

Key Factors in Academic Achievement: The Impact of Procrastination, Volitional Control, and Self-Regulated Learning

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Abstract

The recent report from the Programme for International Student Assessment (PISA) has highlighted a concerning lack of engagement and motivation among students globally, resulting in persistently low competencies across various areas of study. This finding highlights a growing concern and the urgency of implementing effective solutions. In the educational context, social-cognitive theory investigates the processes of self-regulated learning, which involves the ability to manage and master crucial factors for high-quality learning and, consequently, academic success. Reducing academic procrastination and using volitional control strategies are also considered essential for achieving good academic outcomes. This study aimed to analyze, using structural equation modelling, the relationship between self-regulation, volitional control strategies, and students' academic achievement, while also investigating the role of academic procrastination. The sample consisted of 805 students (Mage = 13.1) from the 3rd cycle of basic education (7th, 8th, and 9th grades) in Portuguese schools. The results revealed that students exhibiting higher levels of self-regulation not only achieve better academic achievement but also more frequently employ volitional control strategies. Conversely, those displaying high levels of academic procrastination in their school activities show a reduced capacity to self-regulate their learning. Understanding these factors is vital for promoting educational quality and developing autonomous and competent students. Students who value their academic tasks and implement self-regulation strategies while effectively utilizing volitional strategies are likely closer to achieving academic excellence. Some educational implications are also discussed.

Keywords

Academic Achievement, Self-Regulation, Volitional Control Strategies, Procrastination, Basic Education

1. Introduction

Recently, a significant decline in proficiency across certain areas of knowledge, particularly in reading, mathematics, and science, has highlighted an alarming global issue: the lack of commitment and motivation among students, as emphasized in the latest Programme for International Student Assessment (PISA) report (OECD, 2023). These deficits, however, extend beyond the academic sphere, bringing profound social repercussions that affect both individual and collective development (Lourenço & Paiva, 2024). The importance of research into academic achievement (AA) is therefore underscored in the report, emphasizing the urgent need to address these challenges.

This data presents a unique opportunity to observe the profound impact that the recent COVID-19 pandemic and school closures have had on student performance. In an era of rapid transformations and constant discoveries, it is essential for the education system to transcend its role as a mere source of knowledge, evolving into a true incubator of adaptability and resilience (Gianfelice et al., 2024). Today, students' ability to keep pace with developments across various fields of knowledge is more than just an educational goal; it is an indispensable response to the challenges of an ever-changing world.

Thus, understanding and improving AA has become a crucial priority, not only to raise educational standards but also to ensure a more promising and balanced future for upcoming generations. Approaching AA as a complex analytical framework entails understanding the dynamic interaction of various motivational variables, offering deeper insights into the processes that shape learning (Zimmerman, 2008). When students take an active role in their academic journey, it becomes possible to address the lack of guidance and limited perspectives on learning, which negatively impact their metacognitive strategies, self-efficacy beliefs, and study efforts, ultimately influencing their achievement (Lourenço & Nogueira, 2014).

To address the persistent issue of low AA, a concerted effort is required to weave together metacognitive, motivational, and behavioral strategies within classroom environments. This approach aims to empower students to actively engage in learning and to monitor the effectiveness of their study methods (Gutiérrez-Braojos, 2015).

In this context, student autonomy emerges as a pivotal element in the educational journey, highlighting the need for strategies that foster SRL, making the process more effective and transformative (Zimmerman, 2023). Within SRL, research focuses on how students take active and proactive control of their learning, adjusting cognition, motivation, and behavior to achieve their goals. According to Schunk and Zimmerman (2023), this concept is crucial for encouraging student autonomy, emphasizing their active role in cognitive, behavioral, and motivational domains (Alliprandini et al., 2023)—all essential foundations for high academic achievement.

At the same time, students' perseverance in maintaining their intentions and

achieving mastery, even in the face of adversity, depends on the use of VCS, as argued by Vermeer et al. (2000). These strategies, considered essential tools for students' SRL, directly impact the quality of the learning process (Rodríguez-Guardado & Juárez-Díaz, 2023).

According to Boekaerts and Cascallar (2006), these strategies allow students to maintain focus on academic goals, distancing themselves from distractions related to well-being. Such control leads to strong work habits, evident in both school tasks and personal activities (Fuentes et al., 2023; Lourenço & Nogueira, 2014). Vera (2022) adds that volitional control, essential for AA, shapes effort and concentration, preventing the loss of students' initial motivation.

Academic procrastination (AP), defined as the intentional delay of an unpleasant task despite potential negative consequences (Costa et al., 2022), is a common behavior in various daily tasks, particularly in the academic environment. However, when reduced through SRL strategies, it can have a positive effect on students' learning (Júnior et al., 2024; Ks et al., 2023; Mosquera et al., 2022; Umerenkova & Flores, 2017). Although they pose risks to academic success, procrastinator behaviors are frequently observed within the school context (Silva et al., 2022).

Thus, studies on these constructs provide valuable insights into the combined impact of these variables on students' educational trajectories, shedding light on the complex dynamics that influence the path to academic success. The harmonious interaction between these variables is crucial for understanding how students face academic challenges and how this reflects in their AP. In this way, recent research (Júnior et al., 2024; Rodríguez-Guardado & Juárez-Díaz, 2023; Schunk & Zimmerman, 2023) underscores the importance of a holistic approach, consolidating the theoretical foundation that supports educational success.

1.1. Self-Regulated Learning

For students to become truly self-regulated, it is essential that they acquire knowledge about their own learning processes and develop skills to manage and regulate them, whether independently, cooperatively, or collaboratively (Hadwin et al., 2011; Parveen et al., 2023). This practice fosters changes in strategies, beliefs, and knowledge, which will be valuable in new learning contexts. A review of the literature on SRL underscores the importance of cognitive strategies for students' academic success (Callan et al., 2022; Cho & Shen, 2013; Schunk & Zimmerman, 2012), encompassing various crucial aspects in the educational context (Arcoverde et al., 2022). However, without an accurate self-assessment of their own competencies, students struggle to engage in advanced metacognitive activities, which are essential for effective monitoring of their progress (Zimmerman, 2023).

Bandura's *Social Cognitive Theory* (1986, 2002) offers an innovative perspective on human behavior, emphasizing individuals' ability to construct reality, self-regulate, interpret information, and actively engage in learning (Frison & Boruchovitch, 2020). Bandura argues that the human mind is creative, proactive, and reflective, transcending mere reactive responses (Bandura, 2002). At the core of

this theory lies the concept of “human agency”, which encompasses the capacity for symbolization, social learning, planning, and self-reflection. These abilities allow individuals to adjust their behavior toward achieving positive outcomes, aligning closely with SRL through mechanisms such as intentionality, forethought, self-reactiveness, and self-reflection (Bandura, 2008).

Rosário et al. (2013) emphasize that the continuous practice of SRL strategies enables students to become more aware and focused on learning content. Achieving this autonomy requires mastering three types of knowledge: declarative, procedural, and conditional. Declarative knowledge involves factual information about strategies, such as understanding what a mind map is; procedural knowledge entails knowing how to use these strategies; and conditional knowledge involves understanding when to apply them effectively.

SRL transforms learning into an act of autonomy and continuous growth, where challenges become sources of motivation and reinforce students’ competence (Lourenço & Paiva, 2024). Students who perceive themselves as successful demonstrate greater persistence and satisfaction when facing challenges, reflecting their high potential for self-regulation. In this process, students systematically activate and sustain cognitions, emotions, and behaviors directed toward achieving their academic goals (Parveen et al., 2023).

1.2. Volitional Control Strategies

Zimmerman (2002) presents SRL as a cyclical process involving forethought, volitional control, and self-reflection, where volitional control acts as a force that keeps students focused, facilitating learning and task completion even in the face of distractions. According Vera (2022), volitional control is fundamental in the school context, as it guides concentration processes and directly shapes AA, ensuring sustained effort toward success. As refer the author further highlights that the importance of volition becomes evident when observing a student with potential and initial motivation who, nonetheless, frequently deviates from their path and fails to fully engage in completing academic tasks, thus falling short of their true learning potential.

Lourenço (2008) emphasizes the role of self-control and self-monitoring in volitional control, processes that help students maintain focus, organize their efforts, and reflect on their performance. In this phase, students use self-control and self-observation to execute and refine their planned tasks, monitoring their progress through learning techniques and strategies. Performance records and feedback play a crucial role, as they enable students to adjust their approaches to meet their established goals (Ganda & Boruchovitch, 2019; Frison et al., 2021; Silva & Alliprandini, 2020; Silva & Bizerra, 2022; Vieira et al., 2021).

Volitional control is essential for developing consistent work habits, both in academic tasks and personal activities (Fuentes et al., 2023). According Boekaerts and Cascallar (2006), these strategies enable students to focus on task objectives, steering them away from well-being goals that might divert their attention.

Students' persistence in maintaining their intentions and achieving mastery, even in the face of challenges, relies on access to well-developed volitional strategies (Vermeer et al., 2000). Furthermore, Boekaerts and Cascallar (2006) emphasize the importance of volitional skills in meeting social norms and academic expectations, such as responsibility and group collaboration. McCann and Turner (2004) add that the development of volitional control is positively related to students' engagement, self-regulation, and cognitive development, highlighting the need to create environments that foster these skills in schools.

1.3. Academic Procrastination

The academic procrastination is defined as the intentional and irrational delay of school tasks (Abdollahi et al., 2020). This behavior is often associated with a negative impact on academic achievement (Kim & Seo, 2015; Machado & Schwartz, 2018; Rozental & Carlbring, 2014). Among students, procrastination commonly manifests as delays in preparing and submitting assignments, neglecting certain activities, and the tendency to study only the day before exams (Malpica-Chavarria & Garzón-Umerenkova, 2024). As a result, the time available to complete these tasks is reduced, which often leads to performance falling short of expectations (Marcilio et al., 2021; Voss & Vangsness, 2020). Furthermore, the underlying reasons for this behavior vary among procrastinators, who are distinguished by the specific reasons they use to justify delaying tasks (Gil et al., 2020).

Fior et al. (2022) identify several causes for AP, such as poor time management, concentration difficulties, anxiety about assessments, dysfunctional beliefs, fear of failure, low frustration tolerance, and challenges in task execution. In situations where the complexity and volume of tasks increase, this tendency to delay may become more frequent and negatively impact academic achievement (Mosquera et al., 2022). According to González-Brignardello et al. (2023), procrastination is strongly associated with factors such as self-efficacy, self-regulation, and perfectionism.

The variety of reasons for procrastination has led some authors to consider it impossible to define uniform characteristics for this behaviour, as the reasons that lead students to procrastinate can be quite distinct (Machado & Schwartz, 2018; Rahimi et al., 2016). Research suggests that the prevalence of certain reasons is influenced by factors such as culture, gender, historical period, and the demands of the educational context (Afzal & Jami, 2018; Gil et al., 2020).

Studies conducted in countries such as the United States, Canada, and Singapore show that a lack of self-control is linked to AP among children and adolescents (Asri et al., 2017). In the academic context, this behaviour is associated with high levels of anxiety and stress, a decrease in quality of life, and an increase in maladaptive behaviour (Cormack et al., 2020).

It can be concluded that when AP occurs, there is a failure in the student's SRL process, hindering their ability to manage performance and meet academic requirements (Costa Júnior et al., 2023). Moreover, Kim and Seo (2015) indicate

that AP has a considerable negative impact on mental health and interpersonal functioning, often being associated with issues such as anxiety, depression, and other difficulties related to physical and mental health.

1.4. Academic Achievement

Students' academic achievement represents the level of performance demonstrated across various academic activities, serving as an indicator of the knowledge acquired and the ability to apply it practically, collaboratively, and effectively. According to requirements, AA should be viewed as a dynamic and multifaceted process, reflecting the competence that students develop throughout their educational journey, evidenced by the knowledge gained along the way [Liangruenrom et al. \(2019\)](#). This performance is often assessed through both quantitative and qualitative methods, taking into account not only what students have learned but also their ability to manage time, resources, and maintain a proactive attitude toward learning ([Chen et al., 2020](#)).

These skills are typically measured through daily assignments, tests, and exams, where students demonstrate, through their responses, what they have absorbed during lessons ([Manyanga et al., 2022](#)). From this perspective, AA is influenced by a range of complex factors involving both individual and environmental contexts, with performance resulting from a dynamic interaction between the two ([Fernandes & Lemos, 2020](#)). Additionally, it is closely tied to the ability to SRL and the selection of volitional strategies ([Vera, 2022](#)).

Recognizing that students are influenced by their contexts and relationships, schools should understand these interactions and develop methods focused on individual student goals to foster more positive academic performance ([Ks et al., 2023](#)). The goals and motivations of each student, deeply personal, are shaped by their expectations for the future, as well as their relationships with family, teachers, and peers, which significantly influence their performance ([Kulakow, 2020](#)).

In this study, academic achievement was assessed based on grades obtained in Portuguese Language, Mathematics, English, and Natural Sciences. These subjects were chosen because students typically encounter greater challenges in these areas, which are also subject to final examinations in this educational cycle ([OECD, 2023](#)). This selection equally reflects the relevance of these subjects within the curriculum of the 3rd cycle of basic education in Portugal, as they represent key areas for the development of fundamental skills and are frequently associated with learning difficulties highlighted in international reports, reinforcing the importance of their inclusion in this study.

In the context of basic education in Portugal, the grading scale ranges as follows: 1 and 2 (insufficient), 3 (sufficient), 4 (good), and 5 (very good).

1.5. Objective of the Study and Hypotheses

Students' academic achievement depends on how they perceive and apply self-

regulation processes in learning while consciously selecting volitional control strategies (Lourenço, 2008). Simultaneously, the inevitable impact of AP—the intentional and often irrational delay of school tasks—creates a dynamic interplay between the intention to learn and the temptation to postpone. When these three variables interact harmoniously, they reveal not only how students manage academic challenges but also provide deep insights into their educational journey, uncovering the nuances that influence their academic success and development.

Based on the studies mentioned, this research aims to explore the impact of students' volitional control strategies and procrastination behaviors on self-regulated learning, as well as to understand how this set of variables influences academic performance. The research hypotheses are as follows:

Hypothesis 1: The volitional control strategies adopted by students have a direct and positive influence on their self-regulation for learning.

Hypothesis 2: Procrastination has a direct and negative impact on students' self-regulatory processes for learning.

Hypothesis 3: Students' academic performance is directly and positively influenced by their self-regulatory processes and indirectly influenced by volitional control strategies and procrastination.

The choice of the 3rd cycle of basic education is justified by the specific validation of the instruments for this age group (12 - 16 years) and by the significance of this transitional stage in academic and personal development, marked by increased curricular demands and the need for greater autonomy. Furthermore, studies highlight that performance during this phase has significant implications for future academic success, making it essential to understand the factors influencing self-regulation, volitional control, and procrastination.

It is important to highlight that, although the proposed model may not capture the full complexity of the factors influencing academic success, it was carefully designed to reflect the specific objectives of this study. The selection of variables—volitional control strategies, procrastination, and self-regulation—was grounded in robust evidence from the literature, as these have been consistently identified as determinants of academic success in similar contexts. Thus, the model presented here prioritizes a clear and focused approach while recognizing the need for future studies to expand the analysis by incorporating other relevant variables.

2. Methods

2.1. Design

The study follows an explanatory design (Ato et al., 2013) with the objective of analyzing the structure of the relationships between the variables of interest and verifying the fit of an explanatory model using structural equation modeling (SEM). This method enables a detailed exploration of the causal and dependency relationships among the constructs under study (SRL, VCS, AP, AA), as well as an assessment of the strength and direction of these relationships. Consequently, the SEM technique emerges as a robust statistical tool for confirming the

formulated hypotheses, offering a deeper understanding of the mechanisms underlying students' academic success and identifying relevant mediating and moderating variables in the learning process.

2.2. Participants

For this study, a non-probabilistic convenience sampling method was chosen, a technique that, as described by Lohr (2022), is used when there are no specific inclusion criteria for the sample. This type of sampling allows any member of the population to participate and be included in the study group. Among its advantages, the speed, cost-effectiveness, simplicity in data collection, and flexibility in selection rules stand out. However, it has an important limitation: the lack of assurance of an unbiased sample.

The study involved 805 students from the 3rd Cycle of Basic Education (7th, 8th, and 9th grades) in public schools in Portugal, of whom 429 (53.3%) were female. Of the total, 460 students (57.1%) were in the 7th grade, 238 (29.6%) in the 8th grade, and 107 (13.3%) in the 9th grade. The ages of the participants ranged from 12 to 16 years ($M_{age} = 13.13$; $SD = 0.988$).

As for the average grades in the school assessments, the results in the different subjects were as follows: Portuguese Language, with an average of 2.83 ($SD = 0.799$); English, with 3.00 ($SD = 1.028$); Mathematics, with 2.71 ($SD = 0.963$); and Natural Sciences, with an average of 3.07 ($SD = 0.843$).

2.3. Instruments

Self-Regulated Learning Processes Inventory (SRLPI; Rosário et al., 2010): this instrument consists of nine items organized into three dimensions, each with three items: Planning (PL; $\alpha = 0.81$): e.g., “Before starting a task, I create a plan. I think about what I am going to do and what is needed to accomplish it”; Execution (EXE; $\alpha = 0.87$): e.g., “During classes or while studying at home, I analyze my behavior to identify aspects to improve and achieve my goals”; and Evaluation (EVA; $\alpha = 0.86$): e.g., “Whenever I receive a grade, I reflect on what I can adjust to improve my performance.”

The responses were recorded using a five-point Likert scale, ranging from 1 (never) to 5 (always). This instrument assesses self-regulated learning processes, offering a detailed view of the planning, execution, and evaluation carried out by the participants. The primary aim of the SRLPI is to evaluate students' SRL processes, considering their individual characteristics and the learning contexts in which they are embedded.

The responses were recorded using a five-point Likert scale, ranging from 1 (never) to 5 (always). This instrument allows for the assessment of SRL processes, providing a detailed view of the participants' planning, execution, and evaluation processes, while taking into account their individual characteristics and the learning contexts in which they are embedded.

Volitional Control Strategies Questionnaire (VCSQ; Leite, 2008): assesses

students' volitional competencies and consists of a single factor with 9 items ($VC/\alpha = 0.94$; e.g., "Thinking that if I don't achieve a good grade, the responsibility will be mine"). The items were presented on a five-point Likert scale, ranging from 1 (never) to 5 (always), allowing the measurement of the frequency with which students use VCS. It is worth noting that the questionnaire includes some items formulated inversely, ensuring greater accuracy in the analysis of responses.

Academic Procrastination Scale (APS; Rosário et al., 2009): assesses students' predisposition to delay academic tasks and consists of 10 items organized into two dimensions: procrastination in daily study ($PDS/\alpha = 0.82$; e.g., "When the teacher assigns a task during class, I start working on it immediately") and procrastination in test preparation ($PTP/\alpha = 0.80$; e.g., "When a task is very difficult, I give up and move on to another task"). Items are answered on a five-point Likert scale, ranging from 1 (never or rarely) to 5 (always or almost always), capturing the frequency of procrastination behaviors. All scales used in this study were previously validated for the Portuguese context, and the Cronbach's α values reported correspond to the results obtained in the present study.

Academic Achievement: as previously mentioned, students' academic achievement was assessed based on grades in Portuguese Language, Mathematics, English, and Natural Sciences. These curricular areas were selected due to their mandatory nature within the Portuguese educational system, the high failure rates associated with them (OECD, 2023), and the requirement to take a national exam in the 9th grade.

2.4. Procedures

After obtaining approval from the school administration to administer the questionnaires, their distribution was carried out. In most schools, the questionnaires were left at the school office and collected later. In other cases, the researcher conducted the application in person, requesting that students respond with maximum honesty and without omitting any items. Confidentiality of responses was ensured, participation was voluntary, and all ethical procedures required by the institutional research committee were followed. The study was conducted in compliance with the Declaration of Helsinki (2013) and the ethical guidelines of the American Psychological Association (APA).

2.5. Data Analysis

To analyze the validity and reliability of the instruments used, the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity were employed. These indicators confirmed the suitability of the principal component analysis, demonstrating that the variables exhibited significant interrelations. Given the Likert format of the items, internal consistency—the degree of cohesion among the items—was assessed using the Cronbach's alpha coefficient, which is considered acceptable for values greater than 0.70 (Marôco, 2021).

In a preliminary descriptive analysis of the items, rigorous criteria were

established to ensure data normality, with skewness limits below 2 and kurtosis under 7, as recommended by [Finney and DiStefano \(2013\)](#). The results of the Structural Equation Modeling (SEM) analysis were examined using SPSS/AMOS 29 software ([Arbuckle, 2022](#)). The focus was on two key aspects: the overall model fit, and the statistical significance of the regression coefficients obtained.

In this process, the model's fit indices and the magnitude of the factor loadings were analyzed, as they are considered fundamental for assessing the representativeness of the constructs. The adopted criteria included: χ^2 ; χ^2/df ratio; $GFI \geq 0.90$ ([Jöreskog & Sörbom, 1983](#)); $AGFI \geq 0.90$ ([Hu & Bentler, 1999](#)); $CFI \geq 0.95$ ([McDonald & Ho, 2002](#)); $TLI \geq 0.95$ ([Hair et al., 2019](#)); $RMSEA < 0.05$ ([Byrne, 2016](#)); and Critical N above 200 ([Marôco, 2021](#)). Factor loadings equal to or greater than 0.40 were considered significant, following the guidelines of [Brown \(2015\)](#).

Regarding the reliability of the results, considering the sample size (over 300 participants) and the number of items analyzed, Cronbach's alpha coefficient values above 0.70 were established as indicating adequate stability ([Marôco, 2021](#)). This threshold was used as a reference to ensure the robustness required for a detailed and reliable analysis.

Finally, to explore the intensity and direction of the relationships between the different constructs, Pearson's linear correlation (r) was employed. In this analysis, correlation values were interpreted as follows: below 0.200, very weak or negligible associations; between 0.200 and 0.399, weak associations; between 0.400 and 0.699, moderate associations; between 0.700 and 0.899, strong associations; and between 0.900 and 1.000, very strong associations ([Hair et al., 2019](#)).

3. Results

Table 1 provides a detailed overview of the descriptive statistics, including mean, standard deviation, skewness, and kurtosis, for the variables considered in the SEM analysis. The presented data indicate that none of the variables exceeded the thresholds set for extreme criteria, ensuring the reliability of the estimates and the adequacy of the proposed model.

Table 1. Descriptive statistics of the variables analyzed in the model.

Variable	Min.	Max.	Mean	SD	Skewness	Kurtosis
planning (SRL)	3	15	10.73	2.681	-0.281	-0.093
execution (SRL)	3	15	10.78	3.034	-0.844	0.568
evaluation (SRL)	3	15	11.56	2.928	-0.909	0.747
volitional control strategies	9	45	19.28	8.460	-0.799	0.438
procrastination	10	50	24.97	6.597	0.720	0.656
Portuguese level	1	5	2.83	0.799	0.533	0.333
English level	1	5	3.00	1.028	0.491	-0.583

Continued

Mathematics level	1	5	2.71	0.886	0.611	0.040
Natural Sciences level	1	5	3.07	0.7843	0.370	0.054

Legend: Min. = Minimum; Max. = Maximum; SD = Standard Deviation.

The global fit indices of the proposed SEM model demonstrate significant robustness [$\chi^2_{(8)} = 11.146$; $p = 0.194$; $\chi^2/df = 1.393$; GFI = 0.995; AGFI = 0.988; TLI = 0.995; CFI = 0.997; RMSEA = 0.022 (90% CI: 0.000 - 0.050); Critical N (0.05/1119 - 0.01/1450)], confirming that the model accurately reflects the relationships between the variables analyzed in the empirical matrix. The interpretation of **Figure 1** and **Table 2** further supports the validity of the proposed hypotheses, all of which are statistically significant.

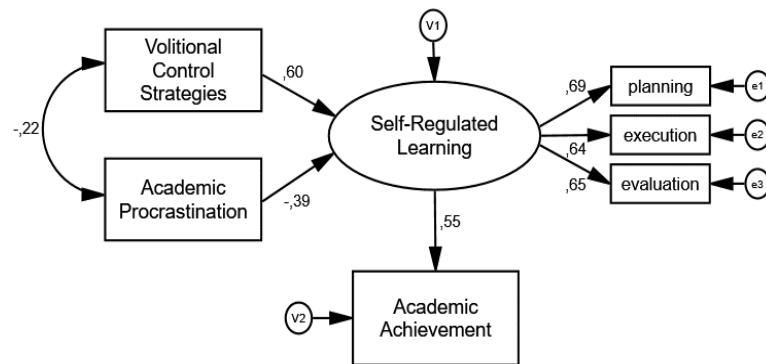


Figure 1. SEM model (n = 805).

Table 2. Descriptive statistics of the variables included in the model.

Hypotheses		UEV	SEV	SE	p
self-regulation	← volitional control strategies	0.099	0.596	0.006	***
self-regulation	← procrastination	-0.080	-0.394	0.007	***
planning (SRL)	← self-regulation	1.000	---	---	---
execution (SRL)	← self-regulation	1.046	0.639	0.069	***
evaluation (SRL)	← self-regulation	1.021	0.646	0.066	***
academic achievement	← self-regulation	0.893	0.552	0.067	***

Legend: UEV = unstandardized estimated values; SEV = standardized estimated values; SE = standard errors; p = significance levels; *** = $p < 0.001$.

It is observed that students who more frequently use volitional control strategies tend to exhibit higher levels of self-regulation in learning (H1; $\beta = 0.60$; $p < 0.001$). In contrast, academic procrastination is associated with lower levels of self-regulation for learning (H2; $\beta = -0.39$; $p < 0.001$).

Furthermore, students' academic achievement is positively impacted directly by

self-regulatory processes and indirectly by volitional control strategies and academic procrastination (H3; $\beta = 0.55$; $p < 0.001$). These results highlight the importance of promoting self-regulation skills and effective volitional control strategies to mitigate the negative effects of academic procrastination and enhance academic success.

The data analysis reveals that the regression coefficients between the latent variables are statistically significant ($p < 0.05$), indicating that the relationships predicted in the model rest on a solid statistical foundation. Additionally, the inspection of the residuals and modification indices (MI) did not identify any significant discrepancies that the model could not explain.

The standardized residuals remained low, and the modification suggestions did not indicate the absence of fundamental relationships, reinforcing the adequacy of the proposed model to the interactions described in the empirical matrix. These results validate the model's structure, confirming that it accurately captures the relationships between the constructs analyzed.

This description underscores that the supplementary analyses support the robustness and adequacy of the model, validating the relationships established between the variables. By meeting these criteria, it becomes clear that the proposed model faithfully represents the interactions between the variables in the empirical matrix, demonstrating a consistent and satisfactory fit to the observed data.

Based on the constructed theoretical model, the squared multiple correlations indicate that academic performance is directly explained by SRL processes and indirectly by VCS and AP by about 30% ($\eta^2 = 0.304$). In turn, students' self-regulatory processes are directly explained by VCS and AP by approximately 61% ($\eta^2 = 0.612$).

Table 3. Pearson correlations of the variables included in the model.

	1	2	3	4	5
1. volitional control strategies	1				
2. procrastination	0.639**	1			
3. planning (SRL)	-0.572**	-0.558**	1		
4. execution (SRL)	-0.503**	-0.419**	0.428**	1	
5. evaluation (SRL)	-0.524**	-0.469**	0.424**	0.444**	1
6. academic achievement	-0.416**	-0.388**	0.402**	0.361**	0.370**

Legend: ** Significant correlation at the level of $p < 0.01$.

An additional analysis was conducted to evaluate the intensity and direction of the linear relationship between the variables under study (see **Table 3**). Two variables are considered correlated when a change in one leads to a change in the other, with this relationship quantified by Pearson's linear correlation coefficient. The analysis revealed statistically significant associations between all model variables, with most correlations falling within moderate levels (values between 0.400

and 0.699). Notably, a moderate and positive association was found between volitional control strategies and procrastination ($r = 0.639$; $p < 0.01$), indicating significant cohesion among the variables analysed.

4. Discussion

This study aimed to explore how SRL processes influence students' academic achievement. Another focus was to evaluate the impact of constructs such as volitional control strategies and academic procrastination on students' SRL. Despite the growing academic interest in these relationships, the available literature remains limited, particularly regarding studies employing the SEM methodology. Acknowledging the educational relevance of this topic, the present study sought to deepen the understanding of the interactions between the variables analyzed, using this analytical approach, which allows for the simultaneous assessment of direct and indirect effects. In this context, the data obtained supported the hypotheses presented in the model, highlighting the dynamics underlying the relationships established.

Regarding Hypothesis H1, volitional control strategies are fundamental for sustaining students' SRL, enabling them to persist in their goals and maintain consistent performance, even in challenging scenarios, as highlighted by [Vermeer et al. \(2000\)](#). The sample data reinforce this idea, particularly through items such as "thinking that if I don't get a good grade, the responsibility will be mine" and "hurrying to the classroom and apologizing to the teacher for being late." These behaviors reflect an active commitment and a sense of responsibility toward academic demands, illustrating the positive impact of VCS in the educational context. Thus, it becomes evident that these strategies play a crucial role in helping students maintain focus and overcome challenges.

The measurement of VCS, although important, can be influenced by students' subjective perceptions. [Fuentes et al. \(2023\)](#) highlight that subjective measurements of self-regulation may be distorted by students' self-perception, limiting the accuracy of the data. Longitudinal studies could provide a more precise understanding of the impact of these strategies over time.

Research conducted by [Fuentes et al. \(2023\)](#) provides an in-depth analysis of how volitional control strategies directly influence the processes of SRL. According to these authors, students' intentional choices in planning, monitoring, and adjusting their strategies are crucial for academic success. When these strategies are well-developed, students can remain focused on their goals even in challenging situations ([Boekaerts & Cascallar, 2006](#)). Furthermore, volitional skills play a vital role in fulfilling academic responsibilities, collaborating effectively in teams, and meeting pedagogical expectations, ensuring not only personal achievement but also alignment with the values and norms of the educational context.

The effectiveness of VCS may vary across different educational contexts, as mentioned by [Vera \(2022\)](#), who suggests that the impact of volitional control may be more significant in higher education settings than in primary education. This

indicates that the generalization of findings from a specific sample may be limited.

Fostering VCS is essential to enhance students' SRL processes, enabling them to achieve better academic outcomes. By adopting a conscious approach to their learning, students can adjust and refine their educational strategies. Several studies emphasize the importance of guiding students in effectively utilizing these strategies to maximize their benefits and improve academic achievement (Fuentes et al., 2023; Rodríguez-Guardado & Juárez-Díaz, 2023; Vera, 2022; Zimmerman, 2008).

To overcome the limitation of observation-based studies, it would be important to implement interventions focused on the development of volitional control strategies, as suggested by Fuentes et al. (2023). Such interventions could include workshops or coaching sessions, helping students enhance their self-regulation skills during periods of greater pressure.

The integration of social and emotional variables in the investigation of VCS can provide a broader understanding of the dynamics between self-regulation strategies and academic performance. Fuentes et al. (2023) and Boekaerts and Cascallar (2006) point out that emotional factors, such as motivation and social support, interact with VCS and deserve greater attention in future studies.

Volitional control involves deliberate decisions and the execution of planned actions aimed at achieving academic goals. According to Vera (2022), the ability to resist distractions and redirect focus toward priority tasks is a critical foundation for fostering learning processes. An example of this mind-set is reflected in the statement, "thinking that even if I miss class, I won't enjoy myself because I won't be doing what I should be doing", which, though less emphasized by students in the sample, underscores the importance of a responsibility-oriented mentality.

These strategies, as noted by Fuentes et al. (2023), are reflected in consistent work habits, both within the school environment and in commitments outside of it. Their implementation demonstrates a continuous effort to align daily activities with personal and academic goals, thereby enhancing the effectiveness of SRL (Lourenço & Paiva, 2024).

The data from this study also support hypothesis 2, confirming that academic procrastination negatively impacts students' SRL processes. This effect manifests as reduced self-discipline and ineffective time management, exacerbating the challenges of achieving academic excellence (Lourenço & Paiva, 2024). Academic procrastination, a phenomenon widely discussed in the literature, stands out as one of the main obstacles to SRL, significantly undermining academic success.

Silva et al. (2022) highlight that procrastination manifests across various aspects of daily life, with the constant postponement of school tasks being particularly concerning. In this study, items such as "falling behind on material because I don't study daily" and "interrupting study to engage in other activities (like watching television or talking on the phone)" were frequently noted by students, illustrating challenges in time management and maintaining focus on academic tasks.

However, the item “when the teacher assigns a task in class, I don’t start it immediately” received the lowest scores. This suggests that, while not always overt, procrastination often reflects shortcomings in SRL processes.

Procrastinator behaviors tend to arise more frequently in contexts of higher demands and pressure, as observed by Machado and Schwartz (2018). Among the most commonly cited reasons for this behavior are poor time management, unfavorable study environments, difficulty concentrating, anxiety about evaluations, dysfunctional beliefs, fear of failure, and low tolerance for frustration (Fior et al., 2022).

The measurement of AP can be imprecise, as it relies on students’ self-reports, which may be influenced by their self-perception or a tendency to omit negative behaviour. This is highlighted by Júnior et al. (2024), who suggest that procrastination is often underestimated by students themselves. Future studies could integrate multiple data collection methods, such as observations and journals, to enhance the reliability of these measurements.

The social and emotional context should also be considered, as social support and emotional management are important factors that can moderate the impact of procrastination on SRL processes. According Fior et al. (2022), educational environments that promote emotional support and student well-being can mitigate the tendency toward procrastination, thereby improving academic performance.

Educational interventions focused on controlling procrastination can be effective. A study by Marcilio et al. (2021) suggests that training programs on emotional regulation strategies and time management could reduce procrastination and increase students’ productivity. Such interventions may also include the development of self-control skills and the use of digital tools for task monitoring and planning.

Future research should consider the role of procrastination in collaborative and group learning contexts, as procrastination can have implications not only on individual performance but also on group dynamics and collective outcomes. Integrating these variables could provide a broader and more contextualized view of the impact of procrastination on SRL processes (Schunk & Zimmerman, 2023).

However, procrastination is not limited to harming academic achievement. As mentioned by Júnior et al. (2024) highlight its multiple adverse impacts, such as increased stress, negative consequences for physical and mental health, and the waste of resources. These authors emphasize the importance of the concepts of self-efficacy and self-regulation in mitigating AP, as these skills directly influence students’ motivation and habits.

In response to this challenge, it is imperative to develop effective intervention strategies. The research by Fior et al. (2022) emphasize the need to raise students’ awareness of the impacts of procrastinator behaviors on their school activities, while Marcilio et al. (2021) underline the importance of tools for time management and productive work habits. By implementing these approaches, the educational community can play a crucial role in strengthening students’ SRL processes, helping them achieve more effective learning and higher academic achievement

(KS et al., 2023).

In the context of hypothesis H3, it was found that students with higher levels of SRL demonstrate superior academic achievement, corroborating the findings of previous studies (Callan et al., 2022; Lourenço & Paiva, 2024). This relationship underscores the importance of creating educational environments that foster the development of the skills underlying SRL, recognizing it as a central factor in explaining students' academic outcomes.

According Alliprandini et al. (2023), preparing students to effectively manage the abundance of available information is essential for fostering autonomous learning. This process requires students to acquire skills to plan, organize, monitor, and evaluate their own learning processes. By doing so, they build personalized systems that help them set clear goals, develop action plans, and optimize their development. Students with well-developed SRL stand out for their ability to set appropriate goals, strategically analyze challenges, and effectively manage their thoughts (Fuentes et al., 2023).

The results by Lourenço and Paiva (2024) demonstrate that students with higher AP are those who set clear goals, calculate the time needed to complete their tasks, and maintain a rigorous study routine. These practices are fundamental elements of effective SRL, allowing not only for the meeting of deadlines but also for the consolidation of more meaningful and deeper learning.

The relationship between SRL and academic success is widely supported by research. The study mentioned by Ganda and Boruchovitch (2019) argues that students who plan, control, and evaluate their cognitive, emotional, motivational, and behavioral processes are more likely to achieve superior results. This idea is reinforced by the work of Callan et al. (2022) and Lourenço & Paiva (2024), which highlight how high levels of SRL are directly linked to academic success.

To promote these competencies, it is crucial to rethink pedagogical processes. Zimmerman (2008) argues that learning should be understood as a personal experience in which the student takes on an autonomous and proactive role. At the same time, teachers must support students in developing these competencies, helping them take responsibility for their own academic journey. Only teachers who practice SRL strategies in their daily activities are able to effectively transmit these skills to students.

In this regard, Parveen et al. (2023) emphasize the importance of students regularly engaging in self-assessments, reflecting on the factors that contributed to their success or failure, and planning strategies for continuous improvement. This cycle of reflection and adjustment is essential for enhancing academic achievement and reinforcing skills that are applicable across various areas of life. Thus, promoting effective SRL processes not only improves students' academic outcomes but also develops essential competencies for long-term success. As highlighted by Schunk and Zimmerman (2023), this holistic approach to learning values both academic and personal growth, underscoring the importance of self-regulation as a pillar of educational success.

The measurement of AP, often conducted through tests or point-in-time

assessments, can be influenced by various factors such as students' motivation and emotional state. These factors may not be accurately captured by traditional performance measures. [Fuentes et al. \(2023\)](#) highlight that academic performance assessment should be more holistic, considering factors such as the evolution of learning over time. The use of longitudinal instruments could provide a more accurate view of the impact of SRL strategies over the course of the study.

The effectiveness of SRL strategies may vary depending on the educational context. For example, the impact of self-regulation strategies may be more pronounced in contexts with greater autonomy, such as higher education, compared to more structured environments, such as primary education. [Vera \(2022\)](#) and [Boekaerts & Cascallar \(2006\)](#) indicate that differences in pedagogical approaches, such as teaching strategies and the support provided, can influence the effectiveness of SRL strategies. This suggests that the study's conclusions may not be fully generalizable to all educational contexts.

To overcome the limitation related to the measurement of AP, it would be useful to adopt a more comprehensive approach, including multiple assessment tools that can capture the cognitive, emotional, and behavioral dimensions of SRL, as suggested by [Zimmerman \(2008\)](#). Furthermore, intervention programs focused on the development of SRL skills could be implemented, providing ongoing support to students throughout their educational journey.

Future research should consider the inclusion of social and emotional variables in the investigation of SRL strategies. [Fuentes et al. \(2023\)](#) and [Boekaerts & Cascallar \(2006\)](#) suggest that factors such as intrinsic motivation, self-esteem, and social support play an important role in the effectiveness of self-regulation strategies. Studies that integrate these elements could provide a more comprehensive understanding of the dynamics between SRL and academic performance, as well as reveal new opportunities to strengthen pedagogical practices.

Limitations and Future Research

This study provides valuable contributions to understanding students' academic achievement, but its conclusions should be considered with caution, taking into account some limitations. Although it includes key variables to explain academic success, it is clear that additional factors remain unexplored. These elements could be crucial in enhancing the impact of the presented model and should be the subject of future research.

The reliance on self-report questionnaires is a significant methodological limitation, as these instruments do not directly capture the dynamics of teaching and learning in real-time. To enrich knowledge in this area, the use of qualitative methodologies, such as interviews or focus groups, is suggested, allowing for a deeper insight into patterns of persistent success and repeated failure among students. These approaches could reveal new perspectives and important differences, broadening the understanding of educational challenges.

Although the sample used was representative, with 805 participants, the results

are not generalizable to the entire school population. However, this was not the main objective. The larger purpose is to lay the groundwork for future research that explores how different variables and strategies can transform the educational environment. Adopting studies that consider multiple levels of analysis and varied contexts will be essential for creating more effective interventions, promoting academic success in a more inclusive and sustainable way. What is presented here is an invitation to innovate in the field of education, challenging researchers and educators to look beyond the obvious and explore what remains to be discovered.

5. Conclusions

The systematic review of PISA reports and recent studies in the field of education highlight the urgency of exploring predictive variables for academic success, focusing on student engagement in cognitive, behavioral, and emotional dimensions. To achieve academic excellence, it is crucial for students to value school tasks, commit to SRL strategies, and plan their school activities effectively. These practices, by promoting autonomy and volitional control, reflect a greater ability to tackle academic challenges.

The ability to set clear, measurable goals aligned with academic objectives emerges as an essential tool for addressing dysfunctions that may compromise academic achievement. This understanding enables more effective pedagogical interventions and a better comprehension of students' behavior in organizing their daily routines. At the same time, reducing procrastination, which is often practiced in school contexts, is a vital strategy that allows students to maintain focus and maximize their efforts in achieving the set goals.

By integrating variables such as volitional control, procrastination, and self-regulated learning, schools have the opportunity to play a transformative role. They not only improve the quality of education but also promote the development of autonomous, resilient, and competent students, capable of dealing with adversity and achieving high academic achievement. This path is essential for building a more promising educational future, characterized by excellence and commitment.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Abdollahi, A., Maleki Farab, N., Panahipour, S., & Allen, K. A. (2020). Academic Hardiness as a Moderator between Evaluative Concerns Perfectionism and Academic Procrastination in Students. *The Journal of Genetic Psychology, 181*, 365-374. <https://doi.org/10.1080/00221325.2020.1783194>
- Afonso Lourenço, A., & Maria Leite Nogueira, C. (2014). Percepções sobre as abordagens à aprendizagem—Estudo de variáveis psicológicas. *Educação e Filosofia, 28*, 323-372. <https://doi.org/10.14393/revedfil.issn.0102-6801.v28n55a2014-p323-372>
- Afzal, S., & Jami, H. (2018). Prevalence of Academic Procrastination and Reasons for Aca-

- Demic Procrastination in University Students. *Journal of Behavioural Sciences*, 28, 51-69. http://pu.edu.pk/images/journal/doap/PDFFILES/04_v28_1_18.pdf
- Alliprandini, P. M. Z., dos Santos, D. A., & Rufini, S. É. (2023). *Autorregulação da aprendizagem e da motivação em diferentes contextos educativos: Teoria, aprendizagem e intervenção*. EDUEL.
- Arbuckle, J. L. (2022). *IBM®, SPSS®, Amos™ 29 User's Guide*. IBM.
- Arcoverde, A. R. d. R., Boruchovitch, E., & Góes, N. M. (2022). Programa de intervenção em autorregulação da aprendizagem: Impacto no conhecimento e nas percepções de estudantes de licenciatura. *Revista de Educação PUC-Campinas*, 27, 1-15. <https://doi.org/10.24220/2318-0870v27e2022a5513>
- Asri, D. N., Setyosari, P., Hitipeuw, I., & Chusniyah, T. (2017). The Academic Procrastination in Junior High School Students' Mathematics Learning: A Qualitative Study. *International Education Studies*, 10, 70-77. <https://doi.org/10.5539/ies.v10n9p70>
- Ato, M., López-García, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología*, 29, 1038-1059. <https://doi.org/10.6018/analesps.29.3.178511>
- Bandura, A. (1986). The Explanatory and Predictive Scope of Self-Efficacy Theory. *Journal of Social and Clinical Psychology*, 4, 359-373. <https://doi.org/10.1521/jscp.1986.4.3.359>
- Bandura, A. (2002). Social Cognitive Theory in Cultural Context. *Applied Psychology*, 51, 269-290. <https://doi.org/10.1111/1464-0597.00092>
- Bandura, A. (2008). An Agentic Perspective on Positive Psychology. In S. J. Lopez (Ed.), *Positive Psychology: Exploring the Best in People (Vol. 1). Discovering Human Strengths* (pp. 167-196). Praeger Publishers/Greenwood Publishing Group.
- Boekaerts, M., & Cascallar, E. (2006). How Far Have We Moved toward the Integration of Theory and Practice in Self-Regulation? *Educational Psychology Review*, 18, 199-210. <https://doi.org/10.1007/s10648-006-9013-4>
- Brown, T. (2015). *Confirmatory Factor Analysis for Applied Research* (2nd ed.). The Guilford Press. <https://www.guilford.com/books/Confirmatory-Factor-Analysis-for-Applied-Research/Timothy-Brown/9781462515363>
- Byrne, B. (2016). *Structural Equation Modeling With AMOS: Basic Concepts, Applications, and Programming*. Routledge. <https://www.taylorfrancis.com/books/mono/10.4324/9781315757421/structural-equation-modeling-amos-barbara-byrne>
- Callan, G. L., DaVia Rubenstein, L., Barton, T., & Halterman, A. (2022). Enhancing Motivation by Developing Cyclical Self-Regulated Learning Skills. *Theory Into Practice*, 61, 62-74. <https://doi.org/10.1080/00405841.2021.1932153>
- Chen, B., Waters, C. N., Compier, T., Uijtdewilligen, L., Petrunoff, N. A., Lim, Y. W. et al. (2020). Understanding Physical Activity and Sedentary Behaviour among Preschool-Aged Children in Singapore: A Mixed-Methods Approach. *BMJ Open*, 10, e030606. <https://doi.org/10.1136/bmjopen-2019-030606>
- Cho, M., & Shen, D. (2013). Self-Regulation in Online Learning. *Distance Education*, 34, 290-301. <https://doi.org/10.1080/01587919.2013.835770>
- Cormack, S. H., Eagle, L. A., & Davies, M. S. (2020). A Large-Scale Test of the Relationship between Procrastination and Performance Using Learning Analytics. *Assessment & Evaluation in Higher Education*, 45, 1046-1059. <https://doi.org/10.1080/02602938.2019.1705244>
- Costa Júnior, J. F., Bezerra, D. D. M. C., de Araújo, A. G., & Ramos, A. S. M. (2023).

- Arquétipos de Procrastinação Acadêmica: Um modelo baseado nos conceitos de autorregulação autoeficácia e perfeccionismo. *International Scientific Journal*, 18, 128-152. <http://dx.doi.org/10.6020/1679-9844/v18n2a8>
- Costa, H. S., Reis, H. L., Lima, V. L. M. C., de Souza, E. T., de Oliveira, C. F., & Chirinéa, G. (2022). Eficácia de intervenções não medicamentosas em procrastinação acadêmica: Revisão integrativa. *Estudos em Psicologia*, 10, 25-47.
- Declaration of Helsinki (2013). Ethical Principles for Medical Research Involving Human Subjects. *JAMA*, 310, 2191-2194. <https://doi.org/10.1001/jama.2013.281053>
- Fernandes, G. N. A., & Lemos, S. M. A. (2020). Motivação para aprender no ensino fundamental e a associação com aspectos individuais e contextuais. *CoDAS*, 32, e20190247. <https://doi.org/10.1590/2317-1782/20192019247>
- Finney, S., & Distefano, C. (2013). Nonnormal and Categorical Data in Structural Equation Models. In G. R. Hancock, & R. O. Mueller (Eds.), *A Second Course in Structural Equation Modeling* (pp. 439-492). Information Age. <https://psycnet.apa.org/record/2014-01991-011>
- Fior, C. A., Sampaio, R. K. N., Reis, C. A. d. C., & Polydoro, S. A. J. (2022). Autoeficácia e procrastinação acadêmica em estudantes do ensino superior: Um estudo correlacional. *Psico*, 53, e38943. <https://doi.org/10.15448/1980-8623.2022.1.38943>
- Frison, L. M. B., & Boruchovitch, E. (2020). Autorregulação da aprendizagem: Modelos teóricos e reflexões para a prática pedagógica. In L. M. B. Frison, & E. Boruchovitch (Eds.), *Autorregulação da aprendizagem: Cenários, desafios, perspectivas para o contexto educativo* (pp. 17-30). Vozes.
- Frison, L. M. B., Simão, A. M. V., Ferreira, P. d. C., & Paulino, P. (2021). Percursos de estudantes da Educação Superior com trajetórias de insucesso. *Ensaio: Avaliação e Políticas Públicas em Educação*, 29, 669-690. <https://doi.org/10.1590/s0104-403620210002902747>
- Fuentes, S., Rosário, P., Valdés, M., Delgado, A., & Rodríguez, C. (2023). Autorregulación del Aprendizaje: Desafío para el Aprendizaje Universitario Autónomo. *Revista latinoamericana de educación inclusiva*, 17, 21-39. <https://doi.org/10.4067/s0718-73782023000100021>
- Ganda, D. R., & Boruchovitch, E. (2019). Intervenção em autorregulação da aprendizagem com alunos do ensino superior: Análise da produção científica. *Estudos Interdisciplinares em Psicologia*, 10, 3-25. <https://doi.org/10.5433/2236-6407.2019v10n3p03>
- Garzón Umerenkova, A., & Gil Flores, J. (2017). El papel de la procrastinación académica como factor de la deserción universitaria. *Revista Complutense de Educación*, 28, 307-324. https://doi.org/10.5209/rev_rced.2017.v28.n1.49682
- Gianfelice, M. A., Murgo, C. S., & Souza, A. P. d. (2024). Resiliência, Bem-Estar Subjetivo e Fatores de Risco e Proteção em Estudantes Universitários. *Psico-USF*, 29, e266514. <https://doi.org/10.1590/1413-8271202429e266514>
- Gil Flores, J., De Besa Gutiérrez, M. R., & Garzón Umerenkova, A. (2020). Por qué procrastina el alumnado universitario? Análisis de motivos y caracterización del alumnado con diferentes tipos de motivaciones. *Revista de Investigación Educativa*, 38, 183-200. <https://doi.org/10.6018/rie.344781>
- González-Brignardello, M. P., Sánchez-Elvira Paniagua, A., & López-González, M. Á. (2023). Academic Procrastination in Children and Adolescents: A Scoping Review. *Children*, 10, Article No. 1016. <https://doi.org/10.3390/children10061016>
- Gutiérrez-Braojos, C. (2015). Future Time Orientation and Learning Conceptions: Effects on Metacognitive Strategies, Self-Efficacy Beliefs, Study Effort and Academic Achievement. *Educational Psychology*, 35, 192-212.

- <https://doi.org/10.1080/01443410.2013.858101>
- Hadwin, A. F., Järvelä, S., & Miller, M. (2011). Self-Regulated, Co-Regulated, and Socially Shared Regulation of Learning. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Handbook of Self-Regulation of Learning and Performance* (pp. 65-84). Routledge, Taylor & Francis Group.
- Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2019). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
<https://www.cengage.uk/c/multivariate-data-analysis-8e-hair-babin-anderson-black/9781473756540/?searchIsbn=9781473756540>
- Hu, L., & Bentler, P. M. (1999). Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1-55. <https://doi.org/10.1080/10705519909540118>
- Jöreskog, K. G., & Sörbom, D. (1983). *LISREL—6 User's Reference Guide*. Scientific Software.
- Júnior, J. F. d. C., Bezerra, D. d. M. C., Araújo, A. G. d., & Ramos, A. S. M. (2024). Anti-procrastination Strategies, Techniques and Tools and Their Interrelation with Self-Regulation and Self-Efficacy. *Journal of Education and Learning*, 13, 72-91.
<https://doi.org/10.5539/jel.v13n1p72>
- Kim, K. R., & Seo, E. H. (2015). The Relationship between Procrastination and Academic Performance: A Meta-Analysis. *Personality and Individual Differences*, 82, 26-33.
<https://doi.org/10.1016/j.paid.2015.02.038>
- Ks, V. M., Rajkumar, E., Lakshmi, R., John, R., Sunny, S. M., Joshua George, A. et al. (2023). Influence of Decision-Making Styles and Affective Styles on Academic Procrastination among Students. *Cogent Education*, 10, Article ID: 2203598.
<https://doi.org/10.1080/2331186x.2023.2203598>
- Kulakow, S. (2020). Academic Self-Concept and Achievement Motivation among Adolescent Students in Different Learning Environments: Does Competence-Support Matter? *Learning and Motivation*, 70, Article ID: 101632.
<https://doi.org/10.1016/j.lmot.2020.101632>
- Leite, R. (2008). *Estratégias de controlo volitivo e processos de auto-regulação em alunos do terceiro ciclo*. Tese de Mestrado, Universidade do Minho.
- Liangruenrom, N., Craike, M., Biddle, S. J. H., Suttikasem, K., & Pedisic, Z. (2019). Correlates of Physical Activity and Sedentary Behaviour in the Thai Population: A Systematic Review. *BMC Public Health*, 19, Article No. 414.
<https://doi.org/10.1186/s12889-019-6708-2>
- Lohr, S. L. (2022). *Sampling: Design and Analysis*. Chapman and Hall/CRC.
- Lourenço, A. A. (2008). *Processos auto-regulatórios em alunos do 3. Ciclo do Ensino Básico: Contributo da auto-eficácia e da instrumentalidade*. Tese de doutoramento, Instituto de Educação e Psicologia da Universidade do Minho.
- Lourenço, A. A., & Paiva, M. O. A. (2024). Self-Regulation in Academic Success: Exploring the Impact of Volitional Control Strategies, Time Management Planning, and Procrastination. *International Journal of Changes in Education*, 1, 113-122.
<https://doi.org/10.47852/bonviewijce42022392>
- Machado, B. A. B., & Schwartz, S. (2018). Procrastinação e aprendizagem acadêmica. *Revista Eletrônica Científica da UERGS*, 4, 119-135.
<https://doi.org/10.21674/2448-0479.41.119-135>
- Malpica-Chavarria, E. A., & Garzón-Umerenkova, A. (2024). Frecuencia y motivos para procrastinar: Impacto del curso, género, autorregulación y autoeficacia. *Revista Fuentes*,

- 2, 171-184. <https://doi.org/10.12795/revistafuentes.2024.23502>
- Manyanga, T., Pelletier, C., Prince, S. A., Lee, E., Sluggett, L., & Lang, J. J. (2022). A Comparison of Meeting Physical Activity and Screen Time Recommendations between Canadian Youth Living in Rural and Urban Communities: A Nationally Representative Cross-Sectional Analysis. *International Journal of Environmental Research and Public Health*, *19*, Article No. 4394. <https://doi.org/10.3390/ijerph19074394>
- Marcilio, F. C. P., Blando, A., Rocha, R. Z. d., & Dias, A. C. G. (2021). Guia de Técnicas para a Gestão do Tempo de Estudos: Relato da Construção. *Psicologia: Ciência e Profissão*, *41*, 1-13. <https://doi.org/10.1590/1982-3703003218325>
- Marôco, J. (2021). *Análise estatística com o SPSS statistics* (8th ed.). Report Number LDA. <https://www.bertrand.pt/livro/analise-estatistica-com-o-spss-statistics-joao-maroco/24699154>
- Mccann, E. J., & Turner, J. E. (2004). Increasing Student Learning through Volitional Control. *Teachers College Record: The Voice of Scholarship in Education*, *106*, 1695-1714. <https://doi.org/10.1177/016146810410600902>
- McDonald, R. P., & Ho, M. R. (2002). Principles and Practice in Reporting Structural Equation Analyses. *Psychological Methods*, *7*, 64-82. <https://doi.org/10.1037/1082-989x.7.1.64>
- Mosquera, P., Soares, M. E., Dordio, P., & Melo, L. A. e. (2022). O ladrão do tempo e a sustentabilidade social: análise de um modelo de procrastinação no trabalho. *Revista de Administração de Empresas*, *62*, e2021-0313. <https://doi.org/10.1590/s0034-759020220510x>
- OECD (2023). *Report of the Programme for International Student Assessment (PISA 2023)*. <https://eco.sapo.pt/2023/12/05/pisa-o-estado-da-educacao-em-cinco-graficos/>
- Parveen, A., Jan, S., Rasool, I., Waseem, R., & Bhat, R. A. (2023). Self-Regulated Learning. In E. Meletiadou (Ed.), *Handbook of Research on Redesigning Teaching, Learning, and Assessment in the Digital Era* (pp. 388-414). IGI Global. <https://doi.org/10.4018/978-1-6684-8292-6.ch020>
- Rahimi, S., Hall, N. C., & Pychyl, T. A. (2016). Attributions of Responsibility and Blame for Procrastination Behavior. *Frontiers in Psychology*, *7*, Article No. 1179. <https://doi.org/10.3389/fpsyg.2016.01179>
- Rodríguez-Guardado, M. d. S., & Juárez-Díaz, C. (2023). Relación entre estilos de aprendizaje y estrategias volitivas en estudiantes universitarios de lenguas extranjeras. *RECIE. Revista Caribeña de Investigación Educativa*, *7*, 123-141. <https://doi.org/10.32541/recie.2023.v7i1.pp123-141>
- Rosário, P., Costa, M., Núñez, J. C., González-Pienda, J., Solano, P., & Valle, A. (2009). Academic Procrastination: Associations with Personal, School, and Family Variables. *The Spanish Journal of Psychology*, *12*, 118-127. <https://doi.org/10.1017/s1138741600001530>
- Rosário, P., Lourenço, A., Paiva, M. O., Núñez, J. C., González-Pienda, J., & Valle, A. (2010). Inventário de processos de auto-regulação da aprendizagem (IPAA). In M. M. Gonçalves, M. R. Simões, L. S. Almeida, & C. Machado (Eds.), *Avaliação Psicológica. Instrumentos validados para a população portuguesa. Inventário de processos de auto-regulação da aprendizagem (IPAA)* (Vol. 4, pp. 159-174). Coimbra.
- Rosário, P., Núñez, J. C., Valle, A., González-Pienda, J., & Lourenço, A. (2013). Grade Level, Study Time, and Grade Retention and Their Effects on Motivation, Self-Regulated Learning Strategies, and Mathematics Achievement: A Structural Equation Model. *European Journal of Psychology of Education*, *28*, 1311-1331. <https://doi.org/10.1007/s10212-012-0167-9>

- Rozental, A., & Carlbring, P. (2014). Understanding and Treating Procrastination: A Review of a Common Self-Regulatory Failure. *Psychology, 5*, 1488-1502. <https://doi.org/10.4236/psych.2014.513160>
- Schunk, D. H., & Zimmerman, B. J. (2012). *Handbook of Psychology* (2nd ed.). Wiley Online Library.
- Schunk, D. H., & Zimmerman, B. J. (2023). *Self-Regulation of Learning and Performance: Issues and Educational Applications*. Taylor & Francis.
- Silva, F. A., & Bizerra, A. M. C. (2022). Percepção de alunos sobre a autorregulação da aprendizagem no ensino médio profissionalizante. *Revista Cocar, 17*, 1-20. <https://periodicos.uepa.br/index.php/cocar/article/view/5447>
- Silva, L. d. S., Bernardes, J. R., Nascimento, J. C. H. B. d., Veras, S. L. L., & Castro, M. M. B. d. (2022). As relações entre o desempenho acadêmico e a procrastinação: Um estudo exploratório com acadêmicos dos cursos de graduação em ciências contábeis e administração do piauí. *Contabilidade Vista & Revista, 33*, 115-143. <https://doi.org/10.22561/cvr.v33i1.6441>
- Silva, P. M. M., & Alliprandini, P. M. Z. (2020). Autorregulação da aprendizagem de alunos do ensino médio: Um estudo de caso. *Revista Cocar, 14*, 1-18. <https://periodicos.uepa.br/index.php/cocar/article/view/3329>
- Vera Sagredo, A. (2022). Autorregulación en el aprendizaje de estudiantes y su relación con rendimiento académico. *Revista Conhecimento Online, 2*, 49-68. <https://doi.org/10.25112/rco.v2.2943>
- Vermeer, H. J., Boekaerts, M., & Seegers, G. (2000). Motivational and Gender Differences: Sixth-Grade Students' Mathematical Problem-Solving Behavior. *Journal of Educational Psychology, 92*, 308-315. <https://doi.org/10.1037/0022-0663.92.2.308>
- Vieira, M. d. S. T. C., Sousa, G. M. C. d., & Nascimento junior, J. R. A. d. (2021). Perfil Metacognitivo de Estudantes Universitários e suas Estratégias de Autorregulação de Aprendizagem. *ID on line. Revista de psicologia, 15*, 740-756. <https://doi.org/10.14295/idonline.v15i57.3233>
- Voss, N. M., & Vangsness, L. (2020). Is Procrastination Related to Low-Quality Data? *Educational Measurement: Issues and Practice, 39*, 95-104. <https://doi.org/10.1111/emip.12355>
- Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice, 41*, 64-70. https://doi.org/10.1207/s15430421tip4102_2
- Zimmerman, B. J. (2008). Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects. *American Educational Research Journal, 45*, 166-183. <https://doi.org/10.3102/0002831207312909>
- Zimmerman, B. J. (2023). Dimensions of Academic Self-Regulation: A Conceptual Framework for Education. In D. H. Schunk, & B. J. Zimmerman (Eds.), *Self-Regulation of Learning and Performance* (pp. 3-21). Routledge. <https://doi.org/10.4324/9780203763353-1>