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## SPECIAL SECTION: UNIVERSITY AND INCLUSION

### Contributions of a subject in promoting self-regulated learning in university students who came from the public school system<sup>1</sup>

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#### ABSTRACT

Self-regulated learning configures an important strategy for learning and academic success. This study describes the pedagogical decisions and mediations from professors of a self-regulated course and analyzes its contributions to university students who came from public school system. This subject, spanning 15 weekly face-to-face classes in a semester, addresses self-regulated processes, is based on collaborative learning, uses storytelling and reflexive and practical activities, and offers personalized feedback. In total, 192 university students who voluntarily answered self-reported questionnaires at the beginning and end of the course were followed-up to evaluate the effect course of the subject on participants. Their understanding and use of self-regulated processes increased after they completed the course. We found statistically significant results in students who began the course with lower levels of self-regulation. This study discusses the role of pedagogical mediations that facilitate the promotion of self-regulated learning in higher education.

**Keywords:** learning; higher education; academic success; mediation of learning.

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## Contribuciones de una disciplina en la promoción del aprendizaje autorregulado en estudiantes universitarios procedentes de la red pública

### RESUMEN

La autorregulación del aprendizaje es una estrategia importante para el aprendizaje y el éxito académico. Este artículo describe las decisiones y mediaciones pedagógicas de una disciplina que tiene como objetivo su promoción, y analiza sus aportaciones para los estudiantes universitarios procedentes de la red pública de educación básica. El curso presencial, con 15 reuniones durante el semestre, aborda el proceso de autorregulación. Está estructurado en el aprendizaje colaborativo y utiliza narraciones, actividades de reflexión y aplicación práctica, con retroalimentación personalizada. El análisis del impacto del curso se realizó mediante el seguimiento de 192 estudiantes, que respondieron voluntariamente a los instrumentos de autoinforme al principio y al final del curso. Los estudiantes describieron un aumento en su conocimiento y uso de estrategias de autorregulación después de asistir al curso. Se encontraron impactos estadísticamente significativos en los estudiantes que comenzaron el curso con niveles más bajos de autorregulación. Se discute el papel de las mediaciones pedagógicas que facilitan la promoción de la autorregulación del aprendizaje en la educación superior.

**Palabras clave:** aprendizaje; educación superior; éxito académico; mediación del aprendizaje.

## Contribuições de uma disciplina na promoção da autorregulação da aprendizagem de universitários egressos da rede pública

### RESUMO

Autorregulação da aprendizagem é uma estratégia importante para a aprendizagem e o sucesso acadêmico. Este artigo descreve as decisões e mediações pedagógicas de uma disciplina que visa sua promoção e analisa suas contribuições para universitários oriundos da rede pública de ensino básico. A disciplina presencial, que conta com 15 encontros ao longo de um semestre, aborda o processo de autorregulação. É estruturada na aprendizagem colaborativa e utiliza narrativas, atividades reflexivas e de aplicação prática, com feedback personalizado. A análise do impacto da disciplina deu-se pelo acompanhamento de 192 estudantes, que voluntariamente responderam aos instrumentos de autorrelato no início e na conclusão do curso. Os universitários descreveram ampliação no conhecimento e no uso das estratégias de autorregulação após cursarem a disciplina. Impactos estatisticamente significantes foram constatados em estudantes que iniciavam o curso com níveis mais baixos de autorregulação. Discute-se o papel das mediações pedagógicas que facilitam a promoção da autorregulação da aprendizagem no ensino superior.

**Palavras-chave:** aprendizagem; ensino superior; sucesso acadêmico; mediação da aprendizagem.

## INTRODUCTION

Until the early 2000s, Brazilian public higher education (HE) maintained its elitist character since the high selectivity of its entrance exams, lack of affirmative actions, and few support policies constituted barriers for young students from public schools to access university and complete their education (HERINGER, 2018; VARGAS; HERINGER, 2017). In turn, the recognition of the importance of schooling for social mobility, quality of life, and national economic development, associated with greater access to basic education and social mobilization to democratize entry into universities expanded policies targeting Brazilian public HE along with the adoption of affirmative actions (HERINGER, 2018; VARGAS; HERINGER, 2017), changing HE students' cultural, social, economic, and ethnic profile (HERINGER, 2018; PENA; MATOS; COUTRIM, 2020).

Along with this expansion, the access of historically absent groups to HE, such as former public schools students and Black, Mixed-race, and Indigenous persons, faces the challenge of student persistence (DIAS *et al.*, 2020; HERINGER, 2018) since inclusion policies are only effective if they enable "the conditions for equal opportunity for students from different social origins and socioeconomic characteristics as they experience, integrate, perceive, appropriate, and affiliate with the university environment" (HERINGER, 2018, p. 12, free translation). Student persistence in HE depends on actions that provide material aid (especially scholarships, housing, food, and transportation) physical and mental health support, and pedagogical assistance (DIAS *et al.*, 2020), thus expanding aid beyond students' basic needs to ensure them social constitutional rights and help them overcome challenges in HE.

HE students especially report academic difficulties, including adapting to new teaching proposals, exam demands, time management, and study methods (CASANOVA; BERNARDO; ALMEIDA, 2021; DIAS *et al.*, 2019). The amount of required reading and activities, workload, and difficulties with content configure for students from public schools who joined university by the Brazilian quota system (SILVA; OLIVEIRA; FERNANDES, 2018). These students report poorer adaptation to their studies than those who came from private schools (FIOR, 2022), especially because former public school students access universities with an educational background unlike that prioritized by HE. Moreover, material living conditions may require students to both work and study, limiting their time spent on HE experiences (AMBIEL; BARROS, 2018).

University students who came from public schools and enroll in Exact Sciences feel less prepared to face them than those from private school students (SILVA, 2019). This perception influences their self-efficacy, i.e., their conviction in their ability to achieve their goals, a predictor variable of academic performance (BANDURA, 1997).

Students who came from public schools experience the scarcity of institutional actions to support their academic demands (SILVA; OLIVEIRA; FERNANDES, 2018), particularly critical for the academic success of students historically excluded from public HE (DIAS *et al.*, 2020). A study with Brazilian university students showed that, although most quota students access universities with lower results in entrance exams and experience difficulties transitioning into HE, their academic performance is similar to general entry candidates (PENA; MATOS; COUTRIM, 2020). Moreover, far from exclusively attributing to students the responsibility for their educational path, institutions must offer support to new HE students so they can overcome their experienced difficulties (CASANOVA; BERNARDO; ALMEIDA, 2021; DIAS *et al.*, 2020).

Regarding academic support, actions to develop self-regulated learning (SRL) stand out (POLYDORO *et al.*, 2015; ROSÁRIO *et al.*, 2015; ROSÁRIO *et al.*, 2020). SRL is an intentional cyclical process by which students plan, monitor, and evaluate their learning process. It includes regulating their cognitive, metacognitive, behavioral, affective, and motivational aspects to achieve academic goals (ZIMMERMAN, 1989; ZIMMERMAN, 2015). Self-regulated students analyze the tasks to be performed, set goals, and monitor their motivations and beliefs. When performing a task, they select strategies that enable them to perform better, such as searching for help and monitoring their performance. They also analyze the results of their tasks, influencing following activities (ZIMMERMANN, 2011). These processes show that SRL, rather than limiting itself to the moment students perform an activity, involves previous and subsequent actions (ZIMMERMANN, 2011). Evidence suggests that self-regulated students show better academic performance, greater motivation to study, appropriate learning strategies, and seek help when facing difficulties (GANDA; BORUCHOVITCH, 2018; ROSÁRIO *et al.*, 2020; ZIMMERMAN, 2011).

Although SRL skills are important for academic success, they are not innate and educational actions should aim at developing them (DIAS *et al.*, 2020; PANADERO, 2017; ZIMMERMAN, 2015). As the promotion of SRL also involves socially constructed skills, educational agents (including professors, other students, and student support services professionals) should mediate it. Therefore, professors training is essential to intentionally plan actions that enable students to acquire knowledge and promote fundamental skills for their lifelong learning (BORUCHOVITCH, 2014; DIAS *et al.*, 2020; SALGADO; POLYDORO; ROSÁRIO, 2018).

Interventions focused on developing SRL can be characterized as curriculum infusion if they integrate self-regulation to the taught content or curriculum juxtaposition if they take place in parallel with specific themes in areas of knowledge. Both interventions show promising results, especially greater motivation, the use of cognitive and metacognitive strategies, improved academic performance, and decreased use of harmful strategies (MACIEL;

ALLIPRANDINI, 2018). Questions remain about the effect of interventions to promote SRL, considering the diverse profiles of current HE students. Therefore, this study aims to: a) describe the pedagogical decisions and mediations of an elective subject that seeks to develop SRL by curricular juxtaposition and b) analyze its contributions to the knowledge and use of SRL processes in university students who came from public schools. The next section describes this subject, highlighting the pedagogical decisions and mediations that guided its planning and implementation. The following sections describe the methodology of this study and discuss the effect of the evaluated subject on self-regulation in university students who came from public schools.

### PEDAGOGICAL DECISIONS AND MEDIATIONS OF A SUBJECT TO PROMOTE SELF-REGULATED LEARNING

The elective subject *Self-Regulated Learning Workshops* is offered since 2013 to students enrolled in HE majors at a Brazilian public university. Despite its elective character, class participation, and activity completion count as four credits for the conclusion of the degree in which the student is enrolled (PELISSONI et al., 2020). The subject is taught by professors with specific training and experience in SRL, with the support of graduate students through the institutional Teaching Internship Program (PELISSONI et al., 2020).

The subject lasts a semester (15 weeks), with weekly two-hour face-to-face meetings and another two hours of reflective activities, which must be held in a virtual environment and dialogue with students' reality. To be approved, students must attend at least 75% of the face-to-face meetings and deliver at least nine of the 14 proposed activities (POLYDORO et al., 2015).

The pedagogical decisions and mediations related to the subject are based on Leite (2012, p. 362, free translation), who stated that "regardless of the theoretical orientation assumed by the professor, in every planned teaching situation, the professor must make some decisions." Professors' choices help both students achieve the planned goals and improve their relationship with the acquired knowledge. These choices are represented by the following questions: Where to go? Where to start from? How to progress? How to teach? How to evaluate?

The objectives of this elective subject include enabling students to learn about SRL, creating conditions for their experience and reflections on several academic situations, and supporting them to improve their study and learning. These objectives are in line with the SRL process, which seeks to prepare students to manage their cognitive, motivational, behavioral, and environmental aspects and achieve their goals (DANTAS et al., 2017; PELISSONI; POLYDORO, 2017; POLYDORO et al., 2015). The objectives of the subject go beyond the mere acquisition

of knowledge and include the process of analysis, application, and evaluation of the addressed topics.

The face-to-face meetings are triggered by narratives, using stories in the book *Letters from Gervásio to His Navel: Getting Committed to Studying in Higher Education* (PELISSONI et al., 2020; ROSÁRIO; NÚÑEZ; GONZALEZ-PIENDA, 2017, free translation). It offers a theoretical framework based on Zimmerman (1989), developed in Portugal to promote SRL among HE students, and adapted to Brazil by Polydoro et al. (2015). It includes 14 letters, mostly written by a first-year university student, Gervásio, and addressed to his navel, in which he describes his experiences in HE and his development according to SRL. By dialoguing with his navel (a figure of speech for the metacognitive construct), Gervásio reports his dilemmas and challenges in HE and reflects on the need to change his study approach and learning methods.

The elective subject discusses the 14 letters, one per meeting, and addresses the following topics: integration into HE, goal setting, learning strategies, time management, memory, the cyclical planning model, self-regulated learning implementation and evaluation, problem-solving, daily study and preparation for exams, exams anxiety, and self-evaluation. Of the pedagogical decisions associated with the subject, working with the letters, whose “open and intrusive character allows us to pose triggering questions from another’s point of view” (ROSÁRIO; NÚÑEZ; GONZALEZ-PIENDA, 2017, p. 29, free translation), makes the experience non-threatening and provides opportunities for students to vicariously learn and self-reflect as they read and analyze the problem situations and strategies used by the main character to cope with HE challenges. The following excerpt from one of the letters serves as an example:

I try to study; the problem is that I successively postpone this good intention. Staying out late with friends, endlessly chatting on the Internet, wandering aimlessly around the house. Sometimes I try to study but my eyes drift without fixating on any of the words... I usually don’t feel like studying and often postpone it (ROSÁRIO; NÚÑEZ; GONZALEZ-PIENDA, 2017, p. 62, free translation).

Using letters aims to mobilize students to construct their own thoughts about Gervásio’s experience and make them understand and act toward SRL processes (ROSÁRIO et al., 2020). Regarding pedagogical decisions and mediations, the professor must encourage students to identify the self-regulatory messages in these narratives and foster metacognitive strategies about learning. In the excerpt above, professors’ mediation could lead students to discuss Gervásio’s motivation and procrastination and conduct a collective survey of their main internal and external distractors and strategies to overcome them so their discussion on time management could address the different SRL dimensions.



In each face-to-face meeting, students discuss a triggering theme that complements other SRL elements, respecting the cyclical planning, performance, and evaluation process (ZIMMERMAN, 2015) and the epistemological organization of the ministered content. Although these meetings address specific themes, professors resume previous content to collaborate to both conceptually and experientially integrate students. Thus, meetings are organized in a cumulative and spiral form regarding the discussion, reflection, and practice of SRL.

Classes follow a script that includes task group activities, video analyses, and other strategies to encourage students to reflect on the addressed content during the face-to-face meetings. Themes are discussed by selecting a corresponding letter and have students perform diverse experiential and reflective activities (dramatization, games, production of materials, among others) under the mediation of a professor and other students. These activities involve sharing and exchanging experiences and providing opportunities for collaborative learning. All meetings end with a summary of the content that reinforces the main discussed points and an explanation of the individual activity to be performed in the virtual environment. These activities help students understand the content of that week, contribute to their self-monitoring of their study process, and enable them to implement changes in their learning process. All activities are followed by personalized feedback, an important element for students and professors to obtain information about the teaching and learning process (LIPNEVICH; PANADERO, 2021). This is one of the most important educational components for learning (HATTIE; TIMPERLEY, 2007). Thus, feedback must be accessible, focused on students' effort in the tasks, adjusted to their characteristics and needs, and offered in a way that triggers motivation and action (LIPNEVICH; PANADERO, 2021) so that, by interpreting its content, students are mobilized to self-monitor, self-direct, and self-regulate their actions, cognition, motivation, and feelings toward their goals (NICOL, 2021). The following excerpt from feedback on an activity on the use of learning strategies aims to illustrate the pedagogical action in each virtual activity.

Hello! You made an interesting authorial reflection on your school trajectory, which involves not only you but also your family, the schools in which you studied, your teachers and colleagues, among other aspects. I felt the need of knowing more about the study strategies you used — for example, notes, summaries, agenda, exercise solving... I was also curious to know about your current academic trajectory. You seem to have a good relationship with Education, which will certainly help you be a great teacher, externalizing affection for your work and your students (*Professor, written information*).

In the elective subject, students received feedback by a written message reporting how they performed in the task with considerations about their advances and the trajectories they still need to undertake, considering the expected standards (LIPNEVICH; PANADERO, 2021).



Feedback strengthens self-efficacy and offers guidance and mobilization toward seeking and adopting more self-regulatory processes (HATTIE; TIMPERLEY, 2007; LIPNEVICH; PANADERO, 2021; NICOL, 2021).

## METHODOLOGICAL PATHS TO INVESTIGATE THE CONTRIBUTIONS OF THE SUBJECT

This course (focused on promoting SRL) has always been associated with studies on learning and evaluation processes and the effectiveness of interventions (POLYDORO *et al.*, 2015). Their results guide class planning and help to collect information that supports a more objective evaluation of the effect of the subject on SRL development.

This study describes a part of this research and analyzes the contributions of the elective subject to the knowledge about SRL strategies and processes in university students who came from public schools. Its quasi-experimental design, with pre- and post-tests, but without a control group, was approved by the Research Ethics Committee (CAAE: 27112414.9.0000.5404).

Students have been invited to participate in our investigation since 2013, when the subject was implemented. Those who agreed by signing informed consent forms fill eight instruments: a characterization questionnaire and seven self-report measures on SRL processes. The post-test began after the end of the semester, in which university students were invited once again to participate in this study. The students who signed informed consent forms answered the same instruments of our initial collection, except for the characterization questionnaire. Data collection was performed online: the instruments were made available by an electronic form that takes, on average, 30 minutes to be answered. Students' answers constituted a database that remains under the responsibility of the main researcher of the study.

A sample was selected from the broader research database, with data from university students who took the elective subject from 2014 to 2019, agreed to participate in the study, completed the pre- and post-tests, and came from the public school system. Based on these criteria, 192 students were included in our sample, of which 110 (57%) were women, 153 (80.5%) were enrolled up to their second year of university, 83 (43%) took Exact Sciences courses, 69 (35.8%) participated in an interdisciplinary training program, and 122 (63.2%) received financial aid from the university to fund their permanence in HE.

Data from the characterization questionnaire and the following two self-report instruments were analyzed in this study. The knowledge of self-regulatory strategies questionnaire (SSQ), developed by Rosário *et al.* (2007), assesses students' knowledge about cognitive, metacognitive, motivational, and resource management learning strategies by 10 multiple-

choice questions with three answer options<sup>6</sup>, of which one is correct (equivalent to one point) and two are incorrect (no score). Its final score is the sum of all correct answers, in which higher values show greater SRL knowledge. The inventory of learning self-regulation processes (IPAA), validated by Polydoro *et al.* (2019), is a nine-item<sup>7</sup> questionnaire that assesses the frequency of use of SRL processes by a Likert scale with answer options ranging from one (never) to five (always). Its final score is the sum of all points divided by the total number of items, in which higher values show greater use of SRL strategies. The IPAA's consistency reliability coefficient is 0.73.

Students' answers were analyzed using the Statistical Package for the Social Sciences (SPSS). Their differences in knowledge and use of SRL were analyzed by the paired Wilcoxon test, considering  $p < 0.05$ . Analyses were performed with the entire sample, and from our tertile subdivision, values were estimated considering participants' initial SSQ and IPAA results. To assess the importance of our findings, effect size (Cohen's  $d$ ) was estimated and interpreted as small ( $d \leq 0.2$ ), moderate ( $0.2 < d < 0.5$ ), or large ( $d \geq 0.5$ ) (COHEN, 1988).

## CONTRIBUTIONS OF THE ELECTIVE SUBJECT TO SELF-REGULATED LEARNING

At the beginning of the elective subject, students' level of SRL proficiency, measured by the SSQ ( $Md = 7.00$ ), was above the scale average. After completing the subject ( $Md = 9.00$ ), their knowledge about SRL increased (Table 1). Analysis of the difference in this knowledge by the paired Wilcoxon test showed a statistical significance ( $Z = -10.04$ ;  $P < 0.01$ ), with a moderate effect ( $d = 0.73$ ).

**Table 1.** Descriptive statistics of the SSQ and IPAA results at the beginning and at the end of the subject.

Beginning					End			
	N	Mean	Median	Standard deviation	N	Mean	Median	Standard deviation
SSQ	191	7.04	7.00	2.08	192	9.00	9.00	1.11
IPAA	192	3.46	3.44	0.58	192	3.79	3.78	0.54

<sup>6</sup> Example of a questionnaire item with answer choices:

"1. Before you start doing any task (exam; activity), it is important:

( ) To think about your goals and objectives and, considering your personal resources, make a plan to achieve them.

( ) To wait for the professor to tell you what you need to do.

( ) To start studying without delay, avoiding excuses."

<sup>7</sup> Example of a questionnaire item:

"When I get a grade/feedback, I think of concrete things I need to do to improve."

Source: prepared by the authors.

Note: N: number of participants.

Table 1 shows that students started to use SRL processes more often after completing the course. At the beginning of the semester, they had lower SRL levels ( $Md = 3.44$ ) than at the end of it ( $Md = 3.78$ ). These differences were statistically significant ( $Z = -7.46$ ;  $p < 0.01$ ) and had a moderate effect size ( $d = 0.54$ ). These results show that the subject meets its central objective of promoting SRL, corroborating qualitative analyses of this experience (POLYDORO *et al.*, 2015) and evidence in the literature (MACIEL; ALLIPRANDINI, 2018).

According to our comparison between pre- and post-test values and after dividing the sample into tertiles according to our measure of participants' SRL knowledge on the first day of their course, all three groups improved their mastery of the topic. Table 2 shows our analysis of variation in SRL knowledge. Of the students who started the subject with less knowledge ( $Md = 5.00$ ) — who were included in the first tertile —, their understanding improved after participating in the subject ( $Md = 9.00$ ), with a statistically significant difference and a large effect ( $Z = -7.09$ ;  $p < 0.01$ ;  $d = 0.87$ ). Those in the second tertile also showed greater knowledge of SRL, when compared their initial ( $Md = 8.00$ ) and final values ( $Md = 9.00$ ). Differences were statistically significant with a moderate effect ( $Z = -6.05$ ;  $p < 0.01$ ;  $d = 0.71$ ). Students who started the subject with higher levels of knowledge ( $Md = 9.00$ ) —included in the third tertile —, showed a small variation in their understanding of the topic at the end of the course ( $Md = 9.00$ ), without statistical significance and with a small effect ( $Z = -0.90$ ;  $p = 0.37$ ;  $d = 0.13$ ). These results suggest that students with less knowledge about SRL at the beginning of the semester benefited the most from participating in it.

Regarding the use of SRL processes, Table 2 shows the variation in the frequency of students' self-regulation of their learning. After dividing students into tertiles according to their knowledge and use of SRL — measured at the beginning of the course — the comparison between the initial and final results showed changes in the occurrence of SRL processes.

**Table 2.** Descriptive statistics of SSQ and IPAA results for students at the beginning and end of the subject.

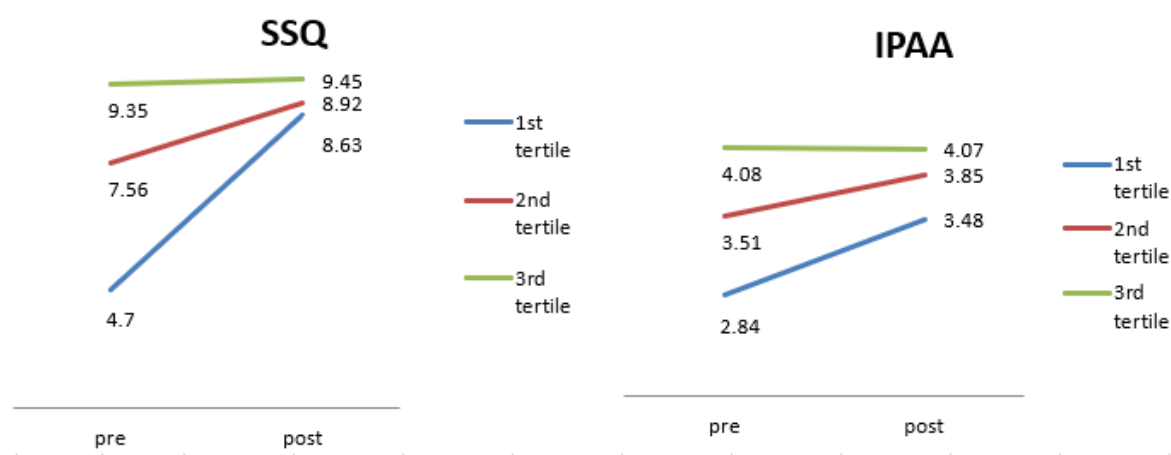
	Initial SSQ				Final SSQ				Initial IPAA				Final IPAA			
	N	M	Md	SD	N	M	Md	SD	N	M	Md	SD	N	M	Md	SD
1st																
tertile	67	4.70	5.00	1.43	67	8.63	9.00	1.23	66	2.84	2.89	0.13	66	3.48	3.56	0.45
2nd																
tertile	72	7.56	8.00	0.50	72	8.92	9.00	1.23	64	3.51	3.56	0.13	64	3.85	3.89	0.51
3rd																
tertile	51	9.35	9.00	0.48	51	9.45	10.00	0.73	61	4.08	4.00	0.26	61	4.07	4.00	0.49

Source: prepared by the authors.

Note: N: number of participants; M: mean; Md: median; SD: standard deviation.

The university students in the lowest tertile ( $Md = 2.84$ ), at the end of the subject, reported increased use of SRL ( $Md = 3.56$ ), with statistically significant differences and a large effect ( $z = -6.58$ ;  $p < 0.01$ ;  $d = 0.81$ ). Those in the second tertile improved their self-regulation of their learning processes, when compared to the beginning of the semester ( $Md = 3.51$ ), after the subjected ended ( $Md = 3.89$ ). Differences were statistically significant, and the effect size, moderate ( $z = -0.55$ ;  $p < 0.01$ ;  $d = 0.56$ ). The use of SRL processes in students in the third tertile remained stable when we compared pre- ( $Md = 4.00$ ) and post-test results ( $Md = 4.00$ ), without significant variations and with small effects ( $z = -0.55$ ;  $p = 0.58$ ;  $d = 0.07$ ).

Graph 1 represents the set of analyzed results and offers a global view of these changes.



**Graph 1.** Variations in the knowledge and use of self-regulated learning, considering the beginning and end of the subject.

Source: prepared by the authors.

Graph 1 shows that, besides the diverse profiles in the literature (DIAS *et al.*, 2020; HERINGER, 2018), even university students who came from the same school system differ regarding their level of knowledge and use of SRL processes at the beginning of the subject. At the end of the semester, analysis of means shows that differences in proficiency and use of SRL strategies decreased among groups. These results show that students can learn self-regulation as results changed among students who participated in an elective subject focused on its promotion (PANADERO, 2017; ROSÁRIO; NÚÑEZ; GONZALEZ-PIENDA, 2017; ZIMMERMAN, 2015).

Our finding that some students started the subject with lower levels of knowledge about SRL is in line with evidence in the literature pointing to the academic difficulties university

students experience in higher education (CASANOVA; BERNARDO; ALMEIDA, 2021; DIAS *et al.*, 2019) and reaffirm that support should go beyond material aid, urging assistance to different processes to ensure effective social inclusion (DIAS *et al.*, 2020).

Data also show that students who came from public schools constitute a heterogeneous group whose particularities should be considered in the planning of educational actions. In the analyzed subject, the flexibility of working with *Letters from Gervásio to His Navel* (associated with pedagogical decisions) represents a proposal that meets students' different contexts and conditions and enables their integral training. By expanding declarative, procedural, and conditional knowledge about SRL (ROSÁRIO *et al.*, 2020), this subject enables the development of cognitive, motivational, and interaction strategies that are relevant to inclusion and performance in university life.

Some pedagogical decisions adopted during the lessons contributed to the understanding of the obtained results, highlighting the care to provide and maintain the equivalence between the objective of the subject, the developed activities, and evaluations with personalized feedback. In line with Biggs (2012), the subject enabled a constructive alignment in which the learning environment was intentionally developed toward its intended goals, providing an experience that enabled students to create meaning.

Regarding professors' choices, the subject broke with a traditional proposal that centers pedagogical practice on the professor and the accumulation of information and overcame the prescriptive course molds on how to apply certain learning strategies. On the contrary, professors used resources that would enable students to take a more active role in their learning, either individually or collectively, by strengthening human agency (BANDURA, 1997).

An effective way to enable the behavioral, affective, and cognitive changes essential to the SRL process involves self-reflection (BORUCHOVITCH, 2014). During the course, the weekly reflective activities (performed collaboratively between professors and students) and the individual activities followed by feedback enabled a concrete experience of participating in a learning community, the ideal context for professors and students to analyze, monitor, and change their own learning and teaching conditions (BORUCHOVITCH, 2014; LEITE, 2012).

The structuring of the themes respected the epistemology of the area and the spiral construction of knowledge. Its professors concerned themselves with recovering previously addressed topics and summarizing the content at the end of the face-to-face activities. These resources may have enabled the acquisition of knowledge. The construction of narratives based on *Letters from Gervásio* and the challenges experienced in the transition to higher education may have been a motivational component for students, who could then relate to the main character's experiences and reframe their own ones (ROSÁRIO *et al.*, 2020). Using

these letters configures a pedagogical resource that favors self-reflection, which is initially raised by the character's perspective and ends in a less threatening analysis of personal experience to students (ROSÁRIO; NÚNEZ; GONZALEZ-PIENDA, 2017).

Another point associated with the creation of a favorable environment for change is including students from different areas of knowledge and self-regulatory skills in class, broadening the discussed experiences. Without looking at differences as limits, our results show the potential of working with different groups of students, recognizing the challenges to enable social inclusion.

## FINAL CONSIDERATIONS

Students' different characteristics challenge institutions to rethink pedagogical practices to promote academic success for all people in higher education. The favorable results in this study show that the subject was a useful support activity for the analyzed sample to cope with their academic demands.

In turn, promoting SRL among students constitutes a pillar for social inclusion since a differentiated teaching that meets students' diversity and places them at the center of the processes, including SRL-promoting practices, depends on the professional development of professors, among other factors. Moreover, reviewing programs and course designs is important to implement student-centered educational practices that expand training beyond specific contents, developing essential skills for lifelong learning. With the recognition of the importance of intentional planning of educational actions to achieve proposed goals, problematizing the pedagogical mediations of an elective subject developed to promote SRL is crucial to support interventions that minimize the difficulties of students and contribute to social inclusion in higher education.

This study adopted a quasi-experimental design without a control group. Thus, we must stress the limits of such design. We should avoid exclusively attributing the changes we observed in students to involvement in the elective subject since they have other educational experiences. Future studies may use different methodological designs, including follow-ups, to evaluate the duration and stability of the changes in this study. Moreover, the study of the contributions of the elective subject could be complemented with analyses of other indicators of academic success, such as academic performance. The use of self-measure instruments also constitutes a limitation of this study, and we recommend that future studies adopt different resources, such as interviews or students' observations.

Regarding their practical implications, actions that support student diversity in HE should be based on varied and multiple initiatives and prioritize the active participation of all students.

Moreover, the experience in this study, rather than serving as a standardized recipe to be rigidly replicated, configures a basis on which to reflect, review, and adjust students' demands to build an educational practice focused on diversity and social inclusion.

## REFERENCES

- AMBIEL, Rodolfo Augusto Matteo; BARROS, Leonardo de Oliveira. Relações entre evasão, satisfação com escolha profissional, renda e adaptação de universitários. *Psicologia: Teoria e Prática*, São Paulo, v. 20, n. 2, p. 254-267, maio/ago. 2018. DOI: <https://doi.org/10.5935/1980-6906/psicologia.v20n2p254-267>. Disponível em: <http://pepsic.bvsalud.org/pdf/ptp/v20n2/v20n2a10.pdf>. Acesso em: 1 out. 2022.
- BANDURA, Albert. *Self-efficacy: the exercise of control*. New York: Freeman and Company, 1997.
- BIGGS, John. What the student does: teaching for enhanced learning. *Higher Education Research & Development*, v. 31, n. 1, p. 39-55, 2012. DOI: <https://doi.org/10.1080/0729436990180105>. Disponível em: <https://www.tandfonline.com/doi/abs/10.1080/0729436990180105>. Acesso em: 2 fev. 2023.
- BORUCHOVITCH, Evely. Autorregulação da aprendizagem: Contribuições da psicologia educacional para a formação de professores. *Psicologia Escolar e Educacional*, São Paulo, v. 18, n. 3, p. 401-409, set./dez. 2014. DOI: <https://doi.org/10.1590/2175-3539/2014/018375>. Disponível em: <https://www.scielo.br/j/pee/a/HYqxtDHyj84FGcJKzHCCMSQ/abstract/?lang=pt>. Acesso em: 1 out. 2022.
- CASANOVA, Joana R.; BERNARDO, Ana Belén.; ALMEIDA, Leandro da Silva. Dificuldades na adaptação acadêmica e intenção de abandono de estudantes do primeiro ano do Ensino Superior. *Revista de Estudios e Investigación en Psicología y Educación*, v. 8, n. 2, p. 211-228, 2021. DOI: <https://doi.org/10.17979/reipe.2021.8.2.8705>. Disponível em: <https://repositorium.sdum.uminho.pt/handle/1822/74904>. Acesso em: 2 fev. 2023.
- COHEN, Jacob. *Statistical power analysis for the behavioral sciences*. New York: Routledge Academic, 1988.
- DANTAS, Marilda Aparecida et al. Intervenção em Autorregulação da Aprendizagem no ensino superior: proposição e desdobramento. In: POLYDORO, Soely Aparecida Jorge Polydoro (org.). *Promoção da Autorregulação da Aprendizagem: contribuições da Teoria Social Cognitiva*. Porto Alegre: Editora Letra1, 2017. p. 77-87.
- DIAS, Ana Cristina Garcia et al. Dificuldades percebidas na transição para a universidade. *Revista Brasileira de Orientação Profissional*, Florianópolis, v. 20, n. 1, p. 19-30, jan./jun. 2019. DOI: <https://doi.org/10.26707/1984-7270/2019v20n1p19>. Disponível em:



[http://pepsic.bvsalud.org/scielo.php?script=sci\\_arttext&pid=S1679-33902019000100003](http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1679-33902019000100003). Acesso em: 1 out. 2022.

DIAS, Carlos Eduardo Sampaio Burgos *et al.* *Os serviços de apoio pedagógico aos discentes no ensino superior brasileiro*. São Carlos: Pedro & João Editores, 2020. Disponível em: <https://pedroejoaoeditores.com.br/2022/wp-content/uploads/2022/01/ebookapoio-pedagocc81gico-2-1.pdf>. Acesso em: 1 out. 2022.

FIOR, Camila Alves. Adaptação ao ensino superior e autoeficácia em universitários medalhistas em Olimpíadas Científicas: um estudo correlacional. *Revista de Estudios e Investigación en Psicología y Educación*, v. 9, p. 284-301, 2022. DOI: <https://doi.org/10.17979/reipe.2022.9.0.8904>. Disponível em: <https://revistas.udc.es/index.php/reipe/article/view/reipe.2022.9.0.8904>. Acesso em: 2 fev. 2023.

GANDA, Daniela Ribeiro; BORUCHOVITCH, Evely. A autorregulação da aprendizagem: principais conceitos e modelos teóricos. *Revista Psicologia da Educação*, v. 1, n. 46, p. 71-80, 2018. Disponível em: <https://revistas.pucsp.br/psicoeduca/article/view/39147>. Acesso em: 1 out. 2022.

HATTIE, John; TIMPERLEY, Helen. The power of feedback. *Review of Educational Research*, v. 77, n. 1, p. 81-112, 2007. DOI: <https://doi.org/10.3102/003465430298487>. Disponível em: <https://journals.sagepub.com/doi/10.3102/003465430298487>. Acesso em: 2 fev. 2023.

HERINGER, Rosana. Democratização da educação superior no Brasil: das metas de inclusão ao sucesso acadêmico. *Revista Brasileira de Orientação Profissional*, v. 19, n. 1, p. 7-17, 2018. DOI: <https://doi.org/1026707/1984-7270/2019v19n1p7>. Disponível em: <http://pepsic.bvsalud.org/pdf/rbop/v19n1/03.pdf>. Acesso em: 1 out. 2022.

LEITE, Sérgio Antônio da Silva. Afetividade nas práticas pedagógicas. *Temas em Psicologia*, v. 20, n. 2, p. 355-368, 2012. DOI: <https://doi.org/10.9788/TP2012.2-06>. Disponível em: <http://pepsic.bvsalud.org/pdf/tp/v20n2/v20n2a06.pdf>. Acesso em: 1 out. 2022.

LIPNEVICH, Anastasiya A.; PANADERO, Ernesto. A review of feedback models and theories: descriptions, definitions, and conclusions. *Frontiers in Education*, v. 6, 2021. DOI: <https://doi.org/10.3389/feduc.2021.72019>. Disponível em: <https://www.frontiersin.org/articles/10.3389/feduc.2021.720195/full>. Acesso em: 1 out. 2022.

MACIEL, Aline Guilherme; ALLIPRANDINI, Paula Mariza Zedu. Autorregulação da aprendizagem: panorama nacional dos estudos de intervenção no ensino superior. *Revista Cocar*, v. 12, n. 23, p. 145-167, jun./jul. 2018. Disponível em: <https://periodicos.uepa.br/index.php/cocar/article/view/1722>. Acesso em: 1 out. 2022.

NICOL, David. The power of internal feedback: exploiting natural comparison processes, *Assessment & Evaluation in Higher Education*, v. 46, n. 5, p. 756-778, 2021. DOI:

<https://doi.org/10.1080/02602938.2020.1823314>. Disponível em:  
<https://www.tandfonline.com/doi/full/10.1080/02602938.2020.1823314>. Acesso em: 2 fev. 2023.

PANADERO, Ernesto. A review of self-regulated learning: six models and four directions for research. *Frontiers in Psychology*, v. 8, p. 1-28, 2017. DOI:  
<https://doi.org/10.3389/fpsyg.2017.00422>. Disponível em:  
<https://www.frontiersin.org/articles/10.3389/fpsyg.2017.00422/full>. Acesso em: 1 out. 2022.

PENA, Mariza Aparecida Costa; MATOS, Daniel Abud Seabra; COUTRIM, Rosa Maria da Exaltação. Percurso de estudantes cotistas: ingresso, permanência e oportunidades no ensino superior. *Avaliação: Revista da Avaliação da Educação Superior*, Sorocaba, v. 25, n. 1, p. 27-51, 2020. Disponível em: <https://periodicos.uniso.br/avaliacao/article/view/3916>. Acesso em: 1 out. 2022.

PELISSONI, Adriane Martins Soares; POLYDORO, Soely Aparecida Jorge. Programas de promoção da autorregulação da aprendizagem. In: POLYDORO, Soely Aparecida Jorge (org.). *Promoção da autorregulação da aprendizagem: contribuições da Teoria Social Cognitiva*. Porto Alegre: Editora Letra1, 2017. p. 33-44.

PELISSONI, Adriane Martins Soares et al. Serviço de apoio ao estudante: contribuições para a permanência acadêmica e aprendizagem. In: DIAS, Carlos Eduardo Sampaio Burgos et al. (org.). *Serviço de apoio ao estudante: contribuições para a permanência acadêmica e aprendizagem*. São Carlos: Pedro & João Editores, 2020. p. 283-318.

POLYDORO, Soely Aparecida Jorge et al. Promoção da autorregulação da aprendizagem na universidade: percepção do impacto de uma disciplina eletiva. *Revista de Educação PUC-Campinas*, v. 20, n. 3, set./dez. 2015. DOI: <https://doi.org/10.24220/2318-0870v20n3a2877>. Disponível em: <http://educa.fcc.org.br/pdf/edpuc/v20n3/2318-0810-edpuc-20-3-00201.pdf>. Acesso em: 1 out. 2022.

POLYDORO, Soely Aparecida Jorge et al. Autorregulação da aprendizagem: adaptação e evidências de validade de instrumentos para universitários brasileiros. *Educação em Análise*, v. 4, n. 1, jan./jul. 2019. DOI: <https://doi.org/10.5433/1984-7939.2019v4n1p21>. Disponível em: <https://www.readcube.com/articles/10.5433%2F1984-7939.2019v4n1p21>. Acesso em: 2 fev. 2023.

ROSÁRIO, Pedro; NÚÑEZ, José Carlos; GONZÁLEZ-PIENDA, Julio. *Cartas do Gervásio ao seu umbigo: comprometer-se com o estudar na educação superior*. 2. ed. São Paulo: Editora Almedina, 2017.

ROSÁRIO, Pedro et al. Eficacia de un programa instruccional para la mejora de procesos y estrategias de aprendizaje en la enseñanza superior. *Psicothema*, Oviedo, v. 19, n. 3, p. 422-

427, 2007. Disponível em: <https://www.redalyc.org/pdf/727/72719310.pdf>. Acesso em: 1 out. 2022.

ROSÁRIO, Pedro *et al.* Transcultural analysis of the effectiveness of a program to promote self-regulated learning in Mozambique, Chile, Portugal and Spain. *Higher Education Research & Development*, v. 4, p. 1-15, 2015. DOI: <https://doi.org/10.1080/07294360.2014.935932>. Disponível em: <https://www.tandfonline.com/doi/abs/10.1080/07294360.2014.935932>. Acesso em: 2 fev. 2023.

ROSÁRIO, Pedro *et al.* Improving college students' critical thinking through the use of a story tool for self-regulated learning training. In: MANALO, Emmanuel (ed.). *Deeper learning, dialogic learning, and critical thinking: research-based strategies for the classroom*. New York: Routledge, 2020. p. 193-208.

SALGADO, Fernanda Andrade de Freitas; POLYDORO, Soely Aparecida Jorge; ROSÁRIO, Pedro. Programa de promoção da autorregulação da aprendizagem de ingressantes da educação superior. *Psico-USF*, Bragança Paulista, v. 23, n. 4, p. 667-679, out./dez. 2018. DOI: <https://doi.org/10.1590/1413-82712018230407>. Disponível em: <https://www.scielo.br/j/psuf/a/DHwxgRJ6GBmtP4jz5nXzSwS/?format=pdf&lang=pt>. Acesso em: 1 out. 2022.

SILVA, Guilherme Henrique Gomes. Ações afirmativas no ensino superior brasileiro: Caminhos para a permanência e o progresso acadêmico de estudantes da área de Ciências Exatas. *Educação em Revista*, v. 35, p. 1-29, 2019. DOI: <https://doi.org/10.1590/0102-4698170841>. Disponível em: <https://www.scielo.br/j/edur/a/JJds6YhTYpWn68F3XY3ccVS/?format=pdf&lang=pt> Acesso em: 1 out. 2022.

SILVA, Hellen Cristina Xavier da; OLIVEIRA, Maísa Aparecida de; FERNANDES, Maria Cristina da Silveira Galan. Adaptação à universidade: dificuldades e estratégias de permanência de estudantes oriundos de escolas públicas. In: SOUSA, José Vieira de; BOTELHO, Arlete de Freitas; GRIBOSKI, Cláudia Maffini (org.). *Acesso e permanência na expansão da educação superior*. Anápolis/GO: UEG, 2018. p.192-204.

VARGAS, Hustana; HERINGER, Rosana. Políticas de permanência no ensino superior público. *Archivos Analíticos de Políticas Educativas*, v. 25, n. 72, p. 1-33, 2017. DOI: <https://doi.org/10.14507/epaa.25.2799>. Disponível em: <https://www.redalyc.org/pdf/2750/275050047114.pdf>. Acesso em: 1 out. 2022.

ZIMMERMAN, Barry J. A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, v. 81, n. 3, p. 329-339, 1989.

ZIMMERMAN, Barry J. Motivational sources and outcomes of self-regulated learning and performance. In: ZIMMERMAN, B. J.; SCHUNK, D. H. (ed.). *Handbook of self-regulation of learning and performance*. New York: Routledge, 2011. p. 49-64.

ZIMMERMAN, Barry J. Self-regulated learning: theories, measures, and outcomes. In: WRIGHT, J. D. (ed.). *International Encyclopedia of the Social & Behavioral Sciences*. 2. ed. [s. l.]: Elsevier, 2015. p. 541-546. DOI: <https://doi.org/10.1016/B978-0-08-097086-8.26060-1>.

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