Analysis of Attitude Towards Chemistry Profile of Students in Senior High School

Teguh Wibowo¹, Ariyatun²

¹Departement of Chemistry Education Science and Technology Faculty, Universitas Islam Negeri Walisongo, Indonesia
²Chemistry Education Programs, Postgraduate School, State University of Semarang, Indonesia

Email: teguhwibowo@walisongo.ac.id¹ (Corresponding author’s), ariarikza@gmail.com²

Abstract. The attitude towards chemistry is one of the factors that influence student achievement as well as to produce scientists who are able to think scientifically. Subjects in this study are all senior high school science students Pondok Modern Selamat Kendal totaling 125 students. This research method is descriptive qualitative with the aim to describe the profile of students attitudes toward learning science in chemistry. Learners questionnaire data analysis using a likert scale is done by three stages: determine a percentage score for each item statement, calculate the value of student attitudes, and determine the criteria for student’s attitudes toward science. The results mean score of attitude towards chemistry assessment conducted during the learning takes place that covers chemical aspects, namely; the difficulty of chemistry at 15.32 (unfavorable category), the interest of chemistry at 22.99 (unfavorable category), the usefulness of chemistry for student’s future career at 9.93 (unfavorable category), and the importance of chemistry for student’s life at 30.86 in the quite good category.

Keyword: attitude towards chemistry, chemistry learning, student profile

1. Introduction

Science literacy is the knowledge needed to understand the science issues, risks and benefits of science, as well as to understand the nature of science, including its relationship to culture [1]. Scientific literacy can be defined as the ability to use scientific knowledge in problem solving, the ability to think critically about science and scientific expertise to handle [2]. The ability of scientific literacy is very important to master each individual for the development of science and technology more rapidly and thus require the capability of very high scientific literacy [3]. The ability to use one's scientific literacy to understand the environmental and social problems faced by modern society which is highly dependent on developments in science and technology [4]. Someone who has the ability to apply the concept of scientific literacy in interaction with environmental science and use science process to solve problems and make decisions in everyday life based on scientific evidence [5].

Problems in education facing our nation today include the low quality of education, especially science literacy issues that require attention and resolution to be immediately addressed. Based on the evaluation of international institutions Cooperation Organization for Economic Cooperation and
Development (OECD) through the Program for International Student Assessment (PISA) 2018, science literacy skills Indonesia still lower that in order to 74 from 79 countries [6]. According to Kurnia, et al., the low capacity of scientific literacy is influenced by several factors, among which the educational curriculum, methods and models of learning, school facilities and infrastructure. Factors interests, motivations, attitudes, beliefs, and self-confidence of students influence on science and technology, as well as affective components also play an important role in decision-making students in acquiring such knowledge [7]. Efforts to improve science teaching in schools needs to be gradual, continuous and purposeful and improvement of the quality of teaching in schools need to be supported by the information on the achievements of science literacy learners in terms of its aspects and tailored to national educational goals [8].

Attitudes towards learning science in chemistry plays an important role on the interest and the response of students to science and technology. Interest as well as the students' responses affect a student's academic success. Science education needs to cultivate an attitude toward science so that students are able to socialize and understand the conditions around the right, rational and scientific. Chemistry learning in school often creates the impression of lack of interest to students, as some students menanggap that chemistry is a difficult subject and abstract, the presentation of the teacher in the classroom is more focused on the achievement of the curriculum so that the classroom atmosphere becomes excited, so students only mastered the subject material in a short period of time without being able to link the knowledge they gain in the classroom to the realities around them [9]. The success of a student science learning achievement is influenced by many factors. One factor expected to influence the internal, it is an attitude of students to object-related science lessons [10].

Those problems must necessarily be resolved in view of the curriculum in Indonesia calls for the development potential of learners in terms of the ability to think reflectively to the resolution of a problem in society [11]. Chemistry as one of the groups have komponene science essentially as a process, product, and attitude. Chemistry is not just a collection of knowledge mastery of facts, concepts or principles, but in it there is a dimension of attitudes that need attention in chemistry learning. According to [12], Dimensions useful attitude to improve the quality of learning chemistry. Components attitudes have a huge influence in the learning of science, because it can affect the considerations in the selection of actions to be taken by students [13]. As for the attitudes towards science as an essential element to a student who berliterasi science as behavioral scientists [14].

One aspect of science literacy is the attitude towards science. The attitude towards science is one important factor in generating a scientist who is able to think scientifically. A positive attitude towards science berpengarauh on student achievement [15]. In addition to relate to academic achievement associated with attitudes toward science teaching methods, the condition of the school, the curriculum, the educational background of parents as well as the different cultures [1].

Attitudes towards science are very important in determining the success and meaningfulness of one's students in learning science. Students who act negatively toward science, for example, is not interested, fear, hate might cause them to fail in studying science completely. The study of attitudes towards science and mastery of science concepts is necessary to be able to introduce the exact factors that influence the level of mastery, understanding and science achievement. Therefore, a teacher must know and evaluate how students' attitudes to science in the process of pembelajarananagar able to process them to determine the interests of science and deeper trends in the field of science, positive, responsible, thoughtful and science literacy and technology [16]. With the hope of improving the quality of education in science and technology in meeting the state tujuna in realizing prosperity of the country in the era of disruption.

Given the importance of a positive attitude towards the learning of science in chemistry, it appears the problems in our education is how to profile attitude toward science possessed by students in science learning or gaining science lessons. Thus the required measurement student attitudes towards science after learning given to know the students' science literacy skills, especially in terms of attitudes toward science.
2. Methodology
This research method is descriptive qualitative with the aim to describe the profile of students' attitudes toward learning science in chemistry. Subjects in this study were all high school students Pondok Modern Selamat Kendal science class in the first semester of the academic year 2018/2019, amounting to 125 students. Consisting of 45 male students and 80 female students. The data collected in this study are primary data. The primary data is taken from the value of the questionnaire attitudes towards science students. The instruments used to collect data to describe the profile of students' attitudes toward chemistry is a form of self-assessment questionnaire adapted from a questionnaire study of Sumarni, et al [15]. Analysis of attitudes towards science using a likert scale with five scales are strongly agreed (SS), agree (S), neutral (N), disagree (TS), and strongly disagree (STS). Ease of use Likert cause of this scale is more widely used by researchers [17]. Data were analyzed using qualitative descriptive analysis in describing the actual condition of high school student attitude towards science Pondok Modern Selamat Kendal after learning chemistry. Rate attitudes toward science conducted during chemistry learning takes place, includes several indicators, namely the difficulty of chemistry, the interest of chemistry, the usefulness of chemistry for students' future career, and the importance of chemistry for students' life.

Questionnaire attitudes towards science in the study contains 43 items statement of 25 grains statement consists of positive (+) and 18 point statement negative (-). 1-5 grading scale used. The data analysis was conducted by questionnaire learners with three stages: determine a percentage score for each item statement, calculate the value of student attitudes, and determine the criteria for students' attitudes toward science. To determine students' attitudes towards science each aspect is calculated by determining the total score of each learner for each aspect, then the results obtained that interpreted in attitudes towards science criteria. Attitudes towards science are categorized by criteria very good, good, good and less good enough [11].

3. Result and Discussion
In the study Suratno expressed attitudes can be attributed to the tendency of students to like or dislike of the components of learning such as teachers, and the subject matter [11]. According to Fibonacci & Sudarmin in his research states that learning presents a problem or phenomenon in the environment can improve students' attitudes toward science [18]. Study [12] also noted that with a positive attitude will be useful to improve the quality of learning. Research conducted [7] Thailand explains that a positive attitude towards the chemical can increase the ability to think analytically and improve learning outcomes. Attitudes toward chemistry research is also done the Turkish students, increase student learning motivation influence attitudes toward chemistry [19]. Based on these views learners' attitudes toward chemistry is very important to study because it can affect motivation, interests, learning outcomes, academic achievement and success of learners in the process of chemical learning.

Attitudes towards science aspects observed in this study there are four aspects, namely the difficulty of chemistry, the interest of chemistry, the usefulness of chemistry for students 'future career, and the importance of chemistry for students' life. In Table.1 described aspects of attitudes towards learning science in chemistry along with an explanation of each item attitudes toward science. Students' attitudes toward science can improve the knowledge of science and technology for the benefit of personal, local, national and global as well as the development of self-efficacy [20].

| Table 1. Aspects of Attitudes Toward Science In Chemistry Learning |
|---------------------------------------------------------------|
| Attitude                                              Item                                                                                      |
| the difficulty of chemistry                             Find the use of chemical symbols with ease; understand chemistry concepts very easily; easy to understand theories, concepts and models of chemistry; easily can solve the problems of chemistry; always trying to understand the chemistry; try to solve chemistry problem, my mind went blank; interpret the world around me use his knowledge of chemistry; chemical knowledge is not related to other knowledge. |
Results of the calculations score students' attitudes toward science learning in high school chemistry Pondok Modern Selamat Kendal overall based on four aspects of student attitudes toward described in Table 2 as follows:

| Attitude                          | Item                                                                 | The average scores | Category          |
|-----------------------------------|----------------------------------------------------------------------|--------------------|-------------------|
| the interest of chemistry         | 1, 2, 3, 4, 5, 6, 7, 8                                               | 15.32              | Unfavorable good  |
| the usefulness of chemistry for students' future career | 22, 23, 24, 25, 26                                                  | 9.93              | Unfavorable good  |
| the importance of chemistry for students' life          | 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43    | 30.86             | Quite good        |

From Table 2, the average score information on aspects is obtained. The difficulty of chemistry 15.32 with an unfavorable category, aspect the interest of chemistry 22.99 with an unfavorable category, aspect the usefulness of chemistry for students future career 9.93 with an unfavorable category and aspect the importance of chemistry for students life 30.86 with a quite good category. Of the four aspects above, the aspects that get the bad category are only aspects the interest of chemistry. Learning chemistry is still considered a difficult lesson and many calculations are full of formulas, so the attractiveness of
chemistry lessons is reduced. This is in line with Suratno et al. research which said that even though students had received learning with a different model than usual, they still did not like chemistry lessons [11]. For them chemistry is a difficult and confusing lesson. This condition is also evident from the results of daily tests of students who 40% reached the minimum criteria for completeness in chemistry and in the final test questions only 30% of students had not achieved satisfactory grades. This situation occurs because the questions at the time of the daily test and the questions from the end of the semester the level of difficulty is different and the standard is also different. Students are not accustomed to working on problems with a higher level of difficulty. This is reinforced by the results of research which examines the analysis of teacher attitudes towards the theory of evolution in learning to conclude that the attitudes of teachers who pay little attention to the conditions of learning paradigm changes and materials in learning can affect student learning outcomes. The teacher should have mastered the minimum standards of completeness from the government so that the material delivered is in accordance with the educational objectives nationally. Profile of attitude towards chemistry for each aspect of chemistry learning, each of which is presented in more detail in Figure.1.

Figure 1. Profile of Students' Attitudes Towards Science in Chemistry Learning

3.1 Aspect the Difficulty of Chemistry
Based on the results of attitude data processing on chemistry as presented in the graph.1 above on the aspects the difficulty of chemistry the number of students who have a very good attitude towards chemistry is 3 people, both 25 people, quite good 37 people and unfavorable good 60 people. Some students have difficulty finding symbols, understanding theories, concepts and chemical models and solving chemical problems. In studying chemistry, students are faced with three things, namely macroscopic, microscopic and symbolic so that not a few students feel confused in understanding chemistry. The phenomenon of student learning difficulties is usually evident from the decline in academic performance or learning achievement. Chemistry learning covers a very wide range of problems, ranging from teacher competencies, laboratory technicians, teaching and learning processes, students, infrastructure and involvement of parents. If studying chemistry is still considered difficult, then this problem is most likely related to these components. Besides that, the poetry of learning is also obtained from the characteristics of the chemistry subjects which are related to chemical reactions and chemical calculations and most of the concepts are abstract. Therefore, student-centered chemistry learning should be applied to overcome this problem.

3.2 The Interest of Chemistry
The second aspect is about chemistry. Of the 125 students there are 50 students who are not interested in chemistry lessons or in the poor category. While in the fairly good category there are 45 students, the good category has 20 students and very good there are 10 students. From these data it can be described that only a small percentage of students are interested in chemistry. Chemistry lessons are less interesting lessons because some of the sources of chemistry lessons they find are still conceptual development. Students are not interested in learning chemistry can also be proven by the emergence of
student behavior (misbehavior, like shouting in class, harassing friends, fighting, often not in class, and often skipping. On negative items, which are related to boredom following chemistry lessons, do not like chemistry, and want chemistry lessons to be less they mostly agree, some even agree strongly. Students still have a little difficulty in solving new problems in chemistry (item 20), this is because teachers still rarely provide chemical project assignments which result in a lack of skills in solving new problems related to daily life and only a few students have the desire to do chemical projects if you have a chance (item 21). The average score obtained as a whole from this aspect which is equal to 23.99 is in the unfavorable category, many students are less interested in chemistry lessons because chemistry is considered a less enjoyable and difficult subject to find in everyday life.

3.3 The Usefulness of Chemistry for Students Future Career
A further aspect is the relationship of chemistry with future career. There are 42 students have an attitude against a pretty good chemistry, 30 students with good category, 18 students that possession of a very good attitude towards the chemical linkage with future career and there are 35 students who have poor attitudes on this aspect. Knowledge of chemistry affects life, however chemistry will always be associated with everyday life, although not all students want to become a chemist after graduation in the study expressed the students agreed that if the chemical is knowledge necessary for a career in the future. Aligned to the research conducted by that the income of the parents of an established career will affect student achievement [21]. Academic achievement should affect future career. Only a minority of students do not agree on the statement of chemical knowledge would be useless if it is passed. This shows the attitude toward science in this third aspect in still good enough category in chemical relationship with a future career.

3.4 The Importance of Chemistry for Student’s Life
The last aspect is the importance of chemistry for students' lives. In this aspect there are 66 students who have a pretty good attitude, 40 students have good attitude, 12 students have poor posture and 7 students who have a very good attitude. Most students still misunderstand chemistry, and this should be immediately rectified. They considered only in laboratory chemical, chemical dangerous only in the food, chemical be explosive objects, and so on. Chemistry in everyday life exist everywhere, all of which we feel, we smell, we taste is chemical. The advancement of chemistry can improve the quality of human life, the chemical can be used to solve various environmental problems and problems of everyday life, the advancement of chemistry can also contribute positively to the country's development, chemistry-based technology, and other programs. Of the two negative statement "progress in the field of chemicals causing environmental problems and worsen living conditions", there are 13 students who disagree and only 3 students who stated strongly disagree. The chemistry is very important in human life since the chemical can give to a phenomenon changes for the better. While in the 42-43 item, there are only 2 students who disagree in a statement to understand the chemistry that one's life can be better and easier. The average score obtained by 30.86 so the attitude towards science on this aspect that is quite good.

4. Conclusion
Overall profile of high school students attitude towards science Pondok Modern Selamat Kendal based on four aspects studied were quite good. In the aspect of the difficulty of chemistry total average scores obtained in the amount of 15.32 are in the unfavorable category. The second aspect is the interest of chemistry obtained an average score of 22.99 was the unfavorable category. The third aspect is the usefulness of chemistry for future career students obtained an average score of 9.93 are in the unfavorable category. Meanwhile, in the aspect of the importance of chemistry for life students obtained a score of 30.86 indicates a category quite well.
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