CHAPTER I
INTRODUCTION

1.1 Background
Currently technological advances in the world are growing rapidly. The instructive procedure in school needs to adjust with the more unpredictable learning condition better than previously (Saleh, 2012a). Numerous hypotheses talk about effective realizing with the goal that students can utilize information and build up their reasoning abilities. Secrets and explorations of the brain are discovered by neuroscientists. Current instructional techniques utilized are said to have not pulled in enough enthusiasm to fulfil most of the students’ needs. These days, to accomplish a more intricate learning condition, the process of education in school requires more than what was expected previously (Saleh, 2012a).

Aziz (in Shabatat & Al-Tarawneh, 2016) expressed that teaching approaches are still concentrating on memorizing. These make the students just go about as a beneficiary of data sent by the educator with no critics, comprehension or connection to students' interest and these methodologies change the students from a student with creative energy and dynamic reasoning to a machine stacked by data without understanding or free reasoning. According to Assalti (2004), the educators and psychologists, refinement of teaching and learning process using neurocognitive concept to raise Brain-Based Learning (Shabatat & Al-Tarawneh, 2016).

Dissimilar to conventional techniques of schooling, which is frequently said to restrain learning by overlooking the brain's regular learning forms, the Brain Based Learning is accepted to support learning because of its all encompassing methodology towards the students. It is a way to deal with realizing which supports the brain's best common operational standards, with the goal of attaining maximum attention, understanding, meaning and memory (Jensen, 2008).

Brain-Based Learning is a student focused and instructor encouraged methodology that uses students’ intellectual gifts and accentuating important learning, it is not only memorization (Uzezi & Jonah, 2017). Brain-Based Learning
recommends that educators must submerge students in perplexing, intuitive encounters that are both rich and genuine (Uzezi & Jonah, 2017). Personally meaningful challenge can stimulate students’ mind to the desired state of alertness that must have by the students (Uzezi & Jonah, 2017).

One of the important things in learning is comprehend the concept. Students’ concept mastery is the important that has to be gained by the students. As we know that Physics is one of the difficult subject for junior high school students (Saleh, 2012b). One of the topic in Physics of junior high school is electric circuit. The concepts investigated include electric diagrams, current, potential difference at battery terminals, and resistance. It has been more than once demonstrated that students and even educators and experts, share misconceptions about these thoughts. One of these misconceptions is the confusion between potential difference and current (Liégeois, et al., 2003). It has been proven that with the correct sort of learning condition, a single pass through Physics can be a valuable learning experience for the majority of students (Redis & Steinberg, 1999). Five groups of factors that influence the level of learning achievement beside previous knowledge, which has the biggest influence on learning success are cites intellectual capability, environmental components, motivational factors, and the application of learning strategies (Klauer, 1988). Teachers have to make learning is meaningful for the students because Brain-Based Learning includes tolerating the tenets of how the brain processes, and after that sorting out guidance remembering these principles to accomplish significant learning (Shabatat & Al-Tarawneh, 2016).

Motivation of students’ towards science is considered a vital variable in achievement of learning results. This is due to more academic efforts and perseverance and achievement are shown better in highly motivated students than in low motivated students during assignment and learning activities. (Uzezi & Jonah, 2017). One of the efforts to improve students’ concept mastery and motivation is by using Brain-Based Learning approach. According to Saosa (1995) stated that a Brain-Based approach integrates the engagement of emotions, nutrition, enriched environments, music, movement, meaning making and the absence of threat for.
maximum learner participation and achievement. It is good strategy to make students’ motivate in learning. Brain-Based Learning can be seen as appropriate for school students. Brain-Based Learning will make the students experiencing in different learning environment as well as the steps is good strategy to apply in school. The researcher chose one of International school in Bandung which most of the students have problem in Physics. Based on the interview with the teacher, the students in that school are hyperactive so that the teacher have to make the learning process during class more interesting and meaningful.

Research on Brain-Based Learning has been extremely prolific in the past two decades (Haghighi, 2013). Previous study by Saleh (2012) it has been found and proven that the Brain-Based Learning was effective in encouraging conceptual understanding and learning motivation towards physics among students. In another studies, Brain-Based Learning was measured achievement of the female students in Chemistry subject (Shabatat & Al-Tarawneh, 2016); students’ attitudes level and motivation in science class (Akyürek & Afacan, 2013); students’ academic achievement and retention of knowledge in science course (Ozden & Gultekin, 2013); students’ academic achievement, attitude, motivation and knowledge retention in electrochemistry (Uzezi & Jonah, 2017); and academic achievement of students with different learning styles (Duman, 2010).

A look into previous research, the researchers have investigated students’ concept mastery in “force and motion” topic and students’ motivation with document analysis (journal documentation) and case study using interview technique (Saleh, 2012). Another study, it was measured students’ achievement in “electrochemical cells, acid, and base” topic and students’ motivation using questionnaire which consists of 15 items with no specific aspect (Akyurek, 2013). However, this research used six scales for measuring students’ motivation which are self-efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment stimulation. Therefore, the researcher decided to conduct the research entitled “The Effect of Brain-Based Learning on Students’ Concept Mastery and Motivation in Learning Electric Circuit”.

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THE EFFECT OF BRAIN-BASED LEARNING ON STUDENTS’ CONCEPT MASTERY AND MOTIVATION IN LEARNING ELECTRIC CIRCUIT
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1.2 Research Problem

The research problem of this study is “How is The Effect of Brain-Based Learning on Students’ Concept Mastery and Motivation in Learning Electric Circuit?”. Based on the research problem above, the research question that developed and explore in this study are:

1) How is the effect of Brain-Based Learning on students’ concept mastery in learning electric circuit?
2) How is the effect of Brain-Based Learning on students’ motivation in learning electric circuit?
3) How is the correlation between students’ concept mastery and students’ motivation in learning electric circuit?

1.3 Research Objectives

The research objective is specified to as follow:

1) To investigate the effect of Brain-Based Learning on students’ concept mastery in learning electric circuit.
2) To investigate the effect of Brain-Based Learning on students’ motivation in learning electric circuit.
3) To investigate the correlation between students’ concept mastery and students’ motivation in learning electric circuit.

1.4 Research Benefit

The result of this research is expected to give good input to as follow:

1) For Teachers
   This research is expected to help the teachers use Brain-Based Learning as the alternative method for teaching Physics especially in electric circuit topic.
2) For Students
   This research is expected to help the students having learning experiences using Brain-Based Learning and it will effect on students’ concept mastery and motivation in learning Physics especially electric circuit topic.
3) For Other Researchers
This research is expected to be a reference especially for researchers who will examine relevant issues to the problems contained in this research.

1.5 Organizational Structure of Research Paper

In order to get systematic structure of the paper, this research paper is arranged based on the following organizational structure:

1) Chapter I: Introduction
   This chapter there will be the background of the research, research problem, research objective, research benefit, and organizational structure of research paper, and limitation of problem.

2) Chapter II: Literature Review
   This chapter describes in details and explanation about Brain-Based Learning, students’ concept mastery, students’ motivation, and electric circuit concept.

3) Chapter III: Research Methodology
   This chapter gives the explanation about research method, research design, population and sample, instrument, procedure, and data collection and analysis.

4) Chapter IV: Results and Discussion
   This chapter discuss about the results of the research. The author analyzed and interpreted it based on the needs of answering research questions that has been determined.

5) Chapter V: Conclusion and Suggestion
   This chapter describes about conclusion and recommendation of the research

1.6 Limitation of Problem

In order to avoid a widening problem in this research, then the research will be limited to as follow:

1) Brain-Based Learning (BBL) is generally implemented based on the integration of ‘Brain-Based Learning Principles’ (Caine & Caine, 1991, 2003; Sousa 1995; Jensen, 1996) through seven brain compatible instructional phases (Sousa, 1995; Smith 2003) which are activation, clarification of the outcome and painting the big picture of the lesson, making the connection, doing the learning activity,
demonstration of student understanding, review of student recall and retention, and previewing the new topic.

2) Students’ concept mastery that is measured in this research involves level cognitive of remembering (C1), understanding (C2), applying (C3), and analyzing (C4) based on Bloom Taxonomy Revised (2001).

3) Motivation in this research is investigated using Students’ Motivation Towards Science Learning Questionnaire (SMTSL) developed by (Tuan, Chin, & Shieh, 2005). There are five scale and six aspects which are self efficacy, active learning strategies, science learning value, performance goal, achievement goal, and learning environment stimulation.

4) In this research, the topic learned is Electric Circuit that is limited by Physics for Cambridge IGCSE that are attached in document of Cambridge curriculum for secondary two students.