

CHAPTER 13: CRITICAL THINKING AND HOW TO TEACH CRITICAL THINKING SKILLS

Prof. Dr. Ali Murat Sünbül

Assist. Prof. Dr. Ahmet Kurnaz

Necmettin Erbakan University, Ahmet Keleşoğlu Education Faculty

(Translated by Sakine Koca Sincer)

INTRODUCTION

It is clear to everyone that social progress depends on individual development in this day and age, which is called information age, therefore, the importance given to the education of an individual has reached its peaking point. When it is considered that the quantity of the information produced in the last ten years is equal to the quantity of information produced from the beginning of the history of humanity until the last ten years, that half life of information has become shorter to a great extent and even that younger people know more about some subjects than elder people nowadays; the aims of education are determined automatically. The unique means of having a productive and democratic social structure equipped with information and technology, which has become the main aim of today's states, is to realize educational principles that can turn the individual into the expected form. What is necessary for a democratic society is an individual who asks, questions, investigates, listens and respects; who is open to communication and interaction besides changes and developments; who is not conducted, directed or deceived; who uses information for a productive society; who dances with information and who can explore new information. And to realize all above, individuals who have developed thinking abilities are needed.

The importance of thinking and teaching thinking will be clearer when "I think, therefore I am" is interpreted as "I will disappear if I do not think."¹ So, it is very important to teach high level thinking skills today. One of these skills is critical thinking.

WHAT IS CRITICAL THINKING?

It has been observed that concepts such as problem solving, decision making, deduction, informal logic, simple thinking, reflective thinking, high-level thinking skills (analysis, synthesis and evaluation) are deemed to have synonymous meanings with critical thinking among educators when critical thinking has not been put forth yet. Although these concepts are often used instead of critical thinking, critical thinking is described quite differently from them.

On the other hand, in our language, the word "criticism" is usually used in terms of mostly negative judgmental evaluation addressing to someone or something, or instead of disapprobation as old people used to mean. Parallel to the meaning mentioned above, the word "critical" is usually perceived as something about criticism, depending on criticism, having qualities of criticism. Such a perception accompanies with a misconception about critical thinking, as well. Critical thinking is a disciplined and self-controlled way of thinking which brings out a perfect thinking related to a special domain or form of thinking.²

According to Doğanay and Ünal³, critical thinking comes from the word "reasoning" whose root is "reason" having Latin meaning "ratio". The Latin meaning of this word is "balance"⁴. In this context, critical thinking means coming to a balanced decision after studying the previous experiences,

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

information and thoughts. Critical thinking does not have a common meaning on which everyone agrees, as is the case in most of the other concepts having social content. The definitions of critical thinking differ in terms of the dimensions and scope it contains.

Critical thinking is generally the process of perceiving the facts objectively. However, the facts may not be what we see. So, critical thinking means coming to decision after analyzing the fact wholly with all positive and negative sides that are visible or invisible to us. Critical thinking is the process of reasoning depending on information. But, the process of getting information is a crucial one. During this process, it is necessary to question the source of information, cross-check the information by means of questioning it in different sources, determine the premises and prejudices. A person who thinks critically is aware of why and how s/he thinks. S/he is not only aware of his/her own thinking process but also considers others' thinking processes. One of the important concepts that define critical thinking is independent and original thinking. A person who thinks critically does not accept others' views and thoughts passively, but analyzes them and thus creates his/her own thought independently. This sort of independence liberate the mind, heart and actions of a person.⁵

In this context, the definition of critical thinking can be summarized as making a judgement after reasoning on a problem or a state (gathering information related to a current state, determining assumptions and evidences, discussing the previously-determined evidences, deducing and synthesizing individually)⁶.

If we would like to give a broader definition of critical thinking, we can say that critical thinking is to build an inter-disciplinary relation considering the reliability of information sources by means of grounding on independent and objective thinking, analyze and evaluate premises, understand the relationship between thoughts and feelings, refine generalizations and consider the future products of a generalization avoiding to disturb its meaning, compare similar states, notice contradictions, explore products and results, decide on logical deductions, predictions or interpretations, use socratic discussion and think perfectly on one's own thinking while a person is analyzing a view, an interpretation, a belief or a theory.

WHY CRITICAL THINKING?

To determine the type of person needed today means determining how to build and implement teaching activities. Today, when information develops and changes very quickly, individuals need to adopt to new situations quickly and to find solutions for new problems immediately. Educational activities play an important role in growing up such individuals. How information is gained and experiences of individuals who learn during this period are very important since individuals will use the information according to how they learn the information. When teaching mentality depends on transferring information, individuals get and accept the transferred information as it is, and remembers it the same when asked about it. As a result of this, individuals who do not question, who cannot adopt to recent developments and changes, who cannot find solutions for the problems, who takes and accepts what is presented in a dogmatic manner, who cannot detect mistakes and who cannot foresee possible facts about future are raised up. Such an individual has no chance of reaching the long-awaited level of civilization in today's world.

It is possible to eliminate the handicaps mentioned above by means of enabling individuals to gain skills to process, assess, defer the information and states they encounter, and thus adopt them to new situations. To do this, individuals have to examine the information presented to them instead of accepting it as it is, consider the fact that there is always a possibility for a state or information to change in the future instead of accepting everything as a fact, avoid giving up looking for a second way keeping in mind that there may always be a second way. An individual needs intense mental activities for all these processes. In short, individuals who think should be raised for all those mentioned above.

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

Thinking is a name attributed to organized and goal-oriented active mental processes aiming at understanding the current situation. Everything lies in thinking, is directed and produced by thinking. Thoughts are integrated through setting a balance between mind, body and soul. However, a screening process should be carried out among these thoughts in order to choose the effective ones. And this is possible with critical thinking. Creativeness gains importance while putting *de facto*, previously unthought ideas forth. Everything that makes up life is indeed the on-going creation of thoughts.

The momentum and dimensions of changes experienced in many fields that affect people's lives deeply such as science, technology, economics, press, politics, social relations are much deeper and more comprehensive than known. It is possible to understand the effect of this transformation on society if we address the changes and developments just within the domain of information technology. The same is true for changes in the fields of economics and politics. It is possible to say that an average citizen has difficulty in following economical issues, perceiving attitudes and strategies of politicians.⁷

Today, the main purpose of curriculum is to develop thinking skills and to raise thinking individuals. Turkish education system is aware of the type of person that is needed. It has taken important steps in taking the necessary precautions in order to reach this type of person. However, the fact that such tendencies and implementations in this direction are new to our education system is accompanied by some uncertainties, complexities and deficiencies.

From this point of view, it is necessary to determine the ways of enabling individuals to gain thinking skills through educational experiences in today's conditions in Turkey.

THINKING PROCESS AND CRITICAL THINKING

Thinking means reasoning, racking brain, having a view, reconsidering, meditating on a subject; guessing, having in mind; remembering, calling back to mind, imagining, dreaming; worrying, mourning, getting anxious, saddening, being troubled; being interested in something, making tiny distinctions; designing, planning; holdign a view, thinking in a (...) way; examining, evaluating; keeping all the details in mind, stickling; supposing, assuming; bringing to mind.⁸

As Demir (2006) cites from Ünalın (2006), here are some definitons of thinking:

Thinking is reflection of outer world on people's minds. Moreover, thinking means object and idea that are designed, shaped and imagined mentally.

Thinking is all the intentional mental behaviours in order to eliminate the situations that disturb the individual in terms of internal or external factors and that unbalance the individual physically and psychologically.⁹

Thinking is a process of symbolic mediation. "Mediation" means that thinking fills in the blank between the stimulant event and the behaviour of the individual forthis event. In other words, thinking is to process the information about our surrounding.¹⁰

Thinking is generally acknowledged as a complex cognitive process that makes figuration possible while this kind of figuration necessitates information, skill and attitude, and is more effective than instinctive figuration.¹¹ Thinking is used to describe states of mental process aiming at attracting attention, alerting, imaging, dreaming, looking up in mind, remembering and dreaming of wishes that reflect inner world; mental process that means believing in a certain thing or things, or belief; mental process addressing reasoning, problem solving and criticizing.¹² Thinking is the disciplined form of conceptualisation, implementation, analysis and evaluation of information received through observation, experience, instinct, reasoning and other channels.¹³

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

Thinking is reaching something with the current information and transferring of the current information to the other one. It is using information in new situations by means of noticing the practicality of the previous information. It is a fact of logic.¹⁴

Thinking is to review mental skills in order to shape the ideas and arriving at a decision: reasoning consisting of the logical series of idea is reaching to a certain conclusion through inference and starting from the point that is known or assumed: reflecting one's backward ideas on a subject or calling quietly-going-on thinking back to mind.¹⁵

Thinking is one the most significant qualities of humanity. A person should behave consciously, not instinctively. A person can lead a peaceful life only if s/he develops thinking power. Humane sciences mention that thought is shaped after going through certain phases and that development is too insufficient in some environments. Education economists think that one is supposed to get his/her money's worth which s/he paid for thinking education. Education philosophers think that one can realize oneself only if s/he can develop thinking skill, that s/he can perceive the meaning of the events in that way. Education sociologists believe that thinking training should be arranged keeping social conditions in mind. Thinking training during primary and secondary school years is a small but important part of this fact that prevails the various stages of life.¹⁶

Swartz and Parks¹⁷ divide the basic thinking areas into three such as I) Critical Thinking, II) Creative Thinking and III) Explaining and understanding opinions; and divide thinking process into two such as I) Deciding and II) Problem solving. In Figure 1, the relationship between critical thinking, and other domains and processes of thought.

MAP OF THINKING DOMAINS

Thinking Skills

The concept of critical thinking has been tried to be explained taking the two main disciplines of philosophy and psychology as a basis. While philosophical approaches focus on the norms of thinking well, the concept of human thinking and mental skills necessary for a realistic, objective world view, psychological approaches focus on experimental studies which ground on thoughts and thinking, individual differences about learning complex views, and the concept of problem solving that is a part of critical thinking.

The Relationship between Critical Thinking and Other Types of Thinking

When books and articles are analyzed, it is clear that critical thinking is compared to many different types of thinking or is used instead of them. Many experts have tried to analyze the relationship between critical thinking, which is accepted to be high level thinking in books and articles, and other types of thinking.

The question related to what the difference is between low level and high level thinking is an important one among educators. As Mirioğlu¹⁸ cites from Newmann (1990), low level thinking requires routine and mechanical implementation of information in a simple way. The examples of low level thinking are memorization exercises such as completing a formula with numbers or listing the remembered information. On the other hand, high level thinking requires students to manipulate information when they come across a problem or question that is difficult to solve by means of interpretation, analysis or routine implementation of the previously-learned information.

As Bruning, Schraw & Ronning¹⁹ cites, Perkins and others have determined four domains of thinking in one of their studies and they have explained the purposes and thinking skills of these domains in terms of product.²⁰

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

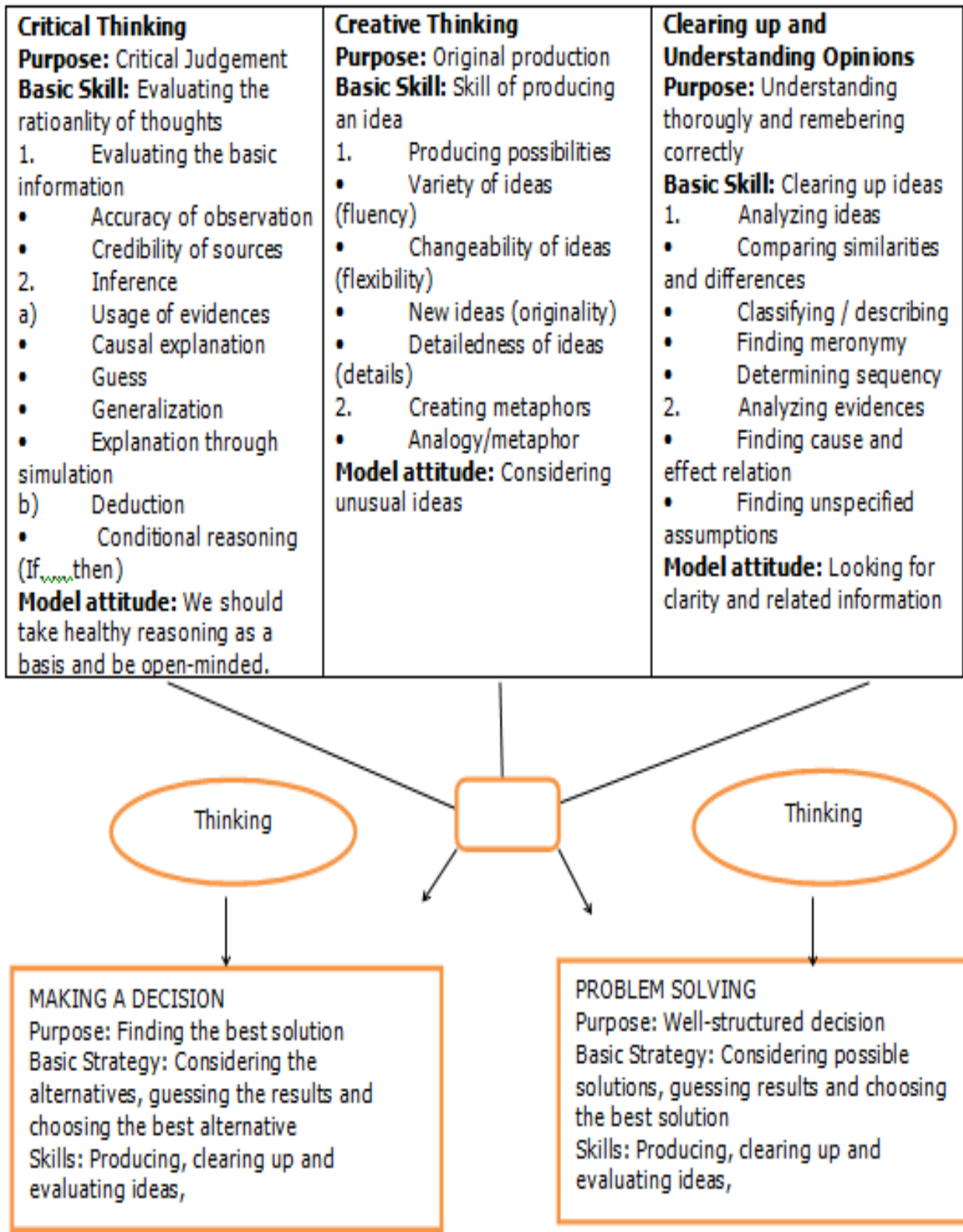


Figure 1: Thinking domains and the relationship between their processes
 Source: Cited from Swartz, Robert J. and Sandra, Parks (1994:6)

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

Chart 2.1: The relationship between thinking skills

Types of thinking	Purposes	Thinkings Skills	Relations between them
Critical Thinking	Evaluating the opposite states or clarity of ideas	Defining states or ideas, analyzing opposite views, evaluating evidences	Critical thinking is needed for all thinking skills.
Creative Thinking	Producing new ideas and products	Determining ideas, re-structuring the problem, determining the possibilities	The newly-created product which has been produced through creative thinking is evaluated by means of critical thinking.
Making a Decision	Making an informed decision	Thinking the information, defining the alternatives and making a decision	Critical thinking is one of the basic processes necessary for making a decision.
Problem Solving	Finding one or more solutions for a problem	Defining, explaining, choosing, implementing and evaluating a strategy,	While problem solving starts with a problem, critical thinking encompasses evaluation of all information, ideas and events that one comes across.

Source: Prepared with the help of Mehmet Kaan Demir, (2006:43).

Bittner and Tobin²¹ state that the process of critical thinking is multi-dimensional and compare critical thinking to an umbrella under which there are many different types of thinking depending on the situation. According to Skinner (1976), the concepts such as "scientific method," "scientific thinking," "reflective thinking," "productive thinking" and "critical thinking" which are often used in books and articles have the same meaning although there are some tiny differences between them.²² Critical thinking cannot be equated with other types of thinking. Although it is a part of making a decision, it cannot be deemed to be just decision-making. It is also not only a brainstorm. According to Kazancı (1989), all types of thinking generally necessitate criticism to some extent. Almost none of the types of thinking can do without the help of mental activities used during criticism.²³

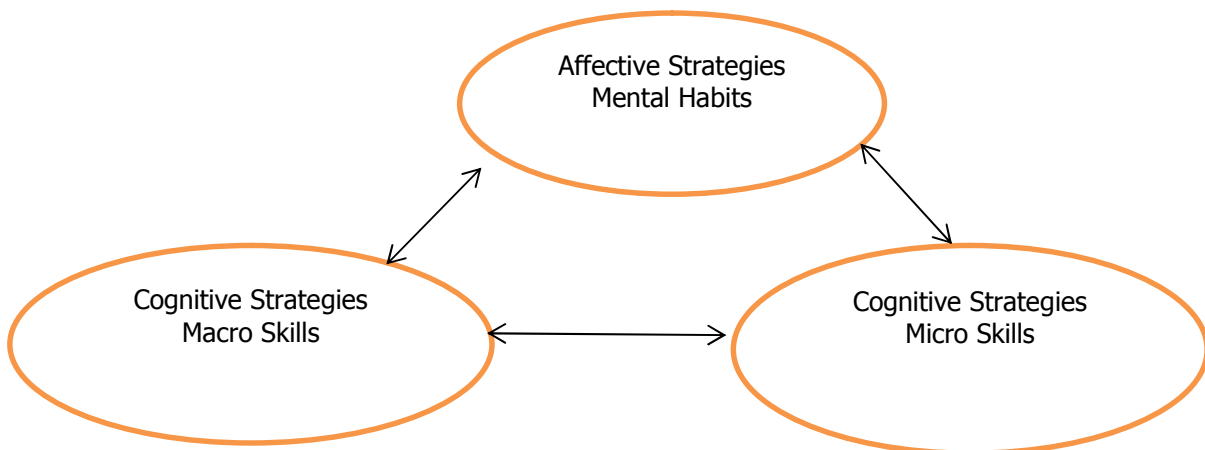
THE QUALITIES OF TEACHING CRITICAL THINKING

1. Teaching critical thinking can be achieved easily without needing much equipment in terms of technology and physical conditions.
2. Critical thinking can be implemented by all of the teachers having the principles and methods of it.
3. As it requires all the students to participate, teaching activities take much time.
4. The attitudes and tendencies of students at the beginning of teaching critical thinking are important. So, before teaching critical thinking, some activities that will enable students to gain positive attitudes in terms of critical thinking should be done first.
5. It depends on students' activities. The students should definitely be active about learning.
6. Teaching should be carried out through intentional, goal-oriented and well-designed activities.
7. It can be taught at all ages and levels. The teacher should be careful about which critical thinking strategies and skills should be taught at which level and age.
8. All subjects are suitable for teaching critical thinking. However, critical thinking strategies and skills that are more suitable for each subject should be chosen carefully.
9. In teaching critical thinking, out-of-school contents can also be used as well as lesson contents.
10. In teaching critical thinking, teaching through research and study, strategy of collaborative learning, group discussion and problem solving activities can be used.

STRATEGIES OF CRITICAL THINKING

There are some qualities that differentiate critical thinking from other types of thinking. These qualities are very important in teaching critical thinking skills as well as determining and evaluating the form of thinking that the individual presents. The qualities of critical thinking can get clearer by means of thirty five critical thinking strategies which are divided into three main groups by Paul, Binker and Jensen²⁴. These strategies are listed in thirty five different dimensions as below:²⁵

Strategies of Critical Thinking



Affective Strategies – Mental Habits

- S-1: Independent thinking
- S-2: Developing egocentric or socio-centric insights
- S-3: Realizing objective thinking
- S-4: Understanding the relationship between feelings and thoughts
- S-5: Developing mental modesty and delaying judgement
- S-6: Developing mental bravery
- S-7: Developing mental good faith and honesty
- S-8: Developing mental tenacity
- S-9: Developing trust in thinking skill

Cognitive Strategies – Macro Skills

- S-10: Clearing up generalizations and avoing disturbing their meaning through simplifying
- S-11: Comparing similar states: Transferring insights into new contexts
- S-12: Developing the individul's perspective: Creating/Exploring beliefs, views, theories
- S-13: Clearing up problems, results or beliefs
- S-14: Clearing up and analyzing words or word phrases
- S-15: Developing standards for evaluation: Clearing up values and standards
- S-16: Evaluating the credibility of information sources
- S-17: Asking basic and important questions, ensuring the continuity of questions
- S-18: Analyzing or evaluating views, interpretations, beliefs, theories
- S-19: Producing solutions or evaluating solutions
- S-20: Analyzing or evaluating activities or policies
- S-21: Critical reading, clearing up or probing texts
- S-22: Critical listening
- S-23: Establishing relationships between disciplines
- S-24: Implementing socratic discussion
- S-25: Thinking in terms of dialogues
- S-26: Dialectical reasoning

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

Cognitive Strategies – Micro Skills

- S-27: Comparing and differentiating real implementations and ideals
- S-28: Thinking perfect about thinking: Using critical vocabulary
- S-29: Paying attention to important similarities and differences
- S-30: Probing and evaluating premises
- S-31: Differentiating related events from unrelated ones
- S-32: Creating rational inferences, estimates and remarks
- S-33: Evaluating evidences and claimed events
- S-34: Noticing contradictions
- S-35: Exploring products and results

CRITICAL THINKING SKILLS

In teaching critical thinking, some skills should be taught besides critical thinking strategies. Although these skills are used together and within each other during thinking process, these skills can be addressed under separate titles in order to make it easier to teach these skills. According to Swartz and Park (1994), these skills are:²⁶

- A. Reliability of Sources
- B. Causal Explanation
- C. Prediction
- D. Generalization
- E. Reasoning by Analogy
- F. Conditional Reasoning

These skills can be taught in teaching lesson contents through the approach of integrating to the subject or through using contents apart from specific subject matters with a skill-based approach. Some of the educators who write and think on critical thinking perceive critical thinking as a skill.

Paul (1984) accepts critical thinking as a set of integrated macro mental skills. Similarly, Facione (1990) accepts critical thinking as cognitive skills such as interpretation, analysis, evaluation, inference, explanation and self-discipline. Ennis (1991: 68-71) classifies the critical thinking skills as stated detailedly in Graph 4²⁷:

Chart 4: Critical Thinking Skills

CRITICAL THINKING SKILLS				
Clearing Up Skills	Supporting Skills	Inference Skills	High-level Clearing up Skills	Strategy and technical skills
<ul style="list-style-type: none"> • Focusing on a question • Analyzing discussions • Asking various questions at various levels in order to clear up the states 	<ul style="list-style-type: none"> • Judging the reliability of a source • Judging observation reports 	<ul style="list-style-type: none"> • Being able to make inferences from the current data • Being able to think deductively • Being able to create value judgements 	<ul style="list-style-type: none"> • Being able to define the terms and judge the definitions • Being able to determine the premises 	<ul style="list-style-type: none"> • Deciding on a movement • Interaction with others

Source: Prepared with the help of Doğanay, Ahmet and Ünal, Figen (2006:215).

Özden states the significant qualities of critical thinking as below²⁸:

1. Evaluating prejudice and consistency,
2. Differentiating primary and secondary sources,

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

3. Evaluating inferences and their causes,
4. Differentiating premises, ideas and claims,
5. Noticing the deficiencies of the argument and uncertainties of explanations,
6. Evaluating the sufficiency of definitions and suitability of results.

Watson and Glaser address the critical thinking skills as defining a problem, determining the suitable alternatives or strong premises for the solution, inferring available results for the solution and evaluating them, and they explain these skills as below:

Inference: It can be defined as reasoning, getting a new information from the current state or information, deducing from the proposals that are known to be true.

Noticing premises: Premise is defined as "theoretical proposal that has to be confirmed practically" (Haçerlioğlu, 1994). Noticing premises is the skill of knowing structured and unstructured premises, deciding whether a premise inferred from a given state can really be inferred from that state.²⁹

Deduction: "Through deduction, new proposals that necessarily come from true proposals or proposals that are thought to be true are produced. If the initials are true in this process, the result is logically true."

Interpretation: Evaluating the evidences related to a state, inferring valid result depending on these evidences or from the information related to the state, deciding whether the inferred results are true or false.

Evaluation of discussions: The power of determining the weaknesses or strengths of the necessary inferences or statements about this situation.

According to (Richetti and Tregoe 2001:, Sternberg and Spear – Swerling 1996), effective thinking skills are as below³⁰:

1. Observing
2. Defining problems
3. Defining relations, premises, mistakes of reasoning, cause and effect relation, mistakes of logic, prejudices, charts
4. Classifying and developing standards
5. Comparing and contrasting
6. Making inferences and interpretations
7. Summarizing
8. Making analysis, synthesis and generalizations
9. Creating and imagining hypothesis
10. Differentiating related information from the unrelated one, verifiable information from unverifiable one.

PREREQUISITE STRUCTURES NECESSARY FOR CRITICAL THINKING

In order to develop critical thinking, critical thinking trainings should get started at early ages and the individual should be raised up as a critical thinker. If an individual doesn't receive critical thinking training, s/he will structure his/her own way of thinking, habits and attitudes related to thinking. Therefore, while giving critical thinking trainings to individuals who are in the mid of their education lives, they should be ensured to be ready for critical thinking training. The prerequisite structures necessary for a sound training of critical thinking are explained below.

One of the most important elements that one comes across while reading definitions of critical thinking is the dimension of attitude. Attitude is defined as a "tendency that is attributed to an individual and that shapes the thoughts, feelings and behaviours about a psychological object regularly"³¹ If we put critical thinking instead of the psychological object in this definition, we can say

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

that it affects the feelings, thoughts and behaviours about and attitudes to critical thinking. Attitudes toward critical thinking affect both the attainment process of critical thinking skills and strategies and their tenure. In many of the definitions, the dimension of attitude is also considered besides skill, strategy, process and proceeding. For example, Scriven and Paul define critical thinking as "an intellectual process during which information attained through observation, experience, reflection, reasoning or communication is conceptualized, implemented, analyzed, synthesized and evaluated effectively and skillfully in order to guide our beliefs and actions³². According to Paul, critical thinking has two dimensions. The first one is the set of skills to shape and analyze information and beliefs while the second one is the habit of using these skills as a guide for behaviour³³.

Having the mind attain positive attitudes and habits makes it easier to use skills and strategies. For example, the fact that one has attitudes and habits such as being open to alternatives, emphasizing and being open-minded will make him/her during the process of getting information to study different views, consider different opinions and look for different alternatives without being contented with the current alternatives.

Fisher (1995) mentions about three important attitudes about critical thinking. The first one of these is to be ready for and enthusiastic about reasoning. People should perceive the need of making sense of their experiences as a requirement. The second attitude is the desire to struggle. People should develop thinking habits by means of producing thoughts against their own ones. In other words, they should criticize their own thoughts. Moreover, they should desire to come to a conclusion through considering contrasting thoughts while they are shaping their own thoughts. In short, being open-minded is an important attitude in terms of critical thinking. Fisher explains how to be open-minded as below³⁴:

- Making decisions taking the evidences and evaluating evidences as the basis.
- Considering the thoughts that contrast with one's own decisions and thoughts.
- Being open to others' producing thoughts that contrast with one's own thoughts.
- Always keeping in mind the possibility of being wrong.

The third attitude is the will to look for and find the truth. People should dedicate themselves to find and look for the truth. But people always want to be right during the process of looking for the truth. The approach that can be summarized in a few words such as "I am always right and true" is quite dangerous in terms of critical thinking. Instead of this, the approach that can be summarized as "I am not sure, let's look for and find" is better.

At the beginning of trainings about teaching critical thinking, activities that enable one to develop enthusiasm and positive attitudes about critical thinking should be used. An intention in the direction of critical thinking should be shaped in the individual's mind especially through activities that make the individual to feel that s/he can be mistaken within his/her own thinking system, that s/he need to think over and over about his/her thinking because of this reason, that s/he may not see all dimensions of an event, that the opinions of people around are also important to evaluate an event as a whole, that all the surrounding stimula may not be the same as what it looks as first, that s/he need to question and think all the time in order to understand the future cases of a stimulus in all forms and shapes.

Before the trainings about teaching critical thinking, preparatory activities which make the individual to think that it is impossible to trust one's own thinking forever, that individuals may think differently, that the views of people around us are also valuable, that our own eyes may also misguide us and because of this reason we need to analyze all kinds of information that we come across carefully can be carried out by means of using pictures that lead to illusions.

CURRICULUM AND CRITICAL THINKING

Depending on the scientific developments and also the changes in the aims of education, curriculum is quickly moving away from the past's traditional understanding of transferring information to the

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

understanding of using information and transferring it into different fields. The increase in the amount of information received through different means makes it necessary to replace the understanding of reaching and transferring information by the understanding of using and processing information to produce a new one³⁵.

What should be the role of education in the light of these developments and changes? According to which skills and information should the student prepare herself/himself in this quickly-changing world? Of course, education is one of the leading fields that is affected by this transformation. Therefore, today's education systems are examined and studied more than ever before while studies of reform and re-structuring are gaining a new and important impetus. Within this framework, new teaching models are tried and traditional teaching approaches are changed in the light of new transformations. Our children incur important losses as a result of a teaching approach that depends on transferring information and learning without understanding and internalizing. First and foremost, education is starting to lose its meaning for them. Because of the decreasing interest and motivation, especially for students of secondary education, schools are turning into boring places while education is perceived as experiences that students have to stand just because they have to. The approach that depends on transferring information takes the premise as basis that children can learn the information easily as separate and simple definitions, explanations, formula and units, and that what is learnt will be transformed into understanding and implementation later. But, it is impossible for students to learn the information thoroughly and meaningfully through simple readings and explanations. Information can be used in different fields only when it is learnt thoroughly and meaningfully.

The final purpose of education is to ensure the individual reach the truth. While gathering information for the sake of reaching the truth, it is possible to get and interpret the information safe and sound, and to produce new information only through thinking. While the common purpose of all education policies is especially to raise up individuals that have learnt to learn and think, this also makes up the real study field of curriculum³⁶.

Some of the reasons that can be listed in terms of teaching critical thinking skills are summarized as below:

- In order to raise up citizens that can make meaningful and logical decisions while they are participating in the management through democracy,
- In order to create a public opinion that knows critical thinking and that sees the "whole" while evaluating the social events wholesomely,
- In order to develop curriculum that enables individuals to learn depending on creative and critical thinking skills instead of inflexible behaviour and information based on memorization and compulsion, and to be able to be objective while thinking,
- In order to raise up individuals who can produce new information by means of using the information wholesomely in today's world of information explosion,
- In order to raise up individuals who can make sound decisions despite of intentional and negative campaigns carried out by press, advertisements, propaganda and various steering centers,
- In order to raise up individuals who can develop multi-perspectives about solving problems and individual differences about learning mental skills and complex views necessary for an objective and realistic worldview³⁷.

Statements that exist in curriculum designed for different subject fields in Turkish national Education system and that emphasize the fact that critical thinking skills should be attained can be seen in the chapter where the general purposes of Turkish National Education System at National Education Fundamental Law are explained. The second of the general purposes clearly indicates the need to raise up individuals who think by means of education. According to this purpose:

"The goal of Turkish National Education is:

To raise all Turkish citizens as constructive, creative and productive persons who are physically, mentally, morally, spiritually and emotionally balanced, have a sound personality and character, with the ability to think freely and scientifically and have a broad worldview, that are respectful for human

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

rights, value personality and enterprise, and feel responsibility towards society"³⁸. It will make great contribution to make use of critical thinking skills in order to achieve this goal.

Özden accepts critical thinking as a prerequisite for a sound democracy. Özden explains the contributions of individuals who think critically to democracy as below³⁹:

"If individuals attain critical thinking skill at school, they will be able to differentiate the opinions, assumptions and claims of the speaker they are listening to, they will be able to see the unclear points in the speech and the deficiencies of the argument, and they will be able to evaluate the sufficiency of the definitions and feasibility of the results. ... A majority that knows how to think critically and that sees the whole picture is an indispensable prerequisite for a sound democracy. Public opinion which is one of the most important elements of democracy is shaped by people who can think critically, who can understand what they read and listen to, who can evaluate the events and objects according to their point of view."

According to Kazancı, in countries where pluralistic democracy exists, thinking and all dimensions of freedom of thought are studied in detail, and it is believed that especially to learn how to think critically is accepted to be the most important civic duty. As J. Dewey stated, no one can think over a subject that s/he has no experience. So, the leading duty of schools is to provide students with opportunities as much as possible, where possible and about subjects as various as possible and then to have students discuss these experiences freely⁴⁰.

Today is the first period in history when younger people know more than elder ones. The individuals of future must be ones who reach information, produce information out of information, play with information, dance with information. It is a must for such an individual to possess critical thinking skills.

TEACHING CRITICAL THINKING

Basic Approaches About Teaching Critical Thinking

While all educators agree on the importance of developing critical thinking skills within education system, there is no common view about how to teach these skills. Related body of literature mentions four basic approaches considering the discussions and programmes to develop critical thinking. These approaches are⁴¹,

- A. Subject-Based Educational Approach,
- B. Integrating-to-the-Subject Approach,
- C. General Approach (Skill-Based Approach),
- D. Blended Learning Approach (Glaser, 1984; McPeck, 1981; Kruse and Prensseisen, 1987; Sternburğ and Bhana, 1986; Ennis, 1989; Perkins and Solomon, 1989; Akt; Mcknown, 1997).

A. *Subject-Based Educational Approach*: This approach defended by Glaser (1984) and McPeck (1981) envisages that critical thinking should be taught together with the content planned to be taught. According to this approach, the principles and rules of critical thinking are clearly presented to the students in parallel to content unit.

B. *Integrating-to-the-Subject Approach (Content-Based Critical Thinking Teaching)*: Although this approach is similar to the first approach, it envisages integrating content unit and critical thinking principles and rules. However, these rules and principles are not presented explicitly. On the other hand, some thinkers and educators do not agree. Mc Peck has stated that all kinds of thinking are about an X, so there isn't a set of critical thinking skills applicable to all subjects; therefore it is useless to teach critical thinking as a set of skills. According to Mc, since good reasoning is dependant upon the epistemological and logical norms of subject field, critical thinking may change from one field to another. It is more meaningful to teach critical thinking skills through integrating to the subject field instead of teaching independently from the field⁴². Resnick (1987), Pauker (1987), Vincent Ryan Ruggiero (1988), Paul (2001) and Elder (2001) who are some of educators who study

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

on critical thinking also claim that critical thinking should be taught with an approach that envisages integrating to the subject.

Paul and Elder state that the elements of critical thinking guide us about this. The elements of critical thinking and how these elements guide learning are explained as below⁴³:

- All thinkings have a goal.
- All thinkings focus on at least one question.
- All thinkings require information.
- All thinkings require concepts.
- All thinkings include inferences.
- All thinkings include some premises.
- All thinkings include perspectives.
- All thinkings include a point of view.

There are some changes in the steps to be followed according to the approach adopted about teaching critical thinking. Below are seen the steps of preparing activities to be followed in teaching content-based critical thinking in Social Sciences⁴⁴.

Determining the educational attainment to be studied about Social Sciences

1. Determining the attainments that can be realized through to-be-studied attainment and stating them as student's behaviour by means of critical thinking strategies
2. Determining which one to use among thinking skills (determining the reliability of sources, guess, reasoning through analogy, etc.) that can be attained to the students while studying this behaviour.
3. Completing introductory (preliminary) information and determining warm-up activities
4. Determining the best approach/strategy/method/way in order to realize these behaviours
5. Determining activities for the best thinking skill (specifying standards in the studey below)
6. Determining the necessary course materials
7. Determining questions that will lead students to produce their slogans
8. Determining thinking activities (analysis and synthesis, finding cause and effect relations, guessing, comparison, inference, etc.)
9. Determining research subjects
10. Determining complementary activities
11. Making lesson plans out of activities that will enable the determined studies to be carried out in class

Content-based critical thinking teaching organization diagram

<p>Student Behaviour Depending on Critical Thinking Strategies That Will Be Studied Together With Attainments</p> <p>S-14: Exemplifying the state of our town in terms of natural and historical antities</p> <p>S-15: Determining the standards necessary for a place/structure or object to be accepted as natural beauty</p> <p>S-16: Questioning the accuracy of the sources from which information is received while learning the qualities of natural/historical places around</p>	<p>RESEARCHES</p> <ol style="list-style-type: none"> 1. Researching the natural entities of our own 2. Researching the historical places and structures in our town 3. Researching the significant historical places in Turkey 4. Researching the significant natural beauties in Turkey 5. What can be done depending on the historical and natural beauties in our town? 				
<p>Warm-up Activities The game called "What does s/he have?"</p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">Completing Preliminary Information</td> <td style="width: 50%; padding: 5px;">Explaining the related concepts: Historical structure, Natural beauty, Source of Information</td> </tr> <tr> <td style="width: 50%; padding: 5px;">Thinking Skill</td> <td style="width: 50%; padding: 5px;">Reliability of Sources, Generalization, Guess, Reasoning, etc.</td> </tr> </table>	Completing Preliminary Information	Explaining the related concepts: Historical structure, Natural beauty, Source of Information	Thinking Skill	Reliability of Sources, Generalization, Guess, Reasoning, etc.
Completing Preliminary Information	Explaining the related concepts: Historical structure, Natural beauty, Source of Information				
Thinking Skill	Reliability of Sources, Generalization, Guess, Reasoning, etc.				

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

<p>S-17: Questioning the explanations made about the subject</p> <p>S-22: Welcoming the questionings of people around about the explanations s/he made</p> <p>S-26: Re-shaping his/her view with the help of contrasting views coming from people around</p> <p>S-29: Noticing the similarities and differences between the historical entities around us and in places far away</p> <p>S-30: Determining the premises in his/her friends' thoughts</p> <p>S-31: Stating the related and unrelated elements about a place's being historical monument</p> <p>S-32: Foretelling the future state of a place with reference to historical/natural structure of this place</p> <p>S-33: Evaluating the evidences presented about a place's state</p> <p>S-10: Avoiding prejudice while evaluating his/her own thoughts</p> <p>Thinking Activities Synthesis: Are there similarities between the historical artifacts in our town and today's lifestyle? Cause-Effect: What are the causes and effects of the fact that there are a lot of historical artifacts in our town? Comparison: Specify similarities and differences between the life today and in the past in the light of historical artifacts. Truth and Opinion: What do you think of the saying that "Our town is rich in terms of historical artifacts"?</p>	<p>ATTAINMENT: The student knows the natural entities, historical places, objects and structures around him/her and in various places of our country.</p> <p>MATERIAL</p> <ul style="list-style-type: none"> • Introductory film about our town • Clip of "Memleketim" • CD of "Türkiyem" • Website of the Ministry of Tourism <p>Slogan of the Day Bad according to what? Good according to what? Ugly according to what, beautiful according to what? According to what! Of course, according to standard.</p> <p>According to standard! Standard...</p> <p>Complementary Activities Collect information about life during the period when these monuments were built starting from the historical structures in our town.</p>	
<p>SCALES</p> <ul style="list-style-type: none"> • Scale of determining historical building • Scale of determining Natural Beauties • Scale of evaluating one's own way of thinking 		
<p>Method/Strategy: (Methods and strategies to be used during the activity will be specified in this part.) Discussion, Small Group Study, Teaching Through Research and Study, etc.</p>		

C. Skill-Based Teaching (General Approach): It is structured completely different from subject-based teaching. Critical thinking skills have the characteristics of a skill-based programme

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

which has been developed depending on a non-school context apart from the contents presented at school. Kruse and Prensesisen (1987) and Sternburg and Bhana are advocators of this approach.

Ennis (1991), one of the pioneers of critical thinking, states that there are twelve dimensions of critical thinking, and that these are teachable and transferrable skills. Critical thinking should be taught through a skill-based approach. When critical thinking is taught through a skill-based approach, repetitions of basic disciplines within the subject are avoided while it gets easier to apply the attained cognitive skills to other lessons and to support these skills by these lessons⁴⁵.

One of educators who claim that critical thinking should be taught through a skill-based approach is Lipman. According to Lipman (cited from Fisher, 1995), thinking is made up of individual skills and one should start to teach critical thinking with these skills. According to Lipman, when critical thinking is taught with a content-based approach, subjects get attention and critical thinking skills are ignored during the lesson. Thus, the development of such critical thinking skills of the students are limited. Lipman lists more than thirty skills as critical thinking skills. One and the first of these skills is "to specify concepts clearly and neatly." To define a concept clearly requires to define the examples within and out of the border of this concept. Lipman states that it is suitable to do this through discussion. Although the programme offered by Lipman is designed for elementary school students, it can be adapted to all levels. Lipman thinks that the use of the skills listed below should be developed;

1. Concepts and thoughts
2. The skill of generalization
3. Being able to understand the cause and effect relations
4. The skill of inferring logically
5. Noticing the consistency and contradictions
6. Being able to make analogies
7. Being able to understand meronymy
8. Being able to formulate problems
9. Being able to reverse and re-state logical statements
10. Being able to apply rules to the real-life conditions

There are various methods that can be followed in teaching skill-based critical thinking. Here is the graph designed by Swartz and Parks (1994) and used in activities:

Graph of Activities Used in Teaching Skill-Based Critical Thinking

SKILL-BASED CRITICAL THINKING LESSON PLAN GRAPH	
SKILL:	LEVEL:.....
GOAL Thinking Skill or Process: Defining the thinking skills or processes that the students are going to learn	
METHODS AND MATERIALS Using Teaching Methods in order to Teach Thinking Process Effectively	
<ul style="list-style-type: none"> • Strategy of structured questioning • Tables of organizing data • Collaborative learning comprising small group works • Explaining the thinking process directly or inductively • Cognitive maps (Picture or drawing) produced by students 	
LESSON Explaining the To-Be-Studied Thinking Skill or Process and its Importance to Students The explanation should activate the preliminary information and experience of students about thinking skills by means of revealing thinking skills and processes, reviewing thinking skills and processes, and showing the importance and helps of skillful thinking.	
ACTIVE THINKING PROCESS Active thinking includes verbal messages and graphic maps (tables of organizing data) Students should be helped with thinking activities through verbal messages and tables of	

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

organizing data.

Thinking Activities About Thinking Process That Helps Students To Notice Thinking Ways

Students are directly asked questions to explain their own way of thinking. The prepared cognitive maps guide the formation of questions that will be asked to the students. Students explain which way of thinking they use, how they do this and how they can display (reflect) this thinking skill.

APPLYING THINKING TO OTHER FIELDS AND DAILY LIFE

These are activities which envisage students to transfer the learnt skill

Activities of transferring can be divided into two:

1. Instant transferring

a) *Immediate transfers:* Applying the skill that is addressed during the lesson to a similar situation at the same level

b) *Distant Transfer:* Applying the skill that is addressed during the lesson to different situations and subjects at the same level

2. Transferring for strengthening the next structure: Applying the skill that is addressed during the lesson to the future days of education or to daily life.

Statements and activities of teachers should be diminished while students' activities are increased in both kinds of transfers.

ACTIVITIES TO ENLARGE THE SKILL (At will)

(Can be carried out at any time during the lesson)

Strengthening other thinking skills and processes: While a skill is being taught, other skills that have been learnt before and that can be presented together with this skill are used.

Studies of enlarging: Gathering extra information useful for enriching the conclusion or interpretation found at this lesson.

Using specific exercises and homeworks in order to strengthen thinking: Homeworks given in the form of written, verbal or Project work in order to make skill to be learnt better

EVALUATION OF STUDENTS' THINKINGS

Evaluating the effective use of thinking skills and processes through performance work, written or verbal presentations

Source: Prepared with the help of Swartz, Robert J. and Parks, Sandra (1994:505)

D. Blended Approach: This approach adopted also by Ennis (1989) and Perkins and Solomon (1989) sets forth that both subject-based approach and general approach be used together.

THE ROLE OF TEACHING IN TEACHING CRITICAL THINKING

One of the most important things that a teacher can do in class is to make students able to notice their own operating cognitive processes which means that students can form their own learning regardless of the subject and level of the class. The students should be able to try thinking, classifying and comparing, defining the wrong things about their thinking and correcting their own mistakes by themselves⁴⁶. So, teachers should have the students attain the skills of learning how to learn and think.

Teachers need a deep and comprehensive content knowledge and educational methods knowledge in order to improve students' critical thinking skills. However, the teachers' own perceptions about their being a good teacher and their attitudes towards critical thinking are also very important⁴⁷.

Teachers are both planners of learning-teaching activities and organizer of the classroom environment. Oppressive and authoritative environments prevent learning to think in class. Over-oppression, fear and excitement cause some hormones to be excreted more in the brain, and this causes mental processes to slow down⁴⁸.

Demirel and Şahinel explain the role of teaching in teaching critical thinking as below⁴⁹:

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

Missions of teachers in democratic education systems:

- Accepting the value and importance of all the teenagers as an individual.
- Believing in the soundness of agreed decisions.
- Believing in teenagers' abilities to face and solve their own problems.
- Being patient about the seeming slowness of democratic processes.

In the light of these understandings, a teacher;

- should let students participate in determining the classroom activities and even their goals through discussion and preference.
- should let students ground their own ways of behaving on their own decisions in a gradually increasing manner and should prepare opportunities for them.
- should display some certain ways of behaviours to the students through examples, criticism and explanations or have the students do them instead of repeating the necessity of these behaviours, should give students chance of revealing, improving and making use of their abilities as an individual.
- should work with students in a nice environment collaboratively through encouraging student participation and individual initiative.

Lipman explains the goals of teachers in order to have teachers help the students with moving from usual thinking to critical thinking⁵⁰:

A teacher should arrange educational activities that go;

1. from assuming to guessing
2. from preferring to evaluating
3. from grouping to classifying
4. from believing to supposing
5. from mere deducing to logical deducing
6. from remembering concepts to perceiving principles
7. from giving importance to relations to giving importance to relations between relations
8. from presuming to hypothesizing
9. from Suggesting without thinking to presenting an opinion after thinking
10. from judging without evaluating with standards to judging through evaluating with standards.

Gürkaynak, Üstel and Gülgöz expect a teacher who facilitates critical thinking to do the things listed below⁵¹:

- a mental transformation that will help avoid that famous "role of teacher" who tells, who asks close-ended questions, who asks for what s/he tells, who expects quietness, good behaviour, obedience and submission, who sometimes shouts and reprimands, who knows everything and all the time.
- Being able to go beyond course books and course plans.
- Transforming the atmosphere of the class in a manner that is fair, dependent upon human rights, far away from violence and force.
- Carrying out all educational activities considering human rights, respecting students and their opinions (not in a so-called manner, in act: For example, giving students time to think, decide, express their opinions).
- Using interactive methods understanding and believing in the students' contribution to the critical thinking skills.
- Correlating information and life.
- Not being "objective" but "participating in the discussion in class without directing."
- Having facilitating skills
- Not humiliating students by means of using age, status and position of being a teacher (in other words, not misusing power).
- Being aware of the fact that one can force his/her own opinion involuntarily.
- Not salving one's conscience by means of "carrying out a so-called discussion", not behaving in a manner that the class have come to a conclusion after a "so-called discussion", namely, not

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

trying to make a reconciliation/agreement that has not agreed upon yet or not trying to quicken this process.

- Thinking reflectively about the day in question – the attitude in class, the atmosphere s/he has created in class, goals that have been reached or not reached, etc. – every night, or making a reflective dialogue with one of the colleagues about these subjects.
- Creating a free atmosphere suitable for interaction in class.

THE ROLE OF THE STUDENT IN TEACHING CRITICAL THINKING

1. The students should start the education with a positive attitude. Their beliefs and tendencies about critical thinking affect education directly.
2. Students should directly participate in teaching activities. Especially when group work is in question, each student should actively participate in works in group and then in class.
3. Students should also critically evaluate their own opinions.
4. All students should contribute to creating a democratic atmosphere in class.
5. The students who come to the front in terms of leadership skills and other qualities in class should not hinder the creation of circumstances that will let other students display their opinions and studies in class.

THE ADVANTAGES OF TEACHING CRITICAL THINKING

1. It ensures the subjects to be learnt thoroughly.
2. Learning thoroughly creates interest in and motivation about the subject in the student.
3. It increases the level of active participation of students to a great extent.
4. It facilitates transferring of the learnt skills and subjects to other lessons and life.
5. In-class communication and interaction increases as a result of attaining skills.
6. Teaching critical thinking skills contributes to creating a democratic atmosphere in class.
7. It contributes to the socialization of students.
8. It helps the students to develop self-evaluation skills.
9. Especially in skill-based teaching, choosing extracurricular subjects helps students to be more active in class.

DIFFICULTIES OF TEACHING CRITICAL THINKING

1. As learning styles of students who haven't received critical thinking teaching in the first years of education life are shaped, an orientation period is needed to pass to teaching critical thinking.
2. The teachers should be well-trained about teaching critical thinking skills.
3. It requires a good planning. This planning should be composed of a yearly plan that covers a whole educational year and daily plans that show how to get students attain the critical thinking skill in each lesson. These plans may require to be prepared by people having specialized in critical thinking especially in our country until teaching critical thinking becomes widespread.
4. Stationery expense is more than usual activities.
5. Critical thinking activities take longer time.
6. Teaching critical thinking should be spread over a long period of time. Teaching critical thinking should be planned with a spiral sense that is distributed to all levels of education starting from pre-school period instead of teaching in one or a few years⁵².

REFERENCES

1. Kurnaz, A. Kurnaz, A. (2011). Activities of Teaching Critical Thinking Skills. Konya. Eğitim-Akademi Yayınevi.
2. Demirel, Ö. (2004). *Kuramdan Uygulamaya Eğitimde Program Geliştirme*. (Seventh Edition). Ankara: Pegem Yayıncılık.

LEARNING AND TEACHING : THEORIES, APPROACHES AND MODELS

3. Doğanay, A., Ü. Figen. (2006). *Eleştirel Düşünmenin Öğretimi*. Ali, Şimşek (Editor) Teaching Based on the Type of Content. Ankara. Nobel Yayın-Dağıtım.
4. Fisher, R. (1990). *Teaching Children To Think*. London: Stanley Thornes Publishers Ltd.
5. Doğanay, A., Ü. Figen. (2006). *Eleştirel Düşünmenin Öğretimi*. Ali, Şimşek (Editor) Teaching Based on the Type of Content. Ankara. Nobel Yayın-Dağıtım.
6. Demir, M.K. (2006). *Demokrasi Eğitimi ve Sınıf Öğretmenlerinin Demokratik Davranışları*. National Congress of Primary School Teaching Bulletin Book 1.Volume. Ankara. Kök Yayıncılık.
7. Yıldırım, A. (2003) *Öğrenmeyi Öğrenmenin Temeli Olarak Düşünmeyi Öğrenme*. "Workshop of Learning How to Learn" organized by Turkish Intelligence Foundation and Ministry of Education. www.tzv.org (downloaded on 30.12.2005)
8. MEB. (2005). *İlköğretim Sosyal Bilgiler Dersi Öğretim Programı ve Kılavuzu*. Ankara, MEB Yayınevi.
9. Kazancı, O. (1989) Mentioned Source
10. Morgan, C. T. (1984). *Psikolojiye Giriş*. (Translated by Sibel Karakaş and Others), Ankara: Hacettepe University Departman of Psychology Publications.
11. Gibson, C. (1998). *Teaching Strategies: A Guide To Better Instruction*. Usa. Orlichharder Collation.
12. Thomson, R. (1969). *The Psychology of Thinking*. Maryland: Penguin Books.
13. Armay, U. (1981). *Bilimsel Araştırma El Kitabı*. İstanbul. Kültür Matbaacılık.
14. Yıldırım, C. (1988). *Eğitim Felsefesi*. Eskişehir: Anadolu University Faculty of Open University Publications.
15. Paul, W. R. (1995). *Critical Thinking: How To Prepare Students For A Rapidly Chaning World*. Dillon Beach, ca. Foundation For Critical Thinking, Appendix B, pp.521-552.
16. Çakmak, H. (2002). *İlköğretim Okullarında Düşünme Eğitimi- Cumhuriyet Dönemi*. Diyarbakır: Dicle University Institute of Social Sciences (Unpublished Master's Thesis).
17. Swartz, R., J.S. parks (1994). *Infusing the Teaching of Critical And Creative Thinkinginto Content Instruction*. USA. The Critical Thinking Co.
18. Mirioğlu, M. (2002). *The Relationship Between Proficiency in A Foreign Language And Critical Thinking Skills*. Adana: Çukurova University Institute of Social Sciences (Unpublished Doctoral Dissertation).
19. Bruning, R., G. Schraw, R. R. Royce. (1995). *Cognitive Psychology And Instruction*. New Jersey: Prentice Hall Inc.
20. Demir, M. K. (2006). Mentioned Source
21. Bittner, N., D. Tobin. (1998). *Critical Thinking: Strategies of Clinical Practice*. Journal for Nurses in Staff Development 14(6): 267-272.
22. Kazancı, O. (1989) Mentioned Source
23. Demir, M. K. (2006). Mentioned Source
24. Paul, R. W., A. Binker, K. Jensen. H. Kreklau. (1990). *Critical Thinking Handbook: 4. – 6. Grades A Guide For Remodelling Lesson Plans In Language Arts, Social Studies and Science*. Rohnert Park, Ca, Foundation For Critical Thinking. Shania State University.
25. Şahinel, S. (2001). *Eleştirel Düşünme Becerileri İle Tümüleşik Dil Becerilerinin Geliştirilmesi*. Ankara: Hacettepe University Institute of Social Sciences (unpublished doctoral dissertation).
26. Swartz, R., J. S. Parks (1994). Mentioned Source
27. Doğanay, A., Ü. Figen. (2006). Mentioned Source
28. Özden, Y. (2002). *Kendini Keşfet, Tanı, Geliştir, Gerçekleştir*. Ankara: Pegema Yayıncılık.
29. Kürüm, D. (2002). *Öğretmen Adaylarının Eleştirel Düşünme Gücü*. Eskişehir: Anadolu University Institute of Educational Sciences (Unpublished Master's Thesis).
30. Orlich, D.C., H. R. J. Callahan, R. C. Trevisan, M. S. Brown, (2004). *Teaching Strategies. A Guide to Effective Instruction*. Seventh Edition, Houghton Mifflin Company, Boston New York.
31. Kağıtçıbaşı, Ç. (1979). *İnsan ve İnsanlar*. Third Edition. İstanbul: Can Ofset Matbaacılık.
32. Paul, R. W., L. Elder, (2001). *Critical Thinking: Tools For Taking Charge of Your Learning And Your Life*. Upper Saddle River, Nj: Prentice Hall.
33. Doğanay, A., Ü. Figen. (2006). Mentioned Source
34. Fisher, R. (1995). *Teaching Children To Think*. United Kingdom: Stanley Thornes Publishers Ltd.
35. Meyers, C. (1998). *Teaching Students to Think Critically (A Guide For Faculty in Ah Disciplines)*. San Fransisco: Jossey-Bass Publishers.
36. Meyers, C. (1988). Mentioned Source

37. Demirel, Ö., Ş. Semih. (2005). *Öğretimde Çağdaş Yaklaşımlar*. Ankara: Pegema Yayıncılık.
38. MEB. (1984). *1739 Sayılı Millî Eğitim Temel Kanunu*. Ankara: MEB Publication.
39. Özden, Y. (1998). *Öğrenme ve Öğretme*. Ankara. Second Edition. Pegema Yayıncılık.
40. Kazancı, O. (1989). *Eğitimde Eleştirel Düşünme ve Öğretimi*. İstanbul: Kazancı Kitap Aş.
41. Vural, R., O. Kutlu. (2005). *Eleştirel düşünme: ölçme araçlarının incelenmesi ve bir güvenilirlik çalışması*. <http://sosybilimler.cu.edu.tr/dergi.asp?dosya=160>. (downloaded on 17.12.2005).
42. McPeck, John. E. (1981). *Critical Thinking and Education*. England Oxford: Martin Robenson.
43. Doğanay, A., Ü. Figen. (2006). Mentioned Source
44. Kurnaz, A. (2007). The Effect of Teaching Critical Thinking Having the Basis of Skill and Content on Students' Critical Thinking Skills, Access And Attitudes in Social Sciences at Grade 5 of Primary School. Konya: Selçuk University Institute of Social Sciences (unpublished doctoral dissertation).
45. Ennis, R. H. (1991). Goals for a Critical Thinking Curriculum. A. Costa (editör). *Developing Minds*, Volume 1. Alexandria: Virginia. Ascd.
46. Ornstein, A., C. Thomas, J. Lasley II. (2004). *Strategies for Effective Teaching*. (Fourth Ed.) USA. McGraw Hill Companies.
47. Grant, G. E. (1988) *Teaching Critical Thinking*. New York. Praeger Publishers.
48. Jensen, E. (1988). *Teaching With The Brain In Mind*. Alexandria, Va: Ascd.
49. Demirel, Ö. Ş. Semih. (2005). Mentioned Source
50. Ornstein, A., C. Thomas, J. Lasley II. (2004). Mentioned Source
51. Gürkaynak, İ., F. Üstel, S. Gülgöz, (2003). *Eleştirel Düşünme*. İstanbul: Initiative of Educational Reform.
52. Kurnaz, A. (2011). *Activities of Teaching Critical Thinking*. Konya. Eğitim-Akademi Yayınevi.