

CRITICAL THINKING SKILLS AND DISPOSITIONS IN THE EDUCATIONAL CONTEXT: DIFFERENT VIEWS

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Abstract

This review article presents an overview of the cognitive and operative dimension of critical thinking and, in turn, of this type of thinking from a pedagogical approach to develop it in an educational context. To do the above, a review of different articles is made with which it is possible to clarify that the skills are identifiable, teachable and are learned; and that by themselves they have a cognitive component, but that this must be accompanied by the non-cognitive (dispositions of thought). Likewise, it is established that there is no universal or exclusive concept of critical thinking, because each author defines it depending on the skills and the respective threads with which they relate. In this sense, the following skills are proposed to work in the university educational context: analyze, synthesize, solve problems and evaluate, which can be applicable to any context: personal, professional or vital.

Keywords: Thought; critical thinking skills; cognitive dimension; operative dimension.

Introduction

Gómez (1998) argues that the 21st century society, known as the information and knowledge society, is characterized by having intelligent industries, that is, dynamic industries that do not depend on land, capital and labor, but on a new factor of production: knowledge. This factor causes, in turn, that the occupations are high-tech and require people who are capable of “designing solutions for unique problems” (p.3). Likewise, Paul and Elder (2005) state that this society is characterized by increased complexity and uncertainty, accelerated change and excess information, and that the latter is manipulated to serve groups with particular interests and not for the good common to most citizens.

Consequently, talking about critical thinking in these times makes sense due to the need to enhance the thinking skills of students at all educational levels, so that they adapt to the changing reality and can create knowledge, recognize their own values and make decisions that contribute to your own good and that of others. To address this purpose, worldwide, considerable efforts have already been made through the implementation of programs and projects for the development of critical thinking, especially in higher education, which are created and offered by corporations, foundations, universities, agencies (ministries of education), etc. or agencies, which are in charge of education in different countries.

Next, mention is made of some governmental and non-governmental organizations that have been managing the development of thinking skills: the Australian Higher Education Council, The Tunning Latin America project, based on the original European version (O. Uribe , D. Uribe and Vargas, 2017), the Paul and Elder Foundation for Critical Thinking created since 1980, the universities in the United States and England that are implementing their approach, the Cambridge Academy on Critical Thinking (The Foundation for Critical Thinking, 2019), the Veracruz university in Mexico with a program of more than 20 years, where Dr. Ariel Campirán, professor of philosophy, was the winner of the national logic prize in November 2018, among others.

In these programs and projects, critical thinking has been approached from different dimensions (pedagogical, philosophical and psychological) and, therefore, there are many definitions that have been formulated about this type of thinking, which makes it somewhat difficult to establish a concept universal or exclusive that encompasses all the abilities, qualities and meanings that this implies. This is why, in this article, a bibliographic review is made of what is considered critical thinking and the skills that comprise it, emphasizing, firstly, its cognitive dimension and, secondly, its operative dimension. , from the point of view of different authors and theories. Finally, some theoretical approaches by various authors are compared who consider this type of thinking as "a transversal axis of learning and as a high-level competence that can be developed by creating an educational environment and teaching-learning strategies" (Rodríguez, 2012, p.36), looking for the common, essential and sequential, to define a sequence of skills that are considered common in actions in academic and work settings.

Methodology

The systematic review of the information and preparation of this document was carried out by making a bibliographic review of articles published between 1981 and 2020, from reliable sources and in different databases such as: Google Scholar, Scielo, Proquest and Scopus. The study found 45 articles that spanned from 1981 to 2019, with a greater search range between 2011 and 2016. The analysis of the documents focused on the cognitive and operative dimension of critical thinking and the conceptual evolution of the critical thinking from a pedagogical approach. The latter was done to identify the cognitive skills that are evidenced from information management to decision-making in the learning scenarios that occur in higher education, considering skills as common categorical elements in the information reviewed.

Results of the documentary and information review

Cognitive dimension of critical thinking: the ability to think critically

In general terms, thinking “involves manipulating and transforming information in memory. This is often done to form concepts, reason, think critically, make decisions, think creatively, and solve problems ”(Santrock, 2006, p. 287). For its part, the word critical, which comes from the Greek crisis, means separation, distinction, choice, dissent, decision, judgment, resolution, sentence (Rodríguez, 2012, p.29). This connotes the ability to question, filter, contrast, disagree, and make decisions. By relating the two terms, it is obtained that critical thinking is useful for evaluating and analyzing judgments, establishing what is true and doubtful, and assuming clear criteria about what is believed and thought.

In this sense, Campos (2007) argues that critical thinking “is a complex combination of intellectual skills that are used for specific purposes, including the careful and logical analysis of information to determine its validity, the truth of its argument or its premises and the solution of a problem ”(p.19). Furthermore, López (2012) points out that “its main function is not to generate ideas, but to review, evaluate and review what is understood, processed and communicated through other types of thinking (verbal, mathematical, logical, etc.) ”(P.44). While for Pérez, Herrera and Ferrer (2016), critical thinking “is in good thinking, focused on criteria and standards, which seek to develop thinking and

metacognition to achieve it. Its purpose is disciplined, self-regulated and purposeful thinking ”(p. 95). For Sánchez, Martínez, Águila and Cáceres (2017), critical thinking “is valued as a superior form of reasoning and a transversal competence in educational systems” (p.29).

In turn, de Sánchez (2002) considers that thinking is typical of each human being and is subject to sociocultural contexts. Likewise, this author believes that thinking is a trainable skill, which can be developed if the following sub-processes are achieved: “expand, clarify, organize or reorganize perception and experience, achieve clearer visions of problems and situations, deliberately direct attention, regulate the use of reason and emotion, and develop systems and schemes to process information ”(p.143).

In addition, Díaz and Montenegro (2016) have grouped critical thinking skills into three large categories: the first concerns skills related to the ability to clarify information (ask questions, conceive and judge definitions, distinguish the different elements of an argumentation , a problem, a situation or a task, identify and clarify the important problems). The second covers skills related to the ability to make a judgment about the reliability of information (judge the credibility of a source of information, identify implicit assumptions and judge the logical validity of an argument). The third refers to the skills related to the ability to evaluate information (obtain appropriate conclusions, make generalizations, infer, formulate hypotheses, generate and reformulate an argument, a problem, a situation or a task in a personal way.

Operative dimension of critical thinking: the inclination to think critically

Thinking is unique to the human being and is multidimensional, which implies that the functions of one dimension are interwoven with those of another. In addition, thinking occurs not only because it is born with the predisposition to think, but also because it is enriched through experience and the motivational component is needed to develop it. Therefore, thinking critically implies not only having the skills to think, but also being motivated to use them in a given situation, scenario or event.

Ennis (1987) affirms that critical thinking is “reasonable, reflective thinking, focused on deciding what to believe or do” (p. 9). Reflective thinking involves questioning the

rationality of both one's own and that of others, which leads to a permanent review of what is believed, thought, accepted or rejected. For his part, Mcpeck (1981) points out that thinking is always about something, one does not think about anything, thinking is associated with something specific, since “thinking about nothing is a conceptual impossibility” (p.3). Consequently, critical thinking is not presented as a particular skill, it does not develop in a vacuum, but is present in the curriculum within the framework of disciplines.

López (2012) also considers that critical thinking is a reflective activity, that is, a self-regulating process because it allows the individual to analyze whether the results of his own reflection and those of other people are well founded. In addition, he exposes that a good critical thinker not only involves skills, but also attitudes, dispositions, motivations in each situation of daily life in which he develops, in a systematic and mentally automatic way with the purpose of seeking solutions and making good decisions. . It is a type of thinking that is based on competencies, on that ability to put into practice a series of knowledge in real situations. Also, Paul and Elder (2003) raise the elements of critical thinking: purpose of thought, question in question, information, interpretation and inference, concepts, assumptions, implications and consequences, point of view. Each of them can be defined as follows:

In the same way, Ennis (1996) considers it necessary to educate for critical thinking, for which the habits of the mind that include both the cognitive and the non-cognitive (motivations and attitudes) must be worked on. To achieve this, he recommends the development of the following skills: “focus on the question, analyze arguments, pose and respond to clarifying and / or challenging questions, judge the credibility of sources, observe and judge observations, deduction, induction, value judgments, define terms, identify assumptions, decision and interaction with others ”(Ennis, 1987 p. 15). Likewise, he proposes to value the dispositions of critical thinking through a taxonomy, which stands out: being clear, staying focused (question-conclusion), keeping in mind the global situation, looking for and offering reasons, trying to stay well informed, seek alternatives and greater precision in the situation, be reflectively aware of your own basic beliefs, be open-minded (consider the points of view of others and be willing to change your own

opinion), retain judgments when evidence and reason are sufficient to do so; and take into account the feelings and thoughts of others. For this purpose, the dispositions are not good or bad, but positive or negative, and both contribute to the general performance of thinking: the former motivate an open and deep intellectual behavior, and the latter a biased and superficial thinking.

For Halpern (1998), the teaching of thinking is supported by two assumptions: the first is that there are skills that must be identified and defined; and to the extent that this occurs, these can be adequately taught to students. The second is that as skills are recognized and applied, students will be more effective thinkers. Likewise, Halpern (2006) proposes a four-point model to improve critical thinking: a) attend to thinking dispositions, b) teach and practice critical thinking skills such as hypothesis testing, verbal reasoning, analysis of arguments, probability and uncertainty, decision making and problem solving, c) carry out activities in diverse contexts to facilitate abstraction and d) use metacognitive components to direct and evaluate thinking.

Similarly, Saiz (2017) states that "critical thinking is a process of seeking knowledge, through reasoning skills, problem solving and decision-making that allows us to achieve the desired results with the greatest efficiency" (p.19). This involves reaching solid conclusions, explaining or predicting a phenomenon through the skills that are required to be effective. In addition, it expresses that the skills (cognitive abilities) must be identified in order to teach them and it is necessary to take into account the non-cognitive (motivational) to work and practice them, which means that the dispositional component plays an important role in the development of skills. Critical thinking, since thinking requires effort and dedication, it is a process that is not achieved in the short term and requires good instruction to achieve a lasting and significant change in the lives of students in different contexts.

For Paul and Elder (2003), critical thinking is a skill that allows the development of processes and sub-processes. Critical thinking is the intellectually disciplined process of conceptualizing, applying, analyzing, synthesizing, and evaluating data through observation, experience, reflection, reasoning, or communication as a guide to belief and action. Likewise, Paul and Elder (2005) present the universal standards of critical thinking

which are: “clarity, truthfulness, certainty, precision, relevance, depth, extension, breadth, logic, importance and justice” (p. 57). These standards, in turn, must apply to the elements that make thinking possible: "purposes, questions, information, inferences, concepts, assumptions, implications and consequences, and points of view" (p. 56). This is done in order to develop intellectual skills (dispositions) that are what “determine the level of perspective and integrity with which people think” (p.58).

In correspondence with the above, Tishman and Andrade (1996) argue that a critical thinker must possess critical thinking skills and critical thinking dispositions (p.3). For their part, Perkins, Jay and Tishman (1993, as cited in Tishman and Andrade, 1998) add that dispositions are of different types and are made up of three psychological elements: a) sensitivity: perception of what is appropriate in a particular behavior, b) inclination: the impetus felt towards a behavior and c) skill: basic ability to carry out the behavior.

In this context, disposition is understood as a tendency or inclination to think and act in a certain way given certain conditions (Ennis, 1962; Norris, 1994; Salomón, 1994, as cited in Tishman and Andrade, 1998). Therefore, the thinking disposition implies that individuals have formed habits to use certain abilities and choose to apply those abilities in certain circumstances.

The American Philosophical Association (as cited in Facione, 2007) defines critical thinking, in the Delphi report, as a “purposeful and self-regulating judgment, resulting in: interpretation, analysis, evaluation and inference, explanation of considerations conceptual, methodological, (...) or contextual evidence. Thus achieving self-regulation ”(p. 58). What is stated by this Association is related to what Villarini (2003) raises, in the sense that critical thinking is the ability of thought to examine and evaluate itself (one's own thinking or that of others). This is why the capacity for critical thinking arises from metacognition.

The ideal critical thinker is also referred to in this same report as:

A person who is habitually inquisitive; well informed; who trusts in reason; Open-minded; flexible; fair when it comes to evaluating; honest when he confronts his personal biases; prudent in making judgments; willing to reconsider and if necessary to retract; clear regarding issues or situations that require judgment;

orderly when faced with complex situations; diligent in finding relevant information; reasonable in the selection of criteria; focused on asking, inquiring, investigating; persistent in seeking results as accurate as circumstances and the problem or situation allow. So educating good critical thinkers means working towards this ideal. It is a combination of developing critical thinking skills and nurturing those dispositions that consistently produce useful insights and that are the basis of a rational and democratic society (American Philosophical Association, as cited in Facione, 2007, p.21).

When comparing the ideas of the authors selected for this section, it is found that Paul and Elder (2003), Ennis (1996) and Facione (2007) agree that analysis and evaluation are essential skills for the development of critical thinking. To these is added Halpern (1998) who thinks the same as them regarding the analysis, but does not give prevalence to the evaluation. Paul and Elder (2003) highlight synthesis as an important skill to be learned, while Halpern (1998) and Saiz (2007) highlight the importance of favoring decision-making and problem solving, respectively. This indicates the validity of these two skills in time, thought 20 years ago by the first author, and the need to develop them in these last times.

Critical thinking from a pedagogical approach

Teaching to think is the task of education, therefore, the school has as a social task the development of thinking skills that allow the student to solve problems, communicate effectively, make decisions and be creative. To date, there are many researchers who have dedicated part of their lives to the study of skills such as observing, comparing, classifying, analyzing, synthesizing, among others. One of them was Margarita de Sánchez whose purpose was to develop in the student skills that would promote meaningful learning and that would be applied in decision-making and problem solving.

Sánchez's initial proposal (1995) consisted in teaching how to "learn to think" in an analytical, critical and creative way. She believed that it was possible to develop this skill with the support of strategies and constant practice in order to guarantee a more meaningful learning and applicable to decision-making and problem solving related to environmental

situations. This author studied basic thinking skills such as observation, comparison, classification, analysis, synthesis and evaluation; as well as the reasoning processes that involve higher thought processes such as inductive, deductive, hypothetical and analog. Based on the above, she established the following taxonomy of critical thinking skills: analysis, deductive reasoning, inductive reasoning, argumentation, problem solving and evaluation.

On the other hand, Priestley (1996) states that critical thinking is a procedure that enables us to process information, hence the author relates the skills to develop critical thinking with the levels of information processing. She proposes working sequentially to reach the highest level of thinking, which involves training a critical and trained thinker who reaches conclusions and solutions, testing them with relevant criteria and information, and evaluating the different implications. This researcher groups the skills to develop critical thinking into three components: a) the literal: it involves perceiving, observing, identifying, matching, identifying details, remembering to sequence (order); b) the inferential: it involves inferring, comparing-contrasting, categorizing-classifying, describing-explaining, indicating cause-effect, predicting-estimating, analyzing, summarizing- synthesizing, generalizing for problem solving and c) critical: it encompasses judging, criticizing and evaluate to achieve metacognition.

In the same way, Villarini (2003) states that achieving the development of critical thinking skills requires that from the classroom strategies are worked that do not lead to automatic thinking, but to systematic thinking with which to reach criticality. He proposes generic processes that involve the development of critical thinking skills such as the following: compare and contrast, order, form classes, classify, infer, reason logically and evaluate to solve problems. In turn, the processes are interrelated with sub-processes such as observing and remembering until reaching decision-making to achieve a goal.

This author focuses on a pedagogy to stimulate critical thinking oriented towards authentic learning, that is, in meaningful, active, reflective, collaborative and empowering learning, as defined below:

Meaningful: relates the study to their needs and interests, establishes purposes and works at an appropriate level for their educational development and learning styles. Active: carry out actions in real or quasi-real situations, develop means or handle instruments and design or produce something. Reflective: exercises your thinking skills, plans and monitors your study and learning process and self-evaluates the results of your learning. Collaborative: develops social competence, gives, receives and incorporates feedback, as well as coordinates its goals and actions with those of others. Empowering: develops skills or abilities, overcomes passivity in the face of reality and transforms or dominates an aspect of reality (Villarini, 2003, p. 41).

Discussion and Conclusions

From the review of the approaches of different authors about the concept and skills of critical thinking in the school environment, it is inferred that this can be of great help for all those educators who want to forge said thinking in their students, taking into account the context in which they are immersed. For example, in a context like Colombia, students have to take internal tests at the end of high school and university, Saber Once and Saber Pro, respectively, to measure their academic performance. The result of these tests in two of the generic competences that the Colombian State evaluates, critical reading and quantitative reasoning, shows that students have difficulties, with respect to the first, to reflect on the texts and evaluate their content and, with respect to the second, to model and establish relationships.

So, knowing the previous results and the ideas of various scholars on critical thinking; The authors of this article, who work as university professors, consider that in the Colombian educational environment it would be appropriate to develop the following skills: analyze, synthesize, solve problems and evaluate; Because these are teachable and adjustable to the socio-cultural environment of the students. Aspect that is related to what was stated by Saiz and Rivas (2011), who state that skills can be applicable to any personal, professional or vital context or situation.

It is important to clarify that the ability to analyze makes it possible to divide the parts of the problem, situation or fact of a whole; synthesize gives the option of grouping these

parts and consolidating them into a whole; solving problems makes it possible to provide a response or solution to the situation of the problem presented and, finally, evaluating makes viable the option of making value judgments based on the comparison and identification of discrepancies between an ideal and a reality, or between two realities to reorient the actions. In this sense, critical thinking is understood as a process that involves thinking in a reasoned and disciplined way, and is exercised through permanent training through practical exercises that gradually lead to the development of skills. In other words, this type of thinking can be taught and requires an attitude, strategies and a scenario. By the value obtained from the Cronbach coefficient (0.912), a high consistency between the items of the instrument is demonstrated. This shows that the items measure the same theoretical concept and that the test is reliable.

Therefore, it is necessary to strengthen critical thinking skills in the professionals of this 21st century, since it is required by the globalized world where they live and because in the 2015 report of the Committee for Economic Development it is mentioned that among the most Difficult to find in the world of work are critical thinking and problem solving (as cited in Bezanilla, Poblete, Fernández, Arranz and Campo, 2018, p. 91). It is precisely these reasons that drive to carry out a job that encourages the development of these skills and guarantees the promotion of a professional who is capable of functioning in an increasingly uncertain and complex labor field.

In this sense, the skills identified above: analyze, synthesize, solve problems and evaluate (ASRPE), lead to the development of critical thinking, since being higher order skills, they allow human beings to put into practice being in agreement or in disagree, take a position on something, assume consequences, consult, confront points of view, give in when the argument is invalid, formulate new arguments and start new searches. This, in turn, involves using the different forms of inferences to be able to reach solid conclusions and explain a situation from problem solving. All of the above, then, is essential for all students to apply good thinking in all areas of their lives not only for their own benefit, but also for that of their community.

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