

## Students' Perception Using Inquiry Based Learning In Science Experiment

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Received 27 November 2017; accepted 9 December 2017; available online 18 December 2017

**Abstract:** Inquiry based learning is an approach that involves questioning, exploration of idea and solving the problem through discussion and exploration of information from the internet or scientific materials. The aim of this study was to identify the perception of student using inquiry based learning in science experiment based on their interest and confident level. A total of 30 respondents were selected through purposive sampling method. The respondents consisted of students' from 5th grade at primary school in Malaysia. The data were analysed using descriptive statistic. The finding showed that using inquiry based learning can increase students interest (mean score = 4.19) and confident level (mean score = 4.32) during the experiment. Based on these findings, using inquiry based learning should be considered as the preferred method of teaching in science experiment.

**Keyword:** Inquiry Based Learning; Science Experiment; Interest; Confident level; Survey Research.

### 1. Introduction

Statistical analysis in Malaysia on the issue of the student's interest in the science field is 37 per cent in science and 29 per cent in pure science [1]. In Europe, 60% of students state that the teaching of science is not quite interesting [2]. Therefore, the issue of the decline of interest by students in science is a topic that is often debated by current scholars [3] not only in Malaysia, but it also worldwide. Among the factors that have caused less interest in science are using of inappropriate methods for teaching science in schools [4].

Usually, the teacher-centered were used as a method teaching science at school. This matter led to students being unmotivated in teaching and learning process (T&L) [5]. Hence, to attract students in science is one of the challenges facing teachers today. Science experiments require students to explore learning. Through inquiry based learning, students will be encouraged their learning by curiosity and a desire to understand in solving a problem. The curious will stimulate students to make observations, questions, making a prediction and make hypotheses. Therefore, this study was conducted to students' perception using inquiry based learning for a standard 5 student in a science experiment.

The analysis of the lab activities showed that, students appeared engaged by hands-on components of all three lab activities, but students lost interest during the concluding divisions of the labs, which included questions and explanations [6]. Additionally, the student has lack confidence level in their abilities and needed encouragement during lab activities. Thus, many students copied the work of their peers without knowing the explanations about the experiment conducted.

### 2. Inquiry Based Learning In Science Experiment

The word inclusion is derived from the word inquire or inquiry which means finding, researching, studying and testing a method of taking a decision [7]. Inquiry based learning is a constructivist theory founded by Vygotsky and John Dewey to T&L. The basic principle in constructivism theory is knowledge constructed by students. Thus, an inquiry-based learning method is a learning method that encourages active learners in learning. Students are given meaningful problems or problems to solve by experimenting and assessing. Students learn actively by engaging in learning content exploration, current issues and questions related to learning concepts or curriculum [8]. While,

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the teacher focuses on exploration of studies to get the explanations. Teacher play an active role through a planning of the process. Teachers plan the process by demonstrating a culture where to ensure the idea are respectfully challenged and how to enact understanding and further questioning [9].



**Fig. 1** The inquiry based learning Circle [10]

Inquiry-based learning involves five main stages, starting with ask or problem about the topic-related issue is given to students (refer to Fig. 1). Next, students will determine how to solve the problem through discussion and exploration of information from the internet or scientific materials. Once the information is obtained, the student will make an experiment to solve the problem. The information obtained will be classified, compared and analyzed. Finally, the problem solving formula is based the result of the accumulated data.

### 3. Research Question

The following are the research question:

- (1) What is the perception of students' interest toward science experiment after experience inquiry based learning?
- (2) What is the perception of student confidence level toward science experiment after experience inquiry based learning?

### 4. Research Design

The inquiry based learning are designed to make sure student were involved actively in learning based on inquiry based learning process. Through this approach, students are expected to actively ask the question, do an

investigation, process the information and answer the question.

In science experiment, the topic of T&L is chemical properties. The teacher will be form a group (five student in one group) and students need to bring a necessary equipment and material. Therefore, the science experiment was carried out not only focused on textbooks, but the student will conduct the experiment in reality. So that, the student will able to develop their ability to investigate how to solve the problem.

As a conclusion, the inquiry based learning phase using in science experiment are (1) Teacher will give a problem (2) Student will investigate or gather an information (3) Student will interpret the information and (4) Student will report the finding. Teacher role as a guiding and help a student in the process investigate and encourage students to deal with complex tasks.

### 5. Methodology

The study was quantitative method. The quantitative methods involving research using statistical analysis to obtain the results of a formal and systematic measurement [11]. A total of 30 respondents was selected through purposive sampling method. The respondents consisted of students' from 5th grade at primary school in Malaysia.

This study utilized a survey design method that aims to identify the students' interest and confidence level toward science experiment after experience inquiry based learning.

In this quantitative study, questionnaire surveys are used as instruments for data collection. The survey used to describe a situation in which the phenomenon exists in a systematic and factual manner [12].

This survey was also able to provide feedback on the questionnaire by analyzing the data obtained from descriptive questionnaire [11]. The study will begin with the raw data collection through questionnaire distribution.

The questionnaire was divided into three parts: Part A (demography) and Part B (interest) and Part C (confidence level). A questionnaire form developed using five-point Likert scale. The Likert scale was divided as very agreeable, agreeable, uncertain, disagree and strongly disagree. After collecting data, analysis uses percentages and frequency values for analyzing

demographics. While the mean score is used for part B and part C.

## 6. Finding

This chapter will be discussed about the findings of the study. The data obtained from the questionnaires that have been distributed and the detailed data analysis shown to answer the research question of the study.

### 6.1 Demography

Part A in the questionnaire is the demographic of the respondents'. The demography part is related to the gender of respondent who participate in this study. Respondents of this study consist of 30 students. Table 1 shows student demographics

Table 1 Demography of respondents.

Demography	Result	
	Percentage (%)	Frequency
<b>Gender</b>		
Boys	55	16
Girls	45	14

Table 1 showed the findings that male respondents were 55% (n=16); while female respondents were 45% (n=14).

### 6.2 Perception of Students' Interest Using Inquiry Based Learning in Science Experiment

Part B in the questionnaire is respondents' interest in science experiment using inquiry based learning. Table 2 shows the findings of the mean score for the respondent's interest items that have been set.

Table 2 Part B: Interest of respondents.

	Item	Min
1	I like science experiment	4.77
2	Activity in science experiment is fun	4.57
3	Science is very useful for me to solve everyday problems	3.67
4	Doing an experiment makes me more aware of the topics I learned	3.88

5	I will remember learning if I do with my own self	4.30
6	I like to explore my experiment rather than look at the textbook	4.10
7	I like working with a group in a science experiment	4.70
8	I like working by exploring the information.	3.90
9	After the science experiment, I have much interest about the topic	4.10
10	Using Inquiry based learning to enhance my interest in science	3.90
Overall		4.19

Based on Table 2, the findings for the interest aspect show the highest mean score is item 1 which is 4.77. Meanwhile, the lowest item is in item 3 which is the mean score of 3.67. Overall, the findings for the interest of students using inquiry based learning in science experiment have a higher mean score with an interpretation mean score of 4.19. This means using inquiry based learning has attracted the interest of fifth year students in science experiments for the topic of chemical properties.

### 6.3 Perception of Students' Confidence Level Using Inquiry Based Learning in Science Experiment

Part C in the questionnaire is respondents' confidence level in science experiment using inquiry based learning. Table 3 shows the findings of the mean score for the respondent's confidence level items that have been set.

Table 3 Part C: Confidence level of respondents.

	Item	Min
1	I confident with the result of the experiment	4.45
2	A real equipment and materials, help me confident in conducting an experiment	4.72
3	I can lead the experimental group very well	3.70
4	I can do an experiment very well	4.50
5	The result of my experiment is exactly as shown in textbooks	4.70
6	I can show. How to get the result of the experiment	3.87

7	I am satisfied with the results of the experiment	4.35
Overall		4.32

Based on Table 3, the findings for the confidence level aspect show the highest mean score is item 2 which is 4.72. Meanwhile, the lowest item is in item 3 which is the mean score of 3.70. Overall, the findings for the interest of students using inquiry based learning in science experiment have a higher mean score with an interpretation mean score of 4.32. This means using inquiry based learning has gain student confidence level of fifth year students in science experiments for the topic of chemical properties.

## 7. Discussion

Based on the results of the study, it was found that using the inquiry based learning in science experiment have increased the interest and confidence level of 5th grade students for the topic of chemical properties. This is clearly seen as the whole item of the score is at a high level. The inquiry based learning is a student centered. Students are motivated by the curiosity and desire to understand things or solve problems. Hence, throughout the T&L process the students feel more excited and curious about what they are doing. The students' used a real equipment and material to investigate the problem. Therefore, students' can understand the contents of the lesson. For the further research, it is recommended to do experiment on other areas. So that, the effectiveness using inquiry based learning in the experiment will be investigated. Other than that, the readiness of teachers to apply the inquiry based learning in science subjects can also be further investigated.

## 8. Conclusion

Based on the findings, several conclusions were develop. These conclusions are intended to provide a perspective of student when using inquiry based learning in science experiment from the aspect of interest and confidence level. Using an inquiry-based learning method is one of the approaches to encourage and attract students in science experiment. This is one of the efforts to encourage and attract students through inquiry based learning in science experiment. To increase the students' interest in

science, the planning of activity in experiments must be relevant to everyday life [6] such as, the activity related to science experiment should be designed for students actively and able to explore information that can be linked to their daily lives.

Using inquiry based learning in science experiments has involved students directly which is against the demonstrations method. Traditionally, teacher using demonstration method to explain the science experiment. Students only observe the demonstration during science experiments which is conducted by teacher. Thus, using inquiry based learning in science experiment, students are actively participating in learning and can develop students' interest in science [13]. Students who are interested in the science experiment have also increased the confidence level. Student confidence level can be shown during science experiment conducted by students and directly guided by a teacher.

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