

## IMPLEMENTATION OF CONTEXTUAL TEACHING AND LEARNING APPROACH TO IMPROVE STUDENT CRITICAL THINKING SKILLS ON SALT HYDROLYSIS MATERIALS IN CLASS XI MIA SMAN 18 SURABAYA

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### Abstrak

Penelitian ini bertujuan untuk mengetahui keterlaksanaan, aktivitas siswa, dan keterampilan berpikir kritis siswa setelah dilaksanakan pendekatan CTL pada materi hidrolisis garam, ada tidaknya peningkatan setelah diterapkannya pendekatan CTL ini. Jenis penelitian ini merupakan penelitian deskriptif kuantitatif, dengan tujuan mendeskripsikan secara sistematis, faktual, dan akurat terhadap keterampilan berpikir kritis siswa dilihat dari tes keterampilan berpikir kritis siswa pada materi pokok hidrolisis garam dengan pendekatan CTL. Sasaran penelitian ini adalah siswa kelas XI MIA di SMAN 18 Surabaya dengan rancangan penelitian *one group pretest-posttest design*. instrumen penelitian yang digunakan adalah lembar pengamatan keterlaksanaan pendekatan CTL; lembar pengamatan aktivitas siswa; dan lembar tes keterampilan berpikir kritis. Berdasarkan hasil penelitian dan pembahasan, maka (1) Keterlaksanaan pendekatan CTL untuk melatih keterampilan berpikir kritis siswa mendapatkan nilai Kemampuan Mengelola Pembelajaran (KMP) rata-rata pada pertemuan I, II, dan III adalah sebesar 3,5; 3,7; dan 3,8; ketiga nilai KMP ini termasuk dalam kriteria sangat baik. (2) Berdasarkan hasil persentase aktivitas siswa selama 60 menit kegiatan berlangsung, secara keseluruhan aktivitas siswa sudah baik, dan mendukung pendekatan CTL untuk melatih keterampilan berpikir kritis baik pada pertemuan I, II, dan III. (3) Melalui pendekatan CTL keterampilan berpikir kritis siswa dapat dilatihkan dengan adanya peningkatan nilai pretest dan posttest dengan nilai <g> sebesar 0,86 dengan kategori tinggi.

**Kata Kunci:** Pendekatan CTL, Keterampilan Berpikir Kritis, Hidrolisis Garam

### Abstract

This study aims to determine the feasibility, student activities, and critical thinking skills of students after CTL approach implemented in salt hydrolysis material, whether there is an increase after the implementation of this CTL approach. This type of research is a quantitative descriptive research, with the aim of describing systematically, factual, and accurate to the critical thinking skills of students seen from test students' critical thinking skills in the subject matter of salt hydrolysis with CTL approach. The target of this research is a class XI student MIA at SMAN 18 Surabaya with research design *one group pretest-posttest design*. instruments used in this research is the observation sheet feasibility CTL approach; observation of student activity sheet; and critical thinking skills test sheet. Based on the results of research and discussion, then (1) Feasibility of CTL approach to enhance critical thinking skills students gain value Managing Learning Ability (KMP) on average at a meeting I, II, and III are at 3.5; 3.7; and 3.8; KMP's third value included in the criteria very well. (2) Based on the percentage of student activity during the 90 minutes of activity takes place, overall activity has been good students, and support CTL approach to enhance critical thinking skills either at a meeting I, II, and III. (3) Through the CTL approach students' critical thinking skills can be trained by an increase in the value of pretest and posttest with a score of <g> of 0.9 to a high category.

**Keywords:** CTL approach, Critical Thinking Skills, Hydrolysis of Salts

## INTRODUCTION

One goal in high school chemistry course is to enable students to understand the concepts, principles, laws, and theories of chemistry and connection with its application to solve problems in everyday life and technology [1]. Based on these objectives, it can be seen that the understanding of important concepts to be developed in students. But to understand the concept alone is not enough, students should be able to associate with the concept that there is everyday life.

To be well-educated people in the future have the skills, as stated earlier, the necessary education system oriented problem solving, critical thinking skills, creative, systematic and logical [2]. Competency standards have the aim that students have the skills set and follow an effective and creative in the realm of the abstract and concrete as the development of the school independently studied[3].

However, based on the results of pre-experiment held on December 1, 2014 at SMAN 18 Surabaya, which has five classes XI MIA 2014/2015 school year by taking a sample of 10 students per class taken at random. The results obtained are for class XI MIA 1 the average value of their critical thinking skills is 1.92; whereas for class XI MIA 2 is 2.04; MIA eleventh grade 3 is 2.12; Class XI MIA 4 2.08; and XI MIA 5 1.48.

Critical thinking skills students are still unresolved, especially in class XI MIA 5, where the critical thinking skills of students is lower than other classes. It is necessary to use the pattern of further treatment to enhance critical thinking skills of students in the class.

Learning approach has contributed in creating the conditions for students, whether they have the critical thinking skills and be independent or only have a very good memorization skills. Application of learning approach undertaken by teachers has been less

provide opportunities for students to be able to understand the material. The students were able to memorize well, able to answer the exam questions well, but is not able to apply the material well.

Many approaches can be done by teachers so that students can use critical thinking skills and can describe the abstract material in real life. One approach that can help to think critically is CTL approach. CTL approach give meaning to student learning that provides greater opportunities to optimize critical thinking skills. CTL-oriented approach to learning is a teaching strategy that emphasizes the involvement of students in the full process to be able to locate the material studied and relate it to real life situations that encourage students to be able to apply it in their lives [4].

CTL approach involves the seven components that must exist in the learning process. Seventh CTL learning component is: (1) Constructivism;(2) Questioning;(3) Inquiry;(4) Learning Community;(5) Modeling;(6) Authentic Assessment; and (7) Reflection[4].

Through the process of knowledge construction is made possible in the minds of students critical thinking skills, example by comparing the concepts that have been obtained with a new concept that is learned. Upon inquiring, students will be grown curiosity. It aims to (1) stimulate students' thinking skills; (2) Assist the student in the learning process; (3) Directing students at the level of interaction of independent learning; (4) Increase the higher level thinking skills; and (5) Assist students in achieving its objectives and competencies [5].

In learning to be asked questions of quality. Quality question does not have a specific answer, it means there is no right or wrong answer or not there is only one correct answer, so students are required to find an answer that makes them much thought. Familiarize them in culture asked will help in the process of critical thinking. Through discovery,

community learning, modeling and authentic assessment, students will make observations, by observing the means improving critical thinking skills. Then through reflection helps them to think back to back what benefit they get after learning. It allows them to think critically. By using CTL approach can improve students' critical thinking skills of lower category into the category of being [6]. This is supported by critical thinking skills by using the worksheets that use contextual approach obtained that 53.33% of students have an excellent critical thinking skills and 46.67% of students have a good critical thinking skills. The results showed that students' critical thinking skills can be explored through the study of CTL. Application of CTL learning can help students engage in the process of thinking, sharing among friends, ask, observe, discover, reflect, and construct knowledge [7].

Salt hydrolysis is part of chemistry that studies on the decomposition of the salt in the water. The material in it is a matter of learning in the abstract that it does not just convey the concept of course, but more than that the teacher should be able to change from something abstract to be more concrete so easily understood by students. The need to change the material of salt hydrolysis of something abstract into concrete, it takes a study aimed at students in order to gain direct experience as through experiments. It also required a learning process which allows students to be able to construct their own knowledge so that the information which a student can be a significant knowledge and can meet the standard of competence specified.

Based on the background of the problems outlined above, it can be identified problems: (1) How enforceability of CTL approach to the subject matter of the hydrolysis of the salt?(2) How is the activity of the students with the application of CTL approach to the subject matter of the

hydrolysis of the salt? (3) How is critical thinking skills of students after CTL approach implemented in the subject matter hydrolysis of salt?

## METHODS

This type of research is a quantitative descriptive research, with the aim of describing systematically, factual, and accurate to the critical thinking skills of students seen from test students' critical thinking skills in the subject matter of salt hydrolysis with CTL approach. The target of this research is a class XI student MIA with the study design *one group pretest-posttest design*:

<i>Pretest</i> O <sub>1</sub>	<i>Treatment</i> X	<i>Posttest</i> O <sub>2</sub>
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Specification:

O<sub>1</sub> = initial value of critical thinking skills (pretest)

O<sub>2</sub> = final value of critical thinking skills (posttest)

X = treatment by applying the approach in the form of feasibility study CTL CTL, student activities, and critical thinking skills of students [8]

In learning activities, students are divided into small groups of 4-5 people each group contains. Selection is done by heterogeneous groups based on gender, student background, and ability of student learning outcomes.

In accordance with the purpose of learning, the instruments used in this research are: (1) The feasibility observations CTL approach; (2) The observation of student activities; (3) The test of critical thinking skills.

Data collection methods used in this research is the method of observation and tests. Observations were made during the learning process takes place while the tests are given in the form of multiple choice questions about and worked as many as 15 individuals during the learning ends.

Feasibility analysis techniques for learning observed by 3 observers using a score criteria teacher's ability to manage learning as the following table:

Table 1. Criteria Score Master Capability

Score	Criteria
3.1 to 4	Very Good
2.1 to 3	Good
1.1 to 2	Enough
0.5 to 1	Bad
0	Not implemented

[9]

To determine the learning activities of students during the learning process using CTL approach, students' learning activities observed by 3 observers during the learning process takes place. The calculation of the percentage of time each student learning activities in every aspect is done in the following way:

$$\% \text{ time student activities} = \frac{\text{time to do some activities}}{\text{total time}} \times 100\%$$

Assessment of students' critical thinking skills based on the workmanship issues critical thinking skills given to the students. Calculating scores on students' critical thinking skills using the following formula:

$$\text{score} = \frac{\text{student score}}{\text{total score}} \times 4$$

Differences in students' critical thinking skills before (*pretest*) and after (*posttest*) applied CTL approach analyzed by calculating the difference between the average value of the posttest and pretest (*n-gain score*), which is calculated by the formula:

$$\langle g \rangle = \frac{\% \langle G \rangle}{\% \langle G \text{ maks} \rangle} = \frac{(\% \langle Sf \rangle - \% \langle Si \rangle)}{100\% - \% \langle Si \rangle}$$

[11]

Specification:

$\langle G \rangle$  = n-gain score

$\langle Sf \rangle$  = average value posttest

$\langle Si \rangle$  = the value of the average pretest

In this research, CTL approach is effective if the criteria values increase students' critical thinking skills were measured using *n-gain score* is more than equal to 0.3.

## RESULTS AND DISCUSSION

This chapter will describe the results of research and discussion obtained for carrying out research in SMAN 18 Surabaya. Learning tools and instruments of this study first examined and validated by professors of chemistry and chemistry teacher.

This research was conducted in class XI MIA 5, the selection of this class occurs after execution of pre-generated research that the value of critical thinking skills in this class is in the lowest position. Class XI MIA 5 itself in one class consists of 29 students. At each meeting of the observer observing feasibility CTL approach and activities of students with CTL approach to the material salt hydrolysis. Prior to the learning activities using CTL approach, first implemented students' critical thinking skills pretest and posttest done after learning activities ended.

### Feasibility CTL approach

Enforceability of CTL approach has been good when viewed from the value obtained KMP teacher at the first meeting to the third meeting. The third meeting in the category very well. Teachers also have done components CTL well. Enforceability of CTL approach is also supported by the observation data of student activity at a meeting I, II, and III. Moreover, as a whole based on the percentage of student activity during the 60 minutes of activity takes place, either at a meeting of the I, II, and III show that the activities of student support components that exist in the CTL approach to enhance critical thinking

skills. Comparison of CTL feasibility of each component at each meeting as a whole can be seen in the following figure:

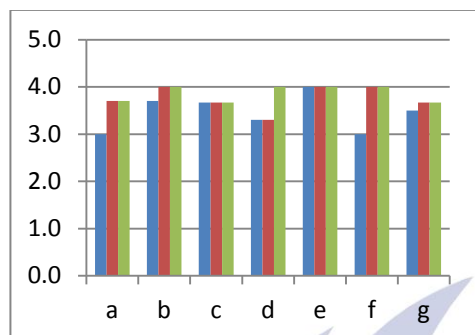


Figure 1. Comparison of CTL components feasibility

Specification:

- a: *Questioning*
- b: *Constructivism*
- c: *Learning Community*
- d: *Modeling*
- e: *Inquiry*
- f: *Authentic Assessment*
- g: *Reflection*

#### Student Activities

Here will be presented graph the percentage of student activity during the application of the approach to the material CTL salt hydrolysis at a meeting I, II, and III.



Figure 2. Graph Percentage of Student Activities

Specification:

- A: *Constructivism*
- B: *Questioning*
- C: *Learning Community*

- D: *Modeling*
- E: *Inquiry*
- F: *Reflection*
- G: *Irrelevant activities*

Student activity has an important role in the implementation of CTL approach for students in classroom activities show students also undertake learning approach. Based on Figure 4.6 we know that one of the dominant activity is the activity of learning communities that have a percentage of 17.59%; 22.41%; 18.28% of the meeting of the I, II, and III. In the students' learning community activities interact with each other to gain knowledge.

Another activity that is dominant inquiry activities that have a percentage 18.28%; 20%; 23.10% of the meeting of the I, II, and III. Activities inquiry involves students to learn to understand the events that surround the environment by observing and analyzing the data from observation, this is in accordance with the theory of cognitive psychology that explains that the learning process for understanding individual happened to environment [4].

The next activity is the activity of constructivism, obtained a percentage of 17.59%; 11.72%; 12.59% of the meeting of the I, II, and III. Constructivism activity involves students to relate the material to be learned by the student's own experience, this is in accordance with the theory of constructivism by Jean Piaget that suggests that learning involves the construction of one's knowledge of his own experience by itself [11]. The next activity is the activity of modeling that has a percentage of 10%; 16.55%, 10.86% at the meeting of the I, II, and III.

Modeling activities performed by students in the form of impersonation of teachers in solving problems and impersonation in using the tools that will be used in the lab. The next activity is to ask who has a percentage of 8.28%; 10.52%; 9.83% at the meeting of the I, II, and III. Asked a very important activity in CTL approach because by

asking the students will practice the skills of thinking.

The next activity is authentic assessment that has percentage of 5.69%; 5%; 5% at the meeting of the I, II and III. Authentic assessment activities undertaken by the students that the activity of self-assessments (self-assessment). Last activity is activity has reflection percentage of 9.14%; 5.17%; 9.14% at the meeting of the I, II, and III.

Percentage of time for activities that are not relevant for the learning process is greater than the activity of asking. This is due to the activity of asking only a few students who do so gets on average a small percentage of the time.

#### **Students Critical Thinking Skills**

To determine the critical thinking skills of students who have been trained CTL approach, performed the method pretest and posttest. Students' critical thinking skills measured by tests which include critical thinking questions. Before applied CTL approach, conducted a pretest to determine the extent of students' critical thinking skills. Furthermore, after application of the approach implemented posttest CTL. Furthermore, the results of pretest and posttest scores calculated using  $\langle g \rangle$  so you will know how much difference the critical thinking skills of students before and after the application of the CTL approach implementation.

Such differences can be analyzed using gain scores  $\langle g \rangle$ . Based on calculations, the value of  $\langle g \rangle$  is 0.9 to a high category, it can be said that the CTL approach students' critical thinking skills can be trained. Increased critical thinking skills is also supported by the data feasibility CTL approach with very good at meeting the category I, II, and III. It is also supported by the data of student activity during the process of applying CTL approach performed; in the student activities are activities that demonstrate critical thinking skills.

## **CLOSING**

### **Conclusion**

Based on the results of research and discussion that has been described previously, it can be concluded that:

1. Enforceability of CTL approach to enhance critical thinking skills students gain value Managing Learning Ability (KMP) on average at a meeting I, II, and III are at 3.5; 3.7; and 3.8; KMP's third value included in the criteria very well.
2. Based on the results of the percentage of student activity during the 60 minutes of activity takes place, overall activity has been good students, and support CTL approach to enhance critical thinking skills either at a meeting I, II, and III.
3. CTL approach students' critical thinking skills can be trained by an increase in the value of pretest and posttest with a score of  $\langle g \rangle$  is 0,9 with high category.

### **Suggestion**

Based on the research results, there are some suggestions that should be considered by teachers in implementing CTL approach to enhance critical thinking skills of students, among others:

1. Good classroom management must be considered, because the CTL approach makes students as a subject of study. This can affect the activity of the students, so that the need for classroom management is indispensable as a teacher's ability to control the activity of the students.
2. Test students' critical thinking skills should be given at the end of each lesson so that the increase in critical thinking skills possessed by students can be made at each meeting.

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