

Current State and Understanding of Critical Thinking in Higher Education

Yüksek Eğitimde Eleştirel Düşüncenin Durumu ve Anlayışı

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Abstract

This paper reviews the literature of Critical Thinking (CT) in higher education of modern societies. Some cornerstone studies on CT are discussed in relation with the other influential works of educational pioneers by referring to key definitions. Also, the current state of CT skills, tendencies and beliefs of educators, the state undergraduates and graduate students in academic environments are accentuated so as to discuss the need of improving CT in our country.

Key Words: Critical Thinking, Habits of Mind, Higher Education

Özet

Bu makale Eleştirel Düşünce (ED) literatürünü yüksek eğitim bağlamında incelemektedir. ED üzerine en önemli çalışmalar, eğitim bilimlerinde bu konuya öncülük etmiş bilimadamlarının yorumlarıyla ilişkilendirilerek ve temel tanımlara dayanarak tartışılmıştır. Bunların yanısıra, ülkemizde ED'nin gelişmesine katkı sağlamak adına ED'nin yüksek eğitimde günümüzdeki yeri, eğitimcilerin eğilim ve görüşleri ve yüksek eğitim öğrencilerinin durumları üzerinde durulmuştur.

Anahtar Kelimeler: Eleştirel Düşünce, Akıl Alışkanlıkları, Yüksek Eğitim

SUMMARY

Aim

This paper is written to materialize a profound review of critical thinking literature, specifically in higher education, by referring to key studies and leading research as well as analyzing the alternative approaches and theories on the issue. This paper may provide the trainers, scholars and researchers with a comprehensive analysis of critical thinking literature so as to scrutinize the traditionally and institutionally accepted norms and facts of Turkish higher education, and to find possible remedies for the existing limitations of this context.

Method

In order to fulfill the aim detailed above, the literature of critical thinking was reviewed carefully in the light of pioneer studies and leading theories of certain disciplines such as educational sciences, psychology and philosophy. As one may find many contradicting theories of critical thinking literature confusing and vague, this descriptive study particularly focused on centering the whole discussion of the article around the fundamental principles of critical thinking, which are accepted as universal by different disciplines. Finally, this study comes to a conclusion where audience is provided with a set of suggestions based on the analyzed studies.

Main Tenets of Critical Thinking Literature

Critical thinking is an important and vital issue in high education. Many academic departments hope that their academic staff will become informed about the strategy of teaching critical thinking skills, identify areas in one's courses as the proper place to emphasize and teach critical thinking, and develop and use some problems in exams that test students' critical thinking skills. However, many significant studies indicate that higher education, in both abroad and our country, does not promote critical thinking effectively (İpşirpoğlu, 1996).

The empirical studies conducted on the assessment of critical thinking have clearly shown that most of the higher education institutions may not be effective in teaching for critical thinking due to some reasons like misconceptions on critical thinking, the traditional teaching and learning habits mostly imposed on teaching contexts by the trainers and the reservations of general educational system. The fact that even ivory league universities have some problems in teaching critical thinking has led to an educational movement and revolution in many developed countries like US, and from decision-makers to researchers tried hard to establish a basis for the promoting of critical thinking in higher education.

Conclusion

As for the case in Turkey, there are no large-scale research concerning the 'state of art' of critical thinking have been conducted that. However, what we know is that teaching critical thinking is a result of long term educational policies and efforts of various responsible institutions. In Turkey, the first step to be taken is to conduct a survey to gather adequate data on the state of critical thinking in higher education. The universities should immediately establish institutions, as is done in developed countries, and conduct academic research and train researchers on the issue.

Introduction

Reviewing a great number of underlying theories, endless approaches and practical applications of Critical Thinking (CT) in educational context is not an easy task to fulfil on account of the fact that CT skills are not a subject-matter of a single field such as, educational sciences or philosophy. Besides, even in the field of psychology, there are numerous approaches, taxonomies, classifications of thinking critically, many of which are not based on a same theoretical infrastructure. Some of these regard CT as a cognitive skill of a human mind having 'stages', 'aspects' or 'phases', and many others take CT as 'the habits of mind' or as personal/intellectual attitudes. Apart from these complicated nature of CT issue, in some studies claiming to provide a clear definition of CT skills, CT is defined as a human phenomenon. There is no general consensus on one

unique encompassing definition (Ennis, 1991; Glaser, 1984; Kurfiss, 1988). Researchers and philosophers differ on their constructions of their understanding and agreement of critical thinking as a concept (McCarthy, 2004). Paul (1990) analyzed several definitions of critical thinking throughout his studies and he offers that one definition should retain a host of definitions, as no one definition covers all of the dimensions of critical thinking. He suggests that by using a combination of definitions, one can avoid the limitations of each (1990). On the other hand, Bailin, Case, Coombes and Daniels (1999) note that agreement about CT persists only so long as “theorists remain at the level of abstract discussion and permit the use of the term to remain vague”. Perhaps the greater limitation on the studies of CT is that most of the studies take CT from merely one aspect, usually in an isolated-sterile laboratory conditions, and do not take the changing winds and shifting sands in societies of our time into account. Above all, all educators and scholars are in a strong accord with the idea that CT is a vital issue for education and a tool for a better life.

1. The Pursuit of a Clear Definition of CT

The beginning of critical thinking goes back to the times of Greeks in the 5th century. Among many other great philosophers of this era, Socrates is usually regarded as the establisher of critical thinking. His questioning method was to ask hard-hitting questions that required a rational, analytic response. However, like in our culture, asking persistent, critical questions is regarded as rudeness and may result in getting an offensive response. The best example of this case is what Socrates experienced. Socrates got on people’s nerves and sometimes humiliated them; he made people realise they did not quite know what they thought they knew (Ikuenobe, 2001). Authorities were annoyed by the questions he asked, and he was eventually killed in 399 B.C. (Cathers, 2000). Socrates advocated thinking clearly and establishing the importance of seeking evidence, examining reasons and assumptions, and identifying implications of actions. Socrates approach to questioning is widely referenced today and known as the ‘Socratic Questioning Method’. This method is still under intensive attention of the modern educators, and is still being utilized in education.

American scholar John Dewey (1933) is accepted as the establisher of the modern CT tradition, and has a great influence on the studies of contemporary pioneers such as Glaser, Ennis, Watson, McPeck and Paul (surely many more others). He emphasized the distinction between ‘process’ and ‘product’ in thinking. Comparing the Socratic questioning and the definition of Dewey thinking classification, a relation can be underlined in that Socrates did not come to a final conclusion by defining or simply labeling the facts or events, which would be defined as a product of thinking. On the contrary, he was leading the participant through the dialogues by relevant and rational questions in a process of a developing thought. Dewey called CT as “Reflective Thinking”, which may indicate the strong relationship between Socratic Questioning Method and Dewey’s CT definition. By defining critical thinking as an ‘active’ process, Dewey is contrasting it with the kind of thinking in which one receives ideas and information from someone else without displaying any ‘rational skepticism’, which may be called ‘a passive process’.

Ennis (1991) influenced by the philosophies of Dewey, defines critical thinking a “reasonable reflective thinking that is focused on deciding what to believe or do” Ennis emphasizes 12 aspects of critical thinking that are all oriented around judgment. These twelve aspects of critical thinking are:

1. Grasping the meaning of a statement
2. Judging whether there is ambiguity in a line of reasoning
3. Judging whether certain statements contradict each other
4. Judging whether a conclusion follows necessarily
5. Judging whether a statement is specific enough
6. Judging whether a principle establishes a statement alleged to be an application of it.
7. Judging whether an observation statement is reliable.
8. Judging whether inductive conclusion is warranted.
9. Judging whether the problem is identified.
10. Judging whether something is an assumption.

11. Judging whether a definition is adequate.

12. Judging whether a statement made by an alleged authority is reliable.

Among all these definitions, perhaps one of the most appropriate one drawing out the nature of CT is the outcome of a Delphi report (A Statement of Expert consensus for Purposes of Educational Assessment and Instruction) conducted by Dr. Peter A. Facione of Santa Clara University. The report was the product of a two-year lasted study with the involvement of 46 theorists, specialists, CT assessment experts and CT teachers. The consensus on the definition of the concept “CT skills” is that:

“We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society” (Facione, 1989).

According to Facione and et al, cognitive CT skills can be classified into two groups as ‘Cognitive Critical thinking skills’ which may be defined as the expected functions and products of mind during thinking critically (see Table 1), and ‘Dispositional CT skills’, which are the habits and the tendency of an individual in terms of thinking critically (see Table 2). Cognitive skills are listed below in Table 1 taken from the Delphi Report.

Table 1: Consensus list of ct cognitive skills and sub-skills

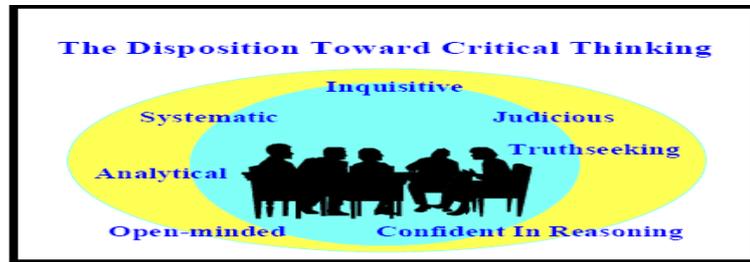
CT SKILLS		CT SUB-SKILLS
1	INTERPRETATION	Categorization Decoding Significance Clarifying Meaning
2	ANALYSIS	Examining Ideas Identifying Arguments Analyzing Arguments
3	EVALUATION	Assessing Claims Assessing Arguments
4	INFERENCE	Querying Evidence Conjecturing Alternatives Drawing Conclusions
5	EXPLANATION	Stating Results Justifying Procedures Presenting Arguments
6	SELF-REGULATION	Self-examination Self-correction

According to the experts, an effective critical thinker is habitually disposed to engage in, and to encourage others to engage in critical judgment. The experts are in general accord with the idea that there is a critical spirit, a probing inquisitiveness, a keenness of mind, a zealous dedication to reason, and a hunger or eagerness for reliable information which good critical thinkers possess but weak critical thinkers do not seem to have (Facione, 1989). Aristotle states that “we are what we repeatedly do. Excellence, then, is not an act but a habit”. Considering Aristotle’s definition, we can infer that being a critical thinker is not only displaying the evidence of being cognitively aptitude to CT skills (what Aristotle defines as *act*), but rather having the tendency and habits

(what we *repeatedly* do) of a critical thinker who has a desire for objective reasoning and for seeking the truth (Table 2). They (Facione, 1989) stated that:

“Each cognitive skill can be correlated with the cognitive disposition to do so. In each case a person who is proficient in a given skill can be said to have the aptitude to execute that skill. But there was a great deal more many experts wished say in regard to the personal traits, habits of mind, attitudes or affective dispositions which seem to characterize good critical thinkers”

Table 2: A brief summary of CT dispositions stated in the Delphi Report.



Socrates argued that the attitude of wanting one’s ideas to be always ‘validated’ and not questioned is intellectually stagnating and is a mark of ‘ignorance’. He pointed this out in his idea of wisdom. A wise person is one who is always willing to ‘learn’ (Ikuenobe, 2001). The term wisdom may be regarded as a headline, or an umbrella term for Facione’s CT dispositions. Four different influential philosophers of CT from different ages emphasize the same domain of CT, labelling with the contemporary jargon: Dispositions. Aristotle named dispositions as “we are what we repeatedly do”, in terms of being critical thinker, or not. In the case of Socrates, the word used for dispositions is ‘wisdom (to learn)’. Nearly seven decades ago, John Dewey(1933:34) noted that “If we were compelled to make a choice between these personal attributes and knowledge about the principles of logical reasoning together with some degree of technical skill in manipulating special logical processes, we would decide for the former”. Finally, Facione (1989) prepared a list of disposition skills and subskills and aimed at describing the attitudes of a critical thinker by reminding that “...too much of value is lost if CT is

conceived of simply as a list of logical operations and domain-specific knowledge is conceived of simply as an aggregation of information”. Surely, critical thinking is dependent on a person’s disposition to use it. McCarthy (2004) points out that “If there is no willingness to use thinking skills, then there will be no thinking.” A similar statement by Norris (1985:40) is that “one must have the disposition to think productively and critically about the issues, or else no amount of skill in doing so will be helpful” So what we understand from ‘Dispositions’ is that they are the ‘habits of a moral mind’, which should be, no doubt, the initial outcome of all education.

Another important contemporary pioneer of critical thinking movement, Richard Paul (1990) models critical thinking in a similar way with the Facione’s Delphi Report. He states that there are simply two kinds of critical thinking process, one is “the weak sense” and the other is ‘the strong-sense’. He concludes that if you approach critical thinking as a method for defending your initial beliefs or those you are paid to have, you are engaged in ‘weak sense critical thinking’. The purpose of weak-sense critical thinking is to resist and annihilate opinions (Paul, 1990). On the other hand, strong-sense critical thinking requires us to apply the critical questions to all claims, including our own. By forcing ourselves to look critically at our initial beliefs, it creates a protection against self-deception and conformity. What Paul broadly underlines, namely weak and strong sense in thinking is defined and deconstructed as the ‘dispositions’ of CT by Facione (1989) and et al. When these two different studies are synthesized, it can be inferred that one may display a cognitive aptitude as a critical thinker, but if biased or did not possess the traits of thinking critically, it would be a mistake to call him/her a critical thinker. Thus, critical dispositions, or intellectual traits, are the superior factors in identifying the attitudes of a critical thinker. We can conclude that the recent studies on CT puts an emphasis on the personal dispositions, affective factors of effective thinking, which may lead followers of CT in classroom and educators from all levels and fields to a better comprehension of effective thinking.

To sum up, the hot debate on CT, ways for its definition, assessment and instruction will continue until theorists reach an agreement on the concept. Apart from the early studies realized in the last hundred years, we have a clear starting point for transferring CT from being a phenomenon to a well-analyzed and interpreted educational element. Facione, Facione and Giancarlo (2000:61) point out the following statement which would be a key element, namely “dispositions” to consider in the pursuit of a clear definition of CT:

“Any conceptualization of critical thinking that focuses exclusively on cognitive skills is incomplete. A more comprehensive view of CT must include the acknowledgement of a characterological component, often referred to as a disposition, to describe a person’s inclination to use critical thinking when faced with problems to solve, ideas to evaluate, or decisions to make. Attitudes, values, and inclinations are dimensions of personality that influence human behavior. The disposition toward critical thinking, as a dimension of personality, refers to the likelihood that one will approach problem framing or problem solving by using reasoning. Thus, the disposition toward critical thinking is the consistent internal motivation to engage problems and make decisions by using thinking” (Facione, Facione, & Giancarlo, 2000).

As interpreted from the ideas of Facione and Giancarlo, interdisciplinary studies are crucial in order to obtain a well-designed conceptualization of critical thinking. However, theorists involved in these interdisciplinary studies should not represent the usual fields such as psychology, educational sciences or philosophy. As well as these common fields that will carry the torch, many different scholars from various fields such as sociology, linguistics, biology, even theorists from the fields of economy and communication should take part in the researches. To give an example, we do not have any empirical evidence on the relationship between economic models of modern countries and CT abilities of their citizens, or effect of media and communication on CT dispositions. These limited study areas of CT researches are, perhaps, one of the reasons of disagreements and misconceptions on the issue.

2. The Current Portrait of CT in Higher Education

It is widely accepted that higher education should not only provide learners with an expertise on a particular field, but also with ‘habits of a mind’ which are disposed to think critically. Among all curriculum objectives of educational institutions, the belief is that an effective education should foster critical thinking skills of the learners, and should create a critical spirit, which will lead millions of graduates through their professional and private lives. The common sense in modern education, theoretically, is not a different one. A number of 1972 studies encompassing 40,000 faculty members by the American Council on Education found that 97 percent of the respondents indicated the most important goal of undergraduate education is to foster students’ ability to think critically (cited in Paul, 2004). However, the current case is far more different than what is aspired to do so. An important study by Gardiner (cited in Paul, 2004), in cooperation with ERIC Clearinghouse on Higher Education, reveals the fact that whereas the faculties aim at developing critical thinking skills of the students and leading them to develop intellectual traits (dispositions), in practice the tendency of education aims at facts and concepts in the disciplines, at the lowest cognitive levels, rather than development of intellect or values.

No doubt all educators agree that giving utmost importance to CT in educational settings is crucial for establishing infrastructure of democratic societies, and of a new generation whose life is based on scientific thinking in lieu of medieval remains of thinking and living habits. Among all other cognitive or psychological aspects of critical thinking having been discussed or to be discovered, it is widely approved that what makes an “effective thinking process” critical thinking is the desire and need for seeking the truth, analyzing and reasoning on precious knowledge (by utilizing the valid and reliable knowledge) within a moral frame. Perhaps one of the greatest contributions of CT in real life context would be the moral applications and reflections of minds disposed to be critical. It is because modern education pioneers have focused on the CT skills in the last 30 years more than ever on the grounds that knowing how to think is definitely much more crucial than what to think in the age of information. In other

words, one initially needs to know 'how to think' to possess and display an advanced competence of 'what to think' Therefore, so as to make lives 'valuable' and create citizens with the ability of CT, the great part responsibility is held by universities. Paul (2004) notes that "Every discipline; mathematics, physics, chemistry, biology, geography, sociology, anthropology, history, philosophy, and so on is a mode of thinking. Every discipline can be understood only through thinking. However, in the context of the USA higher educational system, referring to reliable studies, (Steen, 1987; Gardiner, 1995, Paul 2004:2) claims that departments teach history but not historical thinking; education but not educational thinking, or biology but not biological thinking. As Fisher (2001) points out: "In education, critical thinking can be viewed as a learning outcome, but it can also be viewed as a mediating mechanism for the attainment of other learning outcomes". When we pool our thinking to seek a connection between Fisher's and Paul's statements, we can interpret that in order to create 'a life-long learning ability and tendency', fostering CT skills and dispositions are as vital as the discipline being taught at faculties.

Reviewing the vast amount of literature on critical thinking, the astonishing picture reveals the fact that there is still no certain consensus on the concept of CT. Ironically, in a sense, what is claimed to be promoted by the academicians is not clearly defined yet. The reason, and perhaps the result, of this fact, is defined by Paul as 'overconfidence in promoting CT' at faculties. As we have discussed, the current studies indicate many academic departments fail to enhance critical thinking skills of the graduates (Paul, 1990; İpşiroğlu, 1996; Steen, 1987; Gardiner.). In the last three decades, the United States has been described as a 'nation at risk' because the USA is failing to provide students with the most essential component of education - instruction that fosters the development of the ability to think (National Commission of Excellence in Education, 1983). A report published by National Commission of Excellence in Education stated that "Students are not prepared as critical and quantitative thinkers and clinical problem solvers either when they enter or graduate from medical school" Another similar study realized on mathematical reasoning was summarized by Steen

(1987) with this warning “In the 15 years, the ability of the U.S. students to think (rather than to memorize) has declined accordingly”. In a study assessing the critical thinking skills of 256 university students through the use of the Critical Reasoning Test (CRT), Pithers & Soden (1999) found that:

“No significance between groups differences in critical thinking for graduate versus non-graduate students or for the stage of the course the students were within the program...lack of significance is likely due to a lack of clarity surrounding the construct of critical thinking and reliable methods to assess it, as well as a primary instructional focus on subject-matter content.”

Yet another result of a large study (Paul, Elder & Bartell, 1997) of 38 public colleges and universities and 28 private ones focused on the question: “To what extent are faculties teaching for critical thinking?” The study included randomly selected faculties from colleges and universities across California, and including prestigious universities such as Stanford, Berkeley, and the California State University. Among these “universities of ivory league”, only a small minority could give a clear explanation of what critical thinking is (19%). Furthermore, according to their answers, only 9% of the respondents were clearly teaching for critical thinking on a typical day in class. Commenting on this study, it was underline that “...there was a certain degree of overconfidence among participating faculties in terms of the extent of their understanding of the concept of critical thinking. These are interesting findings emphasizing the need for more profound reflection on critical thinking”. Some of these 66 universities of California State are simply the best universities of the world such as Berkeley, Stanford and California State University. Perhaps this research may give us a broad idea about the universities in Turkey in terms of the familiarity and practical applications of the critical thinking skills. We could not give any empirical results of a large study assessing CT skills in education in Turkey simply because no single study has been conducted yet. This is more than terrifying for Turkish higher education.

The portrait of CT skill in higher education may not be a promising one. However, thousands of invaluable studies have already been carried out in the fields of psychology, philosophy, cognitive and educational sciences in the pursuit of understanding the nature and complicated mechanisms of critical thinking phenomenon. Especially many important studies have been fulfilled on the issue of CT have expanded the literature of thinking skills over the past 30 years.

3. Studies Promoting CT in Higher Education

Barnett (1997:2) laments that: ‘Critical thinking is a defining concept of the Western university. Almost everyone is in favour of critical thinking, but we have no proper account of it. In order to overcome confusions and disagreements on CT, many valuable studies have been carried out by some institutions founded merely to promote critical thinking skills of students at all levels of education. There are, most probably, many different variables affecting CT dispositions of individuals. However, apart from all these possible factors, perhaps one of the greatest factors is that varying definitions, misconceptions and disagreements on CT among scholars mislead the practitioners of CT in educational settings. The first reason of varying definitions is that CT is discussed under many different disciplines such as psychology, philosophy, cognitive science and so on. There are endless ideas, theories, and methods of implementation that can help educators integrate critical thinking into their course curriculum. While the idea of bringing critical thinking into the classroom is unanimous, ideas for fulfilling this outcome, as well as the implementation, differ dramatically.

For years, CT is under discussions aiming at defining it as a skill and disposition to be taught. The approaches of teaching critical thinking are based on the question “Should CT be taught in a course teaching the skills and strategies of mind, in other words to teach CT itself or to implement it in a course, broadly in all the courses?” Answering this question, McPeck (1981) argues that CT skill is not only a cognitive list of acts functioning in isolation from knowledge, but can be developed through subject-specific courses. Yet, this is not the only answer. Actually there are some, but two major trends

in defining CT as a skill to teach: “The generalist view” of Robert Ennis (1989), and ‘Context specific view’ of John McPeck (1981). These two approaches polarized the scholars looking for the best way of teaching CT. The generalist view approach defines Critical Thinking as “a set of independent cognitive abilities which can be taught in relation to any propositional content” (Moore, 2004:5) and models a basis for the teaching of Critical Thinking. It offers a list of cognitive skills, such as “judging ambiguities, assumptions or contradictions in reasoning”, which strongly focus on issues of internal logic, to achieve the main objective of the universal approach to Critical Thinking: ‘the correct assessing of statements’ (Ennis, quoted in Moore, 2004, p5). To give an example, generalist view advocates that a student able to think critically on biology course can display same skills when thinking on a newspaper article or learning a language. On the other hand, the context-specific approach characterises Critical Thinking as “the appropriate use of ‘reflective scepticism’ within the problem area under consideration” (McPeck, quoted in Moore, 2004:5). This approach contends that what is appropriate not only varies from discipline to discipline but even within disciplines (Pohl, 2005). Actually the common belief is that CT is a transferable skill. The general tendency in higher education context is an inductive perspective in which students are guided, and leaded to self discovery if possible. In teacher training field, reflective approach, which aims at inductive teaching, is trendy. Therefore, we can conclude that in order to develop thinking habits and abilities, these two view may contribute to the studies of educators seeking best way of implementing CT to their courses.

4. Conclusion

The conclusion is that the conventional model of educational habits and traits do not foster CT in higher education, and even modern education has similar problems to do so. Also, we can say that necessity of CT is not discussed in Turkish higher education in details. Theorists of CT stress that CT should be promoted by the early ages on the grounds that being disposed to think critically is the controlling factor of utilizing our cognitive CT skills and abilities. However, too much burden still remains on the

shoulders of higher education institutes. Nonetheless, whether the understanding and applications of education are conventional or not, professors and lecturers should be questioning the ultimate production of their curriculum and courses. The main issue whether the graduates are disposed to be Critical Thinker or not. The answer to this question is not only related to the CT dispositions of the graduates, but also an answer related to the acquisition of the field taught, related to lifelong learning and related to becoming a rational and democratic society. The problems hampering development of CT skills and dispositions at Universities are:

1. Assessment designs of courses leading students to memorisation, to learn isolated terms, concepts and methods instead of developing a sense and need of productive thinking;
2. Assessment design of student selection exams for compulsory schools and lycees. These exams begin by primary school and keep its dominance after faculty graduation;
3. No national, governmental or institutional organisations of CT exist in Turkey;

Vagueness of concept CT may hinder effective administrations in both higher education and lower educational facilities. However, we have clear examples of CT acts and successful applications for higher education in the world. In order to shift to an educational model improving CT skills and dispositions, some certain actions should be carried out as follows:

1. Curriculum, syllabuses and assessment models of higher education must be redesigned and CT skills and dispositions must be implemented to all courses possible. Also separate CT lessons must be designed.
2. Lecturers at any level of academic rank should be informed on the theories and practices of CT through in-service trainings.

3. Responsible governmental institutions must have organisations and research centres carrying out researches on CT at National level, following the literature and informing educators. Also those institutions must provide educational process with the valid and reliable results of CT assessment and instruction samples.

In the eve of joining to EU, it is time for Turkish universities to figure out the necessity and importance of CT skills and dispositions for training productive-thinking generations. For personal actions, it is time for lecturers at universities to stop being overconfident on being a skilful CT practitioner, and higher time to ponder over this question: “Do I really teach my students how to think?” It would definitely be an easy answer to put the blame on general educational system, on families or on any other institution. Every person surely merits thinking critically so that s/he may understand and enjoy the world s/he lives in, and higher education possesses enough skills, knowledge and staff to give people what they deserve.

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