THE TAKE OF CONSCIOUSNESS IN A METACOGNITIVE PERSPECTIVE: POSSIBILITIES FOR THE CLASSROOM

A TOMADA DE CONSCIÊNCIA EM UMA PERSPECTIVA METACOGNITIVA: POSSIBILIDADES PARA A SALA DE AULA

LA TOMA DE LA CONCIENCIA EN UNA PERSPECTIVA METACOGNITIVA: POSIBILIDADES PARA EL AULA

Maykon Jhonatan SCHRENK[1]
Rodolfo Eduardo VERTUAN[2]

ABSTRACT: This article aims to present understandings about take of consciousness raising in a metacognitive perspective. To do so, it initially deals with theoretical aspects of cognition and metacognition. Then, it discusses take of consciousness and perceived correlations between it and metacognition to, from there, present an understanding of take of consciousness in a metacognitive perspective. In this context, take of consciousness raising is defined as a conscious process of perception and recognition that takes place while the subject develops tasks and deals with situations that involve investigation, so that the dialogue undertaken within groups can raise mediations that provoke this process. The take of consciousness, in this perspective, has as its essence the administration, reflection and evaluation of the actions of the subjects themselves and of the phenomena studied by them, in order to enhance their own cognitive and metacognitive activities.

KEYWORDS: Cognition. Metacognition. Cognitive monitoring. Education. Learning.

RESUMO: *Este artigo objetiva apresentar entendimentos acerca da tomada de consciência em uma perspectiva metacognitiva. Para isso, trata, inicialmente, de aspectos teóricos de cognição e de metacognição. Em seguida, discute a tomada de consciência e correlações percebidas entre ela e a metacognição para, a partir disso, apresentar um entendimento de tomada de consciência em uma perspectiva metacognitiva. Neste contexto, a tomada de consciência passa a ser definida como um processo consciente de percepção e reconhecimento que se dá enquanto o sujeito desenvolve tarefas e lida com situações que envolvem investigação, de modo que o diálogo empreendido no âmbito de grupos pode suscitar mediações que provoquem esse processo. A tomada de consciência, nesta perspectiva, tem como essência a administração, a reflexão e a avaliação das ações dos próprios sujeitos e dos fenômenos estudados por eles, de modo a potencializar suas próprias atividades cognitivas e metacognitivas.*

[1] Pedro Álvares Cabral Municipal School (EMPÁC), Santa Helena – PR – Brazil. Teacher of the Early Years of Elementary School. Master in Education in Science and Mathematics Education (UNIOESTE). ORCID: https://orcid.org/0000-0002-1448-6596. E-mail: maykon_schrenk@hotmail.com
[2] Federal Technological University of Paraná (UTFPR), Toledo – PR – Brazil. Professor of the Higher Magisterium. Doctor in Science Teaching and Mathematics Education (UEL). ORCID: https://orcid.org/0000-0002-0695-3086. E-mail: mailto: rodolfovertuan@utfpr.edu.br

PALAVRAS-CHAVE: *Cognição. Metacognição. Monitoramento cognitivo. Educação. Aprendizagem.*

RESUMEN: *Este artículo tiene como objetivo presentar entendimientos sobre la toma de conciencia en una perspectiva metacognitiva. Para ello, inicialmente se ocupa de los aspectos teóricos de la cognición y la metacognición. Luego, se discute la toma de conciencia y las correlaciones percibidas entre ella y la metacognición para, a partir de ahí, presentar una comprensión de la toma de conciencia en una perspectiva metacognitiva. En este contexto, la toma de conciencia se define como un proceso consciente de percepción y reconocimiento que tiene lugar mientras el sujeto desarrolla tareas y afronta situaciones que involucran investigación, de manera que el diálogo que se lleva a cabo dentro de los grupos puede generar mediaciones que provoquen este proceso. La toma de conciencia, en esta perspectiva, tiene como esencia la administración, reflexión y evaluación de las acciones de los propios sujetos y de los fenómenos estudiados por ellos, con el fin de potenciar sus propias actividades cognitivas y metacognitivas.*

PALABRAS CLAVE: *Cognición. Metacognición. Monitorización cognitiva. Educación. Aprendizaje.*

Introduction

Imagine yourself, for a moment, coming to a city you've never been in. It is possible that you start thinking: what place to visit? Where is it safer? How to identify the best routes? Even if someone has already told you about the city, or even, that you locate yourself with a technological tool, uncertainties appear and you need to build knowledge about this new situation. Thus, relationships and standards are beginning to be established about this city, so that in a future moment you will no longer be lost or worried about being able to locate yourself in it.

This first "know" can allow you to anticipate situations that previously could not be predicted, gaining time and agility. These anticipations denote an understanding of how it works and what this city is like. However, it is from the awareness of this understanding that we consider it possible to monitor actions based on the knowledge acquired. In this work, which is part of the master's thesis of the first author[3], we are especially interested in deepening and presenting understandings about awareness in a metacognitive perspective.

We recognize the importance of provocative practices and contexts of awareness in the school environment because we understand that the student who is aware of the mechanisms and strategies that he mobilizes to learn is able to resort to the same mechanisms and concepts already used in previous experiences in coping with new situations. This behavior denotes and

[3] The master's thesis of the first author aimed to discuss the awareness of fifth- and sixth-year students when developing activities of Mathematical Modeling, taken from the perspective of Mathematics Education.

contributes to different learnings. That's because we agree that "[...] teaching should encourage the person to stop, reflect on his own way of being, thinking, acting and interacting, as well as consciously invite him to change when it is necessary to improve his learning" (PORTILHO, 2011, p. 106).

In this context, the writing of this article is undertaken, which understands the awareness in a metacognitive perspective, taking the context of the classroom as a plan of reflection. For this, it presents, initially, considerations about cognition and metacognition, to then discuss the awareness and perceived correlations between it and metacognition.

Cognition

Considering the example of visiting the city, it is possible that, when walking through it, a person learns routes, points of reference, ways of getting around, in short, build knowledge when having to deal with different situations. This knowledge about the city is what we can relate to what we call cognition.

To Beber, Silva and Bonfiglio (2014), all knowledge that the subject builds while developing a task is related to their cognitive processes. However, as in the case of the visit to the city, in addition to the acquired learning, we also consider it important that the subjects reflect on the mechanisms underlying the knowledge constructed, said in another way, that reflect on the learning built and on the ways in which they are built, which would imply the possibility of using these learnings in coping with new situations. In the school context, González (2009) attentive to the importance of undertaking a teaching that privileges the cognitive development of students, through approaches that adopt actions of inquiry, research and information management.

But how is it possible for the subject to become aware of their cognitive actions and processes and understand how it "produces knowledge"? In this sense, we began to discuss what has been called in the literature of metacognition, a process also cognitive, but second level, as when the subject takes as an object of reflection and action, his own knowledge and "ways" of knowing.

Metacognition

In the example of visiting the city, it is possible to consider two scenarios: one, in which, when walking through the city with a view to reaching a destination, points of reference are not consciously established, or even seek relations between the streets; and another, in which the establishment of relations between landmarks and streets is done with a view to facilitating an upcoming visit, as one who builds a "mental map" of the city. In both situations, we have examples of cognitive activities related to location in this city, but only in the second scenario is that the cognitive activity of "locating" is assisted by another cognitive activity, as important as the first, but considered second level, since it deals with reflection on the previous cognitive activity. It is, therefore, metacognition.

Metacognition was initially considered by Flavell (1976, p. 232, our translation) as "the knowledge that a person has about one's own cognitive processes or anything related to them". According to González (1996, p. 109, our translation), metacognition "is a term used to designate a series of operations, activities and cognitive functions undertaken by a person through an internalized set of intellectual mechanisms". Portilho (2011, p. 110) states that "the term metacognition can generally apply to people's knowledge about cognition while they are solving a certain task." Beber, Silva and Bonfiglio (2014, p. 146), to Flavell's meeting, present metacognition as "the knowledge of the cognitive products themselves, that is, the knowledge that the subject has about his knowledge". Thus, metacognition can be understood as a thought that occurs while we develop a task and deal with situations, which places the actions undertaken in these situations as a focus of analysis and reflection.

Although metacognition is not always explicitly manifested by a subject, the reflections resulting from this type of thinking, from mental process, influence and trigger actions in other cognitive activities. Yanni-Plantevin (1999) aware that the metacognition of the subject can be the basis for making decisions related to the cognitive activity itself.

In this sense, Grangeat (1999) says that two routes open access to metacognition, the first being success in the face of real cognitive obstacles faced in problem solving and, the second, the relationships depending on group work mediated by another. According to Beber, Silva and Bonfiglio (2014), in school contexts, when the student begins to understand how he thinks to learn, increases the possibilities of overcoming his limitations. In addition to learning about the concepts, by understanding the cognitive processes that it performs in this learning, the student can enhance the development of competencies, strengthening areas

already developed and structured as well as enabling new learning and preparation for facing new obstacles.

For González (2009, p. 133, our translation), metacognitive processes

> [...] are exercised in cognitive processes; they imply the knowledge of our own modes of cognitive performance (both general and specific), the ability to control them simultaneously (that is, while performing some tasks that requires their use) and to regulate them, that is, to use them or stop doing so, when it is convenient to achieve the objectives that the task seeks.

In the example of visiting the city, knowledge of cognitive processes is related to the moment when we understand that we can use the reference points in a useful and effective way. The ability to regulate them refers to the monitoring of this knowledge in order to reach or return to a certain location and evaluate how the route was traveled, that is, to perform actions and evaluate how this experience was. In this context, we find it interesting to deepen the idea of metacognition highlighting two aspects: the "Knowledge About Cognition" and the "Cognitive Monitoring".

Metacognition in the strands Knowledge About Cognition and Cognitive Monitoring

When developing a task, the subject is expected to seek in his experience concepts and strategies that can facilitate their development. At the moment metacognition is presented in its "knowledge about cognition" strand. When the subject begins to monitor this process of revision of concepts or even when he performs the conscious monitoring of the execution of a resolution planning, he is performing metacognition in the aspect of "cognitive monitoring".

Vertuan and Almeida (2016) present that metacognition can be taken as a product when referring to knowledge about cognition or as a process when it relates to the monitoring that a subject exercises about his own cognitive activity. These two strands had already been pointed out by González (2009), when he states that metacognition is associated with knowledge of oneself, enabling self-awareness, regulation and control of his own cognitive activity.

Doly (1999) states that knowledge about cognition and cognition products can guide the cognitive activity of the subject, that is, they can focus on the "how" the thought and mental functions (memory, reasoning, attention, among others) of a subject work while they develop a task or solve a problem.

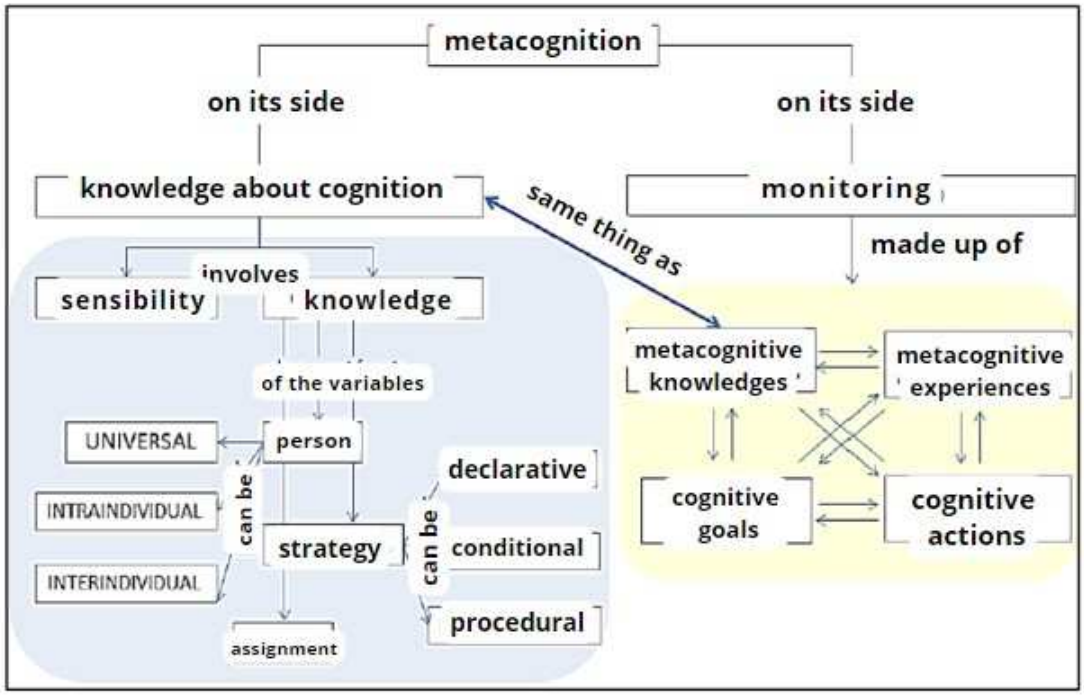
Beber, Silva and Bonfiglio (2014) are looking at "self-regulation"[4]. For the authors, self-regulation allows the subject to develop competencies about what is important to learn, and not only to learn, but to organize and execute the ideas properly, so that the development of the task presents a satisfactory result.

A task can take different paths and require different concepts for its development. These aspects of metacognition contribute so that the subject, faced with a repertoire of strategies and concepts constructed in his/her training, in his previous experiences, can identify, analyze and use the strategy and/or concept he considers most appropriate for the context. From the moment the subject begins to "reflect on" and "monitor" his cognitive processes while developing a task, he begins to have some control over it. According to Doly (1999, p. 24, our translation), "the control of the task is carried out through monitoring mechanisms and metacognitive experiences that can evoke the metaknowledge useful to the management of the task".

Vertuan (2013) presents a scheme (Figure 1), based on Flavell's metacognition perspective, which contributes to the understanding of metacognition in its two strands – knowledge about cognition and cognitive monitoring.

[4] In this work, the words "monitoring", "cognitive monitoring" and "self-regulation" will be treated as synonymous.

Figure 1 – Scheme on metacognition from Flavell's perspective



Source: Vertuan (2013, p. 63)

In the diagram of Figure 1, the knowledge strand on cognition involves two aspects: *sensitivity* and *knowledge of the variables: person, strategy and task*. According to Rosa (2011, p. 43, our translation),

> [...] the individual's ability to decide whether or not to use strategies to develop a given activity is "sensitive". [...] It is the student's decision to make decisions about whether or not to resort to metacognitive thinking. [...] The variables of the person, task and strategy, as well as their relationships, result from the individual's beliefs as cognitive being; it is the knowledge that people have about themselves, which affects their performance in performing their tasks (learning). It is established by awareness of the variables mentioned, as well as by the way they interact and influence the achievement of the cognitive objective.

The author states that it is through awareness that knowledge about cognition is established (about the variables person, strategy and task), in order to enable the achievement of the cognitive objective, such as solving a mathematical problem, for example.

In the case of a visit to the city, the sensitivity is that it allows the subject to decide whether to resort to his metacognitive thinking while walking through it (city). The knowledge of the variables person, task and strategy, called metacognitive knowledge, "are constituted by the subjects, therefore, in the reflection they make in relation to the cognitive processes themselves put into action in everyday situations and in problem solving" (VERTUAN, 2013, p. 58, our translation) and, in our example, are put into action by the

subject to allow traffic through the city and achieve its objective. Similarly, in the context of the classroom, while developing a task, the students' awareness is related to the reflection of their own cognitive processes in order to enable metacognitive thinking.

Exploring the scheme (Figure 1), we evidence that the knowledge strand about cognition is one of the four phenomena that interact in the *cognitive monitoring strand - metacognitive* knowledge (or knowledge about cognition), which we have already presented. Vertuan (2013), based in Flavell (1979), explains about the other three:

- *metacognitive experiences* "are conscious, affective and cognitive experiences that accompany a cognitive enterprise" (VERTUAN, 2013, p. 61, our translation);
- *cognitive objectives* "are responsible for boosting and moving cognitive actions" (VERTUAN, 2013, p. 61, our translation). According to the author, it is from a cognitive objective that the subject seeks in his metacognitive knowledge, already including metacognitive experiences, ways of thinking about the task and performing it;
- *and cognitive (or strategies)* actions, which can assume a cognitive (when aimed at achieving a cognitive objective) or metacognitive (when attempting to evaluate the situation under study, monitor the resolution process, verify whether the way it is conducting the resolution tends to achieve the desired objective).

According to Vertuan (2013, p. 62, our translation), "metacognitive action also produces metacognitive experiences that, in turn, act and modify metacognitive knowledge that, again, influence cognitive objectives and actions." Therefore, the four phenomena interact instantaneously, dynamically and continuously.

In the previous section, we present that, in the example of a visit to the city, the knowledge of cognitive processes is related to the moment when we understand that we can use the reference points in a useful and effective way. The ability to regulate them refers to the monitoring of this knowledge in order to reach or return to a certain location and evaluate how the route was traveled, that is, to perform actions and evaluate how this experience was.

At this moment we can expand this concept, because in relation to the metacognitive experience we use the knowledge we acquire about the city, to achieve a cognitive objective, a destination, and the actions and strategies aim to evaluate the situation during and after reaching the goal. Thus, we perceive that the metacognition in the monitoring aspect is

manifested through the reflection that the subject performs on the cognitive processes used in the visit to the city and in the administration and evaluation of this experience.

Vertuan (2013, p. 64, our translation), based on Tovar-Gálvez (2008), Flavell (1976) and Flavell and Wellman (1977, [n.d.], our translation), presents that reflection, administration and evaluation are manifested as dimensions of cognitive monitoring:

> a) dimension of reflection in which the subject recognizes and evaluates his own cognitive structures, methodological possibilities, processes, abilities and disadvantages; b) dimension of administration during which the individual, who already knows his state, begins to combine the diagnosed cognitive components in order to formulate strategies to solve the task; and c) evaluation dimension, through which the subject validates the implementation of his strategies and the degree to which the cognitive objective is achieved.

According to Vertuan (2013), the three dimensions act simultaneously during the development of a task and present a dynamic character, enabling the subject to pass, as he evolves in his metacognitive experiences, to enjoy the knowledge he has built in order to enhance his learning.

In any case, in order for the subject to identify which cognitive processes to use at different times of coping with a problem, he/she needs to have sensitivity to discern what to use and be open to different possibilities. It is about *becoming aware of the actions, concepts and strategies that are necessary in the development of a task*.

Thus, if it is through the awareness of the subject that knowledge about cognition happens (ROSA, 2011) and if this is one of the phenomena that is related to cognitive monitoring, it becomes significant to investigate "if" and "how" the awareness influences this relationship. In fact, we present in the next section of the text relations between awareness and metacognition, in order to clarify the understanding of awareness in a metacognitive perspective.

Awareness

Returning to the example of the beginning of this article, of the visit to a city, we pay close to the experiences that we accumulate in the passages through the city and how they tend to facilitate if we glimpse make another visit, especially if in addition to passing through the city, we seek to establish relationships and build memories in relation to the lived. What actions to take when returning to the city? Which experiences to select as "best or right"? In

this context, we will approach "awareness", presenting how the reflections made from the awareness we take about our choices and actions relate to our choices.

Considering the dictionary, the word "*taken*"[5], among its meanings, brings the idea of "*action or effect to take; action or effect of invading*." The word "*consciousness*", among its meanings, considers the "perception *of the phenomena proper to existence*", "*notion of what is happening in us*" and "*[Medicine] condition of the central nervous system that causes precise characterization, logical thinking and coherent behavior*". The awareness ("*taken*" + "*consciousness*"), in this context, can be understood as the action of invading and/or taking consciousness, in the sense of taking for itself the perception, notion or thought about something.

Consciousness for Vygotsky, according to Guimarães, Stoltz and Bosse (2008, p. 16, our translation), is a term used

> [...] to refer to the perception of the activity of the mind, that is, the awareness of being conscious. Such awareness, according to the author, is that which the small child does not yet have, and that their entry into school will activate, because school learning induces generalizing perceptions.

Vygotsky (1987, p. 78, our translation) exemplifies:

> Before proceeding, we want to clarify the term consciousness, in the sense that we employ it when talking about non-conscious functions "that become conscious" [...]. The activity of consciousness can follow different directions; can explain only a few aspects of a thought or an act. I just knotted —I did it consciously, but I can't explain how I did it, because my consciousness was centered more on the knot than on my own movements, how i did my action. When the latter becomes the object of my consciousness, I will have become fully aware. We use the word consciousness to indicate the perception of mind activity—the awareness of being conscious. A preschooler who, in response to the question: "Do you know your name?", says what it is called, does not have this self-reflective perception; She knows your name, but is not aware that she does.

Aligning our understanding of consciousness to the Vygotsky definition is that we appropriate the awareness in a metacognitive perspective, because we understand that it takes into account a perception, notion or second-level conscious thinking, in which reflection is present. When a subject identifies, understands and reflects on the process he/she performed to develop a given task, it can be said that he is undertaking a metacognitive activity. According to Beber, Silva and Bonfiglio (2014), this monitoring will be useful to him in

[5] https://www.dicio.com.br/.

coping with new situations, because by having knowledge of the facilities and limitations, he can reflect on the appropriate strategy and the actions necessary for this confrontation.

According to Doly (1999, p. 23, our translation), metacognitive competencies "designate the processes by which the individual exercises control or self-regulation of his activity when solving a problem". The author also states that the surveillance of control or self-regulation happens through metacognitive experiences, which, in turn, are considered "aware" of the subject about the problem faced. Then, based on Yanni-Plantevin (1999), we consider that when the subject recalls the process he performed and how he performed it, he is able to become aware of his action as an interaction between him and the object.

But is it through awareness that cognitive monitoring develops? Or is it the metacognitive process that allows awareness?

For Doly (1999, p. 27, our translation), "awareness is [...] a process that intervenes later to operate a conceptualized reformulation of the procedures put in place to achieve an end". In fact, even if *it happens a posteriori*, the awareness remakes the entire metacognitive process performed by the subject, that is, "implies all the metacognitive activity that passes from the different levels of consciousness, from intentionality to introspection" (PORTILHO, 2011, p. 111, our translation). In the example of visiting the city, the metacognitive activity performed by the subject allows him to become aware of the points that are a reference for that situation. However, it is due to the awareness that the subject takes about this place or situation, that it becomes possible to monitor the processes, experiences and cognitive actions, enhancing new coping situations in that place.

In this line, Guimarães, Stoltz and Bosse (2008) state that it is from the access to one's own thought that its control becomes possible. However, if awareness implies metacognitive activity, it is also a condition for the very awareness to occur. It is inferred that, according to Marini-Filho and Stoltz (2008), situations that stimulate awareness can result in the development of metacognition.

Guimarães, Stoltz and Bosse (2008, p. 25-26, our translation) highlight correlations between awareness and metacognition, which we organize in some topics:

> - Metacognition can be classified as a necessary tool for the process of awareness, since it is not possible for the subject to reach higher levels of awareness of his/her conducts without using his/her metacognitive abilities. On the other hand, it is not possible to exercise metacognition without having an object of knowledge accessible to the subject's consciousness;
> - To metacognitive abilities to be applied on a knowledge, therefore, it is necessary that the subject may have become aware of this knowledge;

- The process of awareness and metacognition are two inseparable and complementary instances;
- In practice, these two processes interchange and complement each other.

It is from these correlations that we come to clarify our understanding of awareness in a metacognitive perspective.

Reflections and considerations on Awareness in a metacognitive perspective

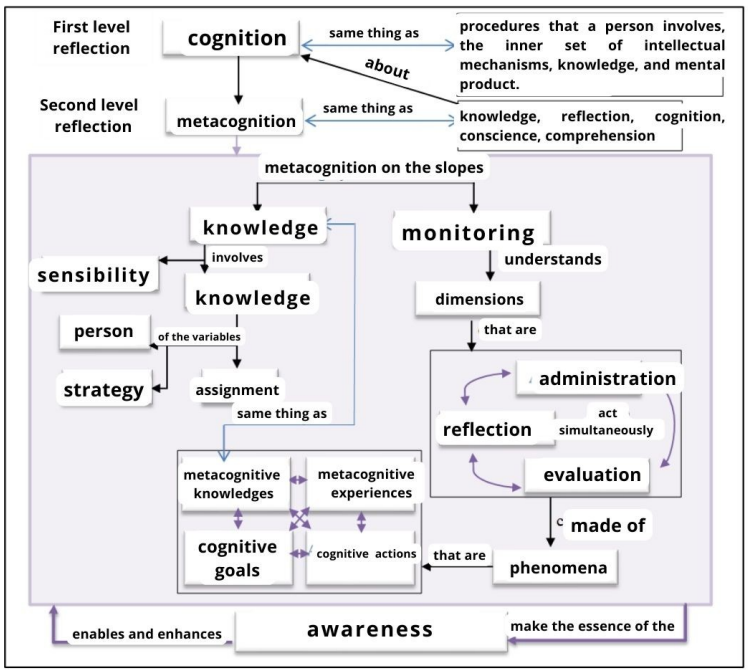
Coping with a situation, as in the example of visiting the city, can take different directions/directions depending on the need or interest of the subject. At this moment, "become aware" allows the subject to decide on the need or not to resort to cognitive processes (which implies in the enterprise of sensitivity and in the application of constructed knowledge) and acts as the kickoff of monitoring in order to reflect, administer and evaluate the best strategy to be used.

Likely, it is by metacognition that it is possible to become aware of these cognitive processes used in the cognitive action of solving a problem. Thus, we perceive a correlation between awareness and metacognition, so that they act simultaneously in the face of a situation that requires reflection.

González (2009) states that metacognition is associated with self-knowledge and, therefore, enables self-awareness, regulation and control of cognitive activity itself. In view of the above, awareness, as we understand it, in a metacognitive perspective, has as its essence both the presence of sensitivity and knowledge of cognitive processes, as well as their monitoring, manifested in the actions of reflecting, administering and evaluating knowledge, experiences, objectives and cognitive actions, allowing to know, recognize, regulate and value the cognitive components of the subject.

In order to systematize the entire process highlighted in this work, we seek to represent in Figure 2 our understanding of awareness in a metacognitive perspective.

Figure 2 – Awareness in a metacognitive perspective



Source: Research data - Prepared by the authors

In the scheme, awareness has in its essence the aspects of metacognition (knowledge and cognitive monitoring), manifested in the administration, reflection and evaluation of phenomena (metacognitive knowledge, metacognitive experiences, cognitive objectives and cognitive actions) that involve the sensitivity and knowledge of the variables person, strategy and task. This whole process allows the awareness to potentiate the subject's own metacognitive activity. This means that they are intertwined and that this cycle is dynamic and continuous.

Moreover, considering that metacognition can be raised by the need to justify ideas and procedures to others, it is that, in the classroom, group work constitutes privileged situations of awareness (VERTUAN, 2013).

In this context, we conceptualize awareness in a metacognitive perspective in school contexts as a *conscious process of perception and recognition that occurs while the subject develops tasks and deals with situations involving investigation, so that the dialogue undertaken within groups can provoke mediations that provoke this process. The awareness, in this perspective, has as its essence the administration, reflection and evaluation of the actions of the subjects themselves and the phenomena studied by them, in order to potentiate their own cognitive and metacognitive activities*.

For Yanni-Plantevin (1999, p. 142, our translation), "awareness results from the passage from the unconscious to the conscious", and it is monitoring that allows reflection, administration and evaluation of cognitive processes during this passage.

Final considerations - possibility for the classroom

In this article we aim to present the awareness in a metacognitive perspective. At the end of our argument, we developed a scheme (Figure 2) that helped us to understand and build an understanding about awareness in a metacognitive perspective, in the context of the classroom. We are aware that this understanding is not finalized/finished, but rather, looking to be thorough ly in future research. We claim to verify if and how this understanding enhances the strategies that can be used by students in the development of tasks in the classroom, and may be a differential between students who manifest difficulty and those who manifest ease in learning.

Based on the theoretical framework of this research, we identified some actions of students related to metacognitive knowledge and experiences in which awareness can be revealed and/or may be related to it while developing tasks in the school context and achieving a cognitive goal: i) what to do when they need to deal with a problem (DOLY, 1999); ii) what they do while organizing and carrying out their activities, when they solve a problem (FLAVELL *apud* DOLY, 1999); iii) of what they produce (YANNI-PLANTEVIN, 1999); iv) of the feelings that are revealed when they perform an activity or when they assimilate an idea, a concept (YANNI-PLANTEVIN, 1999); v) the results obtained, or the reasons for the results obtained (PORTILHO, 2011); vi) how they relate to their peers (DOLY, 1999) and; vii) the way they think or the mechanisms that mobilize in the development of a cognitive activity (BEBER; SILVA; BONFIGLIO, 2014; YANNI-PLANTEVIN, 1999).

We believe that the subject who takes knowledge and monitors their cognitive processes enhances their strategies for the development of the task. And also, that in a school context, when the student is aware and reflects on his/her way of learning, about the knowledge he already has about certain content and on how he/she acts when developing a task or solving a situation in dialogue in the group, this reflection can facilitate and enhance their learning and that of their peers.

We hope that this work can lead readers to reflect on how awareness can enhance metacognitive processes and allow us to understand and cognitively monitor the situations experienced in our experience, especially in school contexts.

ACKNOWLEDGMENTS: This work was carried out with the support of the National Council for Scientific and Technological Development - CNPq, to which we thank for the funding.

REFERENCES

BEBER, B.; SILVA, E.; BONFIGLIO, S. Metacognição como processo da aprendizagem. **Psicopedagogia**, v. 31, n. 95, p. 144-151, 2014. Available: http://pepsic.bvsalud.org/pdf/psicoped/v31n95/07.pdf. Access: 10 Nov. 2020.

DOLY, A. Metacognição e mediação na escola. *In:* GRANGEAT, M. (coord.). **A metacognição, um apoio ao trabalho dos alunos**. Porto: Porto Editora, 1999.

FLAVELL, J. H. Metacognitive aspects of problem solving. *In:* RESNICK, L. B. (ed.). **The nature of intelligence**. Hillsdale, NJ: Earlbaum, 1976.

FLAVELL, J. H. Metacognition and cognitive monitoring: a new area of cognitive – developmental inquiry. **American Psychologist**, v. 34, n. 10, p. 906-911, 1979.

FLAVELL, J. H.; WELLMAN, H. M. Metamemory. In: KAIL, R.; HAGEN, J. W. (ed.). **Perspectives on the development of memory and cognition**. Hillsdale, N. J.: Erlbaum, p. 3-33, 1977.

GONZÁLEZ, F. E. Acerca de la metacognición. **Paradigma**, v. 14, n. 1-2, p. 109-135, 1996. Available: http://revistaparadigma.online/ojs/index.php/paradigma/article/view/184/182. Access: 20 Dec. 2020.

GONZÁLEZ, F. E. Metacognición y aprendizaje estratégico. **Revista Integra Educativa**, v. 2, n. 2, p. 127-136, 2009. Available: http://www.scielo.org.bo/pdf/rieiii/v2n2/n02a05.pdf. Access: 25 Jan. 2021.

GRANGEAT, M. **A metacognição, um apoio ao trabalho dos alunos**. Porto: Porto Editora, 1999.

GUIMARÃES, S. R. K.; STOLTZ, T.; BOSSE, V. R. P. Da tomada de consciência à metacognição. *In:* GUIMARÃES, S. R. K.; STOLTZ, T. (org.). **Tomada de consciência e conhecimento metacognitivo**. Curitiba: Editora UFPR, 2008.

MARINI-FILHO, R.; STOLTZ, T. Aprendizagem baseada em problemas, metacognição e tomada de consciência: reflexões sobre um estudo transversal. *In:* GUIMARÃES, S. R. K.;

STOLTZ, T. (org.). **Tomada de consciência e conhecimento metacognitivo**. Curitiba: Editora UFPR, 2008.

PORTILHO, E. **Como se aprende? Estratégias, estilos e metacognição**. 2. ed. Rio de janeiro: Wak, 2011.

ROSA, C. T. W. **A metacognição e as atividades experimentais no ensino de Física**. 2011. 346 f. Tese (Doutorado em Educação Científica e Tecnológica) – Universidade Federal de Santa Catarina, UFSC, Florianópolis, 2011.

TOVAR-GÁLVEZ, J. C. Modelo metacognitivo como integrador de estrategias de enseñanza y estrategias de aprendizaje de las ciencias, y su relación con las competencias. **Revista Iberoamericana de Educación**, v. 46, n. 7, p. 1-9, 2008. Available: https://rieoei.org/RIE/article/view/1916. Access: 24 Nov. 2020.

VERTUAN, R. E. **Práticas de Monitoramento Cognitivo em Atividades de Modelagem Matemática**. 2013. 247 f. Tese (Doutorado em Ensino de Ciências e Educação Matemática) – Universidade Estadual de Londrina, UEL, Londrina, 2013.

VERTUAN, R. E.; ALMEIDA, L. M. W. Práticas de monitoramento cognitivo em atividades de modelagem Matemática. **Bolema**, Rio Claro, v. 30, n. 56, p. 1070-1091, dez. 2016. Disponível: https://www.scielo.br/j/bolema/a/FchCbsSq9rJrf8bHJMKJqdt/abstract/?lang=pt. Access: 23 Feb. 2021.

VYGOTSKY, L. S. **Pensamento e linguagem**. 1. ed. São Paulo: Martins Fontes, 1987.

YANNI-PLANTEVIN, E. Metacognição e relação com o saber. *In:* GRANGEAT, M. (coord.). **A metacognição, um apoio ao trabalho dos alunos**. Porto: Porto Editora, 1999.

How to refer to this article

SCHRENK, M. J.; VERTUAN, R. E. The Take of consciousness in a metacognitive perspective: Possibilities for the classroom. **Doxa: Rev. Bras. Psico. e Educ.**, Araraquara, v. 23, n. 00, e022003, Jan./Dec. 2022. e-ISSN: 2594-8385. DOI: https://doi.org/10.30715/doxa.v23i00.15795

Submitted: 02/11/2021
Revisions required: 20/12/2021
Approved: 05/02/2022
Published: 30/06/2022