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Difficulties in academic writing and cognitive functions: review of studies *

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Abstract

The objective of this article is to analyze some of the difficulties of academic writing at graduate level, reported in certain studies within the framework of the cognitive functions concept developed by Reuven Feuerstein and other works, which allow to evidence the possible relationship between these two phenomena. To do this, we explored the conceptual framework of cognitive functions and mental operations, based on the theory of Feuerstein et al. (1994); later, it was performed a synthesis of the difficulties described by Carlino (2007), Slafer (2009) and Hernández (2009), to finally establish evidence of the relationship between cognitive functions and difficulties in academic writing. The results show that the different difficulties evidenced in the writing processes at graduate level have their source in the cognitive deficits presented in each phase of the mental act (entry, elaboration and output). It is concluded that the difficulties in academic writing recorded in the studies have a close link with cognitive functions of the elaboration and output stages of thought, even though they are only associated with the input phase.

Key words: Cognitive deficits, academic writing, cognitive functions, mental operation.

Introduction

For Hessen (2006), knowledge is the "material theory of science or the theory of the material principles of human knowledge" (p. 10), where collective representations of reality are designated as a value. This reality of which man is aware is above all a cultural product that depends on the socio-historical context of the subjects.

Academic writing, then, plays a crucial role in the construction of knowledge, that is to say, of the cultural forms that are specific to each socio-historical moment (Pereira and Di Estefano, 2007, p. 406). Thus, academic writing cements its solidity in the pragmatic and creative dimensions. In other words, in the capacity of the subjects to recognize the intentions and objectives of the writing they elaborate and the ability to define the way in which they will carry it out (Jurado, 2007, p. 5), paying special attention to the validity of the arguments and the fulfillment of the logical structures that are shared by a given community. The means for its sharing is academic and scientific discourse; and its development corresponds to institutionalized organizations for this purpose. One of these is the university, and perhaps the one that is most urgently called upon to fulfil this task (Moyano, 2010, p. 465; Castelló, 2011, p. 106).

For Slafer (2009, p. 124), the central functions of universities are teaching at all levels and the generation of knowledge, so that they are institutions that have the possibility of reproducing and transmitting culture. In effect, universities, together with schools, have a symbolic and media power; that is, an ability to act in accordance with purposes and interests that allow them to achieve specific results with the significant symbolic forms they transmit (Thompson, 1998, p. 33). For this reason, the urgency of fostering language skills in some university programs has been recognized in order to strengthen the academic writing of their students and overcome the difficulties that arise when writing (Moyano, 2004, p. 110).

For authors as Carlino (2004, p. 322), there are four major difficulties in academic writing that are fully relevant to pedagogy. The first of these is related to the inability of the writer to do it in relation to the reader; that is, in relation to the characteristics of the reader. The second difficulty has its root cause in the little utilization of the epistemic potential of writing, since the opportunities of this process in the sharing of knowledge are not located. The third difficulty is the revision of the texts in a linear way without a holistic and complex assessment. Finally, the fourth difficulty is associated with a practical element: postponement at the moment of writing, since academic writing requires a permanent work of reflection and construction that breaks down with interruptions.

There have been formulated as alternative solutions to the difficulties presented by students, seminars, courses and writing modules without realizing that this type of disability has its origin in the deficiencies of cognitive functions and the ineffective use of mental operations. This is not a new issue and the problems inherent in academic writing have already

been addressed in various ways. Castelló, Bañales and Vega (2010, p. 1254) point out that academic writing in recent years has been studied from four approaches: sociocognitive, sociocultural, socially shared and cognitive. This last perspective is the one that serves as the framework for the analysis of the difficulties related to academic writing in the present article

On the other hand, Feuerstein et al. al. (1997, p. 98) defines cognitive functions as the prerequisites of intelligence for effective information processing and self-regulation of the organism to adapt to the cultural context. When these cognitive functions are affected, the individual manifests their effects resulting in the poor understanding. In these cases, the cognitive function is in deficit due to several factors that can only be improved by mediation. Mediation, from Feuerstein et al. contributions (1994, p. 304), is one of the ways in which the organism is exposed to the stimuli of the environment, which is marked by interpersonal relationships and socio-cultural elements. Therefore, as Noguez (2002, p. 1) pointed out, mediation "leads to the explanation of cognitive processes as a by-product of cultural transmission".

Behind the difficulties of academic writing lie the effects of deficits in cognitive functions. This article analyses the difficulties encountered in some research projects such as those of Carlino (2004), Slafer (2009) and Hernández (2009), based on the contributions of Feuerstein in his different writings. Therefore, the objective of the paper is to identify and explain the underlying relationships between academic writing difficulties and poor cognitive functions from the theoretical assumptions developed by Feuerstein *et al*. (1994).

Difficulties in academic writing

The so-called graduate writing or academic writing is associated with the processes that allow the management of information, the construction and reconstruction of knowledge in the different disciplines and is it characteristic of the so-called knowledge society in which groups and networks dedicated to the treatment of information and the construction of knowledge are created. One of the tasks in the dynamics related to the construction and reconstruction of knowledge is the work carried out by thousands of people in a permanent way. They externalize their disciplinary thinking so that it can be read and reflected by other communities (cultural sharing), commonly called academic writing.

Academic writing, above all, is an art that requires the construction of the identity of the writer and is transmitted by social function (Ivanic, 1998, p. 12). The way in which this exercise is carried out is through academic discourse. It constitutes a mechanism of mediation, so that culture may be reproduced and received as representations of phenomena (Ivanic, 1998, p. 17; Castelló, 2008, p. 75). It is in this sense that Hessen (2006) indicates that knowledge is related to the cultural context, and Carlino (2005) mentions that the writing used by educational institutions "configures a specific culture around the written word" (p. 145).

Academic writing requires an adequate development of thought, in which mental operations are immersed at all levels. In addition, the problem is also rooted in the inability of some teachers who demand skills when writing in the academic sphere, but do not have an adequate pedagogical perspective for the teaching and training of the skills required when constructing disciplinary written texts (Brailovsky, 2008, p. 26). In other words, teachers who do not understand the roots of the difficulties of effective academic writing cannot address them in order to overcome them.

The main difficulties that graduate students present in relation to academic writing are multiple. However, this article analyses twelve difficulties registered by Hernández (2009); eight, described by Slafer (2009); and four, analysed by Carlino (2004).

The cognitive functions according to Reuven Feuerstein

Feuerstein, et al. (1994) classify the cognitive functions in three large groups according to the phases of the mental act; that is, the location of each cognitive function with respect to the stage of thought that is activated. Cognitive functions can be input, processing or output.

Each of these cognitive functions allows the execution of a set of actions that are responsible for the treatment of information in order to elaborate significant products in the cultural space. Feuerstein (1980) defines mental operations as "internalized,

Table 1. Conceptualization of cognitive functions by mental act

Phase of mental act	Cognitive function	Conceptualization
Input phase	Clear perception	This cognitive function allows us to perceive information or stimuli in a detailed way from both qualitative and quantitative aspects.
	Reflective, systematic and planned exploratory behavior	The cognitive function allows the subject to be properly treated after selecting the basic characteristics of the object of study in the search for a solution to a problem.
	Knowledge of verbal instruments	The adoption of verbal instruments is urgently needed as they facilitate the understanding of the information perceived in the case of texts.
	Spatial and temporal orientation, clear and precise	Through this cognitive function, the subject is able to transcend the here and now, *i.e.,* his perception of space and time proves to be internalized. In the case of writing, the cognitive function allows us to locate the information by projecting it in an orderly manner.
	Precision and accuracy	This cognitive function generates in the subject the need to be clear, concise and semantically valid with the transmitted information.
	Ability to handle multiple sources of information at once	In the establishment of relationships, this cognitive function favors the use of two or more sources of information. This is key in graduate writing.
Elaboration	Clear perception and definition of a problem	This cognitive function mentioned above involves establishing relationships between various sources of information and the contradictions between them and reality.
	Clear identification of relevant or irrelevant data, and definition of the established relationships between them	It facilitates discrimination between important and unimportant data in such a way that the writing includes that information in a precise and exclusive limited way.
	Width of mental field	The width of the mental field as a cognitive function serves for the increasing use of the units of information in such a way that the subject has an increasingly complex working capacity
	Holistic perception of reality	The perception of reality was offered as a unity and the objects appear related to each other, *i.e.* , they are not isolated in the same way the unity of the constructed texts is preserved.
	Definition of logical evidence	This cognitive function allows us to formulate hypotheses, arguments for conclusions and explanations of contradictory phenomena.
	Inferential hypothetical thinking width and hypothesis testing	It leads to establishing and eliminating hypotheses by contextualizing writing and directing it towards the search for alternative answers.
	Behavior planning	In writing, this cognitive function constructs the methodological path and defines the strategy in such a way as to save time and effort and to provide a common direction in the development of the writings.
Output	Objective and not self-centered communication	This cognitive function, regarding writing, generates an approach between the writer and the reader for the latter is taken into account. A differentiation is evident between those who write and read the product.
	Projection of virtual relationships	Possible relationships are established between each of the objects already conceived in the elaboration phase, or in the entrance phase of the mental act.
	Fluency of verbal instruments to communicate adequately	As in the input phase, the information in this case is communicated correctly using various terms in a given context.
	Need for precision and accuracy when communicating answers	Cognitive function requires the writer to offer precise and accurate answers, *i.e.* , clear and valid from a semantic perspective.
	Reflective and non-impulsive behavior	In writing, this cognitive function enables the reflection, decision, choice and self-control.

Source: Adapted from Feuerstein *et al*. (1994)

organized and coordinated actions with which the information received by the subject is elaborated" (p. 106). It is an activity that internalizes and externalizes the modified object of knowledge and can range from a lower to a higher degree of complexity and abstraction (Piaget, 2005). Table 1 specifies each one of them with its respective conceptualization. (see next page)

The analysis of cognitive functions is closely related to the concept of intelligence. Myers (2005) identifies it as a "mental quality consisting on the ability to learn from experience, solve problems and use knowledge to adapt to new situations" (p. 423); adding that this adaptation is reflected in the cultural practice of subjects. Feuerstein (1980) and Feuerstein, et al. (1988) point out that intelligence is not static but dynamic, and most importantly, modifiable:

[...] *intelligence (is) a process instead of a fixed immutable concrete entity. This process is broad enough to cover an enormous variety of phenomena that have in common the dynamics and mechanics of adaptation. In its most generic sense; i.e., the changes that the organism undergoes in response to the appearance of a new situation that requires such changes. This adaptability of the organism is what we will refer to as modifiability. This propensity for change, this flexibility and plasticity, is what we will understand as intelligence*. (Feuerstein, 1980: 62)

The conceptualization of intelligence is necessary to understand the meaning and transcendence of cognitive functions, since these are the prerequisites on which intelligence is based on, and which allow the self-regulation of the organism and the correct use of information. According to Feuerstein (1979), cited by Zúñiga (2006), "cognitive functions as activities of the nervous system explain, in part, the ability of the individual to make use of previous experience in adapting to new situations" (p. 126). Then, when cognitive functions are in good condition, it is possible that mental operations may be performed in order to effectively manage the information.

Mental operations

Mental operations are activities performed from the cognitive functions. Prieto (2008) explains that when "cognitive functions appear deficient, access to mental operation is difficult" (p. 54). From the theoretical point of view, mental operations follow a sequence, but from their practical nature, they can be worked on in parallel. Mental operations are: identification, comparison, analysis, synthesis, classification, coding, decoding, projection of virtual relationships, differentiation, mental representation and mental transformation. Other operations relate to the person's ability to make relationships, provide solutions and draw conclusions from various problems. Next, each one of the mental operations is defined from the contributions of Parada (2012), which allow an adequate activity of the information:

- *Identification*: Recognition of an object and the properties that are part of it.
- *Differentiation*: Recognition of all the properties of the objects, making it possible to establish the differences.
- *Mental representation*: Internalizing each of the properties of the object, at least of the essential that allow its definition.
- *Mental transformation*: Modification of the properties of the object in order to establish relationships and achieve superior constructions.
- *Comparison*: Establishment of similarities and differences, based on criteria previously established by the subject, to be applied to the object.
- *Classification*: Sorting of the objects according to criteria that have allowed them to be compared.
- *Coding*: Use of symbols to name objects or their properties.
- *Projection of virtual relationships*: Organization of representational units that can be projected in similar situations.
- *Analysis*: Separation of the elements or properties of the objects according to criteria established by the subject.

Table 2. Relations according to Slafer (2009)

Difficulty	Affected Cognitive function	Phase of the mental act	Highest mental level operation involved
Low contribution to knowledge	Projection of virtual relationships	Output	Divergent reasoning.
	Need for precision and accuracy in communicating feedback	Output	
	Reflective, non-impulsive behavior	Output	
Not thinking about the reader when constructing the document	Precision and accuracy	Input	Identification
	Fluency of verbal instruments to communicate adequately	Output	
	Objective and non-egocentric communication	Output	
Invalidity of methods and analysis	Definition of logical evidence	Elaboration	Analysis
	Extent of inferential hypothetical thinking and hypothesis testing	Elaboration	
	Behavior planning	Elaboration	
Imprecision in the tables and figures	Accuracy and precision in communicating answers	Output	Mental transformation
Invalidity of the conclusions	Definition of logical evidence	Elaboration	Transitive reasoning
	Extent of inferential hypothetical thinking and hypothesis testing	Elaboration	
Deficiency in the discussions	Perception and clear definition of a problem	Elaboration	Hypothetical Reasoning
	Clear identification of relevant and irrelevant data, and definition of the relationships that will be establish between each other	Elaboration	
	Ability to handle various sources of information at a time	Elaboration	
Inaccuracy in the limitation of the object of study and its context	Perception and clear definition of a problem	Elaboration	Differentiation
Unclear and inaccurate writing	Precision and accuracy	Input	Logical Inference
	Fluency of verbal instruments to communicate adequately	Output	
	Objective and non-egocentric communication	Output	

Source: Adapted from Slafer (2009)

- *Synthesis*: Integration of objects to give new meaning.
- *Logical Inference*: Ability to make deductions, *i.e.*, from general information to draw new ones.
- *Analog reasoning*: Ability to determine a fourth term from three established terms.
- *Hypothetical reasoning*: Ability to make predictions of phenomena from known data or laws.
- *Transitive reasoning*: Ability to order relationships and formulate conclusions.
- *Syllogistic reasoning*: Ability to relate premises and reach conclusions from the interpretation of the same.
- *Divergent reasoning*: Ability to produce new results in productive thinking.

Cognitive functions have a direct relationship with writing so that they allow the identification, comparison, classification, analysis, synthesis and use of the different types of reasoning about the information needed in the written composition. This conception supports Carlino's (2005) affirmation that writing allows the externalization of thought, separating it from the subject that holds it: "without writing, my thought and I are united. With writing I begin to be able to have my thought outside of me" (p. 10). Writing is a reflection of the functioning of mental structures if one takes up the cognitive perspective of Feuerstein *et al.* (1994) described in his theory. The following is an analysis of the present difficulties in academic writing in relation to the deficit of cognitive

Table 3. Relations according to Hernandez (2009)

Difficulty	Affected Cognitive function	Phase of the mental act	Highest mental level operation
Lack or misuse of literal citations or bibliographic references	Fluency of verbal instruments for communicating properly.	Output	Encoding
	Need for precision and accuracy at providing feedback	Output	
Apparent lack of planning and review before, during and after writing the text.	Reflective exploratory behavior, systematic and planned	Input	Comparison
	Behavior planning	Elaboration	
Mixture of expository, analytical and interpretative fragments (it is difficult to distinguish the ideas of the referred authors and the students' own comments).	Clear identification of the relevant data from the irrelevant and definition of the relationships that are established between them	Elaboration	Transitive reasoning
	Extent of the mental field	Elaboration	
	Holistic perception of reality	Elaboration	
Difficulty in distinguishing which questions are asked to the text being exposed or referred, which questions arise from the text, and which judgments are made about the text.	Extent of inferential hypothetical thinking and verification of supposition	Elaboration	Synthesis.
	Clear identification of relevant from irrelevant data, and definition of the relations established between the former and the latter	Elaboration	
	Perception and clear definition of a problem	Elaboration	
Great difficulty to structure one's own discourse, and to insert textual quotations and empirical data in this context.	Holistic perception of reality	Elaboration	Transitive reasoning
	Extent of the mental field	Elaboration	
	Reflective, non-impulsive behavior	Output	
	Objective and non-egocentric communication	Output	
Difficulty in reading, understanding and reconstructing theoretical texts.	Projection of virtual relationships	Output	Mental transformation
	Definition of logical evidence	Elaboration	
	Clear and precise spatial and temporal orientation	Input	
	Ability to manage several sources of information at once	Input	
	Clear and precise perception	Input	
Sometimes, texts with very long personal anecdotes, that is, difficulty in synthesizing (it is difficult to write very little because to do so one needs to understand what one is reading).	Objective and non-egocentric communication	Output	Synthesis
	Need for precision and accuracy in reporting responses	Output	
Mixture of colloquial language with specialized lexicon.	Fluency of verbal instruments to communicate adequately	Output	Mental representation
Difficulties in retrieving theoretical and empirical information, either to support a personal position or to expose a contrary position.	Clear identification of the relevant data from the irrelevant and definition of the relationships that are established between them	Elaboration	Transitive reasoning
	Ability to manage several sources of information at once	Input	
	Precision and accuracy	Input	
	Projection of virtual relationships	Output	
Proliferation of endless lists of questions without any ranking or probable answers.	Reflective exploratory behavior, systematic and planned	Input	Logical inference
	Perception and clear definition of a problem	Elaboration	
	Clear perception	Input	
Spelling errors, syntax or unclear wording, grammatical mismatch (noun/verb/article).	Fluency of verbal instruments to communicate adequately	Output	Synthesis
	Need for precision and accuracy in reporting responses	Output	
	Reflective, non-impulsive behavior	Output	
Nature of text requested: many students write monographic descriptions when they are asked to write their opinions (argumentative text); others are prolific in personal narratives when they are asked for a response to a specific book or article.	Clear perception	Input	Classification
	Reflective, systematic and planned exploratory behavior	Input	
	Precision and accuracy	Input	
	Need for precision and accuracy in reporting responses	Output	
	Reflective, non-impulsive behavior	Output	

Source: Adapted from Hernandez (2009)

Table 4. Relationships according to Carlino (2007)

Difficulty	Affected cognitive function	Phase of the mental act	Highest mental level operation involved
Do not take the reader into account.	Precision and accuracy	Input	Identification
	Fluency of verbal instruments to communicate adequately	Output	
	Objective and non-egocentric communication	Output	
To miss out on the epistemic potential of academic writing	Extent of inferential hypothetical thinking and hypothesis testing	Elaboration	Mental representation
	Precision and accuracy	Input	
	Clear perception	Input	
To postpone the moment of writing.	Reflective exploratory behavior, systematic and planned	Input	Mental transformation
	Behavior planning	Elaboration	
	Reflective, non-impulsive behavior	Output	
Don't check what you write.	Reflective exploratory behavior, systematic and planned	Input	Analysis
	Behavior planning	Elaboration	

Source: Adapted from Carlino (2004)

functions, in order to show a possible relationship between these phenomena.

Evidence of a possible link between "cognitive deficit" and difficulties in academic writing

This section analyses the main difficulties in academic writing, particularly those presented by Hernández (2009), Slafer (2009) and Carlino (2004). They are described by making a relationship between them and the cognitive impairments of the individuals identified by Feuerstein.

Slafer (2009) asks a set of questions in order to evaluate an article. When extrapolating these questions, they can be formulated as a difficulty in the field of academic writing. Thus, difficulties of academic writing could be considered as: (a) little contribution to knowledge; (b) not thinking of the reader when constructing the document; (c) invalidity of methods and analysis; (d) imprecision in tables and figures; (e) invalidity of conclusions; (f) deficiency in discussions; (g) inaccuracy in the limitation of the object of study and its context; and (h) unclear, non-precise writing.

Table 2 presents the difficulties in academic writing identified by Slafer (2009) in his work. In the face of this, it is made a list of the deficient cognitive functions associated with them, the phase of the mental act of cognitive function, and the highest mental operation involved with this difficulty. It can be said that there are multiple impaired cognitive functions when these difficulties occur. As a result, the mental operations required to perform tasks such as validating hypotheses, correctly delimiting the area of study and context, or the ability to generate clear and precise writing are not activated and, therefore, one is unable to do each of these activities.

Every related mental operation brings with it the other lower level mental operations. For example, it is impossible to make a differentiation if it has not been identified; or a mental representation without the action of prior differentiation and identification. Therefore, the capacity to produce knowledge has an action at the level of thought at a very high level: divergent reasoning, so that reaching this level it is necessary to identify, differentiate, represent, compare, classify, encode,

decode, project relationships, analyze, synthesize, infer logically, make analogies, make hypothetical, transitive and syllogistic reasoning.

The explanation above serves to understand and interpret Table 3, which contains the difficulties described by Hernández (2009). Being a little more extensive, Hernández (2009) identifies twelve difficulties in graduate students that are some of the reasons for not elaborating the requirement thesis effectively. Unlike Slafer, Hernández (2009) is more specific on practical difficulties such as the misuse or lack of quotes and the inability to differentiate the writer's voice from that of the other authors cited.

Table 3 shows the difficulties in academic writing according to the contributions of Hernández (2009). It can be inferred that these difficulties are caused by the deterioration of the cognitive functions indicated therein. These functions, being prerequisites of mental operations, are necessary to carry out each of the tasks that allow a correct academic writing. Behind the inability to produce written texts, there is a difficulty at the level of thought. However, these types of deficiencies can be modified and improved through strategies focused on the field of cognition and based on the latest advances in neuroscience (Parada and Avendaño, 2012).

The last author to take up again, in order to analyze the difficulties in academic writing under the perspective of cognitive functions, is Carlino (2007). The author points out (see table 4) four difficulties at the time of writing (cited at the beginning of the article: not taking the reader into account, not taking advantage of the epistemic potential, not reviewing what is written, and postponing the moment of writing) have their genesis in cognitive deficiencies and, therefore, the actions for their correction must be directed towards a modification at the level of thought.

The review of the contributions of Carlino (2004), table 4 (see next page) Slafer (2009); and Hernández (2009) reports a set of difficulties that arise in epistemic or academic writing, which are a permanent manifestation at graduate level in a generalized way. Each of these deficiencies has its origin in a cognitive deterioration in the subject, becoming manifestations of some kind of failure in the way of thinking. For this reason, Martínez (2012, p. 31) states that "when a coherent and cohesive writing is required in the light of a given communicative situation, the participation of at least one set of complex cognitive activities is implicit", that is to say, writing as a complex process can only materialize to the extent that certain actions of a cognitive nature, be they cognitive functions or specific mental operations, occur.

Each written unit is the product of a set of mental processes and sub-processes, as noted by Hayes (1996), and Hayes and Flower (1980). These processes, on the one hand, are cognitive in nature since they refer to the treatment and management of information; on the other hand, they are naturally metacognitive insofar they allow the regulation and control of the cognitive activity by the subject himself. These processes are defined by Calson (2005) or Risso *et al.* (2015) as executive functions that have their origin in the conscious and planned behavior of the individual and are related to the goals, strategies, and actions defined, executed and regulated, becoming high level actions. Similarly, the difficulties reviewed show that they relate to more or less complex acts, which may occur at any time during the written composition.

In summary, studies by various authors (in addition to those already cited), such as Carlino (2006) or Serrano (2014), show that there is an intimate relationship between reading, writing and thinking, which is corroborated by this analysis. For Serrano (2014), this complex phenomenon is configured as:

[...] *the object of study and reflection (and) to deal with its investigation is a sensitive subject today in these times when education is offering few experiences to favor the development of critical thinking and thus to promote the formation of the individual's talent*.

The modification and improvement of these skills requires different pedagogical processes, related to the specific type of difficulty. The mission of universities and other institutions called upon to generate knowledge is to formulate strategies that are coherent with the needs of students. It is therefore recommended that processes be designed to evaluate the cognitive functions and the state of mental operations, the construction of tools in accordance with the deficiencies presented, and the execution of tasks that allow for cognitive development.

Conclusions

Cognitive functions are prerequisites for intelligent thinking. Intelligence, while not static or measurable, can manifest itself in a variety of ways. For example, through the ability or inability to produce academic texts. The ease or difficulty of writing in an academic way has its origin in people's thoughts. Feuerstein *et al*. (1994) develops within his Theory of Cognitive Structural Modifiability the concept of cognitive functions and mental operations, which allow to explain the difficulties presented in epistemic writing.

The different difficulties evidenced in the writing processes in graduate courses have their source in the cognitive deficiencies presented in each phase of the mental act (entry, elaboration and exit). The greatest number of cognitive impairments involved in the writing process are those that are related to the elaboration and output phase of thought, but these are associated with the cognitive functions of the input phase, since this is the first stage for correct cognition.

Management of information fulfills three moments at the level of thought: first, it is detected, identified, explored, and interpreted. Then, it is treated by the thought and the result of this activity are the products of a long task. From a bad perception of the sources of information, whether due to a shortage of verbal instruments or a systematic and unthinking behavior, other difficulties will necessarily be determined in the processes of elaboration and exit of the information. It is an organized and systematic process, which is not isolated between each of its parts.

The obstacles presented by thesis students are due to the deficiencies at the level of thought; for this reason, as a recommendation, it is imperative the use of relevant and suitable training strategies that act in the cognitive field of the subject and that effectively contribute to the gradual elimination of the cultural deprivation syndrome.

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