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Contributions of a hybrid course designed to strengthen self-regulated learning among university students

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Abstract
Introduction. Strengthening self-regulation of learning is essential for navigating academic challenges. This study describes a hybrid course focused on self-regulation and analyzes its impact on the motivational and self-regulatory processes of university students. **Methodology.** This study employed a quasi-experimental design, with an experimental group (N = 104) and a control group (102) who completed two self-report instruments at the beginning and end of the semester. Students in the experimental group participated in a hybrid elective course focused on improving self-regulation of learning. **Results.** Statistically significant differences were identified in levels of self-regulation and intrinsic motivation, comparing the beginning and end of the semester. Increases in intrinsic motivation and self-regulation were observed in the experimental group, while levels decreased in the control group. **Discussion.** The results reaffirm the role of intentional interventions, including hybrid approaches, in fostering skills essential for learning and retention in higher education.

Keywords
higher education; motivation; curriculum; dropout; pedagogical support.

Contribuições de uma disciplina híbrida de fortalecimento da autorregulação da aprendizagem em universitários

Resumo
Introdução. O fortalecimento da autorregulação da aprendizagem é essencial para o enfrentamento dos desafios acadêmicos. Este estudo descreve uma disciplina híbrida com foco na autorregulação e analisa o seu impacto nos processos motivacionais e de autorregulação de universitários. **Metodologia.** Trata-se de um delineamento quase-experimental, com grupo experimental (N = 104) e grupo controle (102) que responderam a dois instrumentos de autorrelato no início e no final do semestre. Os estudantes do grupo experimental participaram de uma disciplina eletiva híbrida com foco no aprimoramento da autorregulação da aprendizagem. **Resultados.** Foram identificadas diferenças estatisticamente significantes nos níveis de autorregulação e na motivação intrínseca,

considerando início e final do semestre. Ampliação na motivação intrínseca e na autorregulação foram observados no grupo experimental, enquanto os níveis diminuíram no grupo controle. **Discussão.** Os resultados reafirmam o papel de ações intencionais, inclusive híbridas, no fomento a habilidades importantes para o aprendizado e permanência no ensino superior.

Palavras-chave
ensino superior; motivação; currículo; evasão escolar; apoio pedagógico.

Contribuciones de una asignatura híbrida al fortalecimiento de la autorregulación del aprendizaje en estudiantes universitarios

Resumen
Introducción. El fortalecimiento de la autorregulación del aprendizaje resulta esencial para el afrontamiento de los desafíos académicos. El presente estudio describe una asignatura híbrida con énfasis en la autorregulación y analiza su impacto en los procesos motivacionales y de autorregulación de estudiantes universitarios. **Metodología.** Se trata de un estudio cuasi-experimental, con un grupo experimental (N = 104) y un Grupo Control (N = 102), cuyos participantes respondieron a dos instrumentos de autorreporte al inicio y al final del semestre académico. Los estudiantes del grupo experimental participaron en una asignatura optativa de modalidad híbrida, orientada al fortalecimiento de la autorregulación del aprendizaje. **Resultados.** Se identificaron diferencias estadísticamente significativas en los niveles de autorregulación y motivación intrínseca entre el inicio y el final del semestre. Se observaron aumentos en la motivación intrínseca y la autorregulación en el grupo experimental, mientras que se observaron disminuciones en el grupo control. **Discusión.** Los resultados reafirman el papel de las acciones intencionales, incluidas las intervenciones híbridas, en el fomento de habilidades clave para el aprendizaje y la permanencia en la educación superior.

Palabras clave
educación superior; motivación; currículo; abandono escolar; apoyo pedagógico.

1 Introduction

In recent decades, Brazilian higher education has experienced an expansion in enrollment numbers, accompanied by greater diversity in student characteristics (Heringer, 2023). Despite the existence of isolated initiatives in some public institutions, one of the milestones for social inclusion in higher education was the passage of Law No. 12,711 in 2012, amended by Law No. 14,723 in 2023 (Brazil, 2012, 2023). This legislation established the reservation of spots at universities and federal institutes for students graduating from public high schools, as well as Black, Indigenous, Quilombola, and disabled individuals. A direct result of this policy is that the national public higher education

system has begun a process of overcoming its elitist nature by ensuring the admission of students from groups that have historically been underrepresented at this level of education (Campos; Lima, 2025; Heringer, 2023).

In turn, the commitment to social inclusion in higher education requires policies focused on access, as well as specific measures to ensure students remain in and complete their programs (Bernardo *et al*., 2025; Heringer, 2023). In Brazil, the democratization of access to institutions is being accompanied by initiatives such as the National Student Assistance Policy (PNAES), regulated by Law No. 14,914/2024, which aims to ensure conditions for student retention (Brazil, 2024).

Among the PNAES's priorities is the provision of material support, with an emphasis on financial aid, housing, food, and transportation. Despite the urgency of providing economic support to students, other initiatives—such as those focused on health (including mental health care), culture, sports, and educational support—are fundamental (Brazil, 2024). The aim is for such retention support policies, with an emphasis on educational support, to be directed at all individuals, not just students in socially vulnerable situations, which remains one of the limitations of the PNAES.

The focus on academic support stems from the fact that higher education, due to its characteristics and objectives, presents demands distinct from those experienced by students in previous years of schooling (Fior; Almeida, 2023). Notable differences exist in teaching practices, assessment activities, time management, relationships with faculty, and the learning process. This is because course curricula tend to be less sequenced, are supported by different learning materials, and require students to play a more active role in knowledge construction (Casanova; Araújo; Almeida, 2020; Fior; Almeida, 2023).

Since the challenges faced by students are multiple and distinct, institutional responses must also be diverse. Meeting academic demands requires institutions to pay attention to their curricula, incorporating new epistemologies and knowledge, ensuring the professional development of faculty, and focusing on students—specifically regarding study processes and the strengthening of self-regulation skills in learning (Cunha, 2014; Dias *et al*., 2020; Reis, 2022; Silva; Alliprandini, 2020; Vieira; Góes, 2025).

Self-regulation is understood as the process through which learners activate and maintain their cognitions, motivations, behaviors, and affections with a view to achieving

their learning goals, prioritizing the contextual and social aspects involved in learning (Schunk; Greene, 2018). Students who self-regulate their learning process tend to persevere in the face of academic challenges, use deeper learning strategies, are more intrinsically motivated, and procrastinate less when completing academic tasks, which results in better academic performance (Theobald, 2021; Valenzuela *et al*., 2020).

Self-regulation of learning (SRL) is essential to students' academic development, and its strengthening should result from a deliberate set of educational practices (Dias *et al*., 2020; Panadero, 2017). In higher education, positive impacts of interventions focused on promoting SRL have been reported, including favorable results regarding motivation (Ganda; Boruchovitch, 2019; Theobald, 2021).

Despite the importance of motivation in the educational process, it is a complex and multidimensional construct (Bzuneck & Boruchovitch, 2016), encompassing its relationship with beliefs, values, and motives for action (Eccles & Wigfield, 2002). Some of the main theories focus on understanding intrinsic and extrinsic motivations. Intrinsic motivation refers to engagement with a task driven by interest in it, by the challenge, and by the intention to understand a particular phenomenon or content. Extrinsic motivation, on the other hand, pertains to an instrumental involvement with the task, guided by external rewards. Although they are not understood from a dichotomous perspective, since both types of motivation accompany students' academic lives, intrinsic motivation is associated with the pursuit of more challenging tasks, greater persistence in the face of challenges, and, consequently, better academic performance (Eccles; Wigfield, 2002; Guimarães, 2001).

The meta-analysis conducted by Theobald (2021), which reviewed 49 studies involving more than 5,000 students, found that programs aimed at strengthening self-regulation of learning among university students improved academic performance, the use of self-regulation strategies, and student motivation, with a particular emphasis on increased intrinsic motivation and interest in studies following participation in initiatives promoting SRL.

Interventions focused on strengthening SRL can be implemented through curricular integration (*integrated programs*), also known as curricular infusion, in which efforts to promote SRL are tailored to the specific content of the courses (Hofer; Yu;

Pintrich, 1998; Silva; Alliprandini, 2020). Curricular *adjunct* programs, also described as curricular juxtaposition, offer proposals that foster self-regulation of learning and occur in parallel with the specific themes addressed in undergraduate course subjects (Maciel; Alliprandini, 2018; Silva; Alliprandini, 2020).

An example of a curricular integration initiative involved a quasi-experimental intervention to promote SRL in the Project Methodology course, taught in the second year of the Fashion *Design* program. The activities, conducted in person over 16 sessions, took place across two semesters and included in-class activities and out-of-class assignments. Compared to the control group, students who participated in the intervention reported gains in cognitive and metacognitive self-regulation strategies, in the use of internal and contextual resources, and in social self-regulation (Silva; Alliprandini, 2020).

Curricular overlay initiatives are also reported in the literature. Notable is the implementation of an elective course focused exclusively on developing learning self-regulation skills at a Brazilian public university. Through in-person sessions over 15 weeks, topics such as goal setting, time management, learning strategies, motivation, and emotion regulation—among other dimensions present in the learning self-regulation process—were addressed (Fior *et al*., 2022). A sample of university students who had graduated from public high schools and participated in the course demonstrated gains in knowledge of strategies and in the use of self-regulation, with more favorable impacts for students who began the course with lower levels of knowledge and use of such processes (Fior *et al.*, 2022).

Increases in knowledge, self-regulation processes, and self-efficacy for self-regulating learning were also reported by Brazilian freshmen when pre- and post-test measures were compared following participation in a workshop promoting SRL consisting of six in-person sessions (Salgado; Polydoro; Rosário, 2018). An expanded understanding of the concept of self-regulation was reported as one of the impacts of an intervention focused on curricular overlap, conducted with students in teacher education programs (Arcoverde; Boruchovitch; Góes, 2022).

Maciel and Alliprandini (2018), through an analysis of national intervention programs with higher education students focused on SRL, highlighted improvements in students' self-regulatory processes and in their affective and motivational aspects, in addition to a reduction in the use of harmful strategies. And the mention of consequences favorable to

students' academic success stemmed from participation in programs developed in both formats: curricular integration and overlap.

Despite the significant contribution of such proposals, the promotion of SRL through curricular integration requires faculty members to have knowledge of self-regulation of learning and to intentionally plan actions that foster not only the learning of specific content but also reflections on the learning process (Boruchovitch, 2014). Furthermore, the interventions described above were developed in a face-to-face format, which imposes limits on student participation. This is because balancing the various demands of higher education is yet another challenge faced by students, which is amplified when considering those who combine their studies with external commitments.

Thus, within the context of curricular flexibility initiated by the university—which emphasizes a more comprehensive university education, not restricted to a specific professional training—a hybrid elective course was proposed, predominantly *online*, focused on strengthening self-regulation of learning among higher education students. The objective of this article is to describe the elective course and analyze its impact on the process of self-regulation and learning and on student motivation. The course will be detailed below.

2 Hybrid elective course focused on strengthening SRL

The proposal for this course was the result of a partnership between a research group and the student support service at a public university. The planning, implementation, and evaluation of the project received support from the university and the National Council for Scientific and Technological Development (CNPq).

The elective course was created in 2023 and has been offered every semester since then. The course is open to welcome students from various undergraduate programs, with preference given to those enrolled in the early semesters of their programs. In 2023 and 2024, four sections were offered, serving 470 students. The course runs over 15 weeks, consisting of 30 hours of activities, conducted in a hybrid format: the first and last sessions are in-person, and part of the coursework is completed *online* in an asynchronous format through a free, open-access virtual learning environment.

The purpose of the first in-person session is to introduce the faculty, undergraduates, and graduate students involved in the course. It also aims to present the course, discuss its structure, provide guidance on using the virtual learning environment, and raise the group's awareness of the importance of the topic of self-regulated learning. The final meeting, also held in person, aims to integrate the content covered, share experiences in the course, and evaluate it, with suggestions for future classes.

The activities carried out in the virtual learning environment are monitored and guided by faculty members and graduate students through the Teaching Internship Program (PED). The SRL enhancement program is structured into seven modules, in addition to two complementary modules: one for introduction and another for conclusion. The first module addresses self-regulation of learning based on the theoretical foundations proposed by Zimmerman, with an emphasis on the cyclical process of self-regulation, which includes the phases of planning, execution, and evaluation (Panadero, 2017). The remaining modules emphasize the dimensions that comprise SRL: goal setting, time management, study strategies, the role of the physical and social environment in learning, motivation, and emotional regulation.

The modules are presented sequentially, and each must be completed within a fifteen-day period. They follow a similar structure to aid in the organization and routine of studies, described below: a) introduction to the topic to be addressed; b) presentation of the content; c) activities to assess understanding of the topic; d) exercises for reflection and practical application of the topics covered; e) summary of the module; f) section on supplementary materials; g) module *feedback*.

Asynchronous activities are accompanied by video lectures, *webinars*, *e-books*, supporting texts, and other freely accessible materials, as well as narratives created specifically for the course. The use of narratives is a highly effective resource for promoting SRL, primarily because it mobilizes metacognitive strategies linked to learning (Fior *et al*., 2022). Below, we present an excerpt from one of these narratives:

> *Cacá is in the first year of a college program, which she really enjoys [...] She makes an effort to read the texts and prepare for classes, but when she finds the topics uninteresting, she skims the words without paying attention to what she actually understood from the ideas in the texts. It is not uncommon for her to lose focus while reading, getting distracted by social media or planning his weekend activities* (Authors, 2025).

To help students identify with the narratives, they were created specifically for this course, based on the experiences of the university students themselves, as reported to the instructors responsible for the courses through individual and/or group discussions. An effort was also made to ensure that the characters presented a non-binary perspective on gender, in order to align with the ongoing process of social inclusion at the university.

Assessments of students' understanding of the subject matter are conducted through multiple-choice questions, presented in various formats, with automated grading and *feedback*. Reflection and application exercises on the topics covered, invite students to relate the topics to their own academic reality. These activities are evaluated by faculty members and graduate students, who participate through the Teaching Internship program, with individualized feedback. The requested application activities can be illustrated by: a) setting goals for their learning; b) identifying distractions that influence their studies; c) organizing a study routine. In these activities, students are encouraged to reflect on their personal reality, their goals, and their course routine, as well as to incorporate practices of self-care, well-being, rest, and leisure. Thus, students' autonomy is fostered to reflect on their own reality, moving beyond a productivist approach to academic activities. Support for students is provided through synchronous messaging and *chat* during predefined times.

At the end of each module, there is a *feedback* activity in which students express their opinions on the module's contribution, relevance, and clarity, including space for suggestions. During the final session, there is also an evaluation of the course, highlighting positive aspects, areas for improvement, and suggestions for future offerings.

Although there has been positive feedback from students and growing demand for enrollment in the course, the offering of this activity was linked to a research protocol in order to provide a more objective assessment of the impact of participation in it. A portion of the results from this broader research is presented in this study. The methodological approaches underpinning the research, as well as the main findings, are described below.

3 Methodology

This is a quasi-experimental study, suitable for assessing the impact of an intervention on a specific condition or dependent variable (Marin *et al.*, 2021). In the present study, two groups were used: one composed of students who participated in a predominantly *online* hybrid elective course focused on self-regulation of learning, and the control group, with pre- and post-test data collected from both. The choice of this design is due to the fact that the control and experimental groups were not randomly assigned.

3.1 Participants

The sample for this study consisted of 206 university students enrolled at a Brazilian public institution in the years 2023 and 2024. The experimental group consisted of 104 students who took a hybrid elective course focused on promoting SRL and consented to participate in the study. The control group consisted of 102 students who did not take the specific course but were regular undergraduate students at the university, consented to participate in the study, and completed the instruments in the pre- and post-tests.

Of the 104 volunteers who made up the experimental group, 58 (56%) self-identified as female, and the participants' mean age was 22.67 years (SD = 5.75), ranging from 18 to 54 years. Of this group, 79 (76%) were enrolled in programs in the STEM field, with 33 (31.7%) in evening programs, 45 (45%) were in their first through third semesters, and 26 (25%) received financial aid provided by the institution.

Of the 102 participants in the control group, 57 (56%) self-identified as female, and the students had a mean age of 22.78 years (SD = 5.70), ranging from 18 to 65 years. Of these participants, 35 (34.3%) were enrolled in courses in the Humanities and Social Sciences, 29 (28.4%) were enrolled in programs in the STEM field, with 50 (49%) enrolled in evening programs, 37 (36.6%) having completed up to the fourth semester of their program, and 18 (17.6%) receiving financial support from the institution to remain in higher education.

3.2 Instruments

For data collection, the following were used: a questionnaire to characterize the sample of participants, consisting of sociodemographic questions and those related to academic life; and two other self-report instruments. The first of these was the Inventory of Self-Regulation of Learning Processes (IPAA), validated by Polydoro *et al.* (2019). This instrument assesses the frequency of use of SRL processes during study, consisting of nine items, such as: “When I receive grade/feedback, I think about specific things I need to do to improve,” answered on a Likert scale with response options ranging from 1 (never) to 5 (always). The final score is calculated by summing the responses and dividing by the total number of items, with higher values indicating greater use of SRL processes. The Cronbach’s alpha for the scale in this sample is 0.73.

The extrinsic motivation and intrinsic motivation subscales of the Motivation Strategies for Learning Questionnaire (MSLQ), developed by Pintrich *et al.* (1991), were also used. Each subscale consists of four items, illustrated by the statement: “The most important thing for me right now is to improve my overall grade point average, so my main concern in my courses is getting a good grade,” referring to extrinsic motivation, whose Cronbach’s alpha in the present sample was 0.726, and “In my course subjects, I prefer study materials that challenge me so that I can learn new things,” linked to intrinsic motivation, with a Cronbach’s alpha of 0.614. The statements should be answered using a Likert-type scale, ranging from 1 (not at all true for me) to 7 (very true for me).

3.3 Procedures

The study followed the ethical requirements for research involving human subjects (Certificate of Submission for Ethical Review: omitted for double-blind peer review). The pre-test data collection was conducted at the beginning of the semester. The invitation to participate in the study was extended in the classroom by the principal investigators, and students were assured that refusal to participate would have no implications for their academic standing. After clarifying the research objectives and procedures and obtaining the volunteers’ consent via the informed consent form, the research protocol was presented— —in paper and pencil format and/or digital format, containing the demographic questionnaire and the two instruments.

The experimental group underwent the intervention, which consisted of participating in a hybrid elective course focused on self-regulation of learning over a 15-week period. At the end of the semester, both groups were invited to complete the post-test, which consisted of the same instruments as the pre-test and could be answered in either paper-and-pencil or digital format. The average response time for both assessments was 20 minutes, and the data were entered into a spreadsheet compatible with the Statistical Package for the Social Sciences (SPSS). The analysis of differences between the levels of use of self-regulation processes and intrinsic and extrinsic motivations measured in the pre- and post-tests, considering both groups, was performed using Repeated Measures Analysis of Variance, with a significance level of $p < 0.05$.

4 Results and Discussion

The information regarding the descriptive statistics on the use of self-regulation processes in learning and the levels of intrinsic and extrinsic motivation is presented in Table 1.

Table 1 – Descriptive statistics on self-regulation of learning and intrinsic and extrinsic motivation, considering the pre- and post-test measures of the experimental and control groups

	Experimental group			Control group		
		Pre-test	Post-test		Pre-test	Post-test
	N	M(SD)	M(SD)	N	M(SD)	M(DP)
Self-regulation (IPAA)	104	3.45 (0.63)	3.86 (0.56)	102	3.65 (0.51)	3.50 (0.53)
Intrinsic motivation (MSLQ)	100	4.61 (1.11)	4.84 (1.10)	100	4.87 (1.08)	4.65 (1.09)
Extrinsic motivation (MSLQ)	101	5.01 (1.32)	5.04 (1.27)	99	4.37 (1.46)	4.37 (1.48)

Note: N – number of participants; M – mean; SD – standard deviation.
Source: Authors (2026).

Regarding the use of self-regulation of learning processes, students in the experimental group reported lower levels on the pre-test (; M = 3.45) and an increase in the use of such processes on the post-test (M = 3.86). In contrast, the control group showed higher levels of use of self-regulated learning (SRL) processes at the beginning of the semester (M = 3.65), with a decrease in frequency of use by the end of the semester (M = 3.50). The analysis of covariance homogeneity indicated the appropriateness of proceeding with the analyses (Box's M = 7.67, df = 3, p = 0.055). The results demonstrated

that there were statistically significant differences in the levels of self-regulation of learning, based on the indices measured in the pre- and post-tests and with reference to the experimental and control groups (F (1, 204) = 50.20, $p < 0.01$, *partial* $\eta^2 = 0.20$).

Post-hoc analyses revealed differences in the pre-test scores between the group of students who took the elective course (M = 3.45) and the university students in the control group (F (1,204) = 6.37, p = 0.012, *partial* $\eta^2 = 0.03$), with higher levels of self-regulation process use reported by the control group (M = 3.65). In the post-test, statistically significant differences were also identified between the experimental and control groups (F (1,204) = 23.32, $p < 0.01$, *partial* $\eta^2 = 0.103$), with students who participated in the elective course reporting an increase in the use of SRL processes at the end of the semester (M = 3.86), compared to measurements at the beginning of the semester (M = 3.45), while volunteers in the control group reported a decrease in the use of SRL (M = 3.50) based on initial measurements (M = 3.65).

These data indicate that students who voluntarily enrolled in an elective course promoting SRL already perceived a lower level of use of self-regulation processes. This may have been one of the motivations for enrolling in an activity that was not mandatory for course completion. We may be dealing with a group of students who have already reflected on their process of studying and learning in higher education and decided to take a course that would support their academic challenges. It should also be noted that the experimental and control groups consist of students enrolled at the same institution but with a distinct distribution of courses across different fields of study. In the experimental group sample, there was a predominance of university students from the STEM fields. It is understood that the curricular organization of courses in different fields has specific characteristics, which could explain the differences in self-regulation levels between the groups at the start of the intervention.

In turn, participation in the course contributed to an increase in the use of processes important for learning and academic performance. These results are consistent with findings previously reported in the literature (Fior *et al*., 2022; Maciel & Alliprandini, 2018; Theobald, 2021). It is noteworthy that the experimental group, consisting mostly of students enrolled in courses in the STEM fields, increased their levels of self-regulation, based on initial and final measurements, resulting in higher scores than

the control group at the end of the semester. These data also suggest that activities promoting SRL may be a promising path for promoting equity in higher education, not only among students entering this level of education with distinct educational backgrounds (Fior *et al*., 2022), but also for providing differentiated support to students based on the curricular and educational experience diversities present within the university.

Furthermore, the reduction in the use of SRL processes reported by students in the control group reaffirms the urgency of actions that foster reflections on studying and learning in higher education. This is because, over the course of the semester and with the increase in academic demands, university students struggle to balance the various demands and engage in their studies in a manner that is poorly planned and unintentional.

The results of a study conducted in Germany, in which 105 students were monitored for 154 days regarding their time management to meet various academic demands, indicated that independent study does not follow a linear pattern. On the contrary, there is little investment in this activity at the beginning of the semester, which increases during the exam and assignment submission period and decreases at the end of the semester. In turn, classroom attendance declines over the course of the semester, with indications that students need to miss some activities in order to cope with academic demands (Liborius; Bellhäuser; Schmitz, 2019), suggesting that the promotion of self-regulated learning should accompany students' academic trajectories to assist them in intentionally planning their study activities with a view to meeting the academic goals established throughout the course.

Still regarding the results of this study and with respect to motivation, in the experimental group, based on the pre-test (M = 4.61) and post-test (M = 4.84) measures, an increase in intrinsic motivation was reported. In contrast, for the control group, a reverse trend was observed, with a decrease in intrinsic motivation over the course of the semester, based on the pre-test (M = 4.87) and post-test (M = 4.65) measures. After analyzing the homogeneity of covariance (Box's M = 2.00, df = 3, p = 0.578), statistically significant differences were identified between the groups based on the pre- and post-test measures (F (1, 198) = 12.51, p < 0.01, *partial* η^2 = 0.053). *Post hoc* analyses conducted using the Bonferroni test indicated no statistically significant differences between the levels of intrinsic

motivation in the experimental and control groups, both at the beginning (z = 2.92; p = 0.89) and at the end of the semester (; z = 1.47, p = 0.23). In turn, at the end of the intervention, the experimental group reported an increase in intrinsic motivation levels (*z* = 6.46, p = 0.012, *partial* η^2= 0.032), while the control group reported a decrease in intrinsic motivation, considering the pre- and post-test measures (*z* = 6.05, p = 0.015, *partial* η^2= 0.030), with the differences being statistically significant in both cases.

These findings indicate that, with regard to intrinsic motivation, the groups did not differ at the beginning of the intervention; that is, levels did not vary between those in the control group and those who voluntarily enrolled in an elective course on self-regulation. In turn, the increase in intrinsic motivation reported by members of the experimental group suggests that the impact of participating in a hybrid course promoting self-regulation of learning is not limited to cognitive and metacognitive strategies but has implications for motivational processes. It should be noted that motivation is one of the dimensions of SRL and is a key component in triggering the entire process. Students who are intrinsically motivated perform tasks out of genuine interest in them, seek to exercise new skills and acquire new knowledge, and are open to deeper learning (Eccles; Wigfield, 2002; Guimarães, 2001). Such behaviors result in better academic performance (Valenzuela *et al*., 2020).

Regarding intrinsic motivation, one of the challenges faced by faculty is how to awaken students' deep interest, persistence, and enjoyment of study tasks (Guimarães, 2001). The statistically significant reduction in motivation levels reported by members of the control group suggests that the activities present in the daily routine of higher education, with a focus on mandatory and classroom-based experiences, are not sufficient to increase student motivation. Curricular changes, including a focus on the development of learning-oriented skills, appear to be promising avenues for fostering intrinsic motivation. Furthermore, the findings of Theobald (2021) highlight the role of instructor *feedback* as a key moderator of the impact of SRL promotion programs on motivation. It is hypothesized that other pedagogical decisions present in the hybrid program presented in this article, such as content organization, narratives, and application tasks with *feedback*, may have helped foster students' intrinsic motivation.

Furthermore, regarding extrinsic motivation, upon visual inspection, students in the control group report higher levels in the pre-test (M = 5.01) and post- -test (M = 5.04) compared to students in the control group, whose levels at the beginning and end of the semester are similar (M = 4.37). Although the results of the covariance analysis indicate the relevance of continuing to study the difference between the groups (Box's M = 5.87, df = 3, p = 0.122), no statistically significant differences were found in the pre- and post-test measures of extrinsic motivation between the experimental and control groups (*F* (1, 198) = 0.047, p = 0.83). These data suggest that the extrinsic motivation of the volunteers in this study was not impacted by participation in the elective course. Despite these results, it is observed that students in the experimental group began the course with higher levels of extrinsic motivation (M = 5.01) compared to their peers in the control group (M = 4.37), with these differences being statistically significant (*z* = 10.53, p < 0.01, *partial* η^2 = 0.05). The volunteers who took the elective course also ended the semester with higher extrinsic motivation scores (M = 5.04) compared to their peers (M = 4.37), and these differences were statistically significant (*z* = 11.91, p < 0.01, *partial* η^2 = 0.06).

Intrinsic and extrinsic motivations should not be viewed as opposing, dichotomous poles, since both are part of a *continuum* (Eccles; Wigfield, 2002; Guimarães, 2001). Furthermore, the characteristics of the national higher education system, with mandatory requirements regarding course load, extension activities, internships, attendance, and grades, help foster extrinsic motivation. This is because many of the actions undertaken by students are aimed at meeting external demands that will help them avoid academic problems, such as failing grades and delays in completing their degree.

Furthermore, progress in schooling is accompanied by a reduction in intrinsic motivation and a consequent increase in extrinsic motivation (Guimarães, 2001). The absence of statistically significant differences in extrinsic motivation among the students in this study suggests that remaining in Brazilian higher education has required students to rely on external motivational regulation. These findings suggest the urgency of resuming discussions about the objectives of higher education, in order to incorporate, beyond professional training, the holistic development of students. To this end, political-pedagogical projects and curricula should provide opportunities for such development. Therefore, the centrality of classroom-based programs and mandatory experiences must

be rethought in order to provide opportunities for other experiences, such as elective courses, research activities, cultural and sports practices, participation in student organizations, and other experiences that provide students with an education that goes beyond the mandatory, classroom-centered content.

5 Final Considerations

The expansion of access to higher education, the greater diversity in student characteristics, and the budgetary constraints imposed by national policies challenge Brazilian public institutions to offer student support services that cater to the diversity of students currently accessing higher education. From the perspective of pedagogical support, social inclusion at this level of education has required institutions to focus on their pedagogical projects, faculty training, and support for university students in the face of the distinct academic demands associated with university education.

This article aimed to describe a hybrid elective course designed to promote self-regulation of learning and to analyze the contributions of participation in it to SRL and student motivation. In summary, the results demonstrated that the group that attended the elective course reported an increase in the use of self-regulation processes and in intrinsic motivation by the end of the semester, whereas the control group that did not participate in discussions on SRL reported a decline in self-regulation and intrinsic motivation by the end of the semester.

The findings of this study confirm that SRL skills need to be fostered through intentional actions throughout students' education. Thus, attention should be directed toward curricula and course programs to move beyond an approach centered on specific content exclusively linked to professional training, incorporating experiences that enable students to gain knowledge about their own learning processes.

A key finding of this study is the positive impact of a program implemented in a predominantly *online* hybrid format. Despite the importance of in-person activities for university education, the incorporation of new technologies into study processes and the development of hybrid initiatives make it possible to serve a larger number of undergraduate students. The presence of asynchronous activities enables access to SRL content without

having to contend with the scheduling constraints imposed by some courses, which are heavily classroom-centered or involve activities outside the university. The findings of this research suggest that hybrid activities can be strong allies in the pedagogical support offered to students, with direct implications for social inclusion in higher education.

The results of this study, however, pertain to a course offered at a specific university. Further research could expand the sample and diversify the profile of the institutions to provide a broader representation of Brazilian higher education. Longitudinal tracking of students, with the aim of understanding the impact of such a course over the course of their education, is also appropriate for a deeper understanding of the limitations and possibilities of initiatives to promote SRL.

Still regarding the present study, the fact that the hybrid course was offered predominantly *online* may be a path toward democratizing access to programs aimed at promoting SRL. As previously noted, since the challenges faced by students during higher education are manifold and institutional responses must also be varied, it is prudent that efforts to promote SRL not be restricted to students. The implementation of initiatives aimed at teacher training is also essential so that they can integrate these skills into specific courses, which constitutes yet another pathway to social inclusion. It is also important to highlight the importance of student support service professionals being familiar with the theoretical frameworks related to SRL, so that they can implement collective or individual actions that support students in their academic journey.

6 References

ARCOVERDE, Â. R. R.; BORUCHOVITCH, E.; GÓES, N. M. Programa de intervenção em autorregulação da aprendizagem: impacto no conhecimento e nas percepções de estudantes de licenciatura. *Revista de Educação PUC*, Campinas, v. 27, p. 1-15, 2022. DOI: https://doi.org/10.24220/2318-0870v27e2022a5513. Available at: https://periodicos.puc-campinas.edu.br/reveducacao/article/view/5513/4244. Accessed on: 14 maio 2026.

BERNARDO, A. B. *et al.* The path to graduation: Progressing and non-progressing university students. *Journal of Applied Research in Higher Education*, [*S. l.*], 2025. DOI: 10.1108/JARHE-12-2024-0724. Available at: https://www.emerald.com/jarhe/article-abstract/doi/10.1108/JARHE-12-2024-0724/1271550/The-path-to-graduation-progressing-and-non?redirectedFrom=fulltext. Accessed on: 14 maio 2026.

BRASIL. Lei nº 12.711, de 29 de agosto de 2012. Dispõe sobre o ingresso nas universidades federais e nas instituições federais de ensino técnico de nível médio e dá outras providências. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 30 ago. 2012. Available at:http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12711.htm. Accessed on: 30 dez. 2025

BRASIL. Lei nº 14.723, de 13 de novembro de 2023. Altera a Lei nº 12.711, de 29 de agosto de 2012, para dispor sobre o programa especial de acesso às instituições federais de educação superior e técnica. *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 14 nov. 2023. Available at: https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/lei/l14723.htm. Accessed on: 30 dez. 2025.

BRASIL. Lei nº 14.914, de 3 de julho de 2024. Institui a Política Nacional de Assistência Estudantil (PNAES). *Diário Oficial [da] República Federativa do Brasil*, Poder Executivo, Brasília, DF, 4 jul. 2024. Available at:https://www2.camara.leg.br/legin/fed/lei/2024/lei-14914-3-julho-2024-795887-publicacaooriginal-172283-pl.html. Accessed on: 30 dez. 2025.

BORUCHOVITCH, E. Autorregulação da aprendizagem: contribuições da psicologia educacional para a formação de professores. *Revista da Associação Brasileira de Psicologia Escolar e Educacional*, São Paulo, v. 18, n. 3, p. 401-409. DOI: https://doi.org/10.1590/2175-3539/2014/0183759. Available at: https://www.scielo.br/j/pee/a/HYqxtDHyj84FGcJKzHCCMSQ/?format=html&lang=pt. Accessed on: 30 dez. 2025.

BZUNECK, J. A.; BORUCHOVITCH, E. Motivação e autorregulação da motivação no contexto educativo. *Psicologia*: Ensino & Formação, São Paulo, v. 7, n. 2, p. 73-84, 2016. DOI: https://doi.org/10.21826/2179-58002016727384. Available at: https://pepsic.bvsalud.org/pdf/pef/v7n2/v7n2a07.pdf. Accessed on: 14 maio 2026.

CAMPOS, L. A.; LIMA, M. *O impacto das cotas*: duas décadas de ação afirmativa no ensino superior brasileiro. Belo Horizonte: Autêntica, 2025.

CASANOVA, J. R.; ARAÚJO, A. M.; ALMEIDA, L. S. Dificuldades na adaptação académica dos estudantes do 1º ano do Ensino Superior. *Revista e-Psi*, Viseu, v. 9, n. 1, p. 165-181, 2020. Available at: https://artigos.revistaepsi.com/2020/Ano9-Volume1-Artigo11.pdf. Accessed on: 30 dez. 2025.

CUNHA, M. I. Aprendizagem da docência em espaços institucionais: é possível fazer avançar o campo da formação de professores?. *Avaliação*: Revista da Avaliação da Educação Superior, Campinas, n. 3, p. 789-802, 2014. DOI: https://doi.org/10.1590/S1414-40772014000300013. Available at: https://www.scielo.br/j/aval/a/QqsDjVj8k8pB6fLdhHr6qHs/?format=pdf&lang=pt . Accessed on:14 maio 2026

DIAS, C. E. S. B. *et al. Os serviços de apoio pedagógico aos discentes no ensino superior brasileiro*. São Carlos: Pedro & João, 2020. Available at: https://pedroejoaoeditores.com.br/produto/os-servicos-de-apoio-pedagogico-aos-discentes-no-ensino-superior-brasileiro/. Accessed on: 30 dez. 2025.

ECCLES, J. S.; WIGFIELD, A. Motivational beliefs, values, and goals. *Annual Review of Psychology*, Palo Alto, p. 109-132, v. 53, n. 1, 2002. DOI: https://doi.org/10.1146/annurev.psych.53.100901.135153. Available at: https://www.annualreviews.org/content/journals/10.1146/annurev.psych.53.100901.135153. Accessed on: 30 dez. 2025.

FIOR, C. A. *et al.* Contribuições de uma disciplina na promoção da autorregulação da aprendizagem de universitários egressos da rede pública. *Revista Docência do Ensino Superior*, Belo Horizonte, v. 12, p. 1-21, 2022. DOI: https://doi.org/10.35699/2237-5864.2022.39772. Available at: https://periodicos.ufmg.br/index.php/rdes/article/view/39772. Accessed on: 14 maio 2026.

FIOR, C.; ALMEIDA, L. S. Transição e adaptação acadêmica dos estudantes ao ensino superior. *In*: OSTI, A. *Ensino superior*: mudanças e desafios na perspectiva do estudante. São Carlos: Pedro & João, 2023. p. 59-76. Available at: https://pedroejoaoeditores.com.br/produto/ensino-superior-mudancas-e-desafios-na-perspectiva-dos-estudantes/. Accessed on: 30 dez. 2025.

GANDA, D. R.; BORUCHOVITCH, E. Intervenção em autorregulação da aprendizagem com alunos do ensino superior: análise da produção científica. *Estudos Interdisciplinares em Psicologia*, Londrina, v. 10, n. 3, p. 3-25, 2019. DOI: 10.5433/2236-6407.2019v10n3p03. Available at: https://pepsic.bvsalud.org/pdf/eip/v10n3/v10n3a02.pdf. Accessed on: 14 maio 2026.

GUIMARÃES, S. É. R. Motivação intrínseca, extrínseca e o uso de recompensas em sala de aula. *In*: BORUCHOVITCH, E.; BZUNECK, J. A. (org.). *A motivação do aluno*: contribuições da psicologia contemporânea. Petrópolis: Vozes, 2001. p. 37-57.

HERINGER, R. Expansão e transformações do ensino superior no Brasil a partir da Redemocratização (1985-2022). *In*: OSTI, A. *Ensino superior*: mudanças e desafios na perspectiva do estudante. São Carlos: Pedro & João, 2023 p. 13-39. Available at: https://pedroejoaoeditores.com.br/produto/ensino-superior-mudancas-e-desafios-na-perspectiva-dos-estudantes/. Accessed on: 30 dez. 2025.

HOFER, B.; YU, S.; PINTRICH, P. Teaching College students to be self-regulated learners. *In*: SCHUNK, D. H.; ZIMMERMAN, B. J. (eds.). *Self-regulated learning*: From teaching to self-reflective practice. New York: Guilford, 1998. p. 57-85.

LIBORIUS, P.; BELLHÄUSER, H.; SCHMITZ, B. What makes a good study day? An intraindividual study on university students' time investment by means of time-series analyses. Learning and Instruction, Oxford, v. 60, p. 310-321, 2019. DOI:

https://doi.org/10.1016/j.learninstruc.2017.10.006. Available at: https://www.sciencedirect.com/science/article/pii/S0959475217306254. Accessed on: 14 maio 2026.

MACIEL, A. G.; ALLIPRANDINI, P. M. Z. Autorregulação da aprendizagem: panorama nacional dos estudos de intervenção no ensino superior. *Revista Cocar*, Belém, v. 12, n. 23, p. 145-167, 2018. Available at: https://periodicos.uepa.br/index.php/cocar/article/view/1722. Accessed on: 30 dez. 2025.

MARIN, Â. H. *et al.* Delineamentos de pesquisa em psicologia clínica: classificação e aplicabilidade. *Psicologia*: Ciência e Profissão, Brasília, DF, v. 41, p. 1-17, 2021. DOI: https://doi.org/10.1590/1982-3703003221647. Available at: https://www.scielo.br/j/pcp/a/6RBYrsv88tHdJVzgBN49k6r/?format=pdf&lang=pt. Accessed on: 14 maio 2026.

PANADERO, E. A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, Lausanne, v. 8, p. 1-28, 2017. DOI : https://doi.org/10.3389/fpsyg.2017.00422. Available at: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2017.00422/full. Accessed on: 14 maio 2026.

PINTRICH, P. R. *et al. A manual for the use of the Motivated Strategies for Learning Questionnaire* (MSLQ). Michigan: University of Michigan, 1991.

POLYDORO, S. A. J. *et al.* Autorregulação da aprendizagem: adaptação e evidências de validade de instrumentos para universitários brasileiros. *Educação em Análise*, Londrina, v. 4, n. 1, p. 21-42, 2019. DOI: https://doi.org/10.5433/1984-7939.2019v4n1p21. Available at: https://ojs.uel.br/revistas/uel/index.php/educanalise/article/view/35534/26896. Accessed on: 14 maio 2026.

REIS, D. S. A colonialidade do saber: perspectivas decoloniais para repensar a univers(as)idade. *Educação & Sociedade*, Campinas, v. 43, p. 1-12, 2022. DOI: https://doi.org/10.1590/ES.240967. Available at: https://www.scielo.br/j/es/a/V4NXjqDTzVTkVLRXQyDfdyQ/?format=pdf&lang=pt. Accessed on: 14 maio 2026.

SALGADO, F. A. F.; POLYDORO, S. A. J.; ROSÁRIO, P. Programa de Promoção da Autorregulação da Aprendizagem de Ingressantes da Educação Superior. *Psico-USF*, Itatiba, v. 23, n. 4, p. 667-679, 2018. DOI: https://doi.org/10.1590/1413-82712018230407. Available at: https://www.scielo.br/j/pusf/a/DHwxgRJ6GBmtP4jz5nXzSwS/?format=pdf&lang=pt. Accessed on: 14 maio 2026.

SCHUNK, D.; GREENE, J. Historical, contemporary, and future perspectives on self-regulated learning and performance. *In*: SCHUNK, D.; GREENE, J. (ed.). *Handbook of self-regulation of learning and performance*. 2. ed. New York: Taylor & Francis, 2018. p. 1-15.

SILVA, M. A. R.; ALLIPRANDINI, P. M. Z. Efeitos positivos de uma intervenção por integração curricular na promoção da autorregulação da aprendizagem. *Educação em Revista*, Belo Horizonte, v. 36, p. 1-15, 2020. DOI: https://doi.org/10.1590/0102-4698227164. Available at: https://www.scielo.br/j/edur/a/TPbGwrRyDSnXT79mtbZMMYx/?format=pdf&lang=pt. Accessed on: 14 maio 2026.

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