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The relationship of preservice teachers' and faculty members' perceptions of critical thinking and their epistemological beliefs

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The relationship of preservice teachers' and faculty members' perceptions of critical thinking and their epistemological beliefs

Abstract

The term "critical thinking" has recently been used in the Ethiopian educational policy documents as well as in its teacher education curricula. Even though the concept has been given a central importance by being the central goal of education at all levels, a well established understanding and practice of nurturing critical thinking at school level, as well as at teacher education and training curriculum has not been achieved yet. From the personal experience both as pre-service teacher and then as teacher educator in Bahir Dar university, one of the teacher education institutions in the country, I have observed, especially during pre-service teachers' practical training, that the very lack of scientific understanding about what critical thinking refers to and the misconceptions associated with it play great role in how they ineffectively grasp the how of organizing learning experiences, prepare lesson plans and execute them.

This study is designed to investigate what pre-service teachers as well as teacher educators in the Department of Pedagogical Sciences believe critical thinking is. One hypothesis investigated in the proposed study is that critical thinking is related to epistemological beliefs. Therefore, participants' epistemological beliefs will be measured by Schraw, Bendixen, and Dunkle's (2004) "Epistemological Belief Inventory" (EBI) and analyzed in relation to their beliefs about critical thinking. Emphasis will also be given in assessing the difference among the different levels of pre-service teachers and their instructors to see if there are any similarities and differences with respect to both the idea of critical thinking and the what and how of knowledge.

The Relationship of Preservice Teachers' and Faculty Members' Perceptions
of Critical Thinking and their Epistemological Beliefs

*A Research paper for the partial fulfillment of Master of Arts in Educational
Psychology: Professional Development for Teachers*

By:
Meskerem Debele

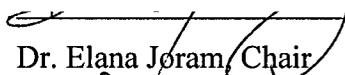
Department of Educational Psychology and Foundations
University of Northern Iowa
July, 2008

The Relationship of Preservice Teachers' and Faculty Members' Perceptions
of Critical Thinking and their Epistemological Beliefs

*A Graduate Research Paper
Submitted In Partial Fulfillment of the
Requirements for the Degree
Master of Arts in Educational Psychology:
Professional Development for Teachers*

Approved by:




Dr. Elana Joram, Chair


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July, 2008

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ABSTRACT

The term “critical thinking” has recently been used in the Ethiopian educational policy documents as well as in its teacher education curricula. Even though the concept has been given a central importance by being the central goal of education at all levels, a well established understanding and practice of nurturing critical thinking at school level, as well as at teacher education and training curriculum has not been achieved yet. From the personal experience both as pre-service teacher and then as teacher educator in Bahir Dar university, one of the teacher education institutions in the country, I have observed, especially during pre-service teachers’ practical training, that the very lack of scientific understanding about what critical thinking refers to and the misconceptions associated with it play great role in how they ineffectively grasp the how of organizing learning experiences, prepare lesson plans and execute them. This study is designed to investigate what pre-service teachers as well as teacher educators in the Department of Pedagogical Sciences believe critical thinking is. One hypothesis investigated in the proposed study is that critical thinking is related to epistemological beliefs. Therefore, participants’ epistemological beliefs will be measured by Schraw, Bendixen, and Dunkle’s (2004) “Epistemological Belief Inventory” (EBI) and analyzed in relation to their beliefs about critical thinking. Emphasis will also be given in assessing the difference among the different levels of pre-service teachers and their instructors to see if there are any similarities and differences with respect to both the idea of critical thinking and the what and how of knowledge.

1. Introduction

1.1. Background of the study

Much has been said regarding the concept of critical thinking and the need to develop the critical mentality among students of all levels for nearly a century (Budmen, 1967; D'Angelo, 1971; Glaser, 1985; Paul, 1990; Facione, 1990). Various studies have also been conducted regarding how to teach critical thinking and how to incorporate it in daily classroom activities. Despite the many efforts, however, research on critical thinking shows that much is still left to be done with regard to helping students and teachers internalize the true essence and disposition of critical thinking (Tsui, 2001; Comerford, et al., 2000; Facione, 2007). After studying the kind of critical thinking skills required in four disciplinary areas in an Australian University, Kirkpatrick and Mulligan (2002) came up with the potentially troubling fact that many subject areas do not demand students to read and learn critically, and that students are still succeeding in school without any demonstration of analytical skills in most of their academic years.

A study conducted by Paul, Elder, and Bartell (1997) in 38 public and 28 private universities in California also assert that the majority of teacher education faculty, although claiming critical thinking to be their priority, could not give clear description of what it is, what traits it refers to, or how they incorporate activities in their classrooms that help students develop their critical thinking skills. Reports of similar studies conducted in other countries also show that there is still unsatisfactory curricular effort devoted to critical thinking despite great efforts to reform educational systems (Bowers, 2004; Gauch, 2006).

The case of Ethiopian education is probably among the worst; it is only since a few decades ago that the education system started to be criticized for not inculcating and nurturing the critical thinking ability in students at all levels. The modern western education system, which is nearly a century old phenomenon in the country's history, is still influenced by the traditional education system which existed for several centuries under the auspices of the Ethiopian Orthodox Tewahedo Church (EOTC), the Mosque, and informal village networks. The first (elementary) level of the traditional education system of EOTC, for instance, was mostly based on rote memorization of sacred literatures and strict relationship between the teacher and the student, which blocked two-way communication and inquiry. The impetus of the more advanced levels of the education system which involves creativity and higher order thinking skills (as in the case of "*Guba'eyat*", which needs critical evaluation and validation of scripts as well as "*Qene*", which needs creative synthesis of literatures), were not adopted into the modern education system. This impeded the growth of the currently adopted formal education system which needed the critical disposition in students to make genuine learning and behavioral change possible.

With the change in the underlying philosophies of the social, economic, and political structure of the country, a major paradigm shift occurred in the education system, especially regarding what should be the result of the education system and how it should be achieved. The need of technological and scientific advancement was emphasized as a major goal of the education system starting from the beginning of the promotion of modern education during the emperor's reign, during the socialist regime (1974-1991), and the present government (from 1991 to the present). Over and over

again, education was defined and introduced to the society as a tool out of “ignorance’, “backwardness”, “darkness” and so on which were labeled as things manifested by a society that does not have an advanced technology (Kebede, 2006; Wagaw, 1979). For such advancement to be realized the creative and inventive mind which dares to break out of the culture of common sense and social consensus was underscored as important. With this, the concept of scientific thinking, inquiry based education, and reflective thinking were slowly accommodated into the educational policy until finally the concept of critical thinking was explicitly mentioned as one of the major goals of the education system (MOE, 1994).

The present Ethiopian government exhibited greater commitment to improve the education system to make it capable of producing critical thinkers and problem solvers. Since the educational policy publication- the Education and Training Policy (MOE, 1994) stressed that critical thinkers and problem solver citizens should be the primary products of the education system, textbooks, syllabus guidelines, and teacher education blue prints were modified in such a way that they potentially allow room to practice learning experiences that are geared towards developing higher order thinking skills and problem solving abilities. However, the assessment mechanisms are still largely not different from the traditional “jug-and-mug” approach instead of the more appropriate open ended assessment format. Claiming that the entire impetus of the education system can change to a more productive, democratic, and inquiry-based education, subsequent policies and strategic plans, such as the Teacher Education System Overhaul (TESO) made many content and structural changes in various teacher education programs of Ethiopia, expecting a better quality of teacher education by emphasizing an active learner-centered

education, teaching that directly makes changes in people's lives, taking the real world into the classroom, taking teachers out into the real world, and democratizing teacher education by giving teachers, students, and citizens confidence to make decisions and take initiatives (Teferra, 2006). Lots of professional programs have also been designed to help teachers and teacher educators develop their understanding about lively teaching skills and nurturing active and critical dispositions among students.

Many attempts have been made in Ethiopia to change the teacher-centered and rigid-knowledge-based curriculum, mainly by promoting interactive and learner centered approaches of teaching. However, the result attained so far in developing critical thinking among both K-12 learners and preservice teachers through formal education appears to be limited (Tessema, 2006; Dufera, 2005), due to reasons such as inconsistent policy implementations (Tessema, 2006) and low quality of input (e.g., teacher-student ratio) (Dufera, 2005). Formal education, though it is the place where students spend most of their time, is the least effective system in inculcating critical thinking abilities among students when compared to other informal and non-formal individual experiences students have within the social organization, both in the school and outside of it. This is apparent in the relative absence of systematic assessment mechanisms in the school system as mentioned above, which shows that there is usually no deliberate effort in teaching thinking skills in the first place. Various reasons can be specifically pointed. The relative infancy of the systematic effort to promote the concept of critical thinking in both K-12 and higher education by itself may be one reason for the unsatisfactory development. Another reason can be the lack of financial, technical, and material resources to implement professional development programs effectively and efficiently for

all teachers. The unfavorable realities in school environments, such as high teacher-student ratio and unavailability of adequate educational materials, have also impeded the very application of interactive teaching learning systems and learning experiences that promote critical thinking. The low quality of the teacher education, which more often than not fails to acquaint students with relevant educational ideas, practices and values, also plays a considerable role. Several other factors can be listed which co-exist and even pose cyclical problems to the development of higher order thinking skills among students of different levels.

However, I believe that the lack of proper understanding of the basic essence of critical thinking is equally, if not more, important to the less satisfactory result so far achieved with respect to embedding critical thinking in academics. Knowing and internalizing the basic cognitive and affective implication of the term “critical thinking” is an essential teaching-learning input which is most of the time taken for granted by policy legislators and teacher educators. While much is said and written about the side-effects of teacher-centered education, passive learning experiences, and lack of critical thinking skills, attempts to clarify what critical thinking is and how it is exhibited are relatively scanty. Would-be teachers as well as teacher educators should be well familiar with cross-cutting ideas like critical thinking which is desperately needed to be infused in to the K-12 education system. It is suggested here that it is very important for preservice teachers and teacher educators to be clear on what they are looking for from their respective students regarding the behavioral disposition and the cognitive and affective component of their thinking and overt performances. Therefore, the need to know how the basic thought process involved in critical thinking is perceived by pre-service teachers

is tremendous. Thus, this study primarily focuses on how preservice teachers understand critical thinking and how it is cognitively and behaviorally manifested.

1.2. Statement of the Problem

Because the major impetus to consider critical thinking and problem solving as major outcomes demanded from the teaching-learning process came in reaction to the traditional teacher-centered system, it is absorbed by and seen together with every other aspect of the student-centered method, such as increased participation of students in the classroom, various active learning methods, encouragement of skepticism, and open-ended contents. This, in the view of the researcher, may have overwhelmed the need to give attention to potential modifications, none of which end up being appropriately defined and clarified. This has given rise to one predominant notion among many preservice teachers with whom the researcher had worked; i.e., critical thinking is all about questioning the correctness of what is taught in the classroom or read from books. This view, though to some extent is one of the essential tenets of critical thinking, does not have any implications or guidance towards possible ranges of actual modes of thinking the learner should be familiar with in order to continue refining his/her knowledge system. Besides, the simultaneous introduction of different aspects of student-centered learning and active teaching methods, such as group discussions, brainstorming, presentations, and so on, has facilitated the conception of critical thinking as a spontaneous outcome of such activities.

One piece of evidence for the prevalence of this notion is the experience I had with many second- and third-year students in the Department of Pedagogical Sciences at

Bahir Dar University during their field-practices in the surrounding secondary schools in years 2004/2005 and 2005/2006. After exposing their students to a student-centered activity in the respective subjects they teach, the student-teachers usually seemed to demand mere conclusions and final answers of an individual student or group of students without any attempt to inspire students to give logical explanations or to argue by providing examples, evidences, and reasons. Moreover, they made no attempt to assess whether students were engaged in critical thinking, problem solving, or higher-order thinking of any sort while participating in such classroom activities. This might be an indication of the lack of understanding among significant numbers of pre-service teachers, and possibly of teacher educators themselves, regarding the general essence of critical thinking. As it will be explained in chapter two, such notion has an intricate relation with beliefs about what knowledge is and how it is attained (epistemological beliefs).

Because assessment in the university, like every other tertiary institution in Ethiopia, is primarily geared towards evaluating students' mastery of content areas, and because there is no comprehensive assessment system independent from the academic departments that assess all-round cognitive and affective development of students, it is not likely for one to find any data on critical thinking skills, be it the perception or the actual level of the skill exhibited among pre-service teachers and teacher educators. This has inspired the researcher to conduct a study on the perception of critical thinking among and epistemological beliefs of pre-service teachers and teacher educators in Bahir Dar University Department of Pedagogical Sciences. More specifically, the study will examine how they think critical thinking is cognitively/ practically manifested and their

epistemological beliefs. The possible impact of the perception of teacher educators and the teacher education curriculum in general will be analyzed by searching the perceptual similarities and differences, if any, among preservice teachers of different year levels and that of teacher educators in that particular department.

1.3. Research question

The three main questions the study will attempt to answer are:

- What kinds of beliefs do preservice teachers and faculty members have about critical thinking?
- Is the level of understanding among pre-service teachers and teacher educators regarding what cognitive and affective dimensions the term “critical thinking” refers to related to the level of sophistication of their epistemological beliefs?
- What difference exists among pre-service teachers of different year levels and faculty members regarding their understanding of critical thinking skills and dispositions and/or their epistemological beliefs?

1.4. Significance of the Study

Understanding how preservice teachers and teacher educators in the Pedagogical Sciences Department of Bahir Dar University perceive the term “critical thinking” and what kind of general thought process it implies will help point out what particular insights, confusions, and misconceptions pre-service teachers have regarding critical thinking. Insight into their epistemological beliefs is also an important clue to suggest what learning experiences, contents, and instructional methods teacher educators may

need to use in order to enhance the development of critical thinking skills among would be teachers and their future students.

1.5. Delimitation of the study

Because there is no course area or special training/educational program that is exclusively dedicated to thinking skills and epistemological knowledge, potential differences among different levels of pre-service students can be assumed to be the result of increased exposure to different courses of pedagogical sciences such as educational psychology, teaching methods, and educational measurement and evaluation. Due to the fact that many factors may come into play in shaping the knowledge and attitude of college students, however, including teaching style of a particular teacher, non-academic experience, age or mere knowledge about critical thinking and philosophies about knowledge and knowing from other sources, a more comprehensive study is needed to point out the real reason behind possible differences. Thus, the major emphasis of the current study will be limited to identifying the predominant notion and common misconceptions (if any) about the essence of critical thinking and assessing the prevalent level of sophistication of epistemological beliefs among the participants.

The population of the study is presently limited to students and instructors of the department of Pedagogical Sciences in Bahir Dar University to ensure the timely accomplishment of the data analysis. The department of Pedagogical Sciences is also chosen because of the fact that it is this department that is engaged in providing courses related with how to teach to the entire preservice teachers of the faculty of education. Thus, relatively better understanding of the prevalent notion associated with critical thinking and epistemological beliefs can be obtained.

2. Literature Review

2.1. Brief introduction to the concept of critical thinking

The term “critical” is derived from two Greek root words, “kriticos”, meaning “discerning judgment,” and “Kriterion,” meaning “standards”, thus giving the idea of having a sense of “discerning judgment based on standards” which, when applied to thinking describes an attempt to make “well-founded judgment” that “utilizes appropriate evaluative standards in the attempt to determine the true worth, merit, or value of something” (Paul, Elder & Bartell, 1997). The current concept of critical thinking has its root in the works of various philosophers and educators of both ancient and modern times.

The most notable prior attempts to systematically approach and apply critical thinking is the questioning method of Socrates, which was based on seeking evidence, closely examining reasoning and assumptions, analyzing basic concepts and tracing out implications of what is said and done (Paul, Elder & Bartell, 1997). His emphasis was on thinking for clarity and logical consistency through a mode of questioning that later came to be known as “Socratic questioning.”

Most of the works of the ancient and medieval philosophers, such as Socrates, Plato, and Aristotle, and the ideas of the philosophers of the middle ages, including Thomas Aquinas and Francis Bacon, were resistances to the contemporary universal sets of beliefs that were often accepted among the mass without satisfactory justification. Rusbult (2001) described the development of the concept of critical thinking as a result of such contradictory intellectual tendencies in history. The first one is a tendency on the

part of the majority to uncritically accept whatever is presently believed as more or less eternal truth; while the second tendency is the tendency of the small minority who thought to systematically question what was commonly accepted. Rusbult phrased the basic concept of critical thinking as “the art of taking charge of our own mind,” which requires the arts of “self-examination” and “self-discipline.” Wong (2007) gave a similar account of the etiology of critical thinking by specifically emphasizing how critical thinking stemmed out of the search for rationality during the enlightenment era. As he summarized, “...the central tenets of the Enlightenment were the belief that authority should be questioned, ignorance was the cause of many societal ills, the ability to reason was a natural and inherently good quality, and that the progress of humanity depend on reason” (2007:194).

Such notions of rejecting the irrational mind were given different names until the term “critical thinking” became widely accepted. One such terminology is “reflective thinking” which is still sometimes used interchangeably with the term critical thinking. After conducting a historical analysis of the works of theorists and educators Dewey (1933), D’Angelo (1971), Glaser (1985) and Seigel (1988), until the early 1990s, Streib (1992) showed that the term critical thinking has been used interchangeably with the term “reflective thinking”, which was first systematically defined and analyzed by John Dewey. However, critical thinking does not completely overlap with other related terms such as problem solving and creativity, even though it is considerably related with them (Streib, 1992). Recent theoreticians such as Paul (1993), Kitchener and King (2004) and Facione (2007) have also used the two terms interchangeably.

Streib's analysis brought to light four phases of the development of critical thinking marked by the works of influential theorists and educators. From one phase to the next, there are developmental changes that Streib claims critical thinking has gone through. The four phases are:

- A) The Thoughts of John Dewey (1910-1939) - during which Dewey introduced the concept of “reflective thought”, “inquiry” and “scientific method of thinking” in his book How we think. Dewey defined reflective thinking as “an active, persistent and careful consideration of any belief or supposed form of knowledge in the light of grounds that support it, and the further conclusion to which it tends” (Streib, 1992:7), and he claimed that two elements are involved in reflective thought;
- i. a stage of perplexity, hesitation, and doubt and
 - ii. an act of search or investigation toward bringing to light further facts which serve to corroborate or nullify the suggested belief (Streib, 1992).
- B) The Transitional Period (1940-1961)- during which authors like Edward Glaser, David Russell, and Othanel Smith described critical thinking as involving propaganda analysis, examining and seeking evidence to knowledge, and judging accuracy of statements. These theorists made the concept of propaganda analysis and assessment of underlying values and assumptions of the source of information more explicit than it was during the previous phase. The importance of properly comprehending what is claimed in speeches, lectures, and propagandas was emphasized by these theorists. The

transitional period was marked by the inclusion of “examination of statements”, as explicitly coined by Russell (1941) cited by Streib (1992), as an important aspect of critical thinking any citizen should be engaged in.

- C) From 1962- 1979- during which authors such as Robert Ennis, Karl Budmen, and Robert Rott described the practical implication of critical thinking as an assessment of statements and critical thinking as distinct from the scientific method. Budmen’s (1967) four stages of critical thinking are: 1) identification of basic assumptions, beliefs, feelings and values; 2) examination of all sides of the issue; 3) examination of all possible actions, and 4) decision (choice of alternatives), which were prominent at this phase. In addition to that, the term “evaluative critical thinking,” coined by Allen and Rott (1969) was also brought to attention, which refers to continuously going back and reflecting on an initial claim based on certain evidence.
- D) From 1980-1992- in which authors such as John McPeck, Harvey Siegle, and Richard Paul who brought to attention concepts and cognitive skills related to critical thinking, such as evaluation of value statements, rational thinking, meta-cognition, higher order thinking, and problem solving. The idea of critical thinking also incorporated what is mentioned by the theorists in the last phase, such as Richard Paul, as “critical spirit”, which is related to the consistent habit of searching for information/experience related to the tentative knowledge system.

2.2. Recent dialogues about critical thinking

Recent theorists and educators argue that critical thinking is intricately related to the context of the subject matter. Considering context in thinking and learning is, of course, by no means a recent phenomenon, even if it widely dominates the discussion of critical thinking recently. Early literatures that deal with considering context in critical thinking repeatedly refer to the importance of clarifying the goal for the task at hand, providing real life context while teaching/learning, incorporating the perspective of the subjective being that is at the center of the inquiry process and considering the unique epistemological approaches of the discipline (e.g. Paul & Scriven, 2007; Bailin et al., 1999; Reed & Kromery, 2001).

Plato (380 B.C.) wrote that the teaching of Socrates can be a good reference for understanding the importance of context in terms of pre-determined goals (Jowett, 2008). Socrates dealt with the idea of “paradox of knowledge” which says that either we already know what we are looking for, in which case we do not need to look, or we do not know what we are looking for, in which case we would not recognize it if we found it. This may mean that we usually set at the beginning a desirable goal for which we are striving and, based on that, we make sense of everything we learn or want to learn. Even if we encounter some kind of stimulus, object, event, or idea, we do not take a notice of the important aspect of it unless we have a pre-determined general direction that guides our observation and makes our learning real. Thus, this paradox suggests that we do not engage in exploring, inquiring or critical thinking for the sake of thinking only; rather, we do so in order to manipulate, alter, or use the phenomenon in a way that helps the direction we have already specified in our mind.

Socrates' idea can be seen in an immediate and specific context in terms of the second way of providing context to think critically. For instance, Schuster and Leland (2008) proposed that in order to teach science to elementary school children, one must provide direction to their observation by asking them to make comparisons of the same object of study in different contexts, such as a tree standing alone and a tree in a jungle, or a reflection of light with different levels of intensity. This, according to Schuster and Leland, helps them notice different features of the object they are looking at that they would otherwise not notice.

Perhaps the most widely discussed aspect of incorporating context in critical thinking is the type of discipline. Paul and Scriven (2007) showed that critical thinking is becoming responsive to various subject matter in such a way that historical thinking, mathematical thinking, scientific thinking, anthropological thinking, moral thinking, etc. are becoming more and more prominent in K-12 education. This contrasts with the previous conception of critical thinking as a universal process, that should be followed step-by-step by every student and every professional. Bailin et al. (1999) also explained that thought processes are intertwined with what is being thought about and that critical thinking, as a thinking process, is also a skill that is applied by individuals in accordance with the content at hand. Willingham (2007) strongly rejects the idea that critical thinking is a general skill that can be applied to any situation in a similar way once it is mastered by whomever is learning it.

Such a conception of critical thinking is widely growing, and more and more researchers and educators are now engaged in studying critical thinking from the perspective of a certain field (subject matter). For example, Freidler et al. (1990) studied

reasoning skills in science; Smith (2001) studied teaching critical thinking in geography through internet resources; Reed & Kromrey (2001) studied the use of critical thinking to develop students' primary resource analysis ability in history; Koyalik and Koyalik (2007) dealt with how to enhance critical thinking through analytical writing in language. This growing focus on critical thinking in the context of specific subject matter came out of a growing recognition of the "problem of transfer" (Bruer, 1993). This refers to the difficulties individuals face when transferring knowledge acquired in one context to a second context.

2.3. Commonly identified critical thinking skills and dispositions

Though the general essence of critical thinking is understood by many educators, it is still difficult to operationally define what critical thinking exactly means (Facione, 2007). However, educators such as Halpern (1999) say that although varieties of definitions of critical thinking have been offered, most include the same underlying principles. For example, there is broad consensus among critical thinking theoreticians that the educational goal is to prepare persons, particularly at college level, who are willingly and skillfully engaged in critical thinking (Facione, et al., 1995). This essence of independent thinking is also reflected by the early influential work of Perry (1971) which shows the role of reflective thinking and change in epistemological beliefs in helping college students form stable identity and their own value system to which they will be committed in their lives. Making reasonable decisions regarding what value system to be committed to is the ultimate purpose of critical thinking in many authors' view. In line with this, Ennis (1987) defines critical thinking as a "reasonable reflective

thinking that is focused on deciding what to believe or do” (p. 10). He also assumes that critical thinking includes “most or all of directly practical higher order thinking skills” (p. 11). In a similar notion of the relevance of critical thinking as a way of choosing among alternative sets of actions, Baron (1991, p.170) defined thinking as “conscious response to doubt or ignorance” which we perform when we are lost among different sets/courses of action.

In an attempt to differentiate between the general mental traits and the specific thinking tasks that are involved in critical thinking, various theoreticians and educators have agreed up on the two broad classifications of the constitutes of critical thinking: critical thinking dispositions and critical thinking skills.

2.3.1. Critical thinking dispositions

Although at the core of critical thinking is found the actual performance of the thinking through deduction, induction, inference, analysis, value judgment and other related skills, a description of a critical thinker or beliefs about critical thinking are usually in line with the descriptions of mental traits associated with critical thinking rather than the actual thinking skills themselves. Thus, in the review, much emphasis is given to the description of critical thinking dispositions rather than the critical thinking skills.

Various mental traits that should be exhibited by a critical thinker have been identified by different authors. These traits are described usually as general habits/trends of dealing with new information or a complex situation. Facione and his associates (2007) described these traits as “characterological attributes”. Weil (2004) referred to

them as “emotional intelligence”. Paul (1987) described them as “rational passions.” In many literatures, however, they are usually termed as “the affective dimension” or “thinking disposition” of a critical thinker (Ennis, 1987; Lipman, 1987; Paul, 1993; The American Philosophical Association, 1990; Stanovich & West, 1997; Paul & Scriven, 2007; the Critical thinking Community, 2007) .

Even though educators do not agree on the similarity of the definite critical thinking skills that are needed by people in different fields and from different perspectives, they tend to agree on the existence of certain dispositions that are pervasive in almost all situations that critical thinking is needed. Weil (2004) gave a concise but comprehensive list of these dispositions which are commonly found on critical thinking literatures. They are described below together with the other comprehensive lists given by American Philosophical Association (Facione, 1990), Paul (1993) and Stanovich and West (1997) and the work of others.

Self-authored thinking: Developing an investigative orientation

Weil (2004) described this disposition as “coming to ones own belief as to what to believe, act, decide, or do.” (2004:486). He underlines the importance of figuring things out for oneself which can be related to the caution an individual should make not to be displaced from his own root and be taken away by others’ claims, reasons, and/or evidences. This is some how similar with the previous works of the transitional period theorists which emphasize examination of statements as an important aspect of critical thinking. For a similar purpose, Ennis (1987) mentioned the importance of keeping into mind the original and/or the basic concern as an important disposition to the individual.

Empathy

The second disposition Weil (2004) explained is empathy which he defined as the “ability to actively, precisely, specifically and fairly recognize a point of view and articulate it, reason from its assumptions, and encapsulate its conclusion” (2004: 486). This, according to Weil, is the antithesis of avoiding the positions and points of view of others without understanding it properly. In relation to being open to new and potentially opposing view points, APA identified “open mindedness,” which is among the seven major dispositions identified, as remaining tolerant to divergent points of views and acknowledging one’s own bias (Facione, 1990). Stanovich and West (1997) gave a description of a flexible thinker which includes willingness to consider beliefs contrary to one’s own and openness to ideas. Paul (1987) gave a detailed description of this disposition as a particular skill that he termed as “dialogical thinking” which includes putting oneself in place of a real or imagined opponent and articulating their possible idea genuinely and reacting to it intellectually through skillful reasoning. He said for such skill, empathy and reciprocity are very important.

Humility

The notion of authentic acceptance that one does not know all there is to know about any topic is repeatedly termed by critical thinking researchers as “humility” (Weil, 2004). It includes self-questioning and setting a parameter of one’s intellectual capacity. APA termed the notion as “truth seeking” and gave a description which is partly similar; i.e., seeking the best knowledge in a given context and not stopping to look for additional

evidences, facts and reasons and being ready to change one's mind accordingly. The other description given to truth seeking by APA is somehow congruent with "open-mindedness" which is related with acknowledging one's bias and influence of prior conceptions.

Developing an insight into the nature of ego and socio-centric thinking

Weil (2004) identified this description as repeatedly used in literatures for the notion that was given to truth seeking and open-mindedness by APA (Facione, 1990). It is related with ruling out the influence of one's prior beliefs and points of view, as well as the group's point of view of which one is part of, in order to make a reasonable and fair judgment in case of new situations.

Courage

Courage is described as the intellectual audacity to examine one's own belief in light of what others believe (Weil, 2004). This is also a description that is grouped under "open-mindedness" in the APA's classification.

Integrity

This disposition is related with working out the disparity between one's standard of good thinking and the standard posed up on others as described by Baron (1991). Weil (2004) described this as "holding ourselves to the same standard that we hold others up to." In the APA classification, this has some commonalities with what is termed as "cognitive maturity" which includes being judicious in decision making especially in

situations that involve many stake holders and ill-structured problems and taking into consideration the special circumstances/contexts others are in (Facione, 1990).

Perseverance and Discipline

The two dispositions of systematicity and truthseeking (Facione, 1990) are partly reflected in these two terms which, according to Weil (2004), are repeatedly used in critical thinking literatures. They represent pursuing one's goal despite the obstacles and the frustrations that one may face. Weil's description also has a component of tolerating ambiguity, complexities and uncertainties which are grouped under "flexible thinking" by Stanovich and West (1997). Weil described tolerance for ambiguity as a separate entity.

Curiosity

Curiosity and inquisitiveness (Facione, 1990) refer to going beyond simply looking for evidence and answers to an already faced problems and making noble questions which may lead to different answers.

Achieving self-esteem through faith and confidence in the ability to develop critical reasoning

APA (Facione, 1990) identified the term "critical thinking self-confidence" for the disposition that is described by Weil as believing in the capability of reasoning in advancing human progress, in the need to develop one's competence in reasoning and in the importance of continuously evaluating one's progress in that regard. Another affective dimension given by APA is "analyticity," which has some commonality with

critical thinking self-confidence. Analyticity refers to believing in reasons and being predisposed to seek, weigh and give reasons and evidences for one's own or others' claims.

Other terms

Other terms that Weil (2004) mentioned are responsibility, which is related with commanding one's own learning; civility, which is related with the ethical way of disagreeing with others; and imagination, which is related to dreaming and exploring things that were never thought that way.

2.3.2. Critical thinking skills

The lower to higher order thinking skills classification of Bloom is considered by most as one of the first attempts to depict how critical thinking skills materialize. The APA gave 6 classifications of critical thinking cognitive skills and their sub-skills (Facione, 1990:6).

- Analysis – which includes the sub-skills of examining ideas, identifying arguments and analyzing arguments
- Interpretation- which includes categorization, decoding significance and clarifying meaning
- Evaluation- which includes assessing claims and arguments
- Inference- which includes querying evidence, conjecturing alternatives and drawing conclusions

- Explanation- which includes stating results, justifying procedures and presenting arguments, and
- Self-regulation-which includes self-examination and self-correction.

Perhaps, the most elaborate and comprehensive classification of critical thinking skills which gave way to the recent taxonomies of critical thinking is given by Robert Ennis (1987) who gave eleven major critical thinking skills with numerous sub-skills. The thinking skills are: focusing on a question, analyzing arguments, asking and answering question of clarification and/or challenge, judging credibility of resource, observing and judging observation reports, deducing and judging deductions, inducing and judging inductions, making value judgments, defining terms and judging definitions, identifying assumptions, deciding on an action and interacting with others.

2.4. Epistemological beliefs and their relation with critical thinking

2.4.1. Brief definition of epistemology and epistemological beliefs

Hofer and Pintrich (1997) described epistemology as “an area of philosophy concerned with the nature and justification of human knowledge” (1997, p. 88). From the psychological and educational point of view, Hofer (2002) described it as concerned with peoples’ concept of the type of knowledge and the means of acquiring it.

Some researches like Paulsen and Wells (1998) claim that epistemological beliefs vary among people in different disciplines where as others like Barnard (2007) found no evidence of substantial difference in epistemological beliefs across faculty members of forty-six academic disciplines. However, epistemological beliefs are generally believed to vary across age, usually in a progressive direction (Perry, 1971; Kuhn, et al.; 1983; Kuhn & Weinstock, 2002). Some researchers like King and Kitchener (2004) claim that epistemological beliefs are influenced by individuals’ unique life experiences as well as education. However, most researches claim that epistemological beliefs have relations with various cognitive constructs. Studies indicate that epistemological beliefs have a considerable impact on different aspects of the teaching learning process, such as beliefs about assessment (Shepard, 2000; Joram, et al.; 2006), information seeking behavior (Whitmire, 2004), and reasoning (Harmen, 1986).

2.4.2. The relationship between epistemological beliefs and critical thinking

Many researchers claim that cognitive dispositions of a critical thinker as well as his/her actual critical thinking skills are highly related to his/her epistemological beliefs.

Specially, the dispositional dimension (or the affective dimension) of critical thinking and epistemological beliefs are claimed to be highly related (Baron, 1985; Anderson, 1990; Kardash & Sinatra, 2003).

In his influential study of college students' intellectual and identity development, Perry (1971) found out that the intellectual development of adolescents is very relevant to their capacity to form their own identity and to settle their value system to which they will be committed as an adult. In Perry's nine stages of intellectual development, the ability to realize that truth is relative is found out to be an important input on which college students build their identity. This is highly related with the development of epistemological beliefs which grows with age and intellectual competence. His study paved the way to the understanding of the intertwined nature of cognitive ability and belief about the nature of knowledge and knowing.

Another influential work of Kitchener and King (2004) also showed the close relation between reflective judgment and epistemological beliefs. In the seven stages of development of reflective judgment, Kitchener and King showed how an individual could grow from relying on the senses as trustable sources of knowledge to relying on reasons, evidences, different perspectives and personal value systems as means of justifying what is believed to be true. Along the seven stages, Kitchener and King showed that the understanding of knowledge as uncertain, subjective, relative, complex, and not readily available is important to be engaged in a critical/reflective thought in search of reasonable and pragmatic basis by which the knowledge system can be justified. From their description of the seven stages, it is evident that the mental traits which are believed to be important for an engagement of a person in an actual reflective thinking grow along

the progress in the stages of reflective thinking. For instance, in the pre-reflective stage, which constitutes the first three stages given by Kitchener and King, the individual does not actively engage in examining an issue assuming that what is sensed is what is true or what is true is what is believed by authorities such as parents or teachers. But in the quasi-reflective thinking stage (stage 4 and 5), the individual understands that knowledge is subjective; and therefore starts to be engaged in relying on reasons and evidence to justify an already established belief or a context-specific situation. But at the reflective thinking stage (stage 6 and 7), the individual analyses the issue from his/her point of view, as well as from others', by being conscious of his/her biases and irrationalities; and considers systematically the pragmatic and contextual implications of subsequent actions based on the belief/conclusion.

In a related study, Stanovich and West (1997) studied the relation between the cognitive ability of college students (among which is their epistemological beliefs and critical thinking predispositions) and the ability to evaluate an argument independent of prior belief. The result was that the two general constructs were highly related; that means, students who showed stronger cognitive dispositions and sophisticated epistemological beliefs showed higher tendency to evaluate an argument in a decontextualized manner. This is related with the emphatic predisposition described by Weil (2004) which is being able to articulate clearly what is presented by others and reasoning from their assumption instead of one's prior belief.

Others have also studied the relationship between critical thinking and epistemological beliefs and obtained consistent results. For example, Whitmire (2004) studied the relationship of epistemological beliefs, information seeking behavior and

reflective judgment of 15 college students, and the results showed that the three constructs were highly related. Undergraduates at higher stages of epistemological development exhibited the ability to handle conflicting information sources and to recognize authoritative information sources.

Based on the result of their study of the relation between cognitive dispositions and epistemological beliefs of 182 college students, Kardash and Sinatra (2003) claimed that perhaps the two terms refer to the same psychological construct.

In general, researchers agree that the tendency of one to be predisposed to think critically and apply the skills of critical thinking increases with the sophistication of his/her belief about knowledge and knowing and vice versa.

2.4.3. The relation of knowledge about critical thinking with actual critical thinking skills, dispositions and epistemological beliefs

Even though critical thinking dispositions and critical thinking skills are not necessarily present in every individual together, researchers agree that they usually predict each other (Halpern, 1999; Weil, 2004; Baron, 1991; and Klaczynski, et al., 1998). However, in relation to the literal knowledge/understanding of critical thinking, I could not locate any research which explicitly states that knowledge about critical thinking is related with actual possession of the dispositions and the skills of a critical thinker. However, the general implication of the works of researchers and theoreticians like Lipman (1987), Baron (1991), Paul (1993), Halpern (1999), Weil (2004), Facione (2007), and others who believe that certain pervasive thinking dispositions are essential in any subject matter and they can be taught explicitly is that belief/knowledge about

thinking is a place to start from in order to influence the actual thinking disposition and skills of students. Baron (1991) stated that peoples' belief about thinking and the ideal standards they set is not necessarily similar with what they actually have; and the beliefs about thinking, just like the actual thinking predispositions and skills, are intricately related with the epistemological beliefs of the individuals (1991, 2000). He claimed that people usually tend to set a higher standard while describing what "good thinking" is, where as they actually perform thinking below the standards they set. However, he claimed that both the beliefs about thinking as well as the actual performance of thinking are related with epistemological beliefs (Baron, 2000).

In close relation to thinking about one's own thinking, the concept of metacognition also comes into play in various empirical and theoretical investigations about critical thinking and epistemological beliefs. For example, Kuhn (1999) stated that the ability to attribute meaning to one's own action and beliefs, as well as to those in the community, is a powerful intellectual skill that facilitates the disposition to think critically. Thus, she emphasized the need to consider critical thinking and epistemology from a developmental perspective because critical thinking can be conceived as metacognition, and metacognition is a "second order" skill that develops through age. This may shed light on the fact that one of the reasons preservice teachers or other students at any level may not be able to explicitly identify critical thinking skills and put them into practice due to the lack of explicit guidance to let the student think about his/her own process of thinking while he/she is engaged in any task. Thus, it is suggested that teaching metacognitive strategies directly contributes to the development of students' critical thinking (Hanley, 1995) and maturity of students epistemological beliefs (Wyre,

2008). Hanley (1995), for example, studied how teaching metacognitive strategies help students develop their critical thinking skills by applying a method of helping students learn about themselves as learners and problem solvers and teaching them cognitive skills with their respective rubrics. Hanley (1995) studied 65 undergraduates enrolled in California State University who learned a module of problem solving and decision making for a semester. They were asked to keep journal of their reflections on problems in their day-to-day activities (for questions such as “what percentage of problems do you try to solve?”) and problems in their class-related thinking engagement (for questions such as “how much have the lectures helped you learn to improve your thinking skills?”). A significant improvement in students’ critical thinking skills as well as their awareness of their improvement was observed in this study.

On the other hand, other researchers seem to assume that belief about thinking is identical with one’s predisposition towards thinking critically. For instance, Klacznski and his associates (1998) used a critical thinking disposition questionnaire to assess students’ belief about critical thinking.

In attempting to explain the relation from another perspective, Comerford and his associates (2000) studied the effectiveness of a course designed to increase community college students’ critical thinking skills in helping students attain more sophisticated levels of epistemological beliefs. The result was that the course was largely unsatisfactory; and other factors such as teachers’ epistemological beliefs were more influential in affecting the students’ epistemological beliefs. They suggested that the embedment of sophisticated assumptions of epistemology in classroom activities, especially in methods of providing feedback and assessment, is important to improve

students' critical thinking ability and epistemological belief. Their finding suggests the above explanation given by Baron (1991) which claims that what students know or believe about the knowledge and thinking may not be readily related with change in their actual thinking skills and epistemological beliefs.

In general, even though the knowledge of students about critical thinking in particular and thinking in general is a fertile ground to build actual dispositions and skills of a critical thinker, it doesn't necessarily guarantee the possession of these abilities by the student. Thus, this study will not extend the data collected from students about their knowledge and beliefs about critical thinking to implying their thinking skill or disposition.

2.5. Common misconceptions about critical thinking

Based on the literatures regarding critical thinking as well as personal and professional experience I had with college students and faculty members, I identified the following common misconceptions about the basic essence of critical thinking.

2.5.1. Critical thinking as skepticism and negativism

One of the most common misconceptions about critical thinking is the tendency to relate the term "critical" with being "critical" and "negative" (Rusbult, 2001). With the general notion of rejecting the didactic approach of teaching, questioning the credibility of the knowledge source, and the emphasis on the questioning skill of a student, many, if not most, students and teachers as well assume that critical thinking is related with

suspicion, cognitive impermeability and “reading between the lines” in an attempt to find out unacceptable and tricky implications.

Budmen (1967) explained that this misconception can be prevalent among students as well as teachers. He advised that teachers should understand curiosities and questions of students in the classroom as signs of an attempt to sharpen their thinking skills rather than as a way of framing the teacher for a certain definite answer or for judging his/her way of thinking.

As explained in chapter one, the idea of nurturing critical thinking through formal education is in its infancy in the Ethiopian education system and is definitely an issue that needs refinement and guidance, especially among those involved in teacher education. The current conception of critical thinking in Ethiopian teacher education in general and Bahir Dar University in particular, as I had experienced through direct engagement in teaching/learning and through acquaintance with publications of various types, can only be comparable to the very initial impetus of rejecting uncritical acceptance of universal belief systems. That means, the systematic and explicit manifestation of critical thinking is predominantly conceived as “not falling for” a newly encountered idea with out “adequate” evidence. While, technically speaking, this is to some extent important, healthy affective trait of openness, intellectual humility and willingness to take other’s point of view also need to have their due places for a true critical thinking skill to develop among learners of any level. Such positive affective components help the learner to be engaged actively in seeking and weighing evidences.

2.5.2. Critical thinking as a certain tool to be applied for specific types of problems/situations

Facione (2007) described critical thinking as “pervasive” which is potentially useful in any situation. Paul (1993) also described the essence of “critical spirit” in such a way that an individual should be predisposed to think critically in any aspect of his/her life rather than assuming that it is a thinking procedure that needs to be applied to complex classroom problems. Thus, he described it as “life skill” which should be possessed by any one in today’s world.

However, there is still a tendency to see critical thinking as a definite procedure which should be applied in cases of complicated problems. This can be mostly the result of viewing every question as having a definite answer which needs to be reached by implementing a certain guideline of thinking when the simple common sense is not effective. As explained in the previous sections, this is equivalent with the less sophisticated notions epistemological beliefs.

2.5.3. Critical thinking as a natural talent rather than an acquired skill

Due to the general human tendency to associate specific traits as caused by natural reasons, people may be usually heard saying “he is naturally curious;” she is naturally stubborn;” “he is simply docile;” and so on without systematically attempting to explain what educational and environmental factors contributed for the trait. The enduring belief in inherent smartness is so pervasive that it may impede what people believe about the efforts to improve thinking skills. If thinking skills and resultant

academic performances are associated with nature, then the initiative to change the way students think will be insignificant.

However, with the recent global intellectual revolution and various educational reforms, which are based on the assumption that every person can learn given the appropriate learning environment, the focus on the importance of teaching thinking skills has increased radically. All the researchers and educators whose works are mentioned above base their works on this assumption. However, since the change is still on its way in many developing as well as developed countries, it is more than likely to expect that beliefs about the unchangeability of thinking skills still prevail among students and educators.

2.5.4. Critical thinking as a scientific procedure

Even though being objective and decontextualizing oneself from the issue at hand is important for a critical thinker to make an unbiased evaluation, critical thinking is yet subjective because it is based on the individual's value system. As Dewey (1933), Budmen (1967), Harman (1986), Perry (1971), Kitchener and King (2004), and others asserted in their discourses and researches, critical thinking is a tool for achieving one's value system which is dependent on the individual's uniqueness and not on an objective truth that exists "out there." However, since different attempts to develop students' critical thinking skills were made and are being made in a step-by-step procedure, the view of critical thinking as an objective, scientific or research-like rule of thumb procedure can definitely be expected to be still in the air. This is often related with epistemological belief which does not take into account the existence of alternative

explanations of a certain problem. A developed epistemological belief leads college students, as well as any individual, to weigh relative knowledge in light of his/her value systems and commit to it accordingly.

In general, in order to enrich teacher education curriculum in such a way that it helps preservice teachers to understand and practice critical thinking and to improve the maturity level of their epistemological beliefs, it is important to know the prevalent understanding among those involved in teacher education both as teachers and learners. Identifying whether it is teaching traditions, level of enrichment of pedagogic courses, relevance, or any other factor that underlies any of the results that can be obtained from the study is a future study that should logically follow the current one. To gain sufficient insight into these issues, recognizing misconceptions, similarities and differences in understanding critical thinking and epistemology among preservice teachers and teacher educators is imperative.

3. Research Methodology

3.1. Population and sample of the study

The population of the proposed study is pre-service teachers and faculty members of the Department of Pedagogical Sciences at Bahir Dar University. The department is chosen because of its central importance to ensuring quality teacher education by offering various courses related to teaching, such as general methods of teaching, curriculum studies, school management, educational psychology, and many others. Understanding the way in which a certain educational concept perceived in this department can explain a great deal about the general perception of the concept among the faculty of education.

Thus, one out of three sections of each level will be selected randomly. Each section consists of approximately 50 students. A total of 150 students will be selected from each level, forming three cohorts. An additional cohort will be formed by the faculty of the department consisting of 40 members.

3.2. Data collection instrument

The data collection instrument that will be used is a questionnaire that consists of both open-ended and close-ended questions. The first part consists of seven open-ended and two close-ended questions about critical thinking and the second part consists of a Likert scale, which is intended to assess participants' epistemological beliefs.

The first seven open ended questions are general questions that ask participants to describe what they think critical thinking is/is not; why they think it is necessary, how they think critical thinking can be enhanced among students, what they feel the drawback

of being a critical thinker is, whether they think they themselves are critical thinkers, and whether they have any confusion regarding the concept. Question number five, which asks participants to evaluate whether or not they themselves often engage in critical thinking, is included to generate a perspective of their ideal standard of a critical thinker's way of thinking from a different angle because, as mentioned in the literature, how people set a standard of "good thinking" may not be necessarily the same for themselves and for others (Baron, 1991).

The last two close-ended questions of the first part are included as a "conclusion question" to evaluate how much importance participants give for learning thinking skills as compared to learning facts.

The second part of the questionnaire is a Likert scale consisting of 28 items taken from Schraw, Bendix, and Dunkle's (2004) Epistemological Belief Inventory (EBI), which was adopted from Schommer's (1990) four-factor instrument. All of the 28 items on the inventory are to be answered by choosing one of the five agreement levels: "strongly disagree", "disagree", "not sure", "agree" and "strongly agree".

The questionnaires that will be administered to both faculty members and pre-service teachers are identical. To avoid possible linguistic barriers, an optional questionnaire that has all of the questionnaire items in Amharic (the working language in Ethiopia other than English) will be provided to participants.

3.3 Methods of data analysis

The data analysis will be both quantitative and qualitative. Quantitatively, the verbal responses participants will give about critical thinking will be examined if they

demonstrate specific patterns of conceptions about critical thinking; each participant's response will be coded in terms of how many of the critical thinking skills and predispositions explained in the literature review are properly described or implied. Specific numeric grades will be generated from the data which will be used to rank the descriptions based on their correct representation of critical thinking skills and dispositions based on the concepts explained in section 2.3.

The rating scale adopted from the Epistemological Beliefs Inventory (EBI) will also be rated using factor analysis and the correlation between the score of each student on the inventory under each factor and the rankings of the verbal responses given to the open ended questions about critical thinking will be examined. Comparisons will be made across year levels and between pre-service teachers' and faculty members' scores to determine if there is a significant difference between the epistemological beliefs and the perception of critical thinking skill, as well as the level of correlation between the two.

Qualitatively, the verbal responses given by the participants will be analyzed for any apparently common misconceptions, descriptions related to thinking that may not have specific category in the coding schemes, and any other interesting patterns, if any. Discussions will also be made regarding the overall pattern of the understanding of critical thinking among pre-service teachers and faculty members of the department; possible explanations for any differences/similarities and proper conceptions/misconceptions about critical thinking and epistemological beliefs will also be made based on the works discussed in the literature review.

3.4. Expected Results of the study

The expected results of the study are:

- Pre-service teachers' level of understanding about critical thinking and epistemological beliefs will show significant positive correlation.
- Significant difference will be observed between faculty members' and pre-service teachers' epistemological beliefs and views about critical thinking.
- Pre-service teachers will show differences in their understanding of critical thinking, as well as their epistemological beliefs, across year levels.
- Various misconceptions about critical thinking will be identified, such as equating it merely with inquisitiveness or negativity and viewing it as a specific classroom procedure instead of a general life skill.

Based on the observations of the pervasive understanding of critical thinking among pre-service teachers, subsequent research can be conducted specifically on the level of development of the actual skills and dispositions among preservice teachers.

3.5. Implications of expected results

The trend of teacher-centered approach that has gone on for decades in Ethiopian classrooms is the main factor that is expected to shape the conception of critical thinking among preservice teachers, as well as teacher educators. Thus, the most pervasive understanding of critical thinking that can be expected to be observed from the result of this study will most probably go with the notion of "challenging the teacher" or

“doubting what is told.” This is because in most cases the introduction and discussion of critical thinking among academicians in Ethiopia took place in such a way that critical thinking is directly contrary to the teacher-centered approach.

However, many factors actually come into play that shape how critical thinking is conceived and practiced. As shown in the literature review, one of the major factors is epistemological beliefs. Other closely related factors, such as the very existence of the vested interest of the learner in what is being taught (relevance) and the ability to view one’s own role and point of view in the web of what is being investigated, also determine the understanding and practice of critical thinking. These factors are intertwined with the very concept of epistemology as discussed in the works of Perry (1971) and various other studies reviewed in Chapter Two (e.g. Kardash & Sinatra, 2003; Kitchener & King, 2004; Stanovich & West, 1997) which explain why the search for building one’s own intellectual, personal and professional identity is the powerful force that leads the person towards an understanding of the complexity of social realities (a desired epistemological belief) and an engagement in various forms of systematic thinking (including critical thinking). Hence, the seemingly tiresome need to understand critical thinking in terms of its technical components becomes less of a problem once the person actually is in the state of the urge to think critically. That justifies the subjectivity of critical thinking.

Therefore, the most important implication of any result obtained from this study becomes the direction it provides to teacher educators in terms of how they should familiarize preservice teachers with critical thinking not only conceptually, but also (and even more importantly and ultimately) how they help them top engage in critical thinking during their college years.

The various misconceptions that the study is expected to find can be addressed through direct teaching in teacher education. The importance of explicit discussion regarding these concepts is inevitable. However, the ultimate objective of teacher education with respect to inculcating productive conception and disposition of critical thinking lies in how much teacher educators help preservice teachers get a hint of the link between their personality, their profession, and their position in an education system that is at a crossroad facing the choice between devastation and reformation towards relevance. Important measures that can be taken to advance the practice of teacher education in this direction are the placement of the local social realities in relation to any topic around schooling and education at the center of the teacher education curriculum and the authentic and consistent engagement of teacher educators in analyzing the national and global trend of education and the political agenda of the nation with preservice teachers.

Unfortunately, this type of discussion has been largely missing in most pedagogical science classrooms, which are filled with mostly prescriptive and hassled discussions of what an ideal teaching-learning process should be, instead of starting from a descriptive approach of what problems exist in schools and society and what caused them. A quick review of the syllabi of various pedagogical science-related courses offered in most teacher education institutions, which are filled by lists of educational theories, can be good evidence for this. A close look at the teacher education classrooms which are dominated by clarifications of what each and every teacher education theorist mean when forwarding various explanatory concepts that are parts of his/her theory can further shed light on the largely missing part of bringing reality to teacher education.

The task of teacher educators should emphasize bringing to light existing problems in schools and inviting students to see the issues from different angles, including from their personal experience and prior views, instead of only from the views of established professionals in the field of education. This, in the mean time, would help students to explore their professional identity and their “mini-theories.” Prescription of what should be done to alleviate the problems on the ground needs to be left largely to the would-be-professional, who needs to think critically about how to think and how to let others think critically in order to be professionals themselves.

The above discussion sheds light on the underlying problem which may be the cause of unsatisfactory development of critical thinking practice in most Ethiopian teacher education curricula. However, it may not explain the expected difference between teacher educators and preservice teachers regarding their understanding of critical thinking and their epistemological beliefs. The teachers are expected to be more sophisticated in both areas. One practical explanation may be that the practice of teaching (whether in the form of telling or facilitation) inherently involves more thinking and articulation than learning. Educational experience, age, and intensive reading in the areas also definitely give teacher educators a better chance to understand educational concepts more than preservice teachers. In relation to age, various studies indicate that people at an early adulthood age level (in this case at the age of college education) tend to have a more black and white view of knowledge and knowing than in middle and late adulthood (e.g. Joram, 2007; Schommer, 1998; Bendixen, Schraw, & Dunkle, 1998).

The intellectual development stages of Perry (1970) is a good model for a reasoned speculation of epistemological difference between aspiring teachers and teacher

educators. As college students, preservice teachers most likely hold the intellectual and epistemological development stage of relativism (the third stage) wherein opinions are evaluated based on context and evidence. At this level, the person understands the possibility of various forms of knowing and peoples' tendency to understand things in their own way, but has not established a coherent system of rules and value system to which he/she is committed at times of uncertainty (the fourth and the most developed stage).

Many studies also show that factors other than age and educational experience also have impact on epistemological beliefs. For example, according to the work of Bendixen, Schraw, and Dunkle (1998), college students are found at the second stage of intellectual development proposed by Perry; i.e., multiplicity when it comes to the domain of moral reasoning. The study conducted by Klaczynski and Robinson (2000) also shows that middle and late adulthood is related to biased thinking which reduces the tendency to engage in analytical thinking, but does not affect ability to engage in analytical thinking. This may show that commitment to a certain value, though depicted as the higher stage in Perry's work, may not be the best stage of intellectual development to apply a sophisticated epistemological belief system due to the tendency to reaffirm one's established belief system. Goals of attending college can also cause a difference in epistemological beliefs among students of the same age range (McLeod, 2002). Nevertheless, educational experience and age still remain the pivotal explanatory factors which, through interaction with other factors, can significantly cause an explainable difference between preservice teachers and teacher educators.

Teacher educators, though most likely have better maturity in their thinking and belief system, may not help preservice teachers to reach higher levels of sophistication in their thinking about thinking and about education due to many reasons. Lack of concern from either the teacher or the student, lack of advanced educational resources and access to information, fear of being politicized for putting one's point of view forward, etc. are major problems that may have a huge share in impeding the understanding and practice of critical thinking because they block the coming of sensitive issues in to the classroom, which invite critical thinking to actually take place and make it easy for the students and the teachers to "put their finger on."

Generally, critical thinking needs a context in which it takes place and one does not usually engage in thinking critically unless there is a relevant, self-related issue that consists of complex social reality. Any factor that rules out the investigation of various aspects of one's own and significant (immediate) others' educational experience by preservice teachers is detrimental due to its role in avoiding the fertile ground where critical thinking may grow and can be learned. Thus, investigating whether the complexities of education and society in Ethiopia are properly and constructively presented in the teacher education pedagogy may be the framework for the next study once the results of this study are known.

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APPENDIX- A

Pre-service teachers' Consent Letter- English Version

Date- _____

Dear student,

This study is being conducted to understand what kind of thinking disposition pre-service teachers in the Pedagogical Sciences Department of Bahir Dar University think the term “critical thinking” refers to and what their epistemological beliefs are. This helps point out what particular insights, confusions and/or misconceptions pre-service teachers have regarding critical thinking. And this is an important clue to decide what learning experiences, contents, and instructional methods teacher educators may use to enhance the development of the understanding of critical thinking skill among would be teachers and their future students.

The questionnaire has 7 open-ended and 1 close ended items in the first part and a rating scale containing 28 items in the second part. It takes about 15 minutes to finish. Your responses will be kept confidential.

Thank you in advance!

Meskerem Debele

*(** This page will be detached from the whole questionnaire before the data analysis begins. Therefore, your identity will not be scrutinized based on your signature below.)*

I have read and agreed to voluntarily participate in the study.

Signature _____

APPENDIX- B

Pre-service teachers' Consent Letter- Amharic Version

ቀን _____

ውድ ተማሪ:

ይህ ጥናት የፔዳጎጂካል ሳይንስ ትምህርት ክፍል ተማሪዎች critical thinking ስለሚለው ጽንሰ-ሀሳብ ያላቸውን ግንዛቤና ስለ-ስነ ዕውቀት (Epistemology) ያላቸውን እምነት፣ እንዲሁም በሁለቱ መሀል ያለውን ተዛምዶ ለማወቅ የታቀደ ጥናት ነው። በነዚህ መሰረታዊ የሆኑ የትምህርት ጽንሰ-ሀሳቦች ዙርያ ተማሪዎች ያላቸውን የግንዛቤ ጥልቀት ወይም ስህተት ለማወቅና በዚያም ላይ ተመርኩዞ የመምህራን አሰልጣኞች ምን ዓይነት የትምህርት ይዘት፣ የማስተማር ዘዴና ልምዶችን ለተማሪዎቻቸው የአስተሳሰብ ክህሎት ዕድገት መጠቀም እንዳለባቸው በየቦኩላቸው ለመወሰን ፍንጭ ይሰጣል ተብሎ ይታመናል።

የመጀመሪያው ክፍል መጠይቅ ሰባት (7) ክፍትና አንድ (1) ዝግ ጥያቄዎች ያሉት ሲሆን ሁለተኛው ክፍል 28 አጭር የምርጫ ጥያቄዎች (rating scales) አሉት። ሁሉንም አንብቦ ለመመለስ ወደ 15 ደቂቃ ያህል ይወስዳል። የምትመልሰው (ሽው) መልስ ከአጥኚዎ በቀር ለማንም ተላልፎ አይሰጥም።

አመሰግናለሁ!
መስከረም ለቺሳ

ከላይ ስለጥናቱ የተጻፈውን መረጃ አንብቤ በጥናቱ በፈቃደኝነት መሳተፌን አረጋግጣለሁ።

ፊርማ _____

APPENDIX- C

Instructors' Consent Letter- English Version

Date _____

Dear Instructor,

This study is being conducted to understand what kind of thinking disposition pre-service teachers in the Pedagogical Sciences Department of Bahir Dar University think the term "critical thinking" refers to and what their epistemological beliefs are. In line with this, it has been found important to assess if there is any commonality between their perception and their instructors' beliefs. This helps point out what particular positive insights, confusions and/or misconceptions both pre-service teachers and teacher-educators have regarding critical thinking. And this is an important clue to decide what learning experiences, contents, and instructional methods teacher educators may use to enhance the development of the understanding about and the skill of critical thinking among would be teachers and their future students.

The questionnaire has 7 open-ended and 1 close ended items in the first part and a rating scale containing 28 items in the second part. It takes about 15 minutes to finish. Your responses will be kept confidential.

Thank you in advance!

Meskerem Debele

(** This page will be detached from the whole questionnaire before the data analysis begins. Therefore, your identity will not be scrutinized based on your signature below.)

I have read and agreed to voluntarily participate in the study.

Signature _____

APPENDIX- D

Instructors' Consent Letter- Amharic Version

ቀን _____

ውድ መምህር:

ይህ ጥናት የፔዳጎጂካል ሳይንስ ትምህርት ክፍል ተማሪዎች critical thinking ስለሚለው ጽንሰ-ሀሳብ ያላቸውን ግንዛቤና ስለ-ስነ ፅውቀት (Epistemology) ያላቸውን እምነት፣ እንዲሁም በሁለቱ መሀል ያለውን ተዛምዶ ለማወቅ የታቀደ ጥናት ነው። በዚህ ረገድ አመለካከታቸው ከመምህራን ጋርም ምን ያህል እንደሚመሳሰል ማወቅ አስፈላጊ ሆኖ ተገኝቷል። በነዚህ መሰረታዊ የሆኑ የትምህርት ጽንሰ-ሀሳቦች ዙርያ ተማሪዎች ያላቸውን የግንዛቤ ጥልቀት ወይም ስህተት ለማወቅና በዚያም ላይ ተመርኩዞ የመምህራን አሰልጣኞች ምን ዓይነት የትምህርት ይዘት፣ የማስተማር ዘዴና ልምዶችን ለተማሪዎቻቸው የአስተሳሰብ ክህሎት ዕድገት መጠቀም እንዳለባቸው በየበኩላችው ለመወሰን ፍንጭ ይሰጣል ተብሎ ይታመናል።

የመጀመሪያው ክፍል መጠይቅ ሰባት (7) ክፍትና አንድ (1) ዝግ ጥያቄዎች ያሉት ሲሆን ሁለተኛው ክፍል 28 አጭር የምርጫ ጥያቄዎች (rating scales) አሉት። ሁሉንም አንብቦ ለመመለስ ወደ 15 ደቂቃ ያህል ይወስዳል። የምትመልሱው (ሽው) መልስ ከአጥኚዎ በቀር ለማንም ተላልፎ አይሰጥም።

አመሰግናለሁ!
መስከረም ለቺሳ

ከላይ ስለጥናቱ የተጻፈውን መረጃ አንብቤ በጥናቱ በፈቃደኝነት መሳተፌን አረጋግጣለሁ።

ፊርማ _____

APPENDIX - E

Questionnaire - English Version

UNIVERSITY OF NORTHERN IOWA

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND FOUNDATIONS

*A study conducted on pre-service teachers' and teacher educators' understanding
of the concept of critical thinking: with particular reference to pre-service teachers*

in the Department of Pedagogical Sciences, Bahir Dar University

*For partial fulfillment of Master of Arts in Educational Psychology: Professional
Development for Teachers.*

Dear student/Instructor,

I am interested in how you think about some important topics related to thinking and learning. I would like you to answer some questions about these topics. There is no right or wrong answers to the questions; I am just interested in how you think about them.

Your patience to read each items of the questionnaire and to write your **genuine** and **elaborate response** is very decisive to make the study successful.

Thank you in advance for your cooperation!

Meskerem Debele

4. When a student is learning some concept or doing some task, how do you think his/her thinking is different when he/she is engaged in critical thinking and when he/she is not?

If he/she is thinking critically	If he/she is NOT thinking critically
(List as many points as you can) • • • •	(List as many points as you can) • • • •

5. When evaluating yourself, do you think you often engage in critical thinking? Please explain the basis for your answer.

6. Do you think when students engage in critical thinking that they may face difficulties in the teaching learning process? If “yes”, give examples of difficulties you think they may face.

7. Does anything confuse you about the topic of critical thinking? If “yes”, describe below.

8. How important do you think it is for students to learn *as many facts as possible* in today’s world?

1	2	3	4	5
Not very important at all	Not much important	Somewhat important	Important	Very important

9. How important do you think it is for students to learn *how to think critically* in today’s world?

1	2	3	4	5
Not very important at all	Not much important	Somewhat important	Important	Very important

Direction: Please circle a number below each statement that best reflects your agreement.

1. Most things worth knowing are easy to understand.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

2. What is true is a matter of opinion.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

3. Students who learn things quickly are the most successful.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

4. People should always obey the law.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

5. Peoples' intellectual potential is fixed at birth.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

6. Absolute moral truth does not exist.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

7. Parents should teach children all they need to know about life.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

8. Really smart students don't have to work as hard to do well in school.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

9. If a person tries to hard to understand a problem, he/she will most likely end up being confused.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

10. Some people are born with special gifts and talents.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

11. How well you do in school depends on how smart you are.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

12. If you don't learn something quickly, you won't ever learn it.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

13. Some people just have a ability for learning and others don't.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

14. Things are simpler than most professors would have you believe.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

15. Children should be allowed to question their parents' authority.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

16. If two people are arguing about something, at least one of them must be wrong.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

17. If you haven't understood a chapter the first time through, going back over won't help.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

18. Science is easy to understand because it contains so many facts.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

19. The more you know about a topic, the more there is to know.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

20. What is true today will be true tomorrow.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

21. The best ideas are often the most simple.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

22. Smart people are born that way.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

23. When some one in authority tells me what to do, I usually do it.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

24. Working on a problem with no quick solution is a waste of time.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

25. Sometimes there are no right answers for life's big problems.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

26. Too many theories just complicate things.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

27. People shouldn't question authority.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

28. Instructors should focus on facts instead of theories.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

APPENDIX – F

Questionnaire - Amharic Version

በሰሜን አሜሪካ የሰሜን አፍሪካ የኒሽርስቲ

የትምህርት ስነ-ልቦና (Educational Psychology) ትምህርት ክፍል

በትምህርት ፋካልቲ የፔዳጎጂካል ሳይንስ ትምህርት ክፍል ተማሪዎች ስለ "critical thinking" ምንነትና ስለ ሥነ-ዕውቀት ያላቸው ግንዛቤና በሁለቱ መሀል ያለው ተዛምዶ

በትምህርት ሥነ-ልቦና (Educational Psychology) ትምህርት ክፍል ለሁለተኛ ዲግሪ ክፍል ማሟያ የተደረገ ጥናት

ውድ ተሳታፊ:

ይህ ጥናት በትምህርት ፋካልቲ የፔዳጎጂካል ሳይንስ ተማሪዎች ከመግር ማስተማር ሂደት ጋር ተዛምዶ ያላቸውን ጽንሰ-ሀሳቦች በተመለከተ ያላቸው ግንዛቤ ምን እንደሚመስል ለማወቅ የታቀደ ነው። አንተም/አንቺም ከዚህ ጋር በተያያዘ በሚከተሉት ጥያቄዎች ዙርያ ያለህን/ያለሽን አስተያየት እንድታሰፍርልኝ/እንድታሰፍሪልኝ በትህትና እጠይቃለሁ። ለጥያቄዎቹ በሙሉ ትክክል ወይም ስህተት የሚባል መልስ የላቸውም። በጥናቱ ለማየት የሚፈለገው በተሳታፊዎች ውስጥ ያለውን ግንዛቤ ለማየት ብቻ ነው።

ለጥናቱ ውጤታማነት የአንተ/ቺ በትዕግስት ጥያቄዎቹን ማንበብና ራስህ/ሽ የምታምንበትን/ኚበትን ምላሽ በተብራራ መልኩ መጻፍ በጣም ወሳኝነት አለው።

ስለትብብርህ/ሽ በጣም አመሰግናለሁ!
መስከረም ለጅሳ

(*Critical thinking* የሚለውን ቃል እና አንዳንድ ቃላትን በአግርኛ በራሴ አባባል ብተረጉም በመላሹ አተረጓጎም ላይ ሊያመጣ የሚችለውን ተጽዕኖ ለማስወገድ እንዳለ የእንግሊዘኛውን ቃል ተጠቅሜያለሁ።) 64

1. "Critical thinking" የሚለውን ጽንሰ-ሀሳብ በራስህ (ሽ) አባባል እንዴት ትተነትነዋለህ(ኚዋለሽ)?

2. ተማሪዎች የ "critical thinking" ችሎታ ሊኖራቸው ይገባል ብለህ (ሽ) ታምናለህ(ኛለሽ)? ለምሳሌህ/ሽ ምክንያት-ህ/ሽ ምንድነው?

3. የ Critical thinking ችሎታ በአንደኛም ደረጃ ሁለተኛ ደረጃ ባሉት ተማሪዎች ውስጥ ለማዳበር ጥሩ መንገድ የሚመስልህ/ሽ ምንድነው?

4. አንድ አዲስ ጽንሰ ሀሳብን እየተማረ ያለ ወይም ደግሞ አካዳሚክ ስራ እየሰራ ያለ ተማሪ critically እያሰበ ሲሆንና critically እያሰበ ሳይሆን እንዴት ይለያያል ብለህ/ሽ ታስባለህ/ታስቢያለሽ? (ማለትም በሁለቱ ወቅቶች የተማሪው የአስተሳሰብ መንገድ እንዴት የሚለያይ ይመስልህ/ሻል?)

Critically እያሰበ ከሆነ	Critically እያሰበ ካልሆነ
የምትችለውን (ይውን) ያህል ነጥቦች ዘርዝር (ራ)::	የምትችለውን (ይውን) ያህል ነጥቦች ዘርዝር (ራ)::
•	•
•	•
•	•
•	•

5. ራስህን በራስህ ስትገመግመው (ራስሽን በራስሽ ስትገመግሚው) ብዙ ጊዜ critically አስባለሁ ብለህ/ሽ ታስባለህ/ታስቢያለሽ? ለምሳሌ/ሽ ምክንያትህ/ሽ ምንድነው?

6. Critically ለማሰብና ለመማር የሚሞክሩ ተማሪዎች በመማር ማስተማር ሂደቱ ውስጥ ሊገጥሟቸው የሚችሉ ችግር አለ ብለህ/ሽ ታስባለህ/ሽ? ካለ ዘርዘር/ሪ::

7. "Critical thinking" ስለሚለው ጽንሰ-ሀሳብ ግራ የሚያጋባህ (ሽ) ነገር አለ? ካለ ግለጽ(ጩ)::

8. በአሁን ጊዜ ተማሪዎች በተቻለ መጠን ብዙ እውነታዎችን (facts) እና መረጃ (information) መማራቸው ምን ያህል አስፈላጊ ይመስልህ(ሻል)?

1	2	3	4	5
ጭራሽ አስፈላጊ አይደለም	እምብዛም አስፈላጊ አይደለም	አስፈላጊነቱ መካከለኛ ነው	አስፈላጊ ነው	በጣም አስፈላጊ ነው

9. በአሁን ጊዜ ተማሪዎች የcritical thinking ክህሎት መማራቸው ምን ያህል አስፈላጊ ይመስልህ(ሻል)?

1	2	3	4	5
ጭራሽ አስፈላጊ አይደለም	እምብዛም አስፈላጊ አይደለም	አስፈላጊነቱ መካከለኛ ነው	አስፈላጊ ነው	በጣም አስፈላጊ ነው

(***Critical thinking* የሚለውን ቃል እና አንዳንድ ቃላትን በአግርኛ በራሴ አባባል ብተረጉም በመላሹ አተረጓጎም ላይ ሲያመጣ የሚችለውን ተጽዕኖ ለማስወገድ እንዳለ የእንግሊዘኛውን ቃል ተጠቅሜያለሁ::)

መመሪያ- የሚከተሉትን ዐረፍተ-ነገሮች ካነበብክ(ሽ) በኩላ በሀሳቡ የምትሰማ(ሚ)በትን ወይም የምትሰማ(ሚ)በትን መጠን የሚያመለክተውን ቁጥር አክብብ(ቢ)::

1. ሁሉም ሊያውቃቸው የሚገቡ ጠቃሚ እውነታዎች ብዙ ጊዜ ለመረዳት ቀላል ናቸው::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

2. እውነት እንደየሰዉ አመለካከት ይለያያል::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

3. ውጤታማ መሆን የሚችሉት ተማሪዎች ነገሮችን በፍጥነት መረዳት የሚችሉ ተማሪዎች ናቸው::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

4. ሰዎች ሁል ጊዜ ለሀገራት ፅዕነት ታዘዥ መሆን አለባቸው::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

5. የሰዎች አእምሮአዊ እምቅ ሀይል (intellectual potential) የሚወሰነው ገና ሲወለዱ ነው::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

6. ፍጹም እውነት የሆነ እውቀት የለም::

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እሰማለሁ	በጣም እሰማለሁ

7. ወላጆች ልጆቻቸውን ስለህይወት ማወቅ ያለባቸውን ነገር ሁሉ ሊያስተምሯቸው ይገባል።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

8. 'Smart'(ጮሌ፡ ፈጣን፡ ምርጥ...) የሆኑ ተማሪዎች በትምህርት ቤት ጥሩ ውጤት ለማግኘት ብዙ መልሳት አይጠበቅባቸውም።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

9. አንድ ሰው አንድን ርዕስ (ጽንሰ-ሀሳብ) ለመረዳት በጣም ከጣረ መጨረሻው መደናገር ይሆናል።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

10. አንዳንድ ሰዎች ለየት ያለ የተፈጥሮ የትምህርት ችሎታ ይዘው ይወለዳሉ።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

11. አንድ ሰው በትምህርት ጥሩ መሆን አለመሆኑን የሚወስነው ምን ያህል "smart" (ጮሌ፡ ፈጣን) መሆኑ ነው።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

12. ሰው አንድ ጽንሰ-ሀሳብ ቶሎ ካልገባው መቼም አይገባውም።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

13. አንዳንድ ሰዎች እንዲያው በጥቅሉ ትምህርት አይሆናቸውም። አንዳንዶች ደግሞ ጥሩ ተማሪ ይሆናሉ።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

14. እውቀት ቀላል (simple) ነው። የሚያወሳስቡት መምህራን ናቸው።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

15. ልጆች የወላጆቻቸውን ትዕዛዝ፣ የበላይነት፣ ወይም ቁጥጥር እንዲጠይቁና እንዲገመገሙ ሊፈቀድላቸው ይገባል።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

16. ሁለት ሰዎች በአንድ ሀሳብ ላይ የሚጨቃጨቁት (የማይስማሙት) ቢያንስ ከሁለቱ አንዱ ቢሳሳት ነው።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

17. አንድ ምዕራፍ (chapter) መጀመሪያ ሲያነቡት ካልተረዱት መልሰው ለውጥ አይኖረውም።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

18. ሳይንስ ብዙ አንኳር እውነታዎችን (facts) ይያዘ ስለሆነ ለመረዳት አያስቸግርም።

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

19. ስለአንድ ጽንሰ-ሀሳብ (ርዕስ) የበለጠ በተመራመሩ ቁጥር ብዙ የማይታወቅ ነገር እንዳለ ግልጽ እየሆነ ይመጣል (ርዕሱ የበለጠ እየሰፋ ይመጣል)::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

20. ዛሬ እውነት የሆነ እውቀት ነገም እውነት ነው::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

21. በጣም ጥሩ ጥሩ ጽንሰ-ሀሳቦች ብዙ ጊዜ በጣም ያልተወሳሰቡ (simple) ናቸው::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

22. "Smart" ሰዎች "Smart" የሆኑት ገና ሲፈጠሩ ነው::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

23. ከኔ በላይ የሆነ ሰው (በስልጣን፣ በእድሜ፣ በትምህርት ደረጃ) አድርጎ ያለኝን ነገር ብዙ ጊዜ አደርገዋለሁ::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

24. አንድ ችግር (ርዕስ) ቶሎ መልስ ካልተገኘለት በቀር ለረጅም ጊዜ ሲመራመሩበት መቆየት ጊዜ ማባከን ነው::

1	2	3	4	5
በጣም አልሰማማም	አልሰማማም	እርግጠኛ አይደለሁም	እሰማማለሁ	በጣም እሰማማለሁ

25. አንዳንድ ቁልፍ የሆኑ የሀይወት ጥያቄዎች መልስ የላቸውም።

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እስማማለሁ	በጣም እስማማለሁ

26. የኑሮሪዎች (theories/ሳይንሳዊ አስተያየቶች) መብዛት የባሰ ነገሮችን ያወሳስባል።

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እስማማለሁ	በጣም እስማማለሁ

27. ሰዎች የበላዮቻቸውን ሊቃወሙ አይገባም።

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እስማማለሁ	በጣም እስማማለሁ

28. መምህራን ከኑሮሪዎች (theories) ይልቅ አንኳር እውነታዎችን (facts) ማስተማር ላይ ሊያተኩሩ ይችላሉ።

1	2	3	4	5
በጣም አልሰማም	አልሰማም	እርግጠኛ አይደለም	እስማማለሁ	በጣም እስማማለሁ

(*Critical thinking* የሚለውን ቃል እና አንዳንድ ቃላትን በአግርኛ በራሴ አባባል በተረጉም በመላሹ አተረጓጎም ላይ ሊያመጣ የሚችለውን ተጽዕኖ ለማስወገድ እንዳለ የእንግሊዘኛውን ቃል ተጠቅሜያለሁ።)

APPENDIX – G

Instruction to the Questionnaire Administrator

1. Describe to the students that:

- The study is about what they think the term ‘critical thinking’ refers to and what their epistemological beliefs are; and has 7 open-ended and 29 close ended questions.
- The study is anonymous (they don’t need to write their names). And the first page on which they sign will be detached before the data analysis, therefore their identity will not be revealed.
- Inform them that the questionnaire takes about 15 minutes.
- Give them a choice that if they agree they can go ahead and sign the first page (the informed consent letter). If they are not interested, they can return the material to the administrator.
- Inform them that if any of the participants is below the age 18, they should take a letter from the administrator after returning the questionnaire.

2. The questionnaires will be given to each student (the Amharic-version) and the English version will be announced as an optional questionnaire.

3. The administrator reads the following direction to them

- a. The first part is to be responded by writing their answer and they should **elaborate** their answer as much as they can.
- b. The second part is rating scale, they just need to circle the number from 1-5 based on the level of agreement they have with each statement.

(If any student claims that he/she is below 18, give them the sealed letter to parents before they leave the room.)

APPENDIX – H

Letter for Parents of participants who are under age 18

Date- _____

Dear parent/care giver,

This is to inform you that on your son (daughter) had participated in a study under my responsibility that was conducted to see what students in the Department of Pedagogical Sciences think critical thinking skill refers to and what their epistemological beliefs are. He/She had filled out a questionnaire that has 7 open ended and 29 close ended items and the data collection procedure was proved to have no risk/harm by the Institutional Review Board of the University of Northern Iowa.

With Regards,

Meskerem Lechissa