Chapter Two

Literature Review

This research talks about teachers' challenges and strategies in developing students' critical thinking at the EED of UMY. In this chapter, the researcher discusses and explores the definition of critical thinking, students' critical thinking, factors influencing critical thinking, and teachers' challenge to develop critical thinking. Then, previous related studies are added as the guideline for the researcher to conduct this research. Conceptual framework is also presented in this chapter to describe the highlight of this study.

Definition of Critical Thinking

Critical thinking has been defined in many different ways. Some scholars have described critical thinking which is frequently correlated to analyses and problem solving. Chance (1986) 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). In addition, instead of the simple act of receiving information and then accepting it, critical thinking involves an active process of thinking and analyzing what we receive (Fisher, 2001). It means that the purpose of critical thinking is to analyze what we receive, to achieve understanding, to evaluate view-points, and to solve problems effectively.

Critical thinking is a process where students improve their thinking quality using an active and careful way considering something. Dewey (1909) as cited in

Fisher (2001) defined critical thinking as "active, persistent, careful consideration of a belief or supposed form of knowledge in the lights of grounds which support it and the further conclusions to which it tends" (p. 9). Furthermore, Fahim and Pezeshki (2012) described critical thinking as a thinking process that requires reasons as well as reflection, and rejects blind acceptance of others' opinions. It means that a critical thinker will not easily accept others' ideas and will prefer to use their knowledge to make reasons and deep consideration before making a conclusion or judgment to solve a problem.

In higher education, critical thinking is a skill that should be mastered by students so that they can make thoughtful life decisions, solve problems creatively and rationally, understand and analyze knowledge in and across disciplines. Based on the aforementioned definitions of critical thinking, it is clear that critical thinking is a skill that helps students to solve problems and to make decisions effectively.

Characteristics of Critical Thinkers

Critical thinking was first highlighted by Benjamin Bloom's taxonomy a few decades ago (Duron, Limbach, & Waugh, 2006). A higher level of cognitive abilities involving critical thinking is a feature in the analysis, synthesis, and evaluation levels while lower levels of cognitive abilities that are knowledge, comprehension, and application only involve remembering, relating and applying information respectively (Duron, Limbach, & Waugh, 2006). The lower levels of critical thinking require less thinking skills while the higher levels require more

thinking skills. Duron, Limbach, and Waugh (2006) further described critical thinkers as those who are able to analyze and evaluate information. They noted that critical thinkers are those who are able to raise vital questions and problems, formulate them clearly, gather and assess relevant information, use abstract ideas, think open-mindedly, and communicate effectively with others.

In brief, critical thinking is individuals' ability to think clearly, rationally and make correct decisions independently. It means that a critical thinker will not easily accept others' ideas and will prefer to use their knowledge to make reasons and complete consideration before making a conclusion to solve a problem. Moreover, Kurland (2000) argued that critical thinkers are active, not passive. They ask questions and analyze. Students considered as critical thinkers consciously apply strategies to find the meaning or assure their understanding. They are willing to have new ideas and know others' perspectives. Kurland (2000) further explained that students are considered as critical thinkers if they meet the following requirements, namely rationality, self-awareness, open-mindedness, discipline, and judgment. First, rationality refers to thinking skills relying on reasons rather than emotions, supported by evidences, and focusing on finding the best explanation. Second, self-awareness recognizes our own assumptions, prejudices, biases, or points of view. Third, open-mindedness is a situation when students consider a variety of possible perspectives or viewpoints, accept a new explanation, model, or paradigm and do not reject unpopular views easily. Fourth, discipline means students' thought or idea must be precise, careful

and comprehensive. Last, judgment emphasizes the importance of recognizing the relevance of alternative assumptions and perspectives.

Factors Influencing Critical Thinking

There are factors influencing students' critical thinking in basic education institution. The factors consist of personal factors followed by other factors. Alfaro-LeFevre (2004) identified age as one of the personal factors that influences critical thinking. The increasing of someone's age influences a higher level of critical thinking. The increasing of age makes someone have more opportunities to practice in many different situations. It is because critical thinking skills develop through experiences or education. According to Purvis (2009), another aspect which enhances critical thinking is personal characteristics such as curiosity, confidence, and perseverance.

Curriculum design is another key factor in promoting critical thinking. Purvis (2009) stated that curriculum design has an impact on the development of critical thinking skills. Besides, integrative learning activities are the other influencing factor of critical thinking. Learning activities including tests, case studies, and simulations help students to bring knowledge and experiences together in their learning process to achieve understanding and consequently improve their critical thinking skills. Meyers (1986) suggested that teaching activities such as debates, presenting problems, and small group work lead to higher critical thinking skill development. Bransford, Sherwood, and Sturdevant (1987) stated that a key to develop students' critical thinking skills is through

enhancing their ability to define problems precisely, and then to dissect problems into manageable portions.

Students' comfort level and learning environment are the other factors influencing critical thinking skills. Shea and Bidjerano (2009) suggested that a crucial factor in developing critical thinking depends on the students' comfort levels and instructors. Teachers should help the students to gain their comfort and confidence during learning the activities which enable the students to develop their critical thinking skills. People who are relaxed, comfortable, and positively stimulated are known to be more creative and innovative. Therefore, the learning environment can influence the development of critical thinking ability (Mortellaro, 2015). The learning environment in the classroom plays an important part in encouraging critical thinking among the students in order to provide a conductive learning environment.

Indeed, different types of tests or assessments can promote critical thinking abilities in various ways. Purvis (2009) interviewed students and findings identified that testing or assessment methods influence the development of their critical thinking skills. Other unique technologies such as gaming have also been utilized as a teaching strategy in education and have been positively perceived by the students. The teaching strategy also promotes active learning, and therefore enhances the students' critical thinking (Royse & Newton, 2013). This may be another component of active learning that may influence the development of critical thinking skills.

Advantages of Being Critical Thinkers

Developing the ability to think critically is an essential life skill. Many studies have been done to determine the benefits of critical thinking. Mahyuddin, Lope-Pihie, Elias, and Konting (2004) stated that language learners with critical thinking skills are able to think critically and creatively, make decisions, and solve problems, understand language or its contents, and treat thinking skills as lifelong learning in order to achieve the goals of the curriculum. Therefore, students who have developed critical thinking skills will have better understanding from what they learn, and solve problems effectively.

Tishman (2008) wrote that there are many reasons why students must learn to think skillfully so that they can make thoughtful life decisions, solve problems creatively, and understand as well as analyze knowledge in and across disciplines. To do any of these things well, students need to become adept at thinking things. To be successful in the future, students need to possess abilities to create and evaluate information, to solve problems, and to make effective decisions.

Critical thinking is important for students to get better learning. It is echoed by Elder and Paul (1994) saying that critical thinking is someone's ability of developing appropriate criteria to analyze their own thinking. They also stated that the ability to raise vital questions, gather relevant information, determine findings, and communicate effectively that a good critical thinker has will able to

solve a complex problem. Hence, it can be said that critical thinker can solve their problems more effectively and efficiently.

Students will be able to gain in-depth understanding of subjects which they are learning, and apply what they have learned in real life. If students are able to think critically, they will be able to perform well at class. Critical thinking is a type of higher order thinking which is not only memorization of materials but also the use of learning materials in new situations (Pikkert & Foster, 1996). Ardington (2010) stated that students having an ability to think critically will achieve better marks and become less dependent on teachers and textbooks. Furthermore, according Choy and Cheah (2009), students with higher levels of critical thinking skills have better abilities of information processing, organizing, deduction, inference, exploring, and openness to experience. Therefore, students who have developed critical thinking skills are capable of doing some activities of which other students may not be capable.

Strategies in Developing Critical Thinking

There are various strategies that teachers can use in order to develop students' critical thinking. According to Walker (2003), there are three strategies that can be used in developing students' critical thinking. The first strategy that can be used is questioning. According to Groisser (1964), the purpose of the questioning strategy is to stimulate students' interests, test their progress, promote understanding, develop new insights, and stimulate logic and critical thinking. For example, the questioning strategy such as calling on students to answer questions

can enhance students' critical thinking. When the students are asked by the teacher, they may use various critical thinking skills such as interpretation, analysis, and recognition of assumptions to make a conclusion. There is not any right or wrong answer because the answer depends on the students understanding. Therefore, the use of the questioning strategies in learning activities helps teachers to evaluate students' knowledge and understanding.

According to Walker (2003), the second strategy is classroom discussion and debates. Discussion is the way to ask the students to get involved in a group and talk about a certain case. Classroom discussion and debates can develop students' critical thinking. In classroom discussion and debates students must analyze, synthesize and evaluate the knowledge they have acquired in order to discuss and organize their points of view of an argument or topic then they are able to discover new information and put knowledge into action. Hence, this activity is believed as a component lifting students' critical thinking.

The third strategy based on Walker (2013) is writing assignments. These assignments can foster students to think and make conclusion into a written form of their understanding. These activities promote critical thinking among students because they should present their understanding and their conclusions into a written form.

Another strategy that can be used is problem-based learning. Krulik and Rudnick (1984) defined problem solving as the use of previously acquired knowledge, skills, and understanding of an individual to encounter unfamiliar

situation. Furthermore, Bransford and Stein (1984) stated that problem-based learning needs students to identify what they know and need to know, define problems, generate solutions, and test as well as evaluate their solutions. There are a number of benefits of this strategy in learning activities. Problem-based learning increases students' motivation, and promotes higher order thinking (Torp & Sage, 1998). Hence, using problem-based learning will encourage students to make better decisions, and will also challenge their intuitive mind to process and evaluate their decisions and thinking to solve their problems.

Challenges to Develop Students' Critical Thinking

One of the ongoing debates in education research is whether students can learn to think critically through their own exploration or they need to be formally taught the skill as part of the curriculum. Sternberg and Williams (2002) noted that critical thinking may not need to be taught as thinking is a natural process carried by everyone. However, Black (2005) argued that students are able to improve their thinking skills if they were taught how to think. It is a skill that can be improved and boosted by practice (Wood, 2002). Therefore, although students have a natural ability to think critically, it is important for teachers to guide them in order to develop their skills.

Nevertheless, some teachers do not know steps to take in their learning activity in order to improve their students' critical thinking skills. For one reason, the teachers may not have mastered critical thinking so that the students cannot develop this form of thinking well. Paul (1987) argued that many teachers lack

clear concept of critical thinking. It will be challenging for teachers to develop students' critical thinking when they do not understand what critical thinking is. Hence, teachers need to improve their understanding of the concept of critical thinking to enable them to effectively teach student to think critically.

If the teachers do not have clear understanding of critical thinking, they will find difficulty in incorporating aspects of critical thinking into their learning activities. According to Choy and Cheah (2009) teaching critical thinking is challenging because teachers have difficulty in engaging critical thinking aspects in their lessons. Critical thinking is equated to higher order thinking skills of Bloom's Taxonomy: analysis, synthesis and evaluation, and teachers find difficulty in incorporating these levels into their lessons (Choy & Cheah, 2009). It is difficult to design learning activities that meets the needs of all learners, and to seek out strategies to foster students' ability to learn and process information. Hence, students may not be able to think critically because their teachers are not able to integrate critical thinking into their daily practice.

Lack of training or practices and lack of critical thinking resources are other barriers which make teaching critical thinking is challenging. Lack of training can impede the integration of critical thinking in education (Snyder & Snyder, 2008). In addition, Southwest Educational Development Laboratory (1988) argued that little training especially in teacher training programs is devoted specifically to how to teach thinking skills. Many experienced teachers are not trained in critical thinking methodology so that they have difficulty in incorporating critical thinking into their lesson. Thus, by having practices and

training in critical thinking methodology, the teachers can develop their skills in critical thinking. Moreover, according to Mimbs (2005), many teachers lack adequate resources. Only a few provide critical thinking resources (Scriven & Paul, 2007). Teachers do not have a wide variety of learning activities due to lack of existing resources. These various barriers of critical thinking explain why lecturers and instructional strategies that emphasize information dissemination are still the dominant style of teaching in today's classroom (Choy & Cheah, 2009; Snyder & Snyder, 2008; Southwest Educational Development Laboratory, 1988).

Another challenge faced by teachers to develop students' critical thinking is that students have passive behaviors in the classroom. Passive means that the students expect the teachers to provide all of information instead of having to find the information by them and also they keep quiet and do not participate in classroom activity. The students are also lack of language mastery and confidence to express their ideas, and many of them are also overly examination oriented. According to Choy and Cheah (2009) students are very passive in learning activities as they are not taught how to think critically since the early age. Furthermore, Paul (1990) revealed that most students are accustomed to sitting back in class passively, and listening to lectures because they are trained in schools to memorize the information, and not to think critically. They expect that that their teachers will provide all the pertinent information that students need (Choy & Cheah, 2009). Paul (1990) also added that students are used to passing classes and tests without thinking critically. They also rely on their teachers to provide them information. Consequently, this habit stunts their ability to analyze.

Therefore, developing students' critical thinking is challenging when teachers meet students who have passive behaviors in the learning activities.

One of the biggest challenges to teach critical thinking is time constraints. According to Mimbs (2005), the challenge of using critical thinking in learning activities is that it takes time and efforts. Critical thinking is a learning process that needs to be constantly practiced and incorporated into daily lessons. Pogrow (1988) stated "it takes an extensive amount of time to produce results… at least 35 minutes a day, four days a week, for several months, for true thinking skills development to occur" (p. 26). Furthermore, Way and Nitzke (1998) discussed an infusion model for teaching critical thinking, and emphasized that critical thinking skills take time to develop and are difficult to measure. Hence, teaching critical thinking is challenging for teachers because it takes a lot of time, and patience. On the contrary, students just want simple solutions that do not require much time and many efforts.

Review of Related Studies

Several studies on critical thinking have been conducted. Firstly, Zachary (2011) undertook research to find out if the implementation of critical thinking would improve academic achievement. The method used in this action research is qualitative and quantitative method approach. The participants of this study were 45 students. The finding of this research showed that teaching critical thinking takes a lot of time, patience, reflection, and practice.

Secondly, another study related to this research was carried out by Mimbs (2005). This study was designed using qualitative and the research participants were 25 teachers. The result showed that the challenges of using critical thinking in the classroom were that the students were only interested in points, the strategy took time and needed many efforts, and the teachers were lack of adequate resources.

Another study was also presented by Aliakbari and Sadeghdaghighi (2012). Their research was about the barriers to implementing critical thinking skills in classes. It aimed at seeing factors which teachers perceive as barriers of the use of critical thinking strategies in the classroom. This research involved 100 English educators as the participants. The method used on this research is quantitative by distributing questionnaires. The findings revealed that students' attitudes and expectations, self-efficacy constraint and lack of critical thinking knowledge among teachers were reported as major obstacles in teachers' view.

Those three reviewed studies have correlation to this study which focuses on challenges in developing critical thinking. However, this research also has some differences from the related studies. Besides discussing the strategies in developing students' critical thinking, this research also attempts to find out the challenges in apllying the strategies so that findings of this research can be a reference for teachers when they teach their students.

Conceptual Framework

This study aims at finding the strategies that teachers applied and challenges that teachers face to develop students' critical thinking at the EED of UMY. Critical thinking was firstly highlighted by Benjamin Bloom's taxonomy a few decades ago (Duron, Limbach, & Waugh, 2006). It was perceived that a higher level of cognitive abilities involving critical thinking was a feature in the analysis, synthesis, and evaluation levels while lower levels of cognitive abilities which are knowledge, comprehension, and application only involve remembering, relating and applying information respectively (Duron et al., 2006). They described that critical thinkers are those who are able to analyze and evaluate information. Indeed, it is not easy for students to be a critical thinker, and teachers should assist the students to develop students' critical thinking.

There are various strategies that teachers can use in order to develop students' critical thinking. The first strategy that can be used is questioning. To answer the question asked by teacher the student may use various critical thinking skills such as interpretation, analysis, and recognition of assumptions to make a conclusion based on their understanding. Therefore, the use of the questioning strategy in learning activities helps teachers to evaluate students' knowledge and understanding of their thoughts and others.

The second strategy is classroom discussion and debates. Classroom discussion and debates can develop students' critical thinking. In classroom discussion and debated students must analyze, synthesize and evaluate the

knowledge they have acquired in order to discuss and organize their points of view of an argument or topic then they are able to discover new information and put knowledge into action. Hence, this activity is believed as a component lifting students' critical thinking.

The third strategy is writing assignments. These assignments can foster the students to think and make conclusion into a written form of their understanding. These activities promote critical thinking among students because they should present their understanding and their conclusions into a written form.

Another strategy is problem-based learning. Krulik and Rudnick (1984) defined problem solving as the use of previously acquired knowledge, skills, and understanding by an individual to encounter unfamiliar situations. Hence, using problem-based learning will encourage students to make better decisions, and will challenge their intuitive mind to process and evaluate their decisions and thinking to solve their problems.

Furthermore, the challenges that teachers face to develop students' critical thinking skills are varied. Paul (1987) argued that many teachers lack clear concept of critical thinking. It will be challenging for teachers to develop students' critical thinking when they do not understand what critical thinking is. Hence, when the teachers do not have a clear understanding of critical thinking, they will get difficulty in incorporating aspects of critical thinking into their learning activities. According to Choy and Cheah (2009), teaching critical thinking is challenging because teachers have difficulty in engaging aspects of

critical thinking in their lessons. In addition, lack of training can impede the integration of critical thinking in education (Snyder & Snyder, 2008). Therefore, by having practices and training in critical thinking methodology, teachers can develop students' critical thinking. Moreover, according to Mimbs (2005), many teachers are lack of adequate resources. Teachers do not have a wide variety of learning activities due to lack of existing resources. Another challenge to develop students' critical thinking is that students have passive behaviors in the classroom. According to Choy and Cheah (2009), students are very passive in learning activities as they are not taught how to think critically since the early young age. Furthermore, Paul (1990) revealed that most students are accustomed to being passive and listening to lectures. It is difficult to develop students' critical thinking when teachers meet passive students. Another challenge of teaching critical thinking is time constraints. Using critical thinking in learning activities takes much time and many efforts (Mimb, 2005: Pogrow, 1988; Way &Nitzke, 1998). Critical thinking is a learning process that needs to be constantly practiced and incorporated into daily lessons. Hence, the researcher uses those expert justifications as the bases to conduct this research.

Figure 1. Conceptual Framework