Critical Thinking as a Qualified Decision-Making Tool

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Abstract

Decision making is a process that we unintentionally apply hundreds of times a day. While the decision-making process for important decisions requires more time-consuming thinking, it can take place instantaneously and spontaneously in situations that have already occurred or where the outcome is not significant. Since decisions are important in human life, it is obvious that the way to make better decisions is to think better and therefore individuals can benefit significantly from having critical thinking skills. In this study, the concepts of decision-making and critical thinking are examined separately to determine the bond and importance between them. The study has a qualitative research feature and a comprehensive literature review and examination have been made. The information obtained as a result of the study conducted within the scope of qualitative research showed that critical thinking is an important requirement for individuals to make better decisions, while various decision-making techniques also contribute positively to the quality of critical thinking of individuals. It is very important for individuals who want to make more successful decisions both in their personal and professional lives, in order to improve their critical thinking capacities and to benefit from decision techniques in making high importance decisions. For today's and tomorrow's executives who influence the lives of countless people with their decisions, developing critical thinking skills will be an approach that requires determination and commitment as an indication of their respect for their professions.

Keywords: Decision, Decision-Making, Thinking, arguments, Modern logic, Logical thinking, Critical Thinking

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INTRODUCTION

Although people usually face instant decision situations that do not require careful thinking when making decisions (Robbins & Coulter, 2012, p. 178; Wiig, 2004, p. 66), it is possible to talk about a longer process of thinking and evaluation when important decisions are to be made. Decisions made as a result of such thinking processes can sometimes affect individuals, their environment or a larger community. The fact that those who make decisions in enterprises are the people who manage the businesses increases the importance of the decisions in terms of the scope of the decision (Certo & Certo, 2012, p. 182). The fact that the decisions made by senior managers are usually important strategic decisions (Pavett & Lau, 1983, p. 176; Drucker, 2005, p. 307) and are vital to both the current situation and the future of the enterprises increases the importance of both the decision-making process and the decisions (Frankelstein et al, 2009, p. 63; Certo & Certo, 2012, p. 182). Whether a single person, a group or a community decision, effective decision making is a fundamental requirement of almost any profession (Freeley & Steinberg, 2009, p. 1). In terms of management, qualified decision making is a sine qua non for effective management, because management decisions determine how an enterprise solves its problems, assesses its resources and achieves its objectives (Daft, R. L., 2008, p. 271). Effective businesses are the result of management that can make and apply qualified decisions. Every business and management invest in human resources to improve the decision quality of senior executives, especially those who make strategic decisions. Undoubtedly, one of the most prominent investments in business resources is the investments made in the training and development of managers. Every effort to improve the decision quality of the managers will increase the quality of the decision in parallel with the increase of the qualifications of the managers.

Decision making is only a part of the work of managers and usually does not take much time. But making important decisions is a "special managerial" task. Managers are expected to make important and positive impacts throughout the enterprise, its operations and production (Drucker, 2005, p. 307). Rational decisions with enhanced qualifications will increase the chances of people to be happy and businesses to be successful. Decisions of people in their private or professional lives directly affect their quality of life. When critical thinking is applied to decision-making, it raises the decision-making model to a level of conscious and deliberate choice and increases the susceptibility of decisions to reason and logic (Paul & Elder, 2014, p. 183). It is possible for business executives whose main purpose is to increase efficiency and productivity, by using critical thinking among other methods, to improve the quality of executive decisions.

The concept of critical thinking is one of the concepts that are becoming more widely researched and studied. According to the Critical Thinking Society, it is defined as:

"*Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action*" (Scriven & Paul, 1987).

Critical thinking is also defined as "metacognition" (Tempelaar, 2006, p. 291), that is, one's ability to think about his / her own thinking processes (Kuhn & Jr., 2004, p. 270). In addition, critical thinking is considered to be one of the few learning and innovation skills necessary to prepare students for post-secondary education and the labor market (Lai, 2011, p. 41). Critical thinking is accepted by educators,

administrators, legislators and employers as one of the desired goals of higher education and independent learning of adults (Geertsen, 2013, p. 52). According to the 2018 report of the World Economic Forum, critical thinking ranks among the rising values until 2022 (http://www.hurriyet.com.tr/ik-yeni-ekonomi/133-milyon-yeni-is-dogacak-40964093 Access Date: 12.11.2019). Career choices are becoming more and more complex, and higher education is becoming more important than ever. As long as critical thinking continues to be a desirable outcome of education, we will need to find ways to help students develop their critical thinking skills and use them (Yılmaz, 2013, p. 419). In the sense of grasping the future, it seems obvious that critical thinking is a must-have skill for future generations.

CONCEPTUAL FRAMEWORK

Decision-Making

Management scientist Daft described the decision as a choice among the existing alternatives. Decision-making is the process of identifying problems and opportunities and then providing solutions to them (Daft R. L., 2008, p. 272).

Drucker, who is regarded as the guru of management science, stated that the decision is a judgment and that in very rare cases a decision is a choice between right and wrong. Drucker stated that the decision is the choice of which of the two alternatives is the closest to the truth, rather than the choice between right and wrong (Drucker, 2005, p. 470). How will the manager decide between these two alternatives? In our opinion, the ability of the manager to make this distinction will depend on his/her ability of critical thinking.

Karl Wiig described decision making as one of the most important activities that people can engage in. According to him, decision making is the identification and determination of a given situation and what to do in this context. Wiig stated that decision-making involves the following three functional tasks: (i) simple decision making, (ii) complex decision making, and (ii) specific decision making. Once the situation to be decided is understood, it is possible to decide how to approach it. Well-understood situations can be addressed directly by single-stage decision-making. More complex situations may require multi-phase complex decision making or even original decision making. Multi-stage decision-making / problem-solving generally requires additional information on decision-making, interpretation and decision-making (Wiig, 2004, p. 131-133).

According to Drucker, in order to make effective decisions and to minimize the risk, the following seven stages are required in the decision-making process: i) Determine that a decision is necessary, ii) Classify the problem, iii) Identify the problem, iv) Decide what is right, v) Have others accept the decision, vi) Put the decision into practice, vii) Test the decision against actual results (Drucker, 2005, p. 296).

The stages in the decision process are important for making effective decisions and achieving the desired results. However, it can be mentioned that in the case of programmable decisions, the importance of some stages decreases compared to non-programmable decisions. Since programmable decisions have a specific structure, they have already been realized exactly or similarly and have been programmed, it is not necessary to waste time with all decision-making stages. The alternative identification step may be excluded or given less importance, because once the definition of the decision has been made, the alternative to be selected may emerge automatically or at least several previously selected and successfully alternatives may remain (Robbins & Coulter, 2012, p. 186).

There are many techniques that can be used at various stages of the decision process and make it easier to make more accurate decisions. Some of the most used ones are explained briefly:

Decision Trees: Decision trees provide a way in which a decision problem can be solved in the form of smaller decision points and these solutions can be combined and provide a solution to the actual decision problem. Decision trees are a technique that illustrates an existing decision-making process. Decision options are represented by the branches of the decision tree. Decisions and options are written in the order in which they are made to the representative tree. Such representation generally includes one or more sub-branches separated from each branch. The decision-making possibilities are appropriately placed in these sub-branches. By following the steps backward from the sub-branches, the option that will produce more desirable decisions can be calculated. When a selection is made in the decision tree, other branches that are not selected and their sub-branches are usually removed from the options. Decision trees representing multiple decision steps visually express the natural or rational steps that can take place throughout the decision-making process (Anderson, et al., 2012, p. 606; Lindley, 1971, p. 147).

Six Thinking Hats: The six thinking hats technique, developed by Edward De Bono, is a highly effective way of dealing with the same subject from different perspectives and using six hats, which represent six different approaches to the subject to be decided. This technique includes six different colored hats. De Bono stated that the aim of this technique is to visualize different hats in their minds and to imagine hats as if they really exist and that the best way is to use colors (Bono, 2000).

Fishbone: The fishbone technique, created by Japanese quality expert Dr. Kaoru Ishikawa, also called root cause analysis or Ishikawa diagrams (Kendrick, 2010), stands out as an important technique in investigating the causes of problems (Kreitner, 2009). In this technique, the result or problem is primarily written as the head of a fish skeleton. Each of the bones of the skeleton is written with concepts that are thought to cause the problem, and the secondary causes that are thought to cause these concepts indirectly are added to the diagram as smaller bones. This diagram shows how the factors that seem to be independent of each other interact with each other and cause problems (Sashkin & Kiser, 1993).

Brainstorming: The brainstorming technique is based on generating as many ideas as possible. In this technique, there is no discussion or criticism of ideas, and all ideas are recorded (Akdere, 2011).

Nominal Group Technique: The nominal group technique is very similar to the brainstorming technique. In this technique, people in the group do not interact with each other in the process of finding new ideas. Developed by Delbecq and Van de Ven (1971), this technique aims to reduce some of the negative effects of brainstorming. In the nominal group technique, people in the group silently look for ideas on their own to solve the problem. Each group member then passes their ideas to the group manager. Once all the ideas that have emerged are recorded, all members in the group will express their opinions. Finally, members vote silently on the resulting ideas, and these votes are evaluated to produce the best-perceived idea.

Delphi Technique: The Delphi technique is a decision-making technique that does not allow group participants to make face-to-face communication but identifies a problem and presents solutions using a questionnaire. A problem is identified in this technique and a series of carefully designed questions are asked through the questionnaire to enable potential group members to participate in the decision process. Group members answer these surveys on their own. The results of the first survey are then

sent to all members of the group who are still physically separated. The survey results are sent anonymously so that the group members are not influenced by each other. After reviewing the feedback, the members are asked again for their ideas in the light of the survey results. This process can continue with repetition until the opinions of the group members begin to agree or the decision options are reduced to only a few (Hitt, et al., 2012; Armstrong, 2006).

Devil's Advocate Technique: A group member of the devil's advocate technique, a technique used in decision-making as a group, is tasked with questioning the group's assumptions and approaches through critical evaluation (Schweiger & Finger, 1984, p. 342). Such an approach allows the decision-making group to justify itself and contributes to a clearer identification of the problem and its sub-clauses (Hitt, et al., 2012). Through repeated criticism and review, the approach leads to the mutual acceptance of a proposal. Proponents of this decision-making approach believe that good recommendations and assumptions will survive even the strongest and most effective criticism, and that this approach is more likely to make sound decisions or recommendations (Schweiger, et al., 1986, p. 58).

Critical Thinking

Critical thinking has been defined in many ways by many researchers working on the subject and has continued to develop by adding different perspectives and information from various fields such as psychology and philosophy since its first introduction. Many researchers agree that the first definitions of critical thinking were made by John Dewey (Alkhatib, 2019; Ennis, 2018; Hitchcock, 2017; Fisher, 2011; Kincheloe, 2004). In his work, Dewey called critical thinking as reflective thinking and described it as an active, persistent and careful evaluation of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends. (Dewey, 1910, p. 6).

Moore saw critical thinking as part of effective thinking and decision-making and also stated that ideas and possibilities created by creative thinking should be tested and evaluated by critical thinking (Moore, 1967, p. 3).

In Critical Thinking and Education, McPeck describes critical thinking as the ability and disposition to engage in reflective skepticism. Royalty stated that the acceptability of this definition stems from the distinction between having critical thinking skills and being able to apply them (cited in Royalty, 1995, p. 479). However, McPeck argued that critical thinking is not a phenomenon on its own and cannot be taught as an independent subject. According to him, critical thinking is a concept specific to a field or subject (Matthews & Lally, 2010, p. 114).

Facione (1990, p. 28) listed the characteristics of the critical thinking individual in his report of the American Philosophical Society's study of critical thinking as: i) inquisitive; ii) well-informed; iii) trustful of reason; iv) open-minded; v) flexible; vi) fair-minded in evaluation; vii) honest in facing personal biases; viii) willing to reconsider.

Paul and Elder stated that a well-educated critical thinker would be able to formulate clearly and accurately by raising important questions and problems, collect and evaluating the necessary information and use abstract ideas to interpret them effectively, reach well thought-out results and solutions by examining them according to relevant criteria and standards and communicate effectively with other people to find solutions to complex problems (Paul & Elder, 2003, p. 2).

Critical thinking is an important thinking process that has the potential to add value to people's lives, as stated by many researchers working on the subject. However, while many people do not use critical thinking in their daily lives at all, only some use it from time to time. The main reason for this is that there are some obstacles for individuals to think critically. It can be understood that even reasonable people cannot think critically at times due to impulses, pressures, tendencies and distractions (Rudinow & Barry, 2008, p. 15). In order to improve the quality of executive decisions, it would be appropriate to find and eliminate the real causes of these barriers.

When a critical thinker examines a problem and finds that existing solutions are inadequate, there is a need to find new methods. In this case, innovative, contradictory thinking can produce various ideas through the individual's previous experience and knowledge. From this point on, the critical thinking process takes over, and through the filters of reason and logic, one must decide whether these ideas are useful and applicable. As a result, it can be said that innovative thinking is based on the evaluation aspect of critical thinking and critical thinking is based on the open-minded and flexible aspects of innovative thinking (Özgenel, 2018).

METHOD

Subject of the Research

The decisions people make in their professional and social lives determine how they live now and how they will live in the future. Therefore, it is very important for people who want to be more successful in their professional and social lives to improve the quality of their decisions. The decision-making quality of individuals who manage or are part of an enterprise also determines the quality of management decisions in those enterprises. Therefore, the future of businesses depends on the quality of decisions of individuals or groups that manage them.

The subject of the study is to examine the relationship between decision-making and critical thinking, to find out which approaches and practices contribute positively to the quality of decision-making and which decision techniques contribute to the process of critical thinking. It also aims to find ways to contribute to the effectiveness of businesses by increasing the ability to think critically and increasing the quality of decisions.

The Purpose and Significance of the Study

The aim of the research is to reveal the relationship between decision making and critical thinking. In a globalized world, the need for more strategic action and the ability to make competitive decisions, growth and profitability of the companies are becoming more and more important due to the increasing speed of change and transportation. It is important to show that decision-making processes can be supported by critical thinking skills and tendencies and that the quality of critical thinking can be improved by using decision-making techniques.

Method of the Study

This study examines the relationship between decision-making and critical thinking. For this study, which was conducted to analyse the relationship between decision making and critical thinking, almost every study written and accessible in relation to decision making and critical thinking was obtained

and meticulously examined. Particular attention has been paid to ensure that comprehensive literature review is performed. By analysing the information available through descriptive analysis, the relationship between decision making and critical thinking was examined.

Scope and Limitations

There are many studies and many books on critical thinking in the international literature, but these resources are difficult to obtain in terms of cost and access to libraries abroad. One of the important limitations in this subject is that the study is done within the scope of a master's thesis and the time limit for this thesis is quite limited. In this study, by focusing on international sources, it is aimed that future studies might also benefit from the resources covered.

FINDINGS

Relationship between Decision-Making and Critical Thinking

Usually, a threat or an opportunity arises when managers need to make a decision (Daft & Marcic, 2009, p. 207). In such cases, managers should first become aware of the threat or opportunity. The main thing that is necessary to recognize a threat or opportunity situation is knowledge. Information needed by managers can be obtained from printed sources such as financial reports, performance reports or reports on activities carried out within the enterprise, or informally through communication with other managers, employees or internal and external stakeholders of the entity (Daft & Marcic, 2009, p. 208).

In the process of defining the problem, which is another stage in the decision-making process, a critical thinking manager needs to analyse or examine the situation or opportunity he/she encounters. The best way to do this is to ask questions that will clarify the situation and clarify the definition of threats or opportunities. Kepner and Tregoe stated that it is necessary to ask a series of questions to better define the problem and to reveal the underlying causes of the problem: i) What is the situation affecting us, ii) When, iii) Where did it happen, iv) How did it happen, v) Urgency of the situation vi) whether the situation is related to other situations or events (Kepner & Tregoe, 1965, p. 41-42).

At the stage of developing alternatives, alternative methods that can be used to solve the problem should be found. At this stage, it was stated that limiting the alternative search had a negative effect on the success of the decision (Nutt, 2004, p. 27). A critical thinker should be able to present possible alternative solutions by evaluating the problem situation from different perspectives. In addition, managers who are based on a critical approach should be aware of the need to apply innovative thinking methods for alternative solutions.

Another step in the decision-making process is the selection of one of the alternatives. Decision selection is the selection of the most promising alternative action. The best alternative is generally the solution that best fits the overall goals and values of the enterprise and provides the desired results using the least resources (Daft & Marcic, 2009, p. 210). In addition, moral and ethical consequences of the decision should be taken into consideration when making decisions (Fisher, 2011, p. 175).

In the implementation of the decision, it is necessary to use the managerial, administrative and persuasive skills of the managers to ensure that the selected alternative is fulfilled. Implementation of

the decision may require negotiation with people affected by the decision. Communication, motivation and leadership skills should be used to see the decision being implemented. Employees are committed to more positive actions when they see that managers follow the decisions made by following the success of the implementation (Daft & Marcic, 2009, p. 211).

Managers should observe the implementation of the decision and examine the positive and negative impacts they believe will be achieved and whether the results they have achieved during the decision-making process are achieved. As a result of these observations, they should make an effort to improve their own thinking processes by reviewing the stages of thinking applied in the decision-making process in the light of the information they have acquired.

Since programmable decisions are often for repetitive situations and the steps to be taken are often specific, there is limited space for critical thinking for such decisions. In any case, from a critical point of view, such decisions can be evaluated to determine the reasons for their emergence and to find out if there is a solution that can eliminate the problem situation.

Unprogrammable decisions are made in unique, ambiguous cases. Usually, such decisions have important consequences for the business. Many unprogrammable decisions require strategic planning because uncertainty is high and decisions are complex (Daft, 2008, p. 272). Critical thinking skills are the most needed decisions. In such a decision-making process, as much information as possible should be obtained and important criteria should be determined for an effective decision. Critical thinking is based on rational thought, and rational thinking will be more reliable than decisions based on emotion, intuition or belief (Tittle, 2011, p. 11).

The techniques used in the decision-making process offer various benefits to decision-makers and help them to make more dominant decisions. The goals of critical thinking include thinking and making decisions with as many and necessary information as possible (Ennis, 2015, p. 32). Decision-making techniques aim to help decision-makers in decision-making by providing them with different perspectives and reviewing information in a specific order.

It is often difficult to decide on a complex issue involving many options and outcomes that interact in all ways. In such cases, decision trees are a useful tool to see the whole problem (Lau, 2011, p. 211). Taking the whole situation into consideration is among the tendencies of a critical thinker (Ennis, 2011, p. 6). Decision trees present the entire problem to the decision-maker's assessment, but a critical perspective is also needed during the formation of the decision tree in order to undertake an ideal decision process. The tendency to approach different views in an open-minded manner and to be aware of and evaluate the alternatives (Facione, 1990, p. 28) should be implemented in the decision-making process and ensure that all available data is contained in the decision-tree. Only after such a decision tree forming process can a knowledgeable and logical decision-making process be completed, which is a requirement of critical thinking. Another feature of decision trees is that they reveal the situations that will arise after the decision. According to Paul, a thinker should take into consideration the reflections that will occur after making a decision and should what consequences will arise when he transforms his thoughts into reality (Gambrill & Gibbs, 2009, p. 5).

Six thinking hats, which is another method to support the decision-making process, becomes more valuable when critical thinking is considered. According to De Bono, the biggest enemy of thinking is complexity, because complexity leads to confusion. When thinking is clear and simple, it becomes more enjoyable and more effective. De Bono stated that thinking with six hats had two purposes. The

first is to simplify thinking by allowing the thinker to deal with one thing each time. Instead of dealing with different perspectives such as emotions, logic, knowledge, hope and creativity at the same time, the thinker can think about them separately. The second objective is to provide a transition in thinking. Focusing only on emotions or information only leads to the same type of information (Bono, 2000, p. 133). Different hats enable us to come up with different kinds of perspectives and protect us from one-sided perspectives. In addition, addressing a subject from one perspective at a time is an effective way to avoid overlooking different perspectives in the decision-making process.

Lack of knowledge, prejudices, emotions or other factors that limit one's objectivity or rationality are factors that hinder critical thinking. Individual's self-monitoring and evaluation, which is an important critical thinking skill, include the consideration of the extent to which an individual's ideas are influenced by these factors and refine themselves from it (Facione, 1990, p. 93).

De Bono's six-hats thinking metaphor represents six different cognitive approaches to critical thinking and analysis in understanding a situation or problem and trying to find a suitable solution. The white hat focuses on the data, information and questions that need to be asked. Lack of information is also identified at this stage. The red hat provides a clear expression of emotions and feelings. Black hats are important for a careful critical approach. Interrogation, revealing negative approaches and revealing weaknesses in propositions are among the features of this perspective. The yellow hat has an optimistic perspective and reveals the strengths in assessing the situation at hand. The green hat combines critical and creative thinking and focuses on finding new ways to solve problems. The blue hat, on the other hand, requires analysis of the situation and awareness of the ideas and situations uncovered. An important benefit of the six-hat thinking technique is that it shows that there is no single method for problem-solving or decision-making (Kivunja, 2015).

In order to find a solution to a problem, it is necessary to first identify and understand the causes of the problem. According to Okes, businesses and managers often feel that they do not have time to carry out the deep analysis needed to solve the problems and turn to solutions that temporarily eliminate the problem at hand. However, this problem then repeats itself, leading to a recurring cycle. Recurring problems can lead to the interpretation that managers are not doing their job well enough or diligently. According to the author, root cause analysis is necessary to overcome such situations, but this is not widely known by most managers (Okes, 2009, p. 14-16). Tools that help groups and individuals to identify root causes of problems are known as root cause analysis tools. Root cause analysis or fishbone diagram is the process of identifying problem-causing factors using a structured approach with techniques designed to focus on identifying and solving problems (Istikomah, et al., 2017, p. 84).

The most important aspect of the fishbone technique, which is developed by Japanese quality expert Dr. Kaoru Ishikawa and is one of the basic techniques used in root cause analysis, is to visually reveal the causes of the problem and to facilitate the solution. It is clear that the fishbone technique will be very useful in asking questions that lead to reasons and explanations in the first stage of the critical thinking process (Cottrell, 2005, p. 2; Tittle, 2011, p. 17; Ennis, 1996, p. 2). In addition, with the fish bone technique revealing the root causes of the problem visually and clearly, situations that can be quite complicated when not handled carefully will be easily clarified. This situation is in line with 'orderliness in working with complexity and diligent in seeking relevant information' approaches of critical thinking (Facione, 1990, p. 25), suggesting that this technique will be useful. On the other hand, in a study conducted in 2017, it was revealed that the development of critical thinking skills was

positively affected when a problem-based teaching technique, which aims to develop students' critical thinking skills, is supported by fishbone technique (Istikomah, et al., 2017, p. 89).

The brainstorming technique, first described by Alex Osborn, is a useful method designed to be used in problem solving as a group, but it's also useful for individuals (Halpern, 2014, p. 492). Osborn described brainstorming as an organized way of letting the mind produce ideas without trying to judge the value of ideas (Ghabanchi & Behrooznia, 2014, p. 514).

In 1992, a research was conducted on developing critical thinking skills of secondary school students with a combination of brainstorming, waiting periods and critical thinking activities. In the study, students were given critical thinking training and then brainstorming technique was applied to the students in order to express their ideas. After the participation of all students, concepts were reinforced with various questions asked by the teacher. The real benefits of using this approach to teaching critical thinking are: i) increased student participation, ii) improved level of communication, iii) better social and academic development, iv) developing techniques to identify and solve problems, vi) less off-duty and disruptive behaviour, (vii) and transferring 'thinking strategies' to other settings. Thanks to this project, it is stated that critical thinking abilities of most students are positively affected and this interactive and integrated process contributes to students' critical thinking in other situations and environments in their lives (Kaplan, 1992, p. 11).

In a study conducted with the students of the Department of English Language and Literature in 2014, the students were first trained on brainstorming technique which was then used before reading the texts and the effect of using this technique on the development of critical thinking skills of students was investigated. As a result of this study, it was found that brainstorming technique is very useful in developing students' critical thinking skills (Ghabanchi & Behrooznia, 2014).

The nominal group technique, another technique used in decision-making, was defined by Van de Ven and Delbecq as structured method of group decision-making which allows obtaining qualitative information from target groups most closely related to a problematic area. Horton emphasized that in order to obtain all the benefits of nominal group technique, silent idea production, recording of ideas, free discussion and scoring of ideas should be followed exactly (1980, p. 812). From a critical point of view, it is a positive practice that ideas are recorded and discussed freely. In an open discussion, all group members will evaluate the proposed idea and open the arguments behind the idea to the discussion, resulting in both weak ideas and strong ones becoming clearer. Critical thinkers give importance to information-based results and recommendations (Halpern, 2014, p. 287). On the other hand, nominal group technique prevents errors of obeying or submission to authority as group members work individually during idea development. This can be expected to have a positive impact on the quality of the decision.

In Delphi technique, another group decision-making technique, participants are physically distant from each other and do not come together for decision-making (Certo & Certo, 2012, p. 195). The Delphi technique enables systematic demand and collation of decisions on a particular topic through a series of carefully designed questionnaires in which the summarized information and feedback from the previous responses are distributed (Turoff, 1970, p. 151). The last set of probability obtained in the Delphi technique is considered to be better than the first set quality in many cases, because people have to think more about their ideas as the process progressed (Simon, 2000, p. 159). One of the important points in this technique is that the members of the group are selected not randomly, but

from among those who have expert knowledge on the particular subject in question (Jacob, et al., 2018, p. 2242).

In a study conducted by Van de Ven and Delbecq in 1974, the facilitating features of the Delphi process that help improve the decision-making performance were identified as follows: i) The production of ideas in writing and individually results in high amounts of ideas, ii) The process of answering questions forces participants to think with the complexity of the question and to provide specific, high-quality ideas, iii) The search behavior of the participants is proactive because they cannot react to the opinions of others. The "problem awareness" period is controlled by using different surveys for each stage of problem solving and is separated from the "solution awareness, period, iv) The identity of the participants is unclear and they are not in the same environment, making it easier to avoid compliance pressures, v) The Delphi process tends to result in a moderate perceived closure and a sense of accomplishment as well as abstraction (Ven & Delbecq, 1974, p. 619).

Devil's advocate technique is based on the idea that conflict is positive in problem-solving as a group, since groups tend to be more adaptable than critical assessment and therefore emphasize the important issues necessary for effective group decision-making (Hartwig, 2010, p. 20; Schweiger, et al., 1986, p. 66). The ability of devil's advocate technique to uncover preconceptions and assumptions by questioning ideas during discussion (Lau, 2011, p. 229) offers a positive approach in terms of both the quality of decision and the contribution to the formation of a critical thinking process.

Applying critical thinking methods to make better decisions prevents individuals from making mistakes and generally leads to better decisions compared to decisions based on intuition (Fisher, 2011, p. 180). Intuition can be defined as knowing or learning something directly without the conscious use of reason. Sometimes we think we know or learn something without realizing how we came to this information. When this happens, we have an inner feeling that what we believe is true. The problem here is that sometimes our intuition is correct and we really experience intuition. Sometimes we are mistaken and become victims of our prejudices (Paul & Elder, 2014, p. 327).

Fast, high-quality, strategic decision-making represents a fundamental dynamic ability in high-performance organizations. In these cases, the method is generally rational analysis where information is collected, collated, analysed and interpreted, alternatives are formulated and a sensible choice is made consciously. However, in modern business environments, there are a number of factors that can affect the effectiveness of a rational process. Strategies and tactics can be disrupted by factors ranging from wars, global terrorism and new diseases to everyday issues such as computer failures and small accounting mistakes. The need for rapid decision-making and the limits of human rational information processing capacities can seriously challenge the cognitive abilities of managers (Sadler-Smith & Shefy, 2004, p. 77). Managers do not make important decisions based on their intuition, but many managers acknowledge that they make decisions based on only intuition from time to time (Yates, 2003, p. 150).

Famous cognitive psychologist Daniel Kahneman, who has very important studies on how people think and decide, has proposed that there are two broad types of thinking that he describes as System 1 and System 2. System 1 is what is often thought of as intuition. It seems to be spontaneous and effortless. System 2 type of thinking directs attention to mental processes requiring effort (Kahneman, 2011, p. 25). Unlike the application of planned and deliberate thinking processes, intuitive decision-making processes operate autonomously and automatically, without conscious control. It is unlikely to observe these processes and they can process multiple information in parallel (Betsch & Glockner, 2010, p. 280). When system 1 thinking provides correct thinking, this is often associated with field knowledge

and expertise. On the other hand, the idea of System 2 is slow, laborious and conscious, and therefore it is close to the definition of critical thinking when applied correctly (Halpern, 2014, p. 35).

FINDINGS AND IMPLICATIONS

In this information age, perhaps over the last fifty years, rapid technological changes have led to significant changes in the way we receive and process information. There are thousands of messages we see, hear and read on the Internet, on television and radio, in magazines and books, on stickers affixed to vehicles and billboards.

Although the importance of decision-making is increasing, teaching of decision-making skills is often neglected in practice. Undoubtedly, the need to make conscious and intelligent choices permeates every aspect of life (Stewart, 1989, p. 64). When important social problems such as poverty, racism, drug addiction and violence are taken into consideration, the importance of teaching individuals how to think, to make sense, to draw conclusions and to make decisions becomes clear.

Numerous examples illustrate the importance of decision-making. The most excruciating mistake in recent history is when the United States has launched a bloody war in Iraq where countless people have been killed and more are forced to leave their territories, on the grounds that the country possesses weapons of mass destruction, develops nuclear weapons, and is linked to terrorist groups. The fact that all the reasons that are thought to cause the war were unreal and rumour (Cohen, 2009, p. 235-239), when taken together with the conclusions of the decision, show how making poor decisions can lead to irreversible results. Of course, not every decision has such important and destructive consequences. Even an arbitrary decision without much thought may produce a better result than a carefully thought-out decision, but it would mean leaving it to chance altogether.

Today, the impact of computers, robots and automation systems that dominate them in business and management applications has reached incredible levels. This effect can be examined in two dimensions which are substituting the labour force and supporting the labour force. The first dimension is that computer technology is rapidly replacing people with labour force to perform routine tasks that can be easily described by programmed rules. The second dimension is that developing technology contributes to the non-routine work that requires flexibility, innovation, generalized problem-solving skills and complex communication. The declining cost of access to technology in recent years has increased the demand for individuals who are more successful in non-routine work (Autor, et al., 2003, p. 1322). The fact that robots and computers are rapidly replacing people in all business lines that can be physically managed according to the rules makes up space to develop critical thinking skills and transforms these skills into a must-have requirement for individuals.

Research shows that with the effect of developing technology, job descriptions have started to change (Levy & Murnane, 2004, p. 49-50). In the past, work that requires more routine physical and cognitive applications is inherited by computers over time. As the developing technology changes simple manual labour, various skills that individuals have to acquire in order to meet the needs of today's work environment have emerged. Nowadays, the number of jobs that require thinking dimension and the skills to produce solutions to problems that we cannot solve using the computers by creating rules gain more importance. In addition, high-level communication skills such as getting information through verbal communication, explaining concepts, persuading people to buy a decision, or giving speeches to increase motivation at work are among the competencies expected from employees in today's

business environment. Since this type of communication usually requires the use of many elements such as knowledge, experience and intuition, the success of individuals depends on their mental capacity, critical thinking, analysis and problem-solving skills.

The changing nature of technology not only provided us with better teaching methods, but also increased the need for critical thinking methods. Reaching a wide range of knowledge at the touch of a few keys easily has made methods of evaluating and classifying information more important than ever. However, most of the information obtained from the Internet is unreliable, and some of it contains intentional and dangerously misleading information (for example, sites that claim to apply miracle treatment methods for serious illnesses or sites that give directive rumours about historical or everyday events). Therefore, the ability to decide the credibility of a source of information, which must be taught diligently and persistently during the period of university education or before, has become an integral part of the ability of critical thinking (Yılmaz, 2013, p. 417).

Solving non-routine problems, high-level communication and social skills are becoming increasingly valuable in the labour market. Modern work environments require employees to have advanced cognitive and mental skills. Often referred to as 21st century skills, solving complex problems, being able to think critically about their tasks, communicating effectively with people from different cultures, using a variety of techniques, collaborating with others, adapting to rapidly changing environments and conditions to accomplish tasks, competences such as managing and acquiring new skills and knowledge on their own have gained considerable importance today (National Research Council, 2011, p. 1).

In particular, critical thinking and problem-solving skills are regarded as the basic skills that individuals should acquire in the 21st century by many researchers. Perhaps the main reason that gives these thinking skills, which should be important at all times, a 21st century label is that today there are powerful technologies that we can use to seek, access, analyse, store, manage, create and transmit information to support critical thinking and problem-solving. Now individuals can access information freely, can communicate with the subject experts in various ways, can work in collaboration with people who look for and use the same information (Trilling & Fadel, 2009, p. 53).

In addition to technology, another aspect that changes in terms of management is that it brings a job environment in which people are required to make various decisions about their jobs and use their creativity, instead of the old-school hierarchical management. This new approach has increased the diversity of people's work. There are now multi-functional teams that perform various business divisions rather than hierarchical management (Kamp, 1999, p. 8-9).

In the light of all this information, it is apparent that critical thinking is an important necessity both in today's business world and in individuals' decisions about their lives. Critical thinking puts our thoughts beyond the automatic, everyday way of thinking. By increasing our critical thinking capacity, we can improve the accuracy and quality of all decisions we make and all the information we choose to believe.

Businesses, as well as individuals, become more successful as the critical thinking capacity of the individuals who manage them increases. Many management functions such as crisis management, customer relations development, and production failures that occur suddenly, or the failure to complete jobs at the time specified in the project plan can benefit from the implementation of critical thinking processes (Kallet, 2014, p. 11-15). Management and business trainings provide the necessary

information to individuals, who are expected to manage businesses in the future, about how to do regular management work. However, most leaders will have to rely on their own mental skills to do their job in an environment of complexity and chaos where there is no order, insufficient time to study past data, or where past data becomes insignificant due to new developments (Snowden & Boone, 2007, p. 75).

Individuals who make better decisions are aware that the decision is a process and that having a critical perspective in these processes contributes to the quality of both the decision process and the final decision. They realize that it is important to ask the necessary questions in gathering information and making analysis about the decision, and they become more familiar with the problem at hand. They keep their minds open to different perspectives and ideas when searching for alternative solutions for the problem and do not hesitate to apply creative thinking processes as well as critical thinking processes.

Critical thinkers can also evaluate the possible consequences of the decision and the possible moral and ethical consequences altogether when making their decision. They follow the implementation and results of the decision in order to convince those who need to take action based on the decision. They evaluate the resulting data and the whole decision process and examine the thinking methods and skills they apply in this process, thus turning them into a learning opportunity for themselves.

In order to make a well-informed, logical and justified decision, various decision techniques will contribute to critical thinking capacity. With the decision trees technique, it is possible to examine the whole the decision situation, the subsequent decisions that will emerge and to be aware of different views and alternatives as critical thinking requires and approach them in an open-minded manner.

Six thinking hats, a technique that simplifies the thinking process and provides protection from complexity, which is the greatest enemy of thinking, will protect individuals from one-sided perspectives. In addition, since it gives an important place to emotions in the decision process, it may prevent the negative effects on the decision process by providing the expressions of emotions that will affect the thoughts of individuals in secret. the black hat, which is De Bono's questioning tool for ideas suggested, gives this technique a kind of control mechanism in itself.

The fishbone technique, which allows root cause analysis to solve complex causes of problems, visually demonstrates the underlying causes of problems in detail and helps reveal which problems interact with each other in a regular manner. Research has revealed that critical thinking skills of individuals using fishbone technique have improved.

Brainstorming, which at first glance can be associated with innovative thinking rather than critical thinking, is another decision-making technique that contributes to critical thinking abilities. In the research, it has been shown that critical thinking training supported by brainstorming improve critical thinking abilities. The correct application of brainstorming technique reveals many different ideas that cannot be expressed with fear of criticism and negative interpretations. Thus, the mechanism of listening to various ideas which are an important function of this technique and looking for new alternatives based on them has a positive effect on the power of critical thinking.

Nominal group technique requires the discussion of ideas produced by all group members as a result of the implementation structure and thus, it enables the emergence of more powerful ideas and reveals the weaknesses of others. With this technique, the biased opinions of individuals to highlight

the choices they favour can be prevented, thus the need to produce conclusions and recommendations based on information that critical thinking attaches importance is satisfied.

In Delphi technique, it is possible to talk about the quality of a set of ideas that has improved gradually as a result of the re-evaluation of the generated ideas and re-communicating them to the group members. The more members of the group have to think about their ideas, the better and more useful ideas and opinions they produce. An important aspect of this technique is that it prevents participants from being inclined to adapt to the group norms because they are not in the same environment.

The devil's advocate technique, which eliminates the tendency to groupthink, an important obstacle in group decisions, and helps make more qualified decisions, reveals possible negative situations related to ideas and alternatives generated. When the assumptions and premises behind the ideas are questioned during this exercise, it makes positive contributions to critical thinking and decision quality. When critical thinking is applied to the necessary steps in decision making, it possible to say that all the steps to be taken do not have to be followed perfectly. The main reason for this is the limited amount of information that people can process cognitively. On the other hand, individuals have the opportunity to improve themselves as they participate in decision situations. This may lead them to make decisions through intuition after a while. A critical thinker must make decisions based on knowledge, not on intuition. However, rather than ignoring intuitions completely, it would be a more appropriate approach to decide by finding information that supports or refutes them.

In the light of all the above information, we can say that critical thinking is of great importance in the decision-making process and as individuals increase their critical thinking capacities, their decisions will yield more positive results for themselves. In addition, various techniques used in decision-making help to improve the quality of critical thinking.

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