



ORIGINAL PAPER

Metacognitive strategies and academic success

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Abstract:

Metacognition is the representation that the student has of the knowledge that he possesses and of the way in which he can construct and use it. One of the best predictors of academic success is precisely the student's ability to reflect on his knowledge and to understand the reasoning he engages in to use and construct new knowledge. Students must therefore be made aware of the learning strategies they use to learn and understand the world. Metacognition is inseparable from self-knowledge and self-confidence. These are key concepts on which the teacher bases himself to develop the relationship between the student and knowledge. It is through cognitive mediation that the teacher gives the student the means to learn and therefore the keys to his academic success. Metacognitive experiences play a central role in cognitive functioning and self-regulatory abilities. It is by their intermediary that the learner can develop the other two components of metacognition: metacognitive knowledge and metacognitive strategies. However, many students have little opportunity to practice such experiences or, when they have it, psychoaffective aspects inhibit the benefit they could obtain from it (lack of decentration, external causal attribution). The lack of self-confidence generates in the student a feeling of fear of doing things, even if he denies it and takes an attitude of indifference, which mobilizes his mental resources. To be a good student is to learn to be aware of one's own intelligence, in the sense of knowledge, and of the degree to which one's own understanding can then reach.

Keywords: *metacognitive, knowledge, academic success, student, strategy.*

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Introduction

Before approaching the concept of metacognition, it seems relevant to define succinctly cognition and introspection. Cognition is a set of mental processes that make it possible to process information, with the aim of creating knowledge. In other words, cognition represents the capacities of our brain which allow us to interact with our environment. These abilities allow us to perceive, concentrate, acquire knowledge, to reason or to interact with others. These cognitive functions are essential for students to succeed in their education. Used well, they promote academic success and social and professional integration. Introspection, for its part, represents our ability to access our mental operations, our inner feelings. If we link cognition and introspection, we can then imagine that introspection should allow us to understand our cognitive capacities through a work of personal reflection.

First of all, it seems important to us to define what cognition is. According to Thagard (1996), cognition is a process by which natural (humans, animals) or artificial (computers) systems acquire information about their world, by constructing representations, transform it into knowledge through specific operations, then implement it in activities, behaviors or functioning. We see through this definition a first mental process that each student must be able to master: the transformation of information into knowledge. This is a fundamental process for academic success. The child and then the adult are in possession of tools, instruments, methods which will allow them to learn throughout their lives. These tools are given to the child by the educational institution. All this then leads us to wonder how the student uses these mental tools to know what he knows and thus meet academic expectations.

This reflection directs our research towards a form of self-regulation of cognition, in other words metacognition. Metacognition corresponds to the representations that an individual has of his knowledge, and of the way in which he can construct and use it. We aim to understand how to promote the acquisition and use of knowledge. The quality and speed of learning, factors which will promote academic success, will depend on several criteria: emotions, motivation, attention, feedback information or the consolidation of knowledge.

However, the ability to learn children will also depend on their level to carry out the activity offered to them and thus understand the learning objective. This is in particular what Vygotsky (1978) called the zone of proximal development. The zone of proximal development corresponds to what is possible for a given student to acquire given his previous educational acquisitions. If the capacities as well as the criteria favoring learning are not taken into account from an early childhood education, and if we do not pay attention to the child's learning pace, then there could be dropout school. Hence the importance of supporting the child in this process of cognitive self-regulation in order to be able to offer him activities that will allow him to learn at his own pace. It is in this sense in particular that the educational institution has established the common base of skills, cultures and knowledge. The objective is then to propose learning in cycles to allow students to make up for any delays. The importance of making students understand the learning process has therefore become a priority for the educational institution.

Berger and Karabenick (2016) define what a learning strategy is: the thoughts, behaviors, beliefs or emotions that facilitate the acquisition, understanding or transfer of new skills or knowledge. These authors will also highlight that these learning strategies can be of different types: cognitive, metacognitive or affective. The educational community must therefore ensure that students master the knowledge relating to methods and tools for learning with the aim of promoting academic success of each student. It is necessary to question students' learning strategies to enable them to acquire skills or knowledge.

The concept of metacognition

Flavell (1976) was the first to theorize the concept of metacognition. He was one of the first to emphasize the importance of the concept of metacognition for children's learning. His study revolved around strategies of active research around memorization, a concept that he called metamemory. Research on metacognition is therefore part of the cognitivist paradigm, having as an object the exploration of the complex mechanisms of the brain. In ancient Greek, the prefix meta means „beyond, above”, and as we have already mentioned, cognition is defined by the faculty of knowing. It is the mental act by which we acquire knowledge or process information. We understand then the need for our students to develop their cognitive abilities in order to acquire the skills and knowledge synonymous with academic success.

Starting from the etymology of the word metacognition, we could in fact define the concept as the body of knowledge we possess about our own cognitive processes. We glimpse a concept that goes beyond simple cognition, with metacognition there is an introspective work in order to discover and know oneself better. Metacognitive knowledge could allow students to know which cognitive „tools” mobilize to acquire and use knowledge and skills with the aim of academic success.

Flavell (1976) breaks down the concept of metacognition into 3 distinct dimensions. Metacognition will then be defined by:

a) knowledge relating to people:

1) intra-individual knowledge or knowledge that the subject has of himself as a learner. For a student, this means, for example, knowing the subjects for which he has the most facilities. Or even know how it is easier for him to integrate knowledge or to solve a problem.

2) Inter-individual knowledge: this knowledge concerns other individuals and allow the student to take points of comparison (who is the 1st in the class in Biology for example, or with whom I can cooperate if I need help).

3) Universal metacognitive knowledge: the knowledge that an individual can have about the human way of thinking in general. For example, this involves understanding how memorization works, or what attention is. In the context of a class group for example, this first dimension refers to the knowledge that the student has of his own learning strategies and those of his peers.

b) knowledge relating to the tasks to be carried out: allows us to identify what we know or think we know about the different phases of the learning process or about the way to solve a problem. This knowledge refers to the knowledge that the student possesses (or not) to carry out an activity at school. This is, for example, ensuring that the student masters the path that will lead him to success in an evaluation.

c) knowledge relating to cognitive and metacognitive strategies: cognitive strategies are general knowledge that students can have in order to concretely carry out

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an activity in French, history or mathematics. Metacognitive strategies are then used to manage and evaluate this cognitive activity. They help the student to question his working method and the result obtained in particular.

Metacognitive strategies

Pereira-Lard and Deane (1997) defined these strategies to develop our knowledge as put in place voluntarily by the learner: these strategies can be implemented consciously or automatically, which leads to a transition from cognitive knowledge to the implementation of metacognitive strategies. We see here appear a strong interrelation between cognition and metacognitive abilities (this interrelation was also highlighted by the Nelson and Narens model in 1990). However, the learner must master these strategies and be aware that these strategies exist and promote his success. We are here at the heart of the missions of the educational community: equipping students with the necessary skills and knowledge to succeed academically. And in particular knowledge which allows us to know how to learn.

Wong and Jones (1982) try to explain the interest of metacognition. In fact, their work has emphasized that the ineffectiveness of the efforts of failing students comes from a metacognitive deficiency. These students have skills and knowledge but are unable to use them in a way that responds to the teacher's instructions. This then relates to the awareness of knowing what we know and what we do not know and which will or will not promote student success.

According to Bărbuceanu (2023: 156): „If a student often shows an insufficiency in memory, along with the patterned behavior, this may possibly indicate even a dissociative mental state, trying to erase traumatic experiences from memory, therefore, the affected person changes in unconsciously attention and cognition.”

Tomlinson (1997) also goes in this direction by explaining that failing students would have difficulty controlling what they do, that they tend to act at random, which compromises their ability to transfer implemented knowledge. Hence the importance of developing metacognitive skills to our students.

The deleterious effect of a lack of self-confidence on a student's academic performance has been proven. Lack of self-confidence generates in the student a feeling of fear of doing things, even if he denies it and adopts an attitude of indifference, which mobilizes his mental resources. He no longer has enough resources to use the memories he has previously constructed, whether it concerns school knowledge strictly speaking or know-how such as knowing how to reason. The situation is then a vicious circle: he does not have confidence in himself, he cannot mobilize his cognitive or metacognitive knowledge; but as he cannot use prior knowledge, he cannot readjust the metacognitive skills necessary to understand and therefore learn. This is the situation of a student with learning difficulties. What is being done within his school situation to enable him to get out of this terrible trap before it is too late for him? How can students develop a positive attitude about themselves?

To promote metacognition and transfer, teachers must control the complexity of the task to be performed, move from decontextualized tasks to contextualized tasks to ensure that they do not overload the student. To do this, the teacher could therefore suggest words, then sentences, paragraphs, texts and finally books, use metaphors (characters or objects) to give meaning to the mental operations to be carried out, model, then support the use of a language of metacognitive skills management. The student who knows how to tell his brain what to do manages it more effectively and gains power.

We believe that tools allowing direct response from learners should be favored, as well as those who engage the person here and now than those which allow distancing over time. Firstly because they give access to what the learner himself considers as being the result of his mental journey, and secondly, because they reduce the risk of somehow imposing metacognitive thinking through researcher where there is none, didactic situations being an amalgam of cognitive, metacognitive and affective processes. This is why the questionnaires, interviews, dialogues and even thinking-aloud protocol are cited here first.

Metacognitive skills in reading and writing

According to Schmitt (2005), metacognition in reading, which she calls metacomprehension, implies that the student is aware of his personal characteristics, the characteristics of the task and the strategies necessary to carry it out. The student must also control the planning, management and review of his strategies.

In reading, metacognitive processes serve to guide comprehension; they enable the reader to adjust to the text and the situation. The reader can thus recognize that he has a loss of understanding and find the strategies to remedy it. Reading implies a double task: the reader must process all the linguistic marks to read the words. At the same time, he must also build and manage his understanding, while mobilizing his previous knowledge. However, the simultaneous conduct of these two cognitive activities is optimal to the extent that the attentional control of each is effective. If one of the two activities is not automated, the reader finds himself overloaded. Metacognitive skills must therefore be mastered and automated by the reader, so that the reading is effective.

According to Chirițescu and Păunescu (2021: 99), regarding special language texts: „they introduce metalinguistic elements such as explanations, definitions, parenthetical material, synonyms, etc. The number of these functional resources used in each text depends on the degree of specialization of the communication, and on the prior knowledge of the readers of the specialized communication. The less expert the reader, the more redundant the text will be and the more metalinguistic elements it will contain.”

In writing, metacognitive skills make it possible to manage the use of cognitive strategies, the learning process and the completion of the task. In writing, students who use metacognitive strategies show more efficiency and autonomy in their learning. At the more specific level of spelling, metacognitive processes are used to reflect on language, while being aware of one's own orthographic knowledge.

In writing, the metagraphic interview advantageously supports the development of metacognition. In this interview the teacher asks the student to comment on certain spellings that he has chosen in the text that he has just written. The student thus has the opportunity to justify his choices and, at the same time, think again about the spelling of the word. The metagraphic interview creates a particularly rich observation context for the teacher. Indeed, he will be able to identify the student's orthographic conceptions: what he knows and what he understands, the strategies used, what is not acquired and also the incorrect conceptions. A student who shares his reasoning out loud to explain his choice of spelling also allows his peers to develop their reflective perspective. It also allows the teacher to know more about the knowledge and know-how that he has transferred.

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According to Lăpădat and Lăpădat (2020: 143): „Language is not just a simple communication tool that consists of the factual transmission of information, but a cultural treasure that encompasses the history and evolution of a people that has been gathered throughout its existence: behaviours, attitudes, values and mentalities, a whole existential philosophy.”

Metacognitive interview models

The interview

The interview is a large group method where the student is asked open-ended questions, such as: What do you do when you receive a text? What do you do when you don't understand? The advantages of the interview are: it is fast and it gives an overview. The disadvantages of the interview are: it is not very precise, the students are not in context (this can be useful to have them read a text just before), student responses do not reflect necessarily reality.

We must favor the words „how” and „what” during interviews, and avoid the „why” which generates explanations of causality and not of description and action. After having experimented with a few interviews with the student, he will be more successful in naming his strategies and his knowledge, and in explaining how he went about it. He will develop awareness of the approach he adopts. This is a major aspect to consider when aiming to transfer your learning.

The qualities of a good metacognitive interview: it is focused on student responses, it gives the student time to think about the question and its answer, leads the student to clarify or justify his answer, uses open questions more than closed questions (yes-no type), make connections, if possible, with what is done in class (do you remember when your teacher said - or showed you something).

Here are some example questions:

Why did you look at the text here?

Why did you come back here?

What did you say to yourself when you read the note?

Why did you stop here?

Do you always do this when you read a text?

At the end, what did you say to yourself after reading the text?

The questionnaires

The questionnaires include open-ended questionnaires (students answer in their own words) and multiple choice questions (students select only correct answers from the choices offered as a list). The advantages of the questionnaires are: they are fast and they give an overview. The disadvantages of the questionnaires are: they are not very precise, student responses do not reflect necessarily reality.

Stimulated recall

Stimulated recall is a method in which the student is asked in the first place to read the text aloud. The student is filmed from an interactive tablet (iPad). The student can choose to reread a series of comprehension questions on the text (still filmed by the tablet). The teacher reviews with the student the tablet registration. At opportune times or at targeted moments, the teacher stops the viewing and questions the student on what he was thinking about. After reading, the teacher watches the video extract with the student, questioning him about his reading: „Why did you do that here? What were you thinking here?” By looking at himself, the student must therefore remember the

strategies he used while reading. The teacher then has the opportunity to model a strategy that the student should acquire. Stimulated recall limits cognitive overload (since the student is invited to describe how he proceeded afterwards) while preserving the natural reading context.

The advantages of the stimulated recall are: it gives a lot of precise information on the processes of understanding and use of strategies and it doesn't place the student in cognitive overload. The disadvantages of the stimulated recall are: it requires time and must be done face to face and the interview is done later.

The „think aloud”

The „think aloud” method consists of asking the student to verbalize everything going on in his head while he reads. The student therefore reads aloud and thinks about loudly at the same time. This method takes practice. The advantage of the „think aloud” method is that it gives an accurate portrait of strategies and many information. The disadvantages of „think aloud” method are: students who are too weak can be cognitively overloaded (read aloud and think out loud at the same time), it requires time and must be done face to face.

Conclusions

Students must learn and use the following metacognitive skills throughout their school career: know how to observe, know how to be attentive, know how to manage their emotions, know how to use their memories, know how to reason, know how to understand and learn.

In our current society, the success of each student has become a necessity, metacognition then represents a means which should make it possible to fight against social inequalities. Every student has within him the potential to succeed. Teachers have a responsibility to promote academic success of each student by putting in place strategies that take into account the diversity of students. Working on the metacognitive field should allow each student to know himself better, to better understand the world which surrounds him.

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