

## **Chapter Two**

### **Literature Review**

In this chapter, definitions are presented to support the researcher's assumptions in the context of the study. The researcher reviews the literatures of learning environment and critical thinking. Then, previous related study is added as the guideline for the researcher in conducting this research. Conceptual framework is presented in this chapter to describe the highlight of this study. The last part added is the hypothesis since this study tries to investigate the correlation between physical learning environment and students' critical thinking.

### **Learning Environment**

There is a growing interest in how to create learning environment which is able to enhance students' reception in learning. Conceptually, learning environment according to Basque and Dore (1998) refers to the whole range of components and activities within which learning happens. Another definition of learning environment comes from Hiemstra (1991, p.8), who defined it into "A learning environment is all of the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of an adult engaged in an educational enterprise."

Based on the two definitions of learning environment from the experts above, learning environment consists of not only one but many components: physical surroundings, psychological or emotional conditions, and social or

cultural. Thus, it is clear that learning environment encompasses many components because learning is not only influenced by one, but many factors.

Furthermore, in the 21<sup>st</sup> century, learning is supported with the use of technology and internet, which is why Philips, McNaught, and Kennedy (2010) added virtual spaces and technology-enhanced environment in their definition of learning environment. Further, in the modern learning environment, classrooms are often equipped with digital information and communication technology such as computer and internet connection to aid students further in learning. This is resulted in students' activities in learning that adjust to the new changing learning environment. Apart of how learning environment is created nowadays, the most important thing is to make sure that the learning environment will assist students in learning.

In addition, the term learning environment itself nowadays is commonly presented with an attribute, to make it more positive, optimistic, promising and promotional (Engestrom, 2009). Aside from the fact that there are many components in learning environment and attributes in the term learning environment itself, it is important that the classroom in which students spend their time to learn provides the students with supportive learning environment to assist them in learning.

Based on the two definitions above, the researcher believes in the importance of creating supportive learning environment in order to assist students in learning which will result in better outcomes. To summarize, learning environment is the whole physical surroundings, psychological or emotional

conditions, social or cultural, virtual spaces, and technology-enhanced environment affecting the growth and development of students in an educational area.

**Components in learning environment.** As what has been explained briefly in the previous section, learning environment consists of not only one but many components. They are physical learning environment, psychological or emotional conditions, social or cultural, virtual spaces, and technology-enhanced environment. In this research, the researcher focuses only on the physical learning environment which becomes the issue.

A physical learning environment is viewed as a conventional classroom where in its broadest sense, a combination of formal and informal education systems in which learning takes place both inside and outside of schools (OECD, 2011). The physical learning environment, according to Andere (2014) is composed of architectural designs, equipment, premises, libraries, sport facilities, arts, science and health facilities, and materials. Importantly, the physical learning environment can create conditions (also known as affordances) (Gibson, 1977) and facilitate relation that can enhance student learning along with a series of indicators (cognitive, physical and mental wellbeing) and the quality of relationships (OECD, 2013). The significance of the physical environment itself has been stated by Earthman (2004), quoting to what he said: "There is sufficient research to state without equivocation that the building in which students spend a good deal of their time learning does in fact influence how well they learn" (p. 18)

Students spend most of their time to learn at school. Temple (2007) argued that students perceive that the physical environment encouraging them to have an improved sense of control and personal autonomy. Therefore, providing supportive physical learning environment will assist students in learning better. Another element of physical learning environment is proposed by Mokhtari, Amini, and Mottaghi (2014) and is classified into 8 groups, which all of them are significant in assisting students in learning. The elements are listed into the following:

- i. Light and other relation factors like type, amount of light (artificial or natural)
- ii. Open spaces
- iii. Color
- iv. Shape and dimensions of the class
- v. Arrangement
- vi. Temperature and air conditioning of the class
- vii. Private and public spaces for students
- viii. Behavioral spaces that students prefer (spaces other than classes that students spend most of their time in there)

The equipment issue is equally significant. Fisher (2008) listed important equipment which should be provided inside the classroom. They include either its spatial elements i.e., floor, windows, walls or other classroom equipment i.e., desks, chairs, rugs, chalkboards, tack boards, easels, counters and computer etc. Additionally, thing as students' seating arrangement, for an instance, is actually

important. Students' need to be seated at points in the classroom is in order that they can see or hear their teacher without straining (Marsh, 2008). This requires thoughtfulness in providing the equipment inside the classroom because it will have direct effect on students' participation in learning inside the classroom.

A 'Module' has been created by OECD Learning Environments Evaluation Programme (LEEP). The module is utilized to produce tools – such as frameworks and validated assessment instruments – and offer information and recommendation to schools, local authorities and communities about how investments in learning environments, especially the physical learning environment, translate into better outcomes, aiming to more efficient use of educational resources. The focus areas identified are for how students address environmental issues, and also some important issues related to engagement in learning, preferred spaces for learning and concern for the environment.

This LEEP Module is created based on “Affordances for students” by (Gibson, 1997). “Affordances for students” is the conditions created by the physical learning environment for students to mediate relationships which can enhance effectiveness along a series of indicators (cognitive and non-cognitive) and the quality of relationships.

**Table 2.1 Focus areas and themes the LEEP Module  
addressed to *students***

<b>Focus areas</b>	<b>Themes</b>
Access and safety	Accessibility and safety of the learning environment
Affordances for students	Students' enjoyment of working in the (new) physical learning environment
Appearance	General appearance of the school building and classrooms
Comfort	Quality of the physical learning environment in terms of temperature, humidity, lighting (natural and artificial) and acoustics (i.e. noise levels)
Concern for the environment	Involvement in activities related to environmentally sustainable practices inside or outside class
Connectivity	Frequency and ease of access to ICTs in class; availability and use of devices such as iPad and iPhone in class
Flexibility of furniture and space	Moveability, agility and movement of furniture and ICT to suit the learning activity; comfort in classrooms where there are moveable tables and chairs; sliding glass or operable walls/doors; comfort when moving around the classroom
Specialist spaces	Preferred specialist spaces (e.g. arts, science, technology, etc.); expected and actual use of specialist spaces for the purpose for which they were designed.

From the table above, it is important to know that there are many elements to consider in creating physical learning environment. In this study, some of the elements such as concern for the environment and specialist spaces are not considered because this study only focuses on the classroom. To conclude, a

physical learning environment is regarded as a conventional classroom where teaching and learning usually takes place and is composed of many elements.

### **Critical Thinking**

The term critical thinking (CT) has been recognized widely and used frequently in pedagogical field. Quite contrary to its popularity, academics seem reluctant or incapable to define what critical thinking is. They would rather take the concept of critical thinking on faith, as a sort of self-evident foundation of Western thought such as freedom of speech (Atkinson, 1997).

Numbers of scholars had supported this notion, including Resnick (1987), who argued that thinking skills has no accurate forms of definition people usually commit to describe specified terms for schooling. Although the term critical thinking is rather difficult to be defined clearly, people can still talk, understand one another when they do so, and recognize critical thinking when it happens (Resnick, 1987).

As a result, the notion that critical thinking exists mainly at the level of tacit, commonsense social practice emerges, which will be hard to be given in the confinement of classroom where heterogeneous students from different social groups are gathered. This notion is supported by Heath (1983) in her study of students from different social groups living in the Carolina Piedmont.

In spite of the notion that critical thinking is unable to be defined clearly, it does not lessen number of other scholars who want to define the term of critical thinking. Some academics claim that critical thinking is rather difficult to be given

as instruction in classroom, in educational field, critical thinking is possible to be learned by students. Cubukcu (2006) stated that “thinking is a disposition, can be taught directly, and it should be taught”. Hence, it is possible that for students to learn critical thinking skills inside the classroom.

Some of the academics have described critical thinking in which it is mostly correlated with analyzing and problem solving. There are several scholars who had tried to define critical thinking. According to Moore and Stanley (2009), critical thinking is a process that involves students to be able to think and reflect about the world for themselves. It is a fact that social upbringing may shape the way how students think. However, school is a place where students gain knowledge and share ideas with teachers and schoolmates which will make them develop their thinking.

Further, Paul and Elder (2005) argued that critical thinking is a process where students improve the quality of his or her thinking by adeptly taking charge of structures inherent in thinking and enforcing intellectual standard upon them. The knowledge students received will be processed stage by stage in accordance with their level of intelligence and issues they will encounter in real life to solve problem.

Another definition of critical thinking comes from Chance (1986). He defined critical thinking as “the ability to analyze facts, generate and organize ideas, defend opinion, make comparisons, draw inferences, evaluate arguments and solve problems” (p.6). Further, Fahim and Pezeshki (2012) described critical thinking as thinking process that requires reasoning and through reflection and



rejects easy acceptance of other's opinions. It means that a critical thinker will not easily accept other's ideas and rather uses their knowledge to make reasoning and complete consideration before making a conclusion to solve a problem.

The interesting part of it is that the process of critical thinking has some sort of connection with Bloom's revised taxonomy. The connection itself is in direct correlation with students' learning in classroom activity. Suffice to say that when students have reached the first three lower levels of Bloom's revised taxonomy based on Anderson and Krathwohl (2001)– remember, understand and apply will they be able to analyze, evaluate, and then create.

Bloom's revised taxonomy has been structured to classify levels of intellectual behavior important in learning. In addition, learning is a continuous process. In a process of learning with the goal of becoming a critical thinker, students need to pass each level starting from the lowest before moving higher. This means that critical thinking is somehow can be taught in classroom in series process of learning.

In higher educational level such as universities, critical thinking is a skill that must be owned by students because this is the last step before they have to meet a real life where sometimes problems that arisen are something that may have not existed before. If the knowledge is given with the right instruction and provided with supportive physical learning environment where students can learn comfortably, the researcher believes that critical thinking can be developed within the confinement of the classroom. Based on the definitions of critical thinking above, it is clear that critical thinking is skill to process the knowledge to make

reasoning and complete consideration where in the end making a conclusion to solve a problem

**Characteristic of critical thinking.** It would be impossible to understand the teaching of critical thinking without gratitude toward the characterological profile of the kind of individual one is trying to nurture even when we understand that critical thinking is a form of cognition. Critical thinkers have their own characterological profile, a constellation of attitudes, a set of intellectual virtues, or a group of habits of mind which we refer to as the overall disposition to think critically that make them different from the other students (Facione, Facione, Giancarlo, & Gainen, 1995). These characteristics can be very outstanding that they can be distinguished easily

An instrument that can be used to measure the dispositions of critical thinking is California Critical Thinking Dispositions Inventory (CCTDI), which was developed originally by Facione, Facione, and Giancarlo in 1998 (Emir, 2013). The original dispositions of critical thinking according to CCTDI include 75 items in seven sub-scales. These seven dispositions are truth-seeking, open-mindedness, inquisitiveness, analyticity, systematicity, critical thinking self-confidence, and cognitive maturity.

Truth-seeking means that the students eager to seek the best knowledge in given subject, courageous to ask questions, and honest and objective about pursuing research even if the findings unsuited with their self-interests or preconceived notions. Students with open-mindedness characteristic tend to show toleration for different approaches and willing to acknowledge their own

mistakes. Consideration plays important role in open-mindedness. Students will respect others' decisions, opinions, or ideas when they are deciding on something in this dimension.

Inquisitiveness is very important in critical thinking. It is significant that students show tendency to gain knowledge and learn new things without any expectation. Study shows that among the characteristics of liberally educated person are having intellectual curiosity and a desire to know. In analyticity, students' carefulness plays important role when they are faced with problems that can be arisen and of the reasoning. Students have to be careful in solving the problem even if they use objective proves. Students are demanded to find as many solutions as possible and choose which one is the best to solve the problem.

Systematicity in critical thinkers makes them being organized, planned and careful in doing an inquiry, meaning that before doing a research, plans are already made along with preparations. The next disposition is critical thinking self-confidence. Confidence in critical thinkers means that they have conviction and trust for their own self-reasoning process in a given problem. They do not easily waver to other people's opinions. The last disposition of critical thinking is cognitive maturity. Cognitive maturity is a sign that students able to perform. Critical thinkers must have mental maturity and cognitive development to able to solve problems and make complex decisions based on given problems.

Those seven characteristics of critical thinker are the most prominent which is easier to be observed by teacher on their students' behavior inside the classroom.

**Techniques to increase critical thinking.** Insofar, some believe that critical thinking can be taught and developed in classroom. Enhancing students' critical thinking can be propelled by: either implanted instruction with critical thinking skills woven into the content matter, or explicit instruction with lessons planned specifically to provide guidance in specific critical thinking (Marin & Halpern, 2011). These two are the most basic ways that can be applied in school.

Implementing critical thinking skill in either content matter or instruction seems to be an easy job. On the other hand, implanting instruction with critical thinking skills merged into the content matter or creating explicit instruction with lessons arranged precisely to provide direction in specific critical thinking requires creativity and patience.

Sometimes, it takes time for teacher to perfect his/her lesson plan because when the previous lesson plan fails, teacher has to evaluate or make another new lesson plan. Not only that, teacher still has to keep an eye upon the implementation of the lesson plan in the learning process because some students may be able to perform and some students may not. However, it must be considered carefully which one will be used that suits the most with the characteristics of the students.

### **The Significance of Learning Environment toward Students' Critical Thinking**

There are at least three significances of learning environment toward students' critical thinking. Beichner, Saul, Abbott, Morse, Deardorff, and Allain

(2007) stated that learning environment helps to increase levels of conceptual understanding, improve problem-solving skills, attitudes and class attendance rates and a reduction in both the overall and at-risk student failure rates. School with poor design and maintenance can vitiate on teacher and student morale and engagement, and impact negatively on aggregate students' learning outcomes (Filardo, 2008). Therefore, it is important to provide supportive physical learning environment for the students in order to attract their interest in learning inside the classroom.

Another significance of learning environment is stated by Montessori (1908) in Matijevic (2012). Maria Montessori emerged with her original pedagogical concept in 1908 and decided to create, besides her book, varied material and equipment to encourage students to learn communication skills and other important life skills such as problem-solving, research, matching, critical thinking, concentration, etc. By providing equipment in classroom, students are expected to be more encouraged during learning activity.

The next significance is encouraging students in real-world problem solving (Fullan, Luke, & West, 2012). In Mokhtari, Amini, and Mottaghi (2014), it is said that physical learning environment of school help to increase conceptual behaviour, intellectual thinking, creativity and ability to solve the problem and also attention and duty. Often, classroom is provided with visual aid such as LCD projector to be used by teacher in delivering material using slide presentation to help the teacher in explaining subject matter. Thing such as slide presentation is helpful in increasing students' levels of conceptual understanding where the goal

is improved critical thinking skills. This is one of the reasons why classroom needs to be equipped with equipment such as computer and LCD projector.

To summarize, physical learning environment is significant element in helping students to learn better in classroom. School with well equipped classroom is believed to be able to attract students' interest in learning and hence, support them in learning which goal is to increase their level of conceptual understanding and improve their critical thinking skills.

### **Previous Related Study**

There have been several studies about the impact of a particular learning environment on students' critical thinking. First is from Raafat George Saadé, Danielle Morin, and Jennifer D.E. Thomas in 2012 entitled 'Critical Thinking in E-Learning Environments'. The authors discuss about the usage of IT-facilitated classroom to make students more active in the learning process where the intended goal is to foster important skills such as critical thinking. Their study presents a web-based course which contained two categories of learning modules, resources and interactive components. This is a useful resource to find out to what extent E-learning environments can help to improve students' critical thinking.

Another study is conducted by Methinee Wongwanich Rumpagaporn in May 2007 entitled 'Students' Critical Thinking Skills, Attitudes to ICT and Perceptions of ICT Classroom Learning Environments under the ICT Schools Pilot Project in Thailand'. Rumpagaporn's research offers an investigation concerning to what extent the schools in the Thai ICT schools pilot project had

classroom learning environments related to two student outcomes, critical thinking and attitudes to ICT. He also investigates about to what extent classroom learning environments related to certain teacher characteristics. Results from both quantitative and qualitative studies are combined in the four research propositions discussion. The author indicates that ICT is indeed support students in improving their levels of critical thinking, and that students develop positive attitudes toward the use of ICT in learning. Rumpagaporn 's study is indeed beneficial and well-researched.

Although both studies aimed to find how students' critical thinking was fostered in learning environment, disparity of the components of learning environment was examined in those studies. The differences can be seen from the object of the study, the place of the study, and the participant of the study. Nonetheless, both of those studies above are very important as guideline and consideration to help the researcher in conducting this research.

### **Conceptual Framework**

Learning environment is all of the components influencing the growth and development of an adult in an educational activity (Hiemstra, 1992). A learning environment consists of many components such as physical surroundings, psychological or emotional conditions, and social or cultural influences. Whereas all the components of learning environment are equally important, the researcher only focuses on the physical learning environment.

It is essential that schools are equipped with supportive physical learning environment to support students in learning inside the classroom. Defined by Fisher (2008), the physical environment includes either its spatial elements i.e., floor, windows, walls or other classroom equipment i.e., desks, chairs, rugs, chalkboards, tack boards, easels, counters and computer.

The significance of physical learning environment of school in general is to increase students' conceptual behaviour, intellectual thinking, creativity and ability to solve the problem and also attention and duty (Mokhtari, Amini, & Mottaghi, 2014). The space inside the classroom, the existence of objects such as air conditioner, light, chairs, desks, etc. that make students feel comfortable during learning, and the supportive aidance from LCD projector, computer, and internet connection to make learning more interesting, are very essential to reach the learning outcomes above.

The importance of critical thinking has been acknowledged in educational field. As cited in Hongladarom (2002), it is widely known that students' ability to think critically is agreed upon educators and educational policy makers as one of the goals of education. As what the experts had defined about critical thinking in the previous context, it is clear that critical thinking can be seen as a series of processes based on one's skill to use knowledge to make reasoning and through reflection where in the end used to solve the problem.

Now the question is what factors influence one's ability to develop this skill and to perform these series of processes? The answer to that question is many and varied. Social practice (Heath, 1983) and certainly through learning would be the



highest influence when students develop their critical thinking. While through learning itself, there are many aspects in learning considered important such as current teaching practice, instructional techniques, learning spaces, facilities, etc. When students are able to learn properly inside classroom, it surely will reflect on their learning outcomes, which in this case will be seen in their critical thinking skills. For that reason, in this research the researcher assumes that there is significant relationship between learning environment and students' critical thinking.

**Table 2.2 The Conceptual Framework**

No.	Variable	Definition	Data Collection Techniques
1.	Learning Environment (Independent Variable)	To conclude, a physical learning environment is regarded as a conventional classroom where teaching and learning usually takes places and is composed of many elements.	Questionnaire adapted from the theory of "Affordance for Students" by Gibson (1997) and elements of physical learning environment proposed by Mokhtari, Amini, & Mottaghi (2014) with total fifteen statements.

No.	Variable	Definition	Data Collection Techniques
	Students' Critical Thinking (Dependent Variable)	Critical Thinking is a skill to process the knowledge to make reasoning and complete consideration where in the end making a conclusion to solve a problem	Questionnaire adapted from CCTDI based on seven dispositions of critical thinking: truth-seeking, open-mindedness, inquisitiveness, analyticity, systematicity, critical thinking self-confidence, and cognitive maturity. The questionnaire is made into fourteen statements

### Hypotheses

There are two hypotheses in this research as the following:

1. Null hypothesis ( $H_0$ ): There is no correlation between physical learning environment and students' critical thinking at English Education Department.
2. Alternate hypothesis ( $H_a$ ): There is a positive correlation between physical learning environment and students' critical thinking at English Education Department.