product 12.6%, and volunteer (student express their opinion and responses) 12.9%. The student activities be describing of thinking skills contains investigation process, analysis and evaluation the result investigation.

3. Can improve thinking skills and scientific attitude students in learning science, as indicated by the student's achievement mastery for first cycle is 43,6%, the second cycle is 61,5%, and the third cycle is 74,4% and scientific attitude significant.
4. Most of students are willingly to joint to this teaching-learning activity, and the improvement of students cooperate in esential concepts finding so learning not boring. Students can be done analysis and evaluation investigation result with their ideas, observation environment theirself, make report investigation and presentation of final product.

Based on the conclusions above, it can be suggested: implementation the group investigation cooperative model oriented contextual approach should be followed up to be applied to other materials or other subjects to make students familiar with a constructive mindset, and should be considered a comfortable classroom atmosphere for learning in groups, including seating position, and time of learning so each student to discuss the activity is higher.

References

- Arends, Richard I., (1997). *Classroom Instruction and Management*. New York: Mc Graw-Hill Companies, Inc.
- Azizah, Utiya., (1998). *Pengembangan Pembelajaran Kooperatif Tipe STAD Untuk Meningkatkan Kualitas Pembelajaran Kimia*. (Tesis S-2). Surabaya: PPS IKIP Surabaya.
- Blanchard, Allan., (2001). *Contextual Teaching and Learning*. [Http://www.contextual.org/](http://www.contextual.org/)
- Bruning, Roger., et.al., (1995), *Cognitive Psychology and Instruction*. New Jersey: Prentice Hall.
- Departemen Pendidikan Nasional, (2006). *Standar Kompetensi Mata Pelajaran Sains SMP dan MTs*. Jakarta: Depdiknas.
- Departemen Pendidikan Nasional, (2002). *Manajemen Peningkatan Mutu Berbasis Sekolah: Pembelajaran dan Pengajaran Kontekstual*. Jakarta: Depdiknas.
- Dryden, Gordon dan Vos, Jeanette. (2000). *Revolusi Cara Belajar*. Bandung: Kaifa.
- Gardiner, Mayling Oey., (2005). *UN, Mengukur Mutu atau UUD?*. <http://www.kompas.com/Kompas-cetak.htm>. Kamis, 03 Februari 2005.
- Muhaimin, Yahya, (2001). "Sambutan Menteri Pendidikan Nasional" dalam Fasli Jalal dan Dedi Supriadi (Eds). *Reformasi Pendidikan dalam Konteks Otonomi Daerah*. Yogyakarta: Adi Cita Karya Nusa.
- Mujiran, Paulus, (2005). *Utilitarianisme dalam Ujian Nasional*. Suara Karya online 14 Juli 2005, diakses 12 Juni 2006.
- Nasrudin, Harun dan Azizah, Utiya, (2006). Implementasi Pendekatan Kontekstual Melalui Model Investigasi Kelompok Kooperatif dalam Pembelajaran Redoks dan Elektrokimia. *Widya Cendika Jurnal Penelitian Pendidikan*. Lembaga Penelitian Universitas Negeri Surabaya dan Asosiasi Peneliti Pendidikan Indonesia (APPI). ISSN: 1978-1024. Vol.1 No.1 hal 1 – 58, Surabaya Desember 2006.
- Nur, Mohamad, (2001a). *Pengajaran dan Pembelajaran Kontekstual*. Makalah yang disampaikan pada Pelatihan TOT Guru Mata pelajaran SLTP dan MTs dari enam

Propinsi pada tanggal 20 Juni s.d. 6 Juli 2001 di Pusat Pendidikan dan Pelatihan Wilayah IV Surabaya.

Nur, Mohammad, (2001b) .“Pandangan Pembelajaran dan Pembelajaran Konstruktivis” Makalah dalam Pembekalan Materi Baru Dosen PPL 1 Universitas Negeri Surabaya tanggal 28 Pebruari 2001.

Slavin, Robert E, (2000). *Educational Psychology: Theory and Practice*. Fourth Edition. Massachusetts: Allyn and Bacon Publishers.

Suparno, Paul. (1997). *Filsafat Konstruktivisme dalam Pendidikan*. Yogyakarta: Kanisius.

Suprodjo, Pusposutarjo, (2000), *Kebijakan Pengembangan Pendidikan MIPA*. Jakarta: UNJ.

Tsoi, Mun Fie, et.al., (2004). “Using Group Investigation for Chemistry in Teacher Education”. *Journal of Asia-Pasific Forum on Science Learning and Teaching*. Volume 5, Issue 1, article 6 (April 2004).

University of Washington Colege of Education, (2001). *Training for Indonesian Educational In Contextual Teaching and Learning*. Seatle, Washington, USA.