Students’ attitude toward science in junior high school after follow science learning used ILD model assisted science magic

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Abstract. The purpose of this research improved students’ attitude toward science in one of the junior high school at Bandung City after follow science learning used ILD model assisted science magic. Research method is used pre experiment and one group post-test only design. The total sample of this research is 70 students, who were selected randomly in cluster. The instrument of the attitude towards sciences scale in this study is attitude towards sciences scale, which is consist of 30 items and refers to four dimensions. They are interest in science, importance of science in life, interest in advanced study in science, and interest in future career in science. The data was collected used Method of Successive Interval (MSI). The Result of this research showed that implemented ILD model assisted science magic can improve students’ attitude toward science in junior high school.

1. Introduction
The life of the world community in 21st century will continue to grow. Through education is expected to educators able to prepare students’ ability to act an active role to be a quality human resources in globalization era. In general, one of the aims of science learning is to develop students’ a positive attitude and interest in science learning [1]. The impact students’ attitude toward science is important, not only for student at elementary and secondary levels, but also at university level in improvement of a state [2].

Attitude is an internal situation that affects persons’ actions. Attitude can also be interpreted as a persons’ readiness to do something [3]. Attitude will be greatly influenced by the circumstances surrounding environment. Attitude establised a person’s belief in the object.

Physics is one part of science learning. In the last few decades, the process of physics learning has not only emphasized the understanding and skills but also about the students’ attitude toward science as well as the main ones [4]. Therefore, students’ attitude toward science is an important research because it has a reciprocal relationship between students’ attitude and achievement [5].

All this time, learning model (conventional) is used has not able to build student become active in teaching and learning process. Educators tend to engage too quickly in the use of mathematical formulas regardless of whether the students have understood the concept or not [6]. The Interactive Lecture Demonstration (ILD) learning model is one of student-centred constructive learning so that students
think actively of their conceptions and enable students to build their understanding about main concept through demonstrations and discussions with colleagues [7, 8]. One of the learning that can be applied is present science magic in learning. Using science magic not only a form of entertainment, but also as an educational tool based on activity, scientific principles and knowledge [9, 10]. Science magic is showed quite effectively to teach science in learning process [11-13].

2. Method
Pre experiment method and one group post-test only design were implemented in this study. A total of 70 students, including 42 female and 28 male students from one of the junior high school in Bandung City participated in this research. They were selected randomly in cluster.

The instrument of the attitude towards sciences scale in this study is attitude towards sciences scale, which is consist of 30 items and refers to four dimensions. They are interest in science, importance of science in life, interest in advanced study in science, and interest in future career in science. Data collected by attitude towards sciences scale, which is ordinal scale were transformed into interval scale using Method of Successive Interval (MSI). In an ordinal scale, the responses can be ranked but the distance between responses is not measurable. Thus, we can not assume whether the difference between responses is large or not. Meanwhile, the difference between responses in interval data can be calculated [14].

In this research, implemented science magic to Interactive Lecture Demonstrations (ILD) model is in second step, namely the students predict what will happen and write down their prediction on the prediction sheet. In this step will strengthen students in understanding the concepts and theories based on phenomena that can attract students’ attention. By understanding the theory based on the phenomenon then the theory will apply for longer in the students’ memory. The importance of the implementation of Interactive Lecture Demonstrations (ILD) assisted science magic is make student active because they have to communicate with their group, developing ability to analysis because students have to explain scientific principles of the phenomenon and students do not immediately learn theory but they are given a stimulus to attract interesting and changing students’ perceptions to science that has been generating for students.

| No. | Steps of Interactive Lecture Demonstrations (ILD) Model Assisted Science Magic. |
|-----|---------------------------------------------------------------------------------|
| 1.  | Teacher explains the demonstration in the class and showing symptoms related to refracting of light subject. | Student pay attention to the teachers’ explanation about demonstration will do and observe its symptoms. |
| 2.  | Teacher shows science magic phenomena in the class and gives students the opportunity to propose some predictions that will happen. | Student predict what will happen and write their answer on predict sheet and propose the question. |
| 3.  | Teacher shows demonstration and notes which prediction is proven correct. | Student pay attention to the demonstrations by teacher and conduct science activities to record demonstrations result on the results sheet. |
| 4.  | Teacher shows the correct answer of the observation result with scientific explanation. | Student pay attention to the observation result that is showed by teacher, analysis and process the data of their group observation. |
| 5.  | Teacher discusses the demonstration result that related to scientific explanation so that student able to understand clearly. | Student discusses about their demonstration result and get the conclusion from their processing the data and analysis. |
3. Results and discussion

Attitude Toward Science scale is analyzed by calculating the percentage of each dimension (interest in science, importance of science in life, interest in advanced study in science, and interest in future career in science). The data of student quantity on attitude towards science aspect is obtained through attitude scale in Likert scale (Agree, Strongly Agree, Disagree and Strongly Disagree). Attitude Toward Science aspect is adapted from Developing Attitude Toward Science Measure [15].

Table 2. Percentage of each dimension.

| Dimension                          | STATEMENT (%) |
|------------------------------------|---------------|
|                                    | Strongly Agree| Agree | Disagree | Strongly Disagree |
| Interest in Science                | 10.23         | 46.15 | 38.46    | 5.16              |
| Importance of Science in Life      | 22.5          | 58.95 | 17.5     | 1.05              |
| Interest in Advanced Study in Science | 5.14       | 43.74 | 46.26    | 4.86              |
| Interest in Future Career in Science | 6.34       | 30.03 | 57.93    | 5.7               |

Based on Table 2, the “Importance of Science in Life” dimension has highest percentage score in the agree statement (58.95 %). It is describes most students expressed the importance of science learning for themselves in life. This is consistent with the result of research which reported that they want to learn more about the environment to make changes and improve their quality of life [16]. In the “Interest in Future Career in Science” has the lowest percentage score on the agree statement (30.03 %).

Table 3. Percentage of each item on “Interest in Science” dimension.

| Item                                                                 | STATEMENT (%) |
|---------------------------------------------------------------------|---------------|
|                                                                    | Strongly Agree| Agree | Disagree | Strongly Disagree |
| I learn interesting things in science lessons.                      | 15.7          | 72.9  | 11.4     | 0                |
| Science is fun subject.                                             | 10            | 65.7  | 24.3     | 0                |
| I do not want to study science in the class.                        | 1.4           | 24.3  | 61.4     | 12.9             |
| I feel science is difficult, complicated and scary                  | 8.6           | 27.1  | 50       | 14.3             |
| I am very enthusiastic to study every science lesson in my school.  | 10            | 65.7  | 22.9     | 1.4              |
| I am not interesting to study science.                              | 2.9           | 15.7  | 65.7     | 15.7             |
| Practical activity in science is very fun.                          | 30            | 64.3  | 4.3      | 1.4              |
| When hearing the word science, that is illustrated are many formulas and complicated. | 14.3          | 45.7  | 32.9     | 7.1              |
| I like science because it studies about nature around us.            | 8.6           | 77.1  | 12.9     | 1.4              |
| I would like to join science club.                                  | 8.6           | 37.1  | 51.4     | 2.9              |
| I would like to avoid science activities outside school.             | 4.3           | 18.6  | 71.4     | 5.7              |
| I would like to do more science activities outside school.           | 4.3           | 50    | 44.3     | 1.4              |
| I am very excited and enthusiastic to do science homework by the teacher | 14.3          | 35.7  | 47.1     | 2.9              |

Table 3 shows the descriptive statistics on the "Interest in Science" dimension show that in the agree statement on the item "I like science because it studies about nature around us" has a high percentage...
score (77.1 %), which indicates that most students enjoy science learning through nature. This is in accordance with the objectives of science subject in junior high school which is very useful for students [17].

**Table 4.** Percentage of each item on “Importance of Science in Life” dimension.

| Item | STATEMENT (%) |
|------|---------------|
|      | Strongly Agree | Agree | Disagree | Strongly Disagree |
| 1    | 8.6            | 44.3  | 44.3     | 2.8               |
| 2    | 28.6           | 68.6  | 1.4      | 1.4               |
| 3    | 21.4           | 65.7  | 12.9     | 0                 |
| 4    | 31.4           | 57.2  | 11.4     | 0                 |
| 5    | 4.3            | 18.6  | 60       | 17.1              |
| AVERAGE | 22.5           | 58.95 | 17.5     | 1.05              |

Table 4 shows the descriptive statistics on items relating to the “Importance of Science in Life” dimension. The information based on the table is the most student (68.6 %) students agree to learn science because can understand the various natural phenomena in daily life. Student recognized can develop technology, so that can make our lives easier and more comfortable.

**Table 5.** Percentage of each item on “Interest in Advanced Study in Science” dimension.

| Item | STATEMENT (%) |
|------|---------------|
|      | Strongly Agree | Agree | Disagree | Strongly Disagree |
| 1    | 7.1            | 68.6  | 21.4     | 2.9               |
| 2    | 2.9            | 54.3  | 40       | 2.8               |
| 3    | 2.9            | 34.3  | 58.5     | 4.3               |
| 4    | 5.7            | 25.7  | 65.7     | 2.9               |
| 5    | 7.1            | 35.8  | 45.7     | 11.4              |
| AVERAGE | 5.14           | 43.74 | 46.26    | 4.86              |

Table 5 shows the descriptive statistics on items relating to the “Interest in Advanced Study in Science” dimension. The information that can be obtained is most students agree on the statement want to deepen science in the future. The mean score on the item “I would like to get deeper science in the future” which described they would like to learn science seriously.
Table 6. Percentage of each item on “Interest in Future Career in Science” dimension.

| Item                                                                 | STATEMENT (%) |
|----------------------------------------------------------------------|---------------|
| I aspire to work closely with science since childhood, such as nuclear power plants, space agencies, solar cell industry, etc. | Strongly Agree 10  Agree 24.3  Disagree 62.9  Strongly Disagree 2.8 |
| I would like to have a job related to science.                      | 2.9  45.7  48.5  2.9 |
| I am not interested to fill a job vacancy related to the science.   | 5.7  31.5  57.1  5.7 |
| I would like to become a teacher science.                           | 2.9  27.1  58.6  11.4 |
| I would like to become a scientist.                                 | 5.7  30.2  57  7.1 |
| I will choose the work related to science, if there is a choice of work offered. | 8.6  27.1  62.9  1.4 |
| I would like to become a researcher science.                        | 8.6  24.3  58.5  8.6 |
| AVERAGE                                                             | 6.34  30.03  57.93  5.7 |

Table 6 shows the descriptive statistics on items relating to the “Interest in Future Career in Science” dimension. The statement “I would like to have a job related to science” almost half of student agreed (45.7 %).

The advantage ILD (Interactive Lecture Demonstration) model assisted science magic can develop students’ physiology who have open mindedness to investigate, explore and research. Using science magic is proven can improve motivation and attitude toward science [18]. Student interested learning the new phenomena in class so that can improve students’ motivation and interest [19]. Students’ attitudes and interests can have an important role for students who learn science [20].

4. Conclusion and recommendation
Based on the data obtained, the result showed that using ILD (Interactive Lecture Demonstration) model assisted science magic can improve attitude toward science. Students agree that science learning is importance in daily life. However, only a few of students have interest in future career in science. It is recommended for the teacher to improve the students’ attitude toward science, especially about interest in future career in science. Teachers can use learning methods that can attract students’ interest to learn about science. Teachers can also tell the scientists’ experiences.

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