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THE USE OF CONCEPT ANALYSIS METHOD TO UNDERSTAND THE CONCEPT OF SELF-REGULATION LEARNING

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ABSTRACT

In recent decades, the term self-regulation has been mentioned in research in different areas, including Education. Due to this growing use, the question is: what are the common elements in the concept of self-regulation learning presented in international research? In this study, integrative review and concept analysis methods were associated. In the first stage of the concept analysis, a survey of peer-reviewed articles was carried out on the CAPES Periodicals Portal, resulting in 372 articles that allowed indicating the areas of use of the term. In the second stage, applying the integrative review criteria, 67 articles were selected from the ERIC journals. Among the common factors, it was possible to identify that the self-regulation learning process includes planning, autonomy, implementation of objectives, goals and strategies, control of emotions, time management, appreciation of knowledge and successful execution of tasks.

Keywords: self-regulation learning; learning; concept analysis method

La utilización del Método de Análisis de Conceptos para la comprensión del concepto de Autorregulación a el Aprendizaje

RESUMEN

En las últimas décadas, el término autorregulación ha sido mencionado en investigaciones de distintas áreas, entre ellas la Educación. Debido a esa creciente utilización, se cuestiona: ¿cuáles son los elementos comunes en el concepto de autorregulación para el aprendizaje presentados en investigaciones internacionales? En este estudio se asociaron los métodos de revisión integrativa y de análisis de conceptos. En la primera etapa del análisis de conceptos se realizó una recopilación de artículos revisados por pares en el Portal de Periódicos de la CAPES, resultando en 372 estudios que permitieron indicar las áreas de utilización del término. En la segunda etapa, aplicando los criterios de revisión integrativa, se seleccionados 67 estudios en la base de periódicos ERIC. Entre los factores comunes se identificó que el proceso de autorregulación al aprendizaje incluye planeamiento, autonomía, implementación de objetivos, metas y estrategias, control de emociones, gerenciamiento del tiempo, valoración del conocimiento y ejecución de tareas con éxito.

Palabras clave: autorregulación; aprendizaje; método de análisis de conceptos

A utilização do método de análise de conceitos para a compreensão do conceito de autorregulação para a aprendizagem

RESUMO

Nas últimas décadas, o termo autorregulação tem sido mencionado em pesquisas de diferentes áreas, entre elas a Educação. Devido a essa crescente utilização, questiona-se: quais são os elementos comuns no conceito de autorregulação para a aprendizagem apresentados em pesquisas internacionais? Neste estudo foram associados os métodos de revisão integrativa e de análise de conceitos. Na primeira etapa da análise de conceitos foi realizado um levantamento de artigos revisados por pares no Portal de Periódicos da CAPES, resultando em 372 trabalhos que permitiram indicar as áreas de utilização do termo. Na segunda etapa, aplicando os critérios de revisão integrativa, foram selecionados 67 trabalhos na base de periódicos ERIC. Entre os fatores comuns foi possível identificar que o processo de autorregulação para a aprendizagem inclui planejamento, autonomia, implementação de objetivos, metas e estratégias, controle de emoções, gerenciamento do tempo, valorização do conhecimento e execução de tarefas com êxito.

Palavras-chave: autorregulação; aprendizagem; método de análise de conceitos

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INTRODUCTION

We know there are diverse causes for low academic performance. However, the process of mediation by the teacher and the adaptation of teaching, and assessment methods are the highlights of the aspects of greater importance when it comes to solving this problem (Pozzobon, Mahendra, & Marin, 2017).

Self-regulation is one of the alternatives that underlies all the mentioned aspects and their construct has been studied, in the past few years, by the researchers of educational psychology (Boruchovitch, 2014; Ganda & Boruchovitch, 2018) as a means to fix the problem of low academic performance at all levels of education (Menescal, 2018; Tanikawa & Boruchovitch, 2016). Generally speaking, self-regulation can be defined as a process of self-reflection and decision-making, in which students organize themselves in order to monitor and assess their own learning (Ganda & Boruchovitch, 2018).

The inclusion of this construct in the Brazilian research works is still fresh, though it already hints at a certain growth (Graph)[1], especially in the past few years, since its first publication in 2001(Paula, 2001).

By analyzing the first published dissertation (Paula, 2001), it is possible to observe that the references that make up their theoretical referential, concerning the discussion on the self-regulation construct, are international. This theoretical basis remains in recent research works (Galvão, 2019; Maciel, 2020; Menescal, 2018). However, research works by Boruchovitch (Boruchovitch, 2014; Ganda & Boruchovitch, 2018; Machado & Boruchovitch, 2015; and others) stand out, despite the string presence of international theoretical input.

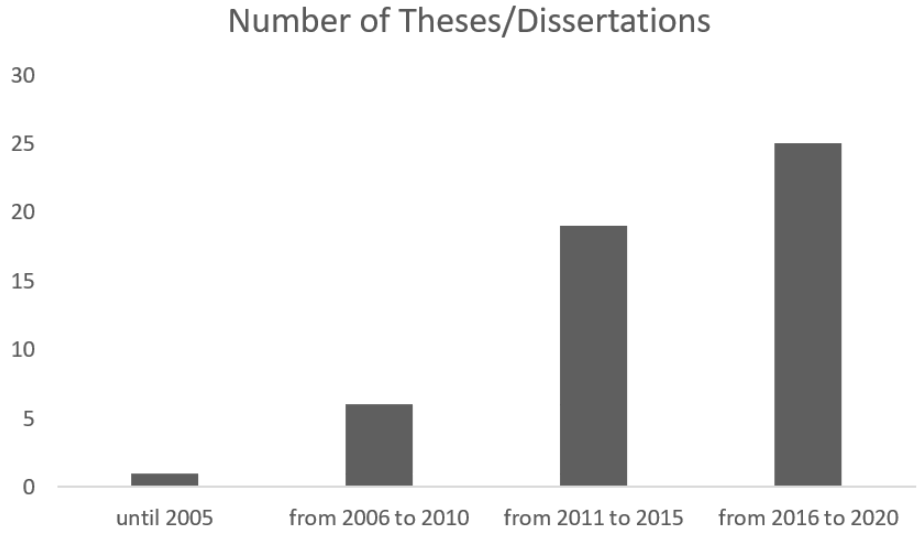
In the discussion presented by Ganda and Boruchovitch (2018) on self-regulation learning and concepts, the authors provide fundamental clues on the models and conceptions presented by researchers of cognitive psychology. On the other hand, considering that a concept is a mental conception built upon a certain phenomenon (Fernandes, Nóbrega, Garcia, & Macêdo-Costa, 2011; Sousa et al., 2018) — the representation of an idea or an abstract phenomenon that might clarify the conception of a given object – it becomes fundamental to recognize the relevance of structural knowledge on the elements present in the self-regulation concepts that have been adopted by research in the last decades. This preoccupation is easily justified by the fact that it might provide guidelines to the work developed by teachers in order to promote self-regulation for students at different levels of education. They can also provide directions to further research and advertising of the theme both in the contexts of psychology and education.

Thus, the following leading question was asked for this research work: what are the common elements present in the self-regulation learning concept that are listed in international research works? In order to answer this question, researchers conducted an integrative review work associated with the method of concept analysis by Walker and Avant (2011).

It is important to emphasize the fact that it was not possible to identify, in the literature, works that

[1] Survey realized on May 08th 2020 using the search terms: "(Portuguese abstract: learning And ("elementary school" OR "Primary learning" OR "high school" OR "basic education" OR "higher education" OR "university course" OR "public teaching" OR "private teaching" OR "private teaching)".

Graph 1 *Theses and dissertations published in the BDTD – Self-regulation learning in all educational contexts.*



Source: the authors.

are based on a method and investigate the concept of self-regulation learning. Thus, it is an innovative and relevant work, for the methodological questions that contemplated in it as well as for the comprehension of the concept investigated then.

METHOD

Based on the questioning over what the common elements would be for the self-regulation learning concept presented by international research works, it was possible to notice that the concept-analysis method proposed by Walker and Avant (2011), contributes to the composition of the self-regulation learning concept. This method leads to the identification of what precedes the concept (Antecedents), what is present in the concept (Categories), and the consequences related to the concept (Consequences), according to what was demonstrated in research works both in the area of Health (Mangueira & Lopes, 2014) and in the Education area (Mirhosseini, Mehrdad, Bigdeli, Peyrovi, & Khoddam, 2018).

The analysis of the concept, based on a method, allow for the decomposition of its structure, function, and basic elements (Mirhosseini et al., 2018). Thus, it is possible to foster a validation of the model, as well as developing and assessing tools towards the standardization of language (Mangueira & Lopes, 2014).

Walker and Avant (2011) propose a method for concept analysis made up of 8 stages: (1) selection of concept; (2) elaboration of the objectives if the assessment to be realized; (3) identification of the uses of the concept in different areas; (4) determination of the definition attributes; (5) elaboration of a model case; (6) construction of limit, related, contrary, invented, and non-legitimate cases; (7) identification of antecedents and consequences related to the concept; (8) choice of empirical references for the concept.

In this research, the gathering of documentation for stage (3) took place by means of a bibliographical survey in the Journal portal of the Coordination of Support for Higher Education Personnel, "Coordenação de Aperfeiçoamento de Pessoal de Nível Superior"' (CAPES). It is worth it to emphasize that, in their proposal, the authors do not define specific criteria for the analysis of publications after Stage (4). Thus, for the subsequent Stages – (4); (5); (6); (7); and (8) – researchers chose to associate the method for Concept Analysis with the procedures of an integrative review (Vosgerau & Romanowski, 2014). Such procedure had already been realized in other applications of the method for Concept Analysis (Mangueira & Lopes, 2014).

In order to present the procedures for each one of these stages, this is the sequence determined by Walker and Avant (2011): ***Stage (1) – Concept Selection:*** according to what has been shown in the introduction, several researchers have pointed at self-regulation as an alternative to combat low academic performance experienced by students at different levels of education (Menescal, 2018; Tanikawa & Boruchovitch, 2016). However, the survey of only 51 documents from the Digital Library of Theses and Dissertations, "Biblioteca Digital de Teses e Dissertações" (BDTD), in the past 20 years, indicates that it is still a new concept, while the production of research has picked up momentum in the last 5 years. This has an impact on the use of the construct, for the realized research works in the Brazilian context, which makes researchers, quite often, resort exclusively to international literature, realizing diversified translations and appropriations of the elements that make up the self-regulation learning concept. This fact validates the search for common categories on which current research works can be based, and which will be able to support future studies and applications. ***Stage (2) – Elaboration of the objectives of the analysis to be realized:*** the main focus of this research is to identify, in internationally published research works, the common elements present in the self-regulation learning concepts for learning used in the articles. ***Stage (3) – Identification of the of the concept in different areas*****:** the Journal portal of the Coordination for Support for Higher Education Personnel, "Coordenação de Aperfeiçoamento de Pessoal de Nível Superior[2]" (CAPES) is a library that contemplates different areas in the most assorted fields. A bibliographical survey was realized by means of the "self-regulation learning" descriptor, comprehending only works reviewed by peers, which yielded 372 works. After reading the abstracts, it was possible to identify seven areas in which the self-regulation theme is discussed (Graph 2).

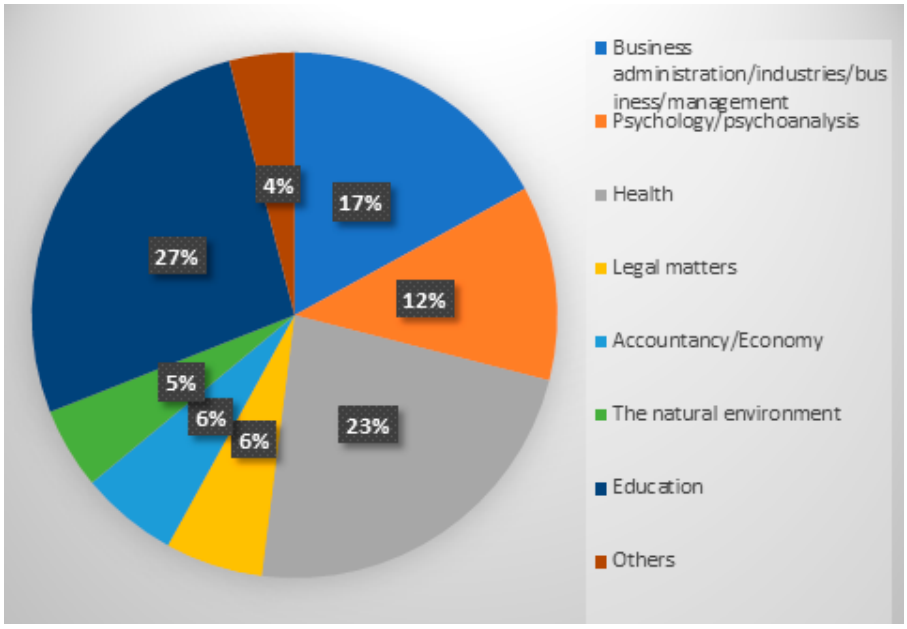
The areas with the greatest concentration of works are: Education[3] (75 works); Health (63 documents); Administration/Industries/Businesses/Management (47 documents); Psychology/Psychoanalysis (33 documents). In the other areas, though at a lesser proportion, it is possible to observe the existence of the appropriation of the term: Legal matters (17 documents); Accountancy/Economy (16 documents); the natural environment (15 documents); and other areas (12 documents).

Self-regulation in the area of physical health is linked to control mechanisms of the organs of the human body that help individuals keep themselves active, and the functions of the organism predictable. In Public Health,

[2] Available on http://www.periodicos.capes.gov.br/. Accessed on October 19 2019

[3] The Education group will not be approached in this topic. It is a pivotal area in the research. The articles will be discussed in the integrative review.

Graph 2 *Areas where discussion on self-regulation takes place.*



Source: the authors.

in turn, the concept defines the capacity by individuals to effectively control their own emotions, as well as their behavior in order to be protagonists in the trajectories of their lives and make healthy choices in the activities they develop.

In the preparation and planning for athletes/sports people, developing their activities, while improving their performances, is considered a self-regulation practice. Thus, individuals that practice sports activities are self-regulated when it comes to focusing on training and preparation to realize their activities.

Concerning the area that comprehends Administration, Industries, and Businesses, as well as Management, the "Self-regulation" term defines businesses/industries that regulate themselves by creating their own production devices without the interference of third parties in their decision-making. It is also connected to their professional performances and its monitoring, to entrepreneurial feedback, and to the achievement of goals within their work environments.

When it is related to the emotional control that individuals possess over themselves in their decision-making, which might influence their temperaments, as well as their reactivities, the concept of "self-regulation" connects with the Psychology/Psychoanalysis area. For this area, self-regulation refers to the capacity of individuals to control their own emotions and behavior in order to adapt to their social contexts. However, in studies on the Psychology of Learning, the "self-regulation" term is linked to learning processes and have been categorized in a similar way to the Education area. therefore, they will be dealt with separately in this article.

Regarding the Natural Environment, the concept of self-regulation is mentioned in connection with the attitudes by people responsible for Industries/Businesses. The businesses concerned with matters of sustainability create mechanisms in order to self-regulate and modify their means of production with the objective of not doing damage to the natural environment.

Concerning legal matters, the "self-regulation" term is linked to autonomy in decision-making. It is emphasized by some authors that the Law seems to regulate the other fields although it is not regulated.

When mentioned concerning Economy/Accountancy matters, self-regulation refers to codes of conduct and ethics, which contribute to good practices by the individuals engaged in these areas.

Since the focus of this research is to investigate the use of the "self-regulation learning" term, the Education area presented in the graph will not be approached at this moment. It was contemplated in a singular manner later on.

Based on the survey into the concept in the different areas, it is possible to conclude that there are elements that distinguish the application of the concept in different sectors. This corroborates the relevance of identifying whether, within the same area, the self-regulation term has common elements that need to

be taken into consideration before their application.

For surveying the articles that make up the analysis of the self-regulation concept in education, the ERIC database was used (in English, *Education Resources Information Center*[4]), while the search is realized by means of the *Self-regulation* AND *Education* terms, leading to the location of 1.946 articles.

With the intention to identify the contemporaneous attributions given to the "self-regulation learning" term, a refining of the works was realized. Therefore, the ones published in the year 2015. In this refinement, 704 titles were presented. In order to comprehend the used concept for the self-regulation learning term, when it is directly connected to learning strategies, a new refinement was realized by means of the descriptor indicated in the ERIC database itself: *learning strategies*, with a result of 185 works.

After a reading of the titles, 59 articles were excluded because they did not specifically discuss the process of developing self-regulation learning.

In the sequence, it was verified that among the 126 selected titles, 23 did not have the complete document in the ERIC database. So, they were excluded, and 103 works were left. After the reading of the 103 abstracts, it was observed that in 36 works the self-regulation learning process was connected tangentially to the study defined here. Consequently, they were excluded, and 67 works were left. These 67 works were fully read and after this reading, it was possible to observe the need for realizing a new exclusion process: 1 work was excluded because it concerned regulation for learning and not self-regulation learning for the objective of this research; 25 other works presented the self-regulation term but did not define the used concept and, for this reason, were also excluded. In the end, 41 works made up the corpus of the analysis realized here, and they are listed in an attachment to this document.

RESULTS

The results are presented as a continuation to the sequence of steps defined within the proposal concept analysis.

Stage (4) – Determination of the definition attributes: The 41 included works were imported into the ATLAS.ti software for analysis of qualitative data. In the software, a single code was used: self-regulation aiming at extracting the concepts present in the text in order to identify the attributes related to this code and that were contemplated throughout the analyzed works (Box 1).

Stage (5) – Production of a model case: according to the proposal by the method of Concept Analysis, the model case is produced by the researchers by means of attributes identifies in the selected quotes, thus:

An undergraduate student in Biology started the Research Methodology discipline for the production of his Course conclusion paper (TCC). From the very beginning, the student engaged into the investigation of relevant themes that, by means of his research, could effectively contribute to a quality natural environment. The student selected assorted publications and websites that approached the theme and started writing, imagining that it could be good enough for discussing the set of themes in the TCC. As soon as the text was finished, the student handed it over to the tutoring teacher and set up a meeting for discussing the chosen set of themes and the written material. In the meeting, the tutoring teacher commented that the research should be systematically conducted and organized, rather than based on random readings, and also recommended materials on research production. The tutor also pointed at a few spelling, grammar, and text-construction mistakes, and provided the student with a text self-correction guide. During the conversation, the very attentive student observed that the teacher's comments were focused on the written text, which needed improvement, rather than on the student himself (i). After the conversation, the student decided to check the mistakes pointed out by the teacher had also been made in other texts produced during his graduation course (a). The texts were reread, with the application of the review guide provided by the tutor. Major mistakes were registered for later lists of materials towards learning by one's mistakes (d). At this moment, the student noticed his own necessity to better learn the Portuguese language and that was probably a result of unsatisfactory basic education. The student needed to solve that problem not only in order to produce a good TCC, but also to acquire a competitive professional edge (b). The student did plenty of internet research by means of free videos on writing, started to read from websites on grammar tips and text writing (n) and got interested in the discovery of most common mistakes in writing (f). After this conversation, the student assessed his possibilities (j), produced work hypotheses, defined the trajectory he would go through, and organized a study timetable. The student established research goals and attempted to investigate the available literature on the chosen theme (m). After that, the student realized an empirical research and wrote his paper with excellence. The student was successful in the development of his research and obtaining academic approval. After obtaining approval, the student also used the acquired knowledge to promote events to raise awareness on protecting the natural environment for people from his neighborhood and from other parts of the city.

[4] Available on https://eric.ed.gov/. Accessed on October 28 2019.

Box 1 *Works included in this research with quotes that contemplate the self-regulation term.*

Id. Article	Reference	Example of quote on self-regulation concepts
Art01	(Abu & Gökdere, 2018)	According to the model, the students can identify their own learning disabilities, reprogram their learning, and assess their own learning results. The students can have the opportunity to develop self-learning skills in grid-based, learning environments (p. 456).
Art02	(Al-Rawahi & Al-Balushi, 2015)	Self-regulated learning can be metacognitive, motivational, and behavioral in the learning process (according to Chen, 2002; Corrigan; Taylor, 2004; Zimmerman, 1990, p. 368).
Art03	(Alivernini, Manganelli, Cavicchiolo, Chirico, & Lucidi, 2019)	Self-regulated strategies are the activities and mental processes that students select and adopt with the objective to obtain knowledge, understanding, and skills, as well as to self-monitor their learning process and control its progress (according to Zimmerman, 2000a, p. 652)
Art04	(Alkharusi, Sulaimani, & Neisler, 2019)	Self-regulation involves self-examination and self-correction (according to Facine, 2013, p. 493).
Art05	(S. Aydın, 2015)	[...] Self-regulated individuals are aware of their own learning, determine personal objectives, design strategies to reach such objectives, monitor their own behavior and increase their own motivation (according to Zimmerman, 2002, p. 53).
Art06	(B. Aydın, Memnun, Dinç, Arsuk, & Meriç, 2019)	Self-regulation is an efficient, constructive process in which individuals determine their own learning goals, try to regulate their cognition, motivation, and behavior. Individuals are guided and limited by their surrounding contexts and purposes (according to Pintrich, 2000, p. 72).
Art07	(Baars, Leopold, & Paas, 2018)	Self-regulated learning (SRL) is seen as a proactive process that students use in order to obtain academic skills, such as the establishment of goals, selection, and implementation of strategies, and the self-monitoring of efficacy (according to Zimmerman, 2008, p. 578).
Art08	(Ben-Eliyahu & Linnenbrink-Garcia, 2015)	[...] the students that are able to regulate basic emotions, behaviors, and cognitions will be better at applying specific learning strategies, which will lead to higher levels of performance (p. 16).
Art09	(Bol, Campbell, Perez, & Yen, 2015)	Self-regulated learning (SRL) refers to a process in which the students proactively start and sustain strategies, affections, and cognitive behaviors in order to reach cognitive behaviors (according to Ramdass; Zimmerman, 2011, p. 480).
Art10	(Colthorpe, Zimbardi, Ainscough, & Anderson, 2015)	[...] self-regulation takes place by means of three phases: premeditation, performance, and self-reflection (according to Zimmerman, 2000a, p. 135).
Art11	(Dignath & Büttner, 2018)	Self-regulated learning (SRL) refers to self-generated thoughts, feelings, and actions that help students reach their goals (according to Schunk & Zimmerman, 1998, p. 128).
Art12	(Dresel et al., 2015)	[...] capacity to regulate one's own cognition and motivation in terms of execution control (p. 456).
Art13	(Duarte & Barros, 2018)	Self-regulation is based on situational demands, while improving the probability for a reflexive approach that is adaptable to the learning task (s.p.).
Art14	(Dunn & Lo, 2015)	[...] the self-regulated students are meta-cognitive, motivational, and behavioral participants in their own learning process (according to Zimmerman, 1989, p. 2598).
Art15	(Dyken & Benson, 2019)	Self-regulated students seek information and support when they need help (according to Zimmernan & Martinez-Pons, 1988, p. 357).

Id. Article	Reference	Example of quote on self-regulation concepts
Art16	(Ebadi & Shakoorzadeh, 2015)	[...] learning self-regulation refers to enhancing the use of cognitive and meta-cognitive management and of resources to maximize learning (according to Pintrich & DeGroot, 1990, p. 194).
Art17	(Fadlelmula, Cakiroglu, & Sungur, 2015)	When students establish appropriate learning goals, [...] it might facilitate their self-regulation (p. 1356).
Art18	(Fryer & Vermunt, 2018)	Self-regulation describes study behaviors in which individuals lead their own efforts and define their own learning goals (p. 23).
Art19	(Gafoor K & Kurukkan, 2016)	Self-regulated students are the ones who manage their own learning and engage in more metacognitive monitoring and control. They are also more motivated (p. 60).
Art20	(Hatami, 2015)	[...] self-regulation for learning refers to the efficient use for cognitive strategies and any behavior, thought, or action towards contributions to learning, organizing, and storing knowledge and skills, in addition to providing further convenience for future operations (according to Zimmerman & Martinez-Ponz, 1990, p. 2155).
Art21	(Kayacan & Ektem, 2019)	The self-regulation process is an active and constructive process in which students regulate and observe their behavior, motivation, and cognition according to the objectives they identified in the learning process (according to Pintrich, 2000, p. 313).
Art22	(Kizkapan, Bektas, & Kimizigul, 2018)	Self-regulation strategies, fundamental principles of social cognitive theory, are seen as a constructivist process in which students establish learning goals and regulate their own cognition and behavior (according to Pintrich, 2000, p. 614).
Art23	(Köseoglu, 2015)	[...] self-regulation is converted into self-regulated learning. Self-regulated students have a combination of skills acquired by means of academic education and self-control, which facilitate learning. Therefore, they are more motivated. In other words, they have the will and the skills to learn (according to Murphy & Alexander, 2000, p. 131).
Art24	(Laureano, Espinosa, & Avilla, 2015)	Self-regulated learning (SRL) refers to learning as a result of thoughts and behaviors produced by the students who are systematically led towards the execution of their objectives (according to Zimmerman, 2001, p. 29).
Art25	(Lawson, Vosniadou, Van Deur, Wyra, & Jeffries, 2018)	[…] the management of learning by individuals (p. 224).
Art26	(Leopold & Leutner, 2015)	The "what" if self-regulation refers to cognitive strategies such as highlighting, mapping, and visualizing [...]. The "how" of self-regulation refers to the efficacy with which specific cognitive strategies are applied (p. 316).
Art27	(Li, Zheng, Liang, Zhang, & Tsai, 2018)	Self-regulation was defined as a set of processes students use in order to activate and keep cognitions, emotions, and behaviors in their attempts to reach personal goals (according to Zimmerman & Ktsantas, 2014, p. 71)
Art28	(MacArthur, Philippakos, & Ianetta, 2015)	[...] self-regulation strategies that include the establishment of goals, the management of tasks, the monitoring of progress, and reflection (p. 855).
Art29	(Muenks, Wigfield, Yang, & O'Neal, 2017)	Cognitive self-regulation includes strategies for cognitive learning such as planning, monitoring, regulation, and assessment before, during, and after procedures (according to Zimmerman, 2011, p. 602).
Art30	(Neitzel, Alexander, & Johnson, 2016)	Academic self-regulation refers to a set of skills that lead children to engage in independent learning (according to Bronson, 2000, p. 474).

Id. Article	Reference	Example of quote on self-regulation concepts
Art31	(Neitzel & Connor, 2017)	Self-regulated learning allows students to independently manage their own participation and learning in the classroom environment (according to Blair, 2002; Butler & Winne, 1995; Zimmerman, 2002, p. 548).
Art32	(Nguyen & Ikeda, 2015)	[...] self-regulation is a self-directive process in which students convert their mental skills into academic skills, and learning is a proactive process in which students actively participate with a lot of responsibility and motivation (according to Zimmerman, 2002, p. 197).
Art33	(Paulino, Sá, & da Silva, 2016)	Self-regulation refers to students' actions towards keeping motivation and persistence in school tasks. It presumes their intentional action and competence to motivate themselves (p. 196).
Art34	(Perry, Fisher, Caemmerer, Keith, & Poklar, 2018)	Self-regulation (or self-regulated learning) refers to a multi-dimensional construct which consists of learning strategies and skills that help students to monitor and organize their own learning, manage their time, focus their attention, reduce their anxiety, delay their gratification, and persist on directed behavior towards their own goals (according to Schunk; Zimmerman, 2013, p. 552).
Art35	(Rabab'h & Veloo, 2015)	Self-regulated learning is described as the acquisition of knowledge and skills by means of the cognitive and metacognitive process and real behavior (according to Zimmerman, 2000b, p. 2).
Art36	(Steiner, Trivedi, & Brown, 2019)	[...] the self-regulation of learning strategies involves acting towards learning and implementing appropriate strategies for accomplishing tasks, defining goals for learning, and reflecting on someone's approach, modifying it for the next task, if necessary (p. 28).
Art37	(Stoten, 2015)	[...] self-regulation means being able to develop knowledge, skills, and attitudes that can be transferred from a learning context into another, and from learning situations in which such information is acquired into a context of leisure time and labor (according to Boekaerts, 1999, p. 465).
Art38	(Sáez et al., 2018)	Self-regulated learning implies a social aspect that includes interactions with peers and teachers, who act as co-regulators of learning. Teachers would be in charge of constructing social support within the classroom, for example, by creating opportunities for peer collaboration in the realization of tasks (p. 226).
Art39	(Tempelaar, Rienties, & Nguyen, 2017)	[...] strategies for processing and regulating learning influence self-regulated learning (p. 8).
Art40	(Thoutenhoofd & Pirrie, 2015)	[...] self-regulation is connected to the personal initiative, perseverance, and adaptation skills of each student (according to Zimmerman, 2001a, p. 74).
Art41	(Yuriev, Naidu, Schembri, & Short, 2017)	Self-regulated learning (SRL) represents proactive processes used by the students in order to set up goals, select and implement strategies, and monitor their efficacy (according to Zimmerman & Pons, 1986; Pintrich, Smith, Garcia, & McKeachie, 1991; Zimmerman, 2008; Low & Jin, 2012, p. 489).

Source: Articles collected for the research.

Stage (6) – Construction of limit, related, contrary, invented, and non-legitimate cases:

The limit case, according to the method proposed by Walker and Avant (2011), can be an idealized case that will help the reader to reach a comprehension of what is not related to the identified attributes. Clearly, the authors if this study point at the following hypothetical case, which can be considered a limit case: a student from the third year of high school intended, at the end of the school year, to take an entrance test for a graduation course in a higher learning institution (IES). The student got enrolled in a preparation course in combination with school activities. The student, however, missed too many classes at the course, and failed to establish a study

Box 2 *Listed Categories, Distributed onto the Analyzed Articles.*

Id. Article	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
Art01	X	X	X													
Art02				X	X											
Art03	X					X										
Art04	X	X		X			X			X						
Art05	X				X			X								
Art06					X			X								
Art07	X		X			X		X								
Art08								X	X							
Art09						X		X	X							
Art10	X									X						
Art11									X							
Art12	X				X											
Art13								X		X						
Art14					X											
Art15											X					
Art16	X			X												
Art17								X								
Art18								X								
Art19									X				X			
Art20								X								
Art21	X				X											
Art22								X	X			X				
Art23					X				X							
Art24													X			
Art25													X			
Art26	X							X								
Art27	X								X							
Art28	X							X		X			X			
Art29	X															
Art30														X		
Art31													X			
Art32			X		X											
Art33					X	X										
Art34			X					X	X				X			
Art35			X	X												
Art36								X		X						
Art37			X												X	
Art38																X
Art39	X															
Art40						X										
Art41	X					X	X	X								
TOTAL	**15**	**2**	**5**	**4**	**9**	**6**	**1**	**15**	**8**	**5**	**1**	**1**	**6**	**1**	**1**	**1**

Source: the authors.

routine while prioritizing other activities such as going to parties with friends. At the end of the school year, on the day of the entrance test for the chosen graduation course, the student was late and forgot to bring along the necessary material to take the test. Obviously, it was an unsuccessful experience.

Stage (7) – Identification of antecedents and consequences related to the concept:

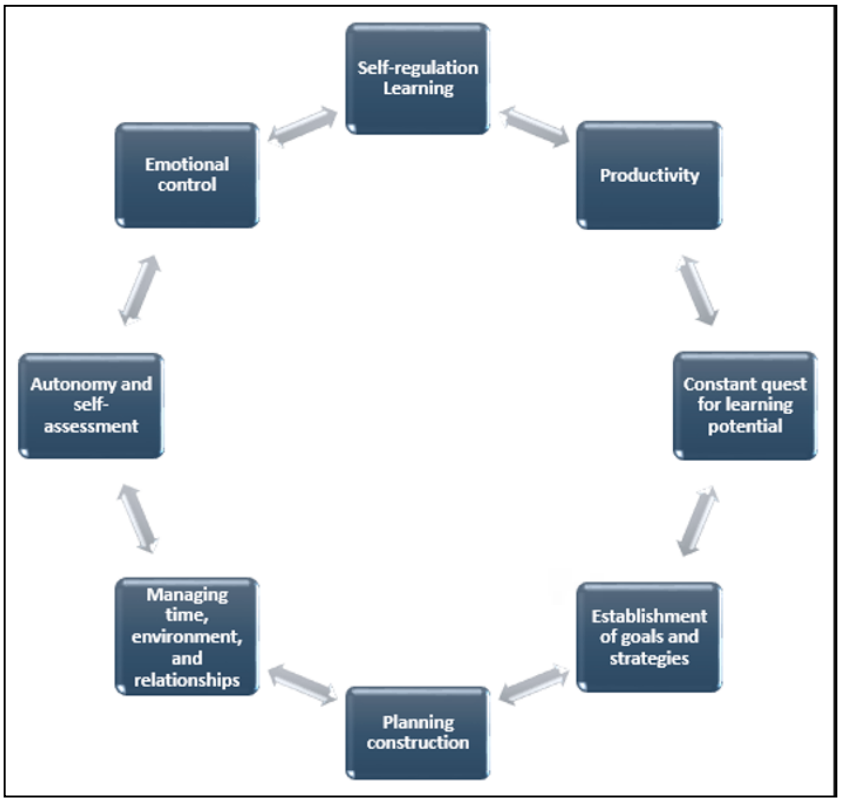
Antecedents are events that need to take place before the formulation of the concept and the consequences are the results regarding the presence of the concept (Mirhosseini et al., 2018). However, concerning the the concept self-regulation learning, it is possible to verify that the antecedents and consequences are part of a continuum. According to the aforementioned attributes, the students: assess their own learning process and identify their own shortcomings during the process (a; b); the students are provided with metacognition and are motivated (d; e); they aim at the acquisition of new knowledge and at a process of self-correction (f; g); they set up clear goals (h; m) which might take place before, during, or after the process of learning different knowledge. They are in search of reflection on their activities (f; i; j; k). Besides that, "cognitive self-regulation includes strategies for cognitive learning, such as planning, monitoring, regulation, and assessment before, during, and after performance" (Zimmerman, 2011 according to Muenks, Wigfield, Yang, & O'Neal, 2017, p. 602, our translation). This continuum can be presented by means of a cyclic process, according to Illustration 1.

On illustration 1, the attributes of self-regulation learning are related to each other without any hierarchy. The antecedents and consequences are associated to each other in a parallel, simultaneous way. Only the attribute of "executing activities successfully" can be separately regarded as a consequence.

Stage (8) – the choice of empirical references for the concept:

the empirical references for essential attributes of a concept can be named 'categories' or 'classes of observable phenomena' and, most often, are identical to the attributes (Fernandes et al., 2011). Thus, it is possible to observe that the attributes of self-regulated learning are interconnected, as in a web or network, in which the threads depend on each other so that the product and/or result can have quality. In other words, so that learning can be effective and significant. Thus,

Illustration 1 *Antecedents and Consequences of Learning Self-regulation Learning.*



Source: the authors.

attributes can be identified by means of the students' attitudes, that is, whether they present the will and the autonomy to learn (e; f; n); establish goals and strategies for the development of activities (f; m); manage their time, while assessing their attitudes and behaviors during the whole process of knowledge construction (a; i; j; m); aim to increase their capacity for learning and realize their activities successfully (a; d; e; f; g; h; j; k; m; n).

FINAL CONSIDERATIONS

Self-regulation is related to planning matters, decision making, and investments in different areas in order to reach a goal that is, in general, meticulously outlined. Businesses and industries seek and exercise self-regulation when they regulate themselves, without the interference of regulating agencies or any other external corporation. Therefore, when they act responsibly, they prove self-regulated regarding the natural environment, for example. The issue of ethics in decision-making is also approached when self-regulation is part of sectors that directly operate with financial situations. The commitment by athletes in the preparation for their physical activities is part of the routine of those who are self-regulated and the emotional control of the individuals is delt with by the areas, denominated here, of Psychology/Psychoanalysis and Public Health, when they approach the concept of self-regulation. There is also the issue of self-regulation related to the health area, by indicating the perfect operation of the organs in the human body.

In the area of Education, because it is related to the learning concept, the following attributes are identified for self-regulation: planning their own learning, autonomy for the realization of different activities, the implementation of objectives, the development of strategies, self-assessment, emotional control, the search for routes towards more potential for learning and for the successful accomplishment of tasks. Self-regulated students understand and appreciate the act of learning. That is the reason why they are able to manage their own time, prioritize learning activities, and get effectively engaged with the processes of construction of their own knowledge. Such students do not depend on the attitudes of their teachers, parents, or peers in order to get engaged in learning activities. These students go beyond classroom time and can be regarded as investigators of the learning possibilities within their reach. Self-regulated students are effectively committed to their own education.

The situations of antecedence and consequence of self-regulation learning are connected and can be seen from a non-linear perspective. For example: an antecedent is the act of planning and managing time for dedication to learning processes. It is also a consequence of self-regulation attitudes.

Thus, the method by Walker and Avant (2011) was chosen in order to realize the analysis of the seff-regulation concept, in which learning was the main focus. Understanding the essence of the term and the elements that make it up leads teachers, as early as basic education, to provide necessary actions to help students become co-responsible for their own learning process, which can provide students with the opportunity to develop an larger inventory of resources in order to obtain success in their academic trajectories.

As a limitation of this study, we can mention the use of only one database – ERIC. Due to the fact that it is a database specifically related to education, with a lot of articles on the theme, we believe that it is possible to overcome such limitation. However, we emphasize that, based on the listed categories, this study can be amplified by means of other bases.

With the results of this study, it is possible to develop new empirical research that will lead to the validation and/or amplification of the obtained results. Among the possibilities for studies, we suggest the use of the listed categories in the conception of instruments for self-assessment and formation of teachers, on their self-regulation process, especially regarding basic education, which is the ideal level of education for developing self-regulated students. Thus, in order to help students to become self-regulated, it is important that teachers also become aware of their own self-regulation processes.

REFERENCES

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, *57*(2), 111–127.

Boekaerts, M. (1999). Self-Regulated Learning: Where We Are Today. *International Journal of Educational Research*, *31*, 445–457.

Boruchovitch, E. (2014). Autorregulação da aprendizagem: Contribuições da psicologia educacional para a formação de professores. *Psicologia Escolar e Educacional*, *18*(3), 401–409. https://doi.org/10.1590/2175-3539/2014/0183759

Bronson, M. B. (2000). *Self-regulation in early childhood: Nature and nurture*. Guilford Press.

Butler, D. L.; Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, *65*(3), 245–281.

Chen, C. (2002). Self-regulated learning strategies and achievement in an introduction to information systems course. *Information Technology, Learning, and Performance Journal*, *20*(1), 11–25.

Corrigan, G.; Taylor, N. (2004). An exploratory study of the effect a self-regulated learning environment has on pre-service primary teachers' perceptions of teaching science and technology. *International Journal of Science and Mathematical Education*, *2*, 45–62.

Facine, N. (2013). *California Critical Thinking Skills Test (CCTST Test Manual)*. CA: California Academic Press.

Fernandes, M. das G. M.; Nóbrega, M. M. L. da; Garcia, T. R.; Macêdo-Costa, K. N. de F. (2011). Análise conceitual: considerações metodológicas. *Revista Brasileira de Enfermagem*, *64*(6), 1150–1156. https://doi.org/10.1590/s0034-71672011000600024

Galvão, P. R. P. (2019). *Estratégias autorreguladas, motivação e percepção dos professores por graduandos de pedagogia* (Dissertação de mestrado). Universidade Estadual de Londrina, Londrina-PR. Recuperado de http://www.bibliotecadigital.uel.br/document/?code=vtls000225541

Ganda, D. R.; Boruchovitch, E. (2018). A autoregulação da aprendizagem: principais conceitos e modelos teóricos. *Revista Psicologia Da Educação*, *1*(46), 71–80. https://doi.org/10.5935/2175-3520.20180008

Low, R.; Jin, P. (2012). Self-regulated learning. In N. M. Seel (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 3015–3018). MA: Springer US.

Machado, A. C. T. A.; Boruchovitch, E. (2015). As práticas autorreflexivas em cursos de formação inicial e continuada para professores. *Psicologia: Ensino & Formação*, *6*(2), 54–67.

Maciel, D. M. (2020). *Aspectos da Avaliação online no contexto de uma disciplina de um curso de Licenciatura em Matemática a distância* (Tese de doutorado). Universidade Estadual Paulista, Rio Claro - SP. Recuperado de https://repositorio.unesp.br/handle/11449/191981

Mangueira, S. de O.; Lopes, M. V. de O. (2014). *Família disfuncional no contexto do alcoolismo: análise de conceito*. *Revista Brasileira de Enfermagem, 67(1), 149-154,* https://doi.org/10.5935/0034-7167.20140020

Menescal, N. R. G. (2018). *Instrumentos de aferição da autorregulação da aprendizagem em universitários* (Tese de Doutorado). Universidade de São Paulo, São Paulo-SP. Recuperado de https://teses.usp.br/teses/disponiveis/47/47131/tde-27072018-104844/publico/menescal_corrigida.pdf

Mirhosseini, F.; Mehrdad, N.; Bigdeli, S.; Peyrovi, H.; Khoddam, H. (2018). Exploring the concept of scholarship of teaching and learning (SoTL): Concept analysis. *Medical Journal of the Islamic Republic of Iran*, *32*(1), 1–7. https://doi.org/10.14196/mjiri.32.96

Muenks, K.; Wigfield, A.; Yang, J. S.; O'Neal, C. R. (2017). How true is grit? Assessing its relations to high school and college students' personality characteristics, self-regulation, engagement, and achievement. *Journal of Educational Psychology*, *109*(5), 599–620. https://doi.org/10.1037/edu0000153

Murphy, P.; Alexander, P. (2000). A motivated Exploration of Motivation Terminalogy. *Contemporary Educational Psychology, 25*, 3–53.

Paula, F. V. de. (2001). *Conhecimento metacognitivo de crianças de 3ª série que apresentam dificuldades na aquisição da leitura* (Dissertação de mestrado). Universidade de São Paulo, São Paulo-SP. Recuperado de https://teses.usp.br/teses/disponiveis/47/47131/tde-08092016-154603/publico/FRAULEIN_ME.pdf

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts; P. R. Pintrich; M. Zeidner (Eds.), *Handbook of Self-regulation* (pp. 451–501). CA: Academic Press.

Pintrich, P. R.; DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom Academic performance. *Journal of Educational Psychology*, *82*(1), 33–40.

Pintrich, P. R.; Smith, D. A. F., García, T.; McKeachie, W. J. (1991). *A manual for the use of the motivated strategies questionnaire (MSLQ)*. MI: University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning.

Pozzobon, M.; Mahendra, F.; Marin, A. H. (2017). Renomeando o fracasso escolar. *Psicologia Escolar e Educacional*, *21*(3), 387–396. https://doi.org/10.1590/2175-3539201702131120

Ramdass, D.; Zimmerman, B. J. (2011). Developing self-regulation skills: The important role of homework. *Journal of Advanced Academics, 22*(2), 194–218.

Schunk, D. H.; Zimmerman, B. J. (1998). *Self-regulated learning. From teaching to self-reflective practice*. Guilford.

Schunk, D. H.; & Zimmerman, B. J. (2013). Self-regulation and learning. In W. M. Reynolds, G. E. Miller, & I. B. Weiner (Eds.), *Handbook of psychology: Educational psychology* (2nd ed., pp. 45–68). NJ: John Wiley.

Sousa, L. M. M. de; Firmino, C. F.; Carteiro, D. M. H.; Frade, F.; Marques, J. M.; Antunes, A. V. (2018). Análise de conceito: conceitos, métodos e aplicações em enfermagem. *Revista Investigação em Enfermagem*, Nov. 2018, 9–19. Recuperado de https://www.researchgate.net/publication/330205622_ANALISE_DE_CONCEITO_CONCEITOS_METODOS_E_APLICACOES_EM_ENFERMAGEM

Tanikawa, H. A. M.; Boruchovitch, E. (2016). Monitoramento metacognitivo de alunos do ensino fundamental. *Psicologia Escolar e Educacional*, *20*(3), 457–464. https://doi.org/10.1590/2175-3539201502031012

Vosgerau, D. S. R.; Romanowski, J. P. (2014). Estudos de revisão: implicações conceituais e metodológicas. *Revista Diálogo Educacional*, *14*(474), 165. https://doi.org/10.7213/dialogo.educ.14.041.DS08

Walker, L. O.; Avant, K. C. (2011). *Strategies for Theory Construction in Nursing* (5th ed.). Pearson.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, *81*, 329–339.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, *25*(1), 3–17.

Zimmerman, B. J. (2000a). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts; P. R. Pintrich; M. Zeidner (Eds.), *Handbook of self-regulation: Theory,*

research, and applications (pp. 13–39). CA: Academic Press.

Zimmerman, B. J. (2000b). Self-Efficacy: An Essential Motive to Learn. *Contemporary Educational Psychology*, *25*(1), 82–91.

Zimmerman, B. J. (2001a). Self-regulated learning. In N. J. Smelser; P. B. Baltes (Eds.), *International encyclopedia of the social & behavioral sciences* (pp. 13855–13859). Elsevier.

Zimmerman, B. J. (2001b). Theories of self-regulated learning and academic achievement: An overview and analysis. In B. J. Zimmerman; D. H. Schunk (Eds.), *Self regulated learning and academic achievement* (pp. 1–38). NJ: Erlbaum Associates.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64–70.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, *45*, 166–183.

Zimmerman, B. J. (2011). Motivational sources and outcomes of self- regulated learning and performance. In B. J. Zimmerman; D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 49–64). Routledge.

Zimmerman, B. J.; Kitsantas, A. (2014). Comparing students' self-discipline and self-regulation measures and their prediction of academic achievement. *Contemporary Educational Psychology*, *32*(2), 145–155.

Zimmerman, B. J.; Martinez-Pons, M. (1988). Construct validation of a strategy model of student self- regulated learning. *Journal of Educational Psychology*, *80*(3), 284–290.

Zimmerman, B. J.; Martinez-Ponz, M. (1990). Student differences self- regulated learning: Relating grade, sex, and giftedness to self- efficacy and strategy use. *Jounal Educational Psychology*, *82*, 51–59.

Zimmerman, B. J.; Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, *23*, 614–628.

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