

RESEARCH ARTICLE



Self-Regulation in Academic Success: Exploring the Impact of Volitional Control Strategies, Time Management Planning, and Procrastination

Abílio Afonso Lourenço^{1,2,*} and Maria Olímpia Almeida Paiva¹

¹*Institute of Education, University of Minho, Portugal*

²*Department of Developmental and Educational Psychology, University of Murcia, Spain*

Abstract: Theoretical foundations in recent years emphasize that a significant number of students globally continue to exhibit a lack of commitment and motivation in school activities, leading to diminished proficiency levels in specific areas of study. The magnitude of this phenomenon, coupled with its evident social implications, suggests that we are facing restlessness and a growing demand for urgent answers and results. In the educational context, the sociocognitive perspective conceives the construct of self-regulation for learning as the management and mastery of a set of factors that emerge as crucial elements for high-quality learning and, predictably, academic success. To achieve this successful learning, it is crucial to manage and control variables such as volitional control strategies (VCS), planning of academic time management, and procrastination (PR). The purpose of this study is to demonstrate, through the technique of structural equation modeling, that these variables impact students' self-regulation and predict academic performance. A sample of 565 students ($M_{age} = 12.97$) from the 3rd cycle of basic education (7th, 8th, and 9th grades) participated, responding to a set of validated scales for the Portuguese context. The results indicated that students who employ more VCS and plan academic time management more effectively demonstrate higher levels of self-regulation for learning. However, those exhibiting higher levels of PR in school activities show a lower propensity to self-regulate their learning. Deepening the understanding of the elements that influence the learning process is crucial to promoting the quality of education and the development of autonomous, self-regulated, and competent students. A student who values school tasks, adopts self-regulatory strategies in their learning process, and manages their time dedicated to school activities appropriately and insightfully will undoubtedly be moving toward academic excellence.

Keywords: learning self-regulation, volitional control, academic time management planning, procrastination (PR), academic performance, basic education

1. Introduction

The recent Program for International Student Assessment (PISA) report by the OECD [1] has highlighted a global issue of lack of commitment and motivation among students. This issue has resulted in decreased proficiency in Reading, Mathematics, and Science, which has significant social implications. It is concerning that we are seeking immediate answers and results, which leads us to reflect on the connection between self-regulated learning (SRL) and academic performance (AP). In today's world, where students' motivation and engagement play crucial roles in their academic success, it is essential to address this issue.

In the ever-changing world of education, research is focused on understanding the factors that drive AP with a particular emphasis on the active role of students in the cognitive, behavioral, and motivational domains [2]. The European Commission has indicated that the Portuguese education system, while not unique in this regard, has

significant weaknesses in AP [3]. This highlights the importance of SRL and the need to explore the relationship between student motivation and academic success.

Research within the field of SRL explores how students take proactive control of their learning by guiding and regulating their cognition, motivation, and behavior toward established goals [4]. This approach aims to develop an educational culture that prioritizes SRL as a fundamental goal in the psycho-pedagogical projects of schools [5]. This focus highlights the significance of student autonomy in the educational process and emphasizes the need to incorporate strategies that promote self-regulation for more effective learning.

In this sequence, the literature review assigns significant importance to the study of AP, emphasizing individual and contextual conditions that foster academic success. The focus is on crucial variables such as SRL volitional control strategies (VCS), time management planning (TMP), and attitudes toward procrastination (PR). These elements, deemed essential, are identified as determinants for achieving the desired mastery. The reviewed literature, encompassing works about these constructs [6–11], underscores the relevance of these variables in a comprehensive understanding of factors contributing to educational success, thereby strengthening the theoretical foundation of the study.

*Corresponding author: Abílio Afonso Lourenço, Institute of Education, University of Minho, Portugal and Department of Developmental and Educational Psychology, University of Murcia, Spain. Email: The research was conducted in University of Minho, Portugal. Correspondence concerning this article should be addressed to privadoxy@gmail.com

In the 1970s, Flavell conducted studies on metacognitive knowledge which highlighted the importance of researching spontaneous acquisitions in the development of this domain. The studies emphasized the need to conduct effective investigations in teaching metacognitive knowledge and cognitive monitoring skills. Metacognitive knowledge includes stored knowledge or beliefs about oneself and others as cognitive agents, tasks, actions, or strategies, and how they interact, influencing outcomes in any intellectual endeavor. This profound understanding becomes crucial to unravel the nuances of AP [12, 13].

Therefore, for a student to be considered self-regulated, they must become a metacognitive, motivational, and behavioral participant in their learning [14]. However, if students cannot accurately distinguish between what they know and what they do not know, they are unlikely to engage in advanced metacognitive activities, such as realistically assessing their learning or planning for effective learning control [15]. Thus, it becomes essential to guide students to acquire knowledge about their learning and develop skills to manage and regulate it. This activity can occur independently, cooperatively, or collaboratively, leading to changes in knowledge, beliefs, and strategies that students can transfer to new contexts [16].

Following these pioneering studies, the emergence of Bandura's social cognitive theory [17, 18] marks a crucial theoretical approach that explores the interaction between personal, behavioral, and environmental factors in human functioning [19]. What sets this theory apart from contemporaries is its mission to explain human behavior, considering the significant influence of cognitive processes. The importance of cognitive aspects in individuals' ability to construct reality, self-regulate, interpret information, and perform behaviors is highlighted. This reveals the active role of individuals in the learning process and their interaction with the learning environment, aiming for academic success.

The environmental and personal factors are intricately linked to individuals' interpretation of the outcomes of their behavior [20]. According to Bandura [18], the human mind is productive, creative, proactive, and reflective, not merely reactive. A pivotal concept in social cognitive theory is "Human Agency", referring to the abilities to symbolize, learn from others, plan, self-regulate, and self-reflect. These capabilities empower individuals to adjust behaviors, achieve positive outcomes, and avoid undesirable results through mechanisms like intentionality, anticipation, self-reactiveness, and self-reflection [20]. These characteristics are intrinsically linked to SRL. Intentionality directs focus and deliberate efforts toward educational goals. Anticipation involves the ability to foresee challenges and adjust learning strategies. Self-reactiveness implies responding appropriately to obstacles encountered during the learning process. Finally, self-reflection enables a critical evaluation of one's performance, facilitating continuous adjustments and improvements in the SRL process [21]. The literature review underscores the importance of these concepts in studying AP and the various associated variables.

Currently, educational research demonstrates a growing concern for dynamics influencing the enhancement of AP, emphasizing the active role of the student in cognitive, behavioral, and motivational dimensions [19]. When examining key contemporary models developed from the sociocognitive perspective of learning, despite some distinct characteristics, it is observed that all emphasize the student as the primary agent of their learning and underscore that SRL can be cultivated at any stage of education, from primary to higher education [21]. SRL is associated with improved content retention, increased engagement in studies, and enhanced AP. In the field of Educational Psychology, particularly under the

sociocognitive theory, various theoretical models have been devised to comprehend this process.

For the development of dynamics associated with AP, SRL plays a fundamental role, with a significant body of studies linking it to other constructs, notably self-efficacy as a predictor of academic success [22], motivation as a key factor that can drive individuals toward autonomous and independent learning [23], and in teaching practice, where it is considered a reference point in teachers' initial training [24].

Recent information from the European Commission [3] in the field of education, and more specifically, the PISA [1] report, clearly highlights that the Portuguese educational system, while not unique, identifies AP as one of its most vulnerable points.

These data are especially important because they represent the first international assessment measuring student performance after the COVID-19 pandemic and school closures, heavily influenced by their effects. This helps explain the results observed across various countries. The results allow for an analysis of which countries incurred greater losses during this period. Approximately 690,000 students from participating countries were part of the PISA, undergoing assessments in mathematics, reading, and science. The results indicate a decline in the skills of students in OECD countries. According to the report, one in four 15-year-olds shows poor performance in mathematics, reading, and science, potentially struggling with basic algorithms or interpreting simple texts.

An approach to address this academic underachievement involves implementing metacognitive, motivational, and behavioral strategies in classrooms, enabling students to increase their engagement in learning, play an active role, and monitor the effectiveness of their study methods [25]. This approach will allow mitigating the lack of future orientation and students' learning conceptions, which, in turn, affect metacognitive strategies, self-efficacy beliefs, study effort, and AP, enabling improvement in these factors to address this underachievement. The adoption of an active role by students suggests the need to consider AP as a complex analytical framework, seeking to understand the interactive behavior of certain motivational variables and, thus, achieve a deeper understanding of the processes involved in learning [26].

The importance of studying the connection between these constructs stems from VCS being considered essential tools for students' self-regulating, directly impacting the quality of the learning process [6], as well as contributing to an organized and structured approach to study [7, 11]. On the other hand, PR, when minimized through SRL [10], positively influences the TMP [9] and, consequently, AP [8, 27].

Therefore, the harmonious interaction of these variables is crucial to understanding how students face academic challenges and how this is reflected in their school performance, providing valuable insights into the combined impact of these constructs on students' educational journey.

Based on the results of the studies described above, which involve the connection of variables that constitute this research [6–11], this study aims to analyze the extent to which the VCS selected by students, coupled with how they plan the management of their time and their approach to PR in school activities, influence their self-regulatory processes in learning. Additionally, the study seeks to investigate the impact of these self-regulatory processes in learning on students' AP, specifically in the aggregate of subjects comprising the Native Language, English, Mathematics, and Natural Sciences.

2. The Constructs Under Study

2.1. Self-regulation for learning

When considering the research conducted over the last three decades on the topic of SRL, it can be inferred that it emerges as a fundamental construct in the learning processes, with clear implications for academic success [18, 26, 28].

SRL refers to the process by which students activate and maintain cognitions, emotions, and systematically oriented behaviors to achieve established goals [5]. Recently, research on this topic has focused on motivational variables such as goal setting, causal attributions, self-efficacy, volition, and PR, with the latter understood as the postponement of academic tasks [11].

When analyzing the results of various empirical studies, it can be inferred that the constructs under examination are interrelated and have a predictive effect on students' AP. These studies indicate that SRL is influenced directly or indirectly by TMP [11], PR [10], and VCS [6].

2.2. Volitional control strategies

In Zimmerman's research [14], the SRL model for learning is outlined as a dynamic and open process, anticipating a cyclical action on the part of the student, unfolding into three distinct phases: forethought; volitional control; and self-reflection. Volition can thus be interpreted as a dynamic system of controlling psychological processes that, in the face of distractions, safeguard concentration and guide effort toward the task, thereby favoring learning processes.

According to Sagredo [29], volitional control encompasses the processes that occur during learning efforts, influencing concentration and AP. The relevance of volition in a school context becomes evident when we encounter a student who, despite their potential and initial motivation, often fails to engage in a way that allows them to accomplish school tasks, thus significantly deviating from their learning potential.

On the other hand, Vermeer et al. [30] argue that students' persistence in maintaining their intentions, as well as their mastery level in the face of difficulties, is conditioned by access to VCS. According to Boekaerts and Cascallar [31], students become more adept at staying focused on task goals, shielding them from well-being goals when they have access to well-developed VCS. These strategies materialize in solid work habits, manifesting in tasks to be performed within or outside of school, as well as tasks that students take ownership of [7].

Boekaerts and Cascallar [31] also add the notion that access to volitional skills is crucial for fulfilling social rules and expectations related to the role of a student, such as being responsible, being able to collaborate in groups, and meeting teacher expectations. According to Mccann and Turner [32], the development of volitional control in students is positively correlated with measures of self-involvement, SRL, and cognitive development. Based on these data, they consider it imperative to identify situations of school tasks that promote students' volitional control, as well as recognize its usefulness in various tasks in the classroom context.

2.3. Time management planning

Research on study skills considers students' TMP as one of the fundamental aspects of learning strategies [10]. According to

Lourenço and de Paiva [5], SRL strategies for learning, including school time management, should serve as a guiding thread in academic activity. It is imperative to understand the students we have and adopt different approaches and strategies that address their needs, to assist them in organizing their study and TMP. The authors also emphasize that the differentiation between students with academic success and failure is related to variables such as the structure of academic time, study methods, and the association of performance with effort.

As pointed out by Marcílio et al. [59], time management is understood as a process directed toward specific purposes, involving the assessment of time usage, goal setting, planning, monitoring, and prioritizing tasks to achieve proposed objectives. More specifically, the authors outline steps to assist in TMP, including diagnosing time usage, developing strategies to deal with challenges, setting objectives and goals, and implementing and evaluating changes. As a result of these efforts, individuals become more proficient and consequently achieve better academic outcomes.

In this line of research, Thibodeaux et al. [9] suggest that students with outstanding AP tend to set goals, calculate the time required for task execution, and maintain a meticulous study routine. Moreover, they often assess the progress made in the learning process, mitigating the impact of PR on their school activities.

2.4. Procrastination

PR is identified as a recurring phenomenon, characterized by the inclination to delay or defer tasks [33]. In this sense, PR can be defined as the intentional postponement of a task considered unstimulating, despite the potential negative consequences or harm associated with such action [34]. PR manifests in various forms of everyday tasks and different contexts, with academic PR standing out, despite its potential drawbacks for students, and it is frequently practiced [35].

In this way, students adopt behaviors such as delays in the preparation and submission of assignments, neglecting activities, and cramming for exams at the last moment [36]. This voluntary postponement of tasks can lead to potential negative implications for the student's AP [8]. Generally, PR tends to be more prevalent in situations where the flow and complexity of demands are prone to increase [37].

Additionally, Fior et al. [38] state that some reasons that can be pointed out as causes for PR include deficient TMP dedicated to school tasks, environmental context, difficulty in concentration, anxiety about evaluation, dysfunctional beliefs and thoughts, fear of failure, low tolerance for frustration, and difficulty in performing tasks. They also mention that among the main variables involving academic PR behavior are self-efficacy, SRL, and perfectionism.

In this sense, it is conceivable that when there is a behavior of academic PR, it is understood that there was a failure in the student's SRL process to manage their performance and fulfill the school requirements [39].

2.5. Academic performance

AP should be understood as a complex system and is characterized as the competence that the student acquires throughout their educational journey, expressing the academic knowledge gained during this period [40]. Generally, this competence is assessed quantitatively through routine tasks, tests, and exams, in which students demonstrate, through their responses, what they have learned during classes [41].

Additionally, in the literature, specific tests are often used to quantify this performance, although this does not exclude the importance of qualitative aspects such as social and interpersonal issues, which are extremely relevant to the manifestation of AP [42].

From this perspective, AP can be influenced by factors related to both the environment and the individual, and it is impacted by the interaction between these groups [43]. Moreover, school performance is intrinsically linked to effective SRL [5].

Therefore, recognizing that students are influenced, act, modify, and live in society, the school must understand these relationships, establishing means focused on students' goals to promote better AP. Students' goals and motivations are personal and can be influenced by future perspectives, and relationships with family, teachers, and school peers, also exerting an influence on their AP [44].

3. Method

3.1. Hypotheses

Regarding the importance or centrality that hypotheses can have in scientific studies, as they can be crucial for defining the advancement of knowledge in various fields, Vilelas [45] emphasizes the need to ensure a careful and thoughtful formulation of them. The author establishes essential elements in the process of formulating hypotheses, including the statement of relationships (between two or more variables, which can be causal or associative), the direction of the relationship expressed in appropriate terms, verifiability (containing observable, measurable, and analyzable variables), theoretical consistency (related to theoretical foundation and expected results), and plausibility (relevant to the phenomenon under study).

In this sequence, a structural equation modeling (SEM) was employed to investigate the intercorrelations among the constructs under study. The SEM technique allows for the assessment of causal relationships between inferred variables (not directly observed) through a set of observed variables that serve as markers for each inferred or latent variable. According to Byrne [46], this technique offers advantages over other approaches, such as: (a) considering that variance is unstable over time; (b) calculating measurement errors (observed variables); and (c) rapidly estimating the statistical significance of each causal effect and the overall fit of the hypothetical model. If the overall fit of the tested model is appropriate, the relationships or effects displayed by the model are approved.

Therefore, based on the theoretical rationale on SRL and the results of the studies described above, the following hypotheses were established: H1 – VCS positively influence students' SRL processes for learning; H2 – The way students plan TMP in school activities positively affects their SRL; H3 – PR negatively impacts students' SRL processes for learning; and H4 – Students' AP is positively influenced by their self-regulatory processes.

3.2. Participants

The sampling process was non-probabilistic (convenience sampling), a technique referred to by Lohr [47] as one used when there are no specific criteria for someone to be included in the sample. Each element of the population can be a participant and is eligible to be part of the sample. The advantages include being a quick, cost-effective, easily collectible method with fewer rules.

However, a limitation is that there is no guarantee that the samples are unbiased. The study included 565 students from basic education (7th, 8th, 9th grades) in Portuguese public schools, with 312 (55.2%) being female. Ages ranged from 12 to 15 years ($M = 12.9$; $SD = 0.969$).

3.3. Instruments

The evaluation of the validity and reliability of the instruments used was conducted by checking the adequacy values for the Kaiser–Meyer–Olkin index and Bartlett's sphericity test, indicating that principal component analysis is viable and the variables are correlated. Due to the Likert format of the items, the calculation of internal consistency, which seeks to analyze to what extent the items composing the test present themselves as a homogeneous whole, was conducted by determining the Cronbach's alpha ($\alpha > 0.70$) coefficient [48]. Regarding the assessment of descriptive aspects, the criteria established by Finney and DiStefano [49] were considered, which suggest that skewness values greater than 2 and kurtosis values greater than 7 should not be considered.

To assess students' SRL processes, the Inventory of Self-Regulation Processes in Learning [50] was utilized. It consists of 9 items distributed across three dimensions: planning (PL/ $\alpha = 0.79$; e.g., *I make a plan before starting a task. I think about what I am going to do and what is needed to complete it*); execution (EX/ $\alpha = 0.86$; e.g., *During classes or in my home study, I think about concrete aspects of my behavior to change and achieve my goals*); and evaluation (EVA/ $\alpha = 0.85$; e.g., *When I receive a grade, I think about concrete things I need to do to improve*), with three items each. It employs a five-point Likert scale, ranging from 1 (never) to 5 (always).

Regarding TMP, the IPGT scale [51] was employed. It comprises 12 items distributed across two dimensions, each with 6 items: short-term (CP/ $\alpha = 0.89$; e.g., *I make a daily list of things I need to do*) and long-term (LP/ $\alpha = 0.90$; e.g., *I organize my study according to the test schedule*). It uses a five-point Likert scale format, ranging from 1 (never) to 5 (always).

To assess students' volitional competence, the Volitional Control Strategies Questionnaire [52] was used, consisting of a single factor with 9 items (VC/ $\alpha = 0.93$; e.g., *Thinking that if I can't get a good grade, the responsibility will be mine*). The items were presented in a Likert scale format with five points, indicating frequency from 1 (never) to 5 (always). The QECV includes some items formulated in reverse.

The Academic Procrastination Perceived by the Student [53] was used to assess students' tendency to procrastinate on school tasks, consisting of 10 items distributed across two dimensions: PR in daily study (PDS/ $\alpha = 0.81$; e.g., *When the teacher assigns a task in class, I start doing it immediately*) and PR study for tests (SFT/ $\alpha = 0.80$; e.g., *When a task is very difficult, I give up and move on to another task*). The scale adopts a Likert scale format with five points, indicating frequency from 1 (never or rarely) to 5 (always or almost always). All scales are validated for the Portuguese context, and the Cronbach's α values presented in the different scales refer to the present study.

The assessment of students' AP was based on the school grades obtained in the subjects of Mother Language, English, Mathematics, and Natural Sciences. These subjects were selected because they are mandatory in the Portuguese school curriculum, have higher failure rates [1], and are subject to a national exam in the 9th year. In the

context of basic education in Portugal, grades are distributed as follows: one and two (insufficient); three (sufficient); four (good); and five (very good).

4. Procedures

After obtaining authorization from the school administration to administer the questionnaires, the surveys were distributed. In most schools, the questionnaires were left in the management office and collected later. In other cases, it was possible to administer the questionnaire in the presence of the researcher, with students being asked to respond with utmost honesty and not omit any item.

Confidentiality of responses was ensured, voluntary participation was upheld, and ethical procedures of the institutional research committee were respected. The study was conducted in accordance with the World Medical Association Declaration of Helsinki [54] and the ethical guidelines of the American Psychological Association. This research followed the ITC Guidelines for test translation and adaptation, adjusting content to the cultural context to preserve semantic equivalence, as outlined in the ITC Guidelines [55].

4.1. Statistical analysis

For data analysis, we employed procedures for descriptive analysis, internal consistency, covariance structure, Pearson correlation, critical *N*, and SEM techniques using SPSS/AMOS 25 [56]. Evaluation of SEM results was based on two criteria: the overall model fit and the significance of calculated regression coefficients. The adequacy of the SEM under study was assessed considering statistical indices and their respective cut-off points: χ^2 ; χ^2/df ; Goodness-of-Fit Index and Adjusted Goodness-of-Fit Index ≥ 0.90 ; Comparative Fit Index ≥ 0.95 ; Tucker-Lewis Index ≥ 0.95 ; Root Mean Square Error of Approximation < 0.05 ; and Critical *N* > 200 [48].

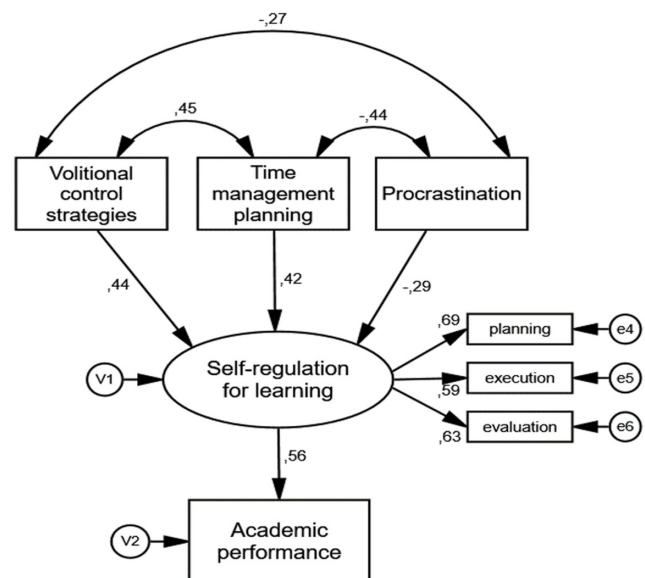
4.2. Results

Table 1 presents the descriptive data (mean, standard deviation, skewness, and kurtosis) corresponding to the variables included in the structural equation model. The criterion established by Hair et al. [57], which considers skewness values greater than two and kurtosis values greater than seven as problematic, was used. In the sample, none of the variables exhibit values close to these criteria, justifying the estimation of the model fit.

Regarding the values found for the global fit indices of the proposed SEM, they are robust [$\chi^2_{(11)} = 20.214$; $p = 0.042$; $\chi^2/df = 1.838$; GFI = 0.990; AGFI = 0.974; CFI = 0.992; TLI = 0.984; RMSEA = 0.039 (CI 90%: 0.007–0.065); CN (0.05/549–0.01/690)], confirming the hypothesis that the proposed model represents the relationships between the variables in our empirical matrix.

From the analysis of Figure 1 and Table 2, it can be inferred that the hypotheses guiding the specifications have been confirmed and are all statistically significant. Thus, students who employ more VCS are more SRL ($\beta = 0.44$; $p < 0.001$), and those who plan their time management in completing activities exhibit a higher level of SRL ($\beta = 0.42$; $p < 0.001$). However, students who procrastinate more are less prone to SRL ($\beta = -0.29$; $p < 0.001$). Regarding covariances, students who employ more VCS tend to procrastinate less ($\beta = -0.27$; $p < 0.001$) and plan their study time management more in school activities ($\beta = 0.45$; $p < 0.001$). Similarly, those who plan their time management in school tasks more tend to procrastinate less ($\beta = 0.44$; $p < 0.001$). All covariances are statistically significant. It is also inferred that AP is directly and positively influenced by SRL and indirectly by VCS, planning of time management spent on school activities, and PR ($\beta = 0.56$; $p < 0.001$).

Figure 1
SEM under study



Regarding the squared multiple correlations (η^2), these indicate that SRL is directly explained by approximately 79% ($\eta^2 = 0.791$) by VCS, planning of study time management, and PR, with this explanatory value being very relevant to the model. On the other hand, AP is directly explained by SRL and indirectly by VCS, planning of study time management, and PR in about 31% ($\eta^2 = 0.313$).

Table 1
Descriptive statistics of the variables included in the model

Variable	Min.	Max.	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
Planning	3	15	11.03	2.459	-0.256	-0.303
Execution	3	15	11.19	2.798	-0.918	0.945
Evaluation	3	15	12.00	2.538	-0.781	0.544
Volitional control strategies	9	45	35.87	9.001	-1.015	0.256
Time management planning	12	60	41.69	11.161	-0.407	-0.039
Procrastination	10	50	25.44	8.659	0.681	0.742
Academic performance	7	20	11.69	2.931	0.772	0.044

Note: Min. = Minimum; Max = Maximum; *M* = Mean; *SD* = Standard deviation

Table 2
Covariance structure contrast results hypothesized for the sample

Hypotheses			EnSV	ESV	EE	<i>p</i>
Self-regulation	←	Volitional control strategies	0.082	0.436	0.008	***
Self-regulation	←	Time management planning	0.064	0.421	0.006	***
Self-regulation	←	Procrastination	-0.056	-0.287	0.007	***
Planning	←	Self-regulation	1,000			
Execution	←	Self-regulation	0.973	0.591	0.077	***
Evaluation	←	Self-regulation	0.935	0.626	0.070	***
Academic performance	←	Self-regulation	0.964	0.559	0.081	***
Covariances						
Volitional control strategies	<->	Procrastination	-21.197	-0.272	3.395	***
Volitional control strategies	<->	Time management planning	45.133	0.454	4.637	***
Procrastination	<->	Time management planning	-42.069	-0.436	4.432	***

Note: EnSV = Estimated non-standardized values; ESV = Estimated standardized values; EE = Estimated errors; *p* = Significance level

Table 3
Pearson’s *r* correlations of the variables included in the model

	1	2	3	4	5	6
1. Volitional control strategies	1					
2. Time management planning	0.454**	1				
3. Procrastination	-0.272**	-0.436**	1			
4. Planning	0.469**	0.537**	-0.383**	1		
5. Execution	0.452**	0.424**	-0.334**	0.399**	1	
6. Evaluation	0.467**	0.456**	-0.367**	0.424**	0.380**	1
7. AP	0.354**	0.411**	-0.389**	0.442**	0.307**	0.315**

Note: **The correlation is significant at the 0.01 level

Another analysis was conducted to measure the strength and direction of the linear relationship between quantitative variables. Two variables are related if a change in one causes a change in the other, and this finding can be quantified through the so-called Pearson linear correlation coefficient (*r*). Thus, considering the variables included in the model, through the analysis of Pearson’s *r* correlation (cf. Table 3), it was possible to determine that all variables show statistically significant associations among themselves, although the associations can be considered between low ($r=0.200$ to $r=0.399$) and moderate ($r=0.400$ to $r=0.699$), indicating some cohesion among the variables under study [58]. It is noteworthy that the association between planning study time management and the planning dimension of SRL ($r=0.537$; $p<0.01$) is the one with the highest value and is considered a moderate association in terms of intensity.

4.3. Discussion

The present investigation aimed to examine the variables under study – VCS, TMP, PR, and SRL – and assess their influence on students’ AP. It was found that the existing literature attempting to relate these constructs is limited, and research utilizing SEM methodology is rare. Therefore, considering the educational implications of this investigation, there is an expectation to expand the analysis of the relationships among the study variables using this analytical method, where all direct and indirect effects are considered simultaneously. In this context, observing the relationships between the considered variables, the study data confirm the hypotheses proposed in the model.

Regarding hypothesis H1, it became evident that VCS exert a positive influence on the SRL process of students’ learning. In the

sample, the items highlighted by students indicate that “rushing to the classroom and apologizing to the teacher for being late” and “thinking that, if I don’t get a good grade, the responsibility will be mine” may align with the argument of Vermeer et al. [30]. These authors claim that students’ persistence in maintaining their intentions and their level of mastery in the face of difficulties are conditioned by access to VCS.

The recent work by Fuentes et al. [7] complements this perspective, providing an in-depth analysis of how VCS are associated with students’ SRL processes. These researchers explored how students’ conscious choices, related to planning, monitoring, and adjusting their learning approaches, play a significant role in their academic success.

Thus, students gain greater ability to sustain attention on set goals when they have appropriately developed volitional strategies [31]. These volitional skills play a crucial role in adhering to social norms and expectations associated with the role of a student, such as responsibility, the ability to collaborate in a group, and meeting the teacher’s expectations.

The VCS, as outlined by Zimmerman [26], can range from setting clear educational goals to implementing effective study plans. The ability to resist distractions, manage time efficiently, and adjust learning strategies in response to specific needs are fundamental aspects of these strategies.

These strategies manifest as robust work habits, reflecting activities both within and outside the school environment, including those that students take on as personal commitments [7]. Although “thinking that even if I skip class, I won’t have fun because I won’t be doing what I should” was the least favored item in the sample, it reveals a fundamental attitude in students’ volitional control. According to Sagredo [29], this highlights that, when faced with distractions, individuals can maintain concentration and direct effort

toward the task, thereby promoting learning processes. Volitional control involves the conscious decision-making and implementation of deliberate actions to achieve academic goals.

In summary, understanding and promoting students' VCS are crucial for strengthening their SRL processes. By consciously engaging in their learning, students can enhance the effectiveness of their educational approaches and, consequently, achieve more successful AP. Studies emphasize the importance of guiding students in actively utilizing these strategies to optimize their learning process [6, 7, 26, 29].

Regarding hypothesis H2, it was confirmed that the way students plan the management of time in school activities positively affects their SRL. This result aligns with the study by Marcilio et al. [59], stating that time management is understood as a purpose-driven process involving the assessment of time use, goal setting, planning, monitoring, and prioritization of tasks to achieve proposed objectives. More specifically, the authors outline steps to assist in TMP, including diagnosing time use, developing strategies to address difficulties, setting goals and objectives, as well as implementing and evaluating changes. As a result of these efforts, students become more proficient, consequently achieving better academic outcomes.

In this regard, Zimmerman [26] emphasizes that TMP is intrinsically linked to SRL, involving students' ability to set goals, establish priorities, and implement effective strategies to meet academic deadlines and objectives. The ability to distribute time in a balanced manner across various tasks and disciplines is essential to promote more efficient learning.

The items with higher scores on this scale indicate that "what I do in my life today is important for what will happen to me tomorrow" and "I know what grades I want to achieve in the next period" justifying the aforementioned. However, the least scored question, "I make a daily list of things I need to do", suggests that SRL strategies for learning, including school time management, should play a guiding role in academic activities, as mentioned by Lourenço and de Paiva [5]. They also emphasize the importance of understanding students and adopting different approaches and strategies to meet their needs, aiming to assist them in organizing their studies and planning school time management. The differentiation between successful and unsuccessful students is correlated with variables such as the structure of academic time, study methods, and the association of performance with effort.

The study by Marcilio et al. [59] contributes to this perspective, highlighting how proper time planning is positively associated with students' self-discipline and volitional control. The ability to anticipate the temporal demands of school activities and implement strategies to avoid PR are central elements that support effective SRL.

Following this line of action, Thibodeaux et al. [9] suggest that students with more outstanding AP tend to set goals, calculate the time required for task execution, and maintain a meticulous short- and long-term study routine. Additionally, they often assess the progress made in the learning process, mitigating the impact of PR on their school activities.

The authors contribute to the discussion by emphasizing that time management goes beyond mere hours allocated for study, encompassing the quality and depth of engagement in school activities. Conscious planning allows students to dedicate themselves not only to meeting deadlines but also to a deep understanding of the content, promoting more meaningful learning.

Effective time management by students plays a crucial role in SRL, being a key element in optimizing AP. Several studies, such as those by Zimmerman [26], Marcilio et al. [59], and Thibodeaux et al. [9], highlight the critical importance of temporal planning for educational success. Thus, the relationship between TMP and

SRL is evident in the referenced studies. A conscious and strategic approach to time management not only contributes to the effective achievement of academic goals but also strengthens students' ability to actively direct their learning process.

The results of this study indicate that PR has a negative impact on the SRL process of student learning, confirming hypothesis H3, impairing their ability for self-discipline and time management, and consequently, increasing the challenges that students face in achieving good AP. PR, a phenomenon widely discussed by scholars, emerges as a detrimental factor in students' SRL processes, negatively influencing their AP [8, 34, 35].

The most prominent items, such as "I am not up to date with the subjects because I do not study every day" and "I interrupt study time for tests to do other tasks (e.g., watch TV, listen to music, talk on the phone)", align with what Silva et al. [35] assert, emphasizing that PR manifests in various daily tasks and different contexts, particularly highlighting academic PR, which, despite its potential drawbacks for students, is frequently practiced.

PR, when recognized as a recurring phenomenon, manifests as a tendency to postpone or delay tasks [33], particularly by deliberately postponing tasks considered uninteresting and demotivating, despite the anticipated negative consequences or drawbacks associated with such behavior [34].

da Costa Júnior et al. [27] state that academic PR gives rise to various problems and negative consequences, both at an individual and collective level: reduced performance, increased stress, adverse effects on physical and mental health, and a global waste of resources. According to the authors, this reality has strengthened the perception that the core elements to comprehend and confront PR are intrinsically linked to the concepts of self-efficacy and SRL, which exert a considerable influence on the motivation, behavior, and habits of students.

Although "when the teacher assigns a task in class, I don't start it immediately" is the least scored aspect by the students in the study, it suggests that, in the presence of academic PR behaviors, these may be associated with a gap in the student's SRL process in managing their performance and meeting school requirements [39]. These procrastinator behaviors tend to be more prevalent in situations where the intensity and difficulty of demands are prone to increase [37].

Often, the most frequently cited reasons for PR include poor time management dedicated to school tasks, environmental context, difficulty concentrating, anxiety about assessment, dysfunctional beliefs and thoughts, fear of failure, low frustration tolerance, and difficulty in task execution [38]. Authors such as da Costa Júnior et al. [39] and as well as Machado and Schwartz [37] have contributed to the understanding of this phenomenon. The inclination to postpone essential tasks compromises students' ability to set clear goals, plan effectively, and maintain focus on academic activities. According to the perspective of Mosquera et al. [8], this voluntary postponement of tasks can have a negative impact on students' AP.

Research underscores the need for effective intervention strategies, emphasizing the importance of raising awareness about PR [38], providing tools for time management, and cultivating more productive work habits [59]. By addressing PR, educators and stakeholders can contribute significantly to the improvement of students' SRL processes and, consequently, their academic success [33].

Regarding hypothesis H4, the results confirm that students' AP is directly and positively influenced by their SRL process and, also, indirectly by the VCS used by students, how they plan academic time management, and their PR attitude toward school activities.

The ability of students to self-regulate their learning is intrinsically linked to achieving positive academic outcomes, and

SRL processes in learning play a crucial role in students' academic success, positively influencing their school performance [15, 60].

For AP to be effectively achieved, it is essential to create learning environments that promote the underlying processes of SRL. Fuentes et al. [7] contribute to this premise, emphasizing the relationship between SRL processes and students' motivation.

In these educational contexts, both students and teachers must understand the complementarity of their roles and adopt realistic models of SRL in the learning process [5].

Therefore, there is a growing need to identify the variables that contribute to defining the framework of intelligibility within which SRL is situated, given that it is an explanatory construct of students' AP [7]. This observation is based on the recognition that students with SRL skills are those who have knowledge of learning strategies and apply them appropriately. These students reflect on their learning process, possessing strategies to monitor, control, and intervene in their behavior for the sake of learning and desirable AP [5].

In this regard, the research by Wolters and Brady [11] highlights the importance of SRL in setting educational goals, planning, and self-monitoring, which are fundamental elements for achieving academic success. Therefore, by promoting and fostering effective SRL processes, students not only enhance their AP but also develop crucial skills for their long-term academic success [15, 60]. This holistic approach, based on the contributions of these authors, underscores the significance of self-directed learning for students' academic and personal flourishing.

5. Limitations and Future Investigations

Although the present study provides interesting results and significant contributions, the implications should be analyzed with caution, considering some limitations. It is acknowledged that the proposed model incorporates theoretically relevant variables for explaining students' AP; however, it is crucial for future research to expand the sample size, considering a multi-level study.

Additionally, all data were obtained through self-report questionnaires, which may not be sufficient to capture real-time responses in teaching and learning process contexts. Therefore, future studies should explore AP using qualitative methodologies, such as interviews or focus groups, examining students with a history of continuous success over time and repeated failure to compare potential differences.

From the results, it is observed that the model has a considerable amount of unexplained variance in students' AP, suggesting the possible existence of other important predictor variables that need to be incorporated in future research. Although this study was conducted with a substantial sample ($N = 565$), it is not intended for this contribution to be generalizable to the school population at this level of education. Its purpose is to contribute to the understanding of the implications of the analyzed constructs in different school years and, above all, to stimulate new research on this issue.

6. Conclusions

Upon systematically examining consecutive PISA reports [1], it becomes evident that there is a pressing need to dedicate ourselves to the search for predictor variables of students' AP. In the educational context, the relevance of investigating elements that can increase students' engagement levels in school, particularly in cognitive, behavioral, and emotional dimensions, is noteworthy.

From the theoretical framework associated with AP, what distinguishes successful students from those facing school failure is how they structure volitional control, how they plan time

management in school activities, their propensity for PR, and the SRL processes adopted in learning. Due to its negative nature, some research suggests contrasting effects regarding school. Because of its negative nature, some research suggests contrasting effects regarding school PR. It is often perceived as a harmful practice capable of triggering a dangerous cycle with potential consequences, especially leading to low academic achievements, feelings of guilt, lack of motivation, anxiety, or even depression.

In conclusion, it can be asserted that schools have, and should have, a relevant role in promoting improvement in the education of their students. A deep understanding of the elements that influence and condition the learning process, especially the constructs addressed in this study, is essential to fostering the quality of learning and the development of autonomous, SRL, and competent students. A student who values school tasks, adopts self-regulatory strategies in their learning process, and manages their time dedicated to school activities appropriately and wisely is undoubtedly on the path to academic excellence.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

References

- [1] OECD. (2023). *PISA 2022 Results (Volume I and II) - Country Notes: Portugal*. Retrieved from: https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/portugal_777942d5-en.html
- [2] 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* [Self-regulation of learning and motivation in different educational contexts: Theory, learning and intervention]. Ukraine: Brasil.
- [3] European Commission. (n.d.). *European education area: Removing barriers to learning and improving access to quality education for all*. Retrieved from: <https://education.ec.europa.eu>
- [4] Zimmerman, B. J., & Schunk, D. H. (2011). *Handbook of self-regulation of learning and performance*. UK: Routledge.
- [5] Lourenço, A. A., & de Paiva, M. O. A. (2016). *Autorregulação da aprendizagem: uma perspectiva holística* [Self-regulated learning: A holistic perspective]. *Ciências & Cognição*, 21(1), 33–51.
- [6] Rodríguez-Guardado, M. S., & Juárez-Díaz, C. (2023). *Relación entre estilos de aprendizaje y estrategias volitivas en estudiantes universitarios de lenguas extranjeras* [Relationship between learning styles and volitional strategies in university students of foreign languages]. *Revista Caribeña de Investigación Educativa*, 7(1), 123–141. <https://doi.org/10.32541/recie.2023.v7i1.pp123-141>
- [7] Fuentes, S., Rosário, P., Valdés, M., Delgado, A., & Rodríguez, C. (2023). *Autorregulación del Aprendizaje: Desafío para el Aprendizaje Universitario Autónomo* [Self-regulation of learning: The challenge for an autonomous

- university learning]. *Revista Latinoamericana de Educación Inclusiva*, 17(1), 21–39. <https://doi.org/10.4067/s0718-73782023000100021>
- [8] Mosquera, P., Soares, M. E., Dordio, P., & Melo, L. A. (2022). O ladrão do tempo e a sustentabilidade social: Análise de um modelo de procrastinação no trabalho [The time thief and social sustainability: Analysis of a model of procrastination at work]. *Revista de Administração de Empresas*, 62(2), 1–22. <https://doi.org/10.1590/S0034-759020220510x>
- [9] Thibodeaux, J., Deutsch, A., Kitsantas, A., & Winsler, A. (2017). First-year college students' time use. *Journal of Advanced Academics*, 28(1), 5–27. <https://doi.org/10.1177/1932202X16676860>
- [10] Umerenkova, A. G., & Flores, J. G. (2017). El papel de la procrastinación académica como factor de la deserción Universitaria [The role of academic procrastination as a factor in university dropout]. *Revista Complutense de Educación*, 28(1), 307–324. https://doi.org/10.5209/rev_RCED.2017.v28.n1.49682
- [11] Wolters, C. A., & Brady, A. C. (2021). College students' time management: A self-regulated learning perspective. *Educational Psychology Review*, 33, 1319–1351. <https://doi.org/10.1007/s10648-020-09519-z>
- [12] Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), *The nature of intelligence* (pp. 231–235). Lawrence Erlbaum Associates.
- [13] Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, 34(10), 906–911. <https://doi.org/10.1037/0003-066X.34.10.906>
- [14] Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2
- [15] 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>
- [16] 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.
- [17] Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, 4(3), 359–373. <https://doi.org/10.1521/jscp.1986.4.3.359>
- [18] Bandura, A. (2002). Social cognitive theory in cultural context. *Applied Psychology*, 51(2), 269–290. <https://doi.org/10.1111/1464-0597.00092>
- [19] Frison, L. M. B., & Boruchovitch, E. (2020). Autorregulação da aprendizagem: Modelos teóricos e reflexões para a prática pedagógica [Self-regulation of learning: Theoretical models and reflections for pedagogical practice]. In L. M. B. Frison & E. Boruchovitch (Eds.), *Autorregulação da aprendizagem: Cenários, desafios, perspectivas para o contexto educativo* (pp. 17–30). Vozes.
- [20] Bandura, A. (2008). Toward an agentic theory of the self. In H. W. Marsh, R. G. Craven & D. M. McInerney (Eds.), *Self-processes, learning, and enabling human potential: Dynamic new approaches* (pp. 15–49). Information Age Publishing.
- [21] Zivich, B. S., & Alliprandini, P. M. Z. (2023). A autorregulação da aprendizagem de alunos do Ensino Fundamental no contexto do ensino remoto [Self-regulation of learning of elementary school students in the context of remote teaching]. *Debates em Educação*, 15(37), 1–17. <https://doi.org/10.28998/2175-6600.2023v15n37pe14082>
- [22] Koh, J., Farruggia, S. P., Back, L. T., & Han, C. W. (2022). Self-efficacy and academic success among diverse first-generation college students: The mediating role of self-regulation. *Social Psychology of Education*, 25(5), 1071–1092. <https://doi.org/10.1007/s11218-022-09713-7>
- [23] Tabacaru, C. D. (2021). Motivation and its challenges to learning. *Științe ale Educației*, 149(9), 43–48. <https://doi.org/10.5281/zenodo.5779525>
- [24] Stan, M. M., Dumitru, C., Langa, C., Tudor, S. L., & Lazăr, A. (2023). Student teachers' perceptions on the engagement experience during teaching practice. In E. Soare, & C. Langa (Eds.), *Education facing contemporary world issues - EDU World 2022*, vol 5. European Proceedings of Educational Sciences (pp. 233–241). European Publisher. <https://doi.org/10.15405/epes.23045.24>
- [25] 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(2), 192–212. <https://doi.org/10.1080/01443410.2013.858101>
- [26] Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166–183. <https://doi.org/10.3102/0002831207312909>
- [27] da Costa Júnior, J. F., Bezerra, D. D. M. C., de Araújo, A. G., & 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(1), 72–91. <https://doi.org/10.5539/jel.v13n1p72>
- [28] Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology*, 54(2), 199–231. <https://doi.org/10.1111/j.1464-0597.2005.00205.x>
- [29] Sagredo, A. V. (2022). Autorregulación en el aprendizaje de estudiantes y su relación con rendimiento académico [Self-regulation in student learning and its relationship with academic performance]. *Revista Conhecimento Online*, 2, 49–68. <https://doi.org/10.25112/rco.v2.2943>
- [30] Vermeer, H. J., Boekaerts, M., & Seegers, G. (2000). Motivational and gender differences: Sixth-grade students' mathematical problem-solving behavior. *Journal of Educational Psychology*, 92(2), 308–315. <https://doi.org/10.1037/0022-0663.92.2.308>
- [31] Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review*, 18(3), 199–210. <https://doi.org/10.1007/s10648-006-9013-4>
- [32] Mccann, E. J., & Turner, J. E. (2004). Increasing student learning through volitional control. *Teachers College Record*, 106(9), 1695–1714. <https://doi.org/10.1111/j.1467-9620.2004.00401.x>
- [33] Vany Mol, K. S., Rajkumar, E., Lakshmi, R., John, R., Sunny, S. M., Joshua George, A., . . . & Abraham, J. (2023). Influence of decision-making styles and affective styles on academic procrastination among students. *Cogent Education*, 10(1), 2203598. <https://doi.org/10.1080/2331186X.2023.2203598>
- [34] 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 [Effectiveness of non-drug interventions in academic procrastination: Integrative review]. *Mosaico: Estudos em Psicologia*, 10(1), 25–47.

- [35] Silva, L. S., Bernardes, J. R., Nascimento, J. C. H. B., Veras, S. L. L., & Castro, M. M. B. (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 [The relationship between academic performance and procrastination: An exploratory study with undergraduate students in accounting and administration in Piauí]. *Contabilidade Vista & Revista*, 33(1), 115–143. <https://doi.org/10.22561/cvr.v33i1.6441>
- [36] Silva, D. J. M., Silva, M. A., Vilela, M. S. S., & Oliveira, R. M. (2016). Procrastinação e desempenho acadêmico: Índices por meio da análise de correspondência [Procrastination and academic performance: Evidence from correspondence analysis]. *Revista Mineira de Contabilidade*, 17(3), 16–31. <https://revista.crcmg.org.br/rmc/article/view/354>
- [37] Machado, B. A. B., & Schwartz, S. (2018). Procrastinação e aprendizagem acadêmica [Procrastination and academic learning]. *Revista Eletrônica Científica da UERGS*, 4(1), 119–135. <https://doi.org/10.21674/2448-0479.41.119-135>
- [38] Fior, C. A., Sampaio, R. K. N., do Carmo Reis, C. A., & Polydoro, S. A. J. (2022). Autoeficácia e procrastinação acadêmica em estudantes do ensino superior [Self-efficacy and academic procrastination in higher education students]. *Psico*, 53(1), e38943. <https://doi.org/10.15448/1980-8623.2022.1.38943>
- [39] da 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 [Archetypes of academic procrastination: A model based on the concepts of self-regulation, self-efficacy and perfectionism]. *International Scientific Journal*, 18(2), 128–152.
- [40] 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(1), 414. <https://doi.org/10.1186/s12889-019-6708-2>
- [41] Manyanga, T., Pelletier, C., Prince, S. A., Lee, E. Y., 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(7), 4394. <https://doi.org/10.3390/ijerph19074394>
- [42] Chen, B., Waters, C. N., Compier, T., Uijtdewilligen, L., Petrunoff, N. A., Lim, Y. W., . . . , & Müller-Riemenschneider, F. (2020). Understanding physical activity and sedentary behaviour among preschool-aged children in Singapore: A mixed-methods approach. *BMJ Open*, 10(4), e030606. <https://doi.org/10.1136/bmjopen-2019-030606>
- [43] Fernandes, G. N. A., & Lemos, S. M. A. (2020). Motivação para aprender no ensino fundamental e a associação com aspectos individuais e contextuais [Motivation to learn in elementary school and the association with individual and contextual aspects]. *CoDAS*, 32(6), 1–10. <https://doi.org/10.1590/2317-1782/20192019247>
- [44] Ribeiro, F. (2011). Motivação e aprendizagem no contexto escolar [Motivation and learning in a school context]. *Profforma*, 1(3), 1–5.
- [45] Vilelas, J. (2009). *Investigação: o Processo de Construção do Conhecimento* [Research: The knowledge construction process]. Portugal: Edições Sílabo.
- [46] Byrne, B. M. (1994). *Structural equation modelling with EQS and EQS/Windows: Basic concepts, applications and programming*. USA: Sage Publications.
- [47] Lohr, S. L. (2022). *Sampling: Design and analysis*. USA: CRC Press.
- [48] Marôco, J. (2018). *Análise estatística com o SPSS statistics* [Statistical analysis with SPSS statistics]. Portugal: ReportNumber, Lda.
- [49] Finney, S. J., & DiStefano, C. (2013). Nonnormal and categorical data in structural equation models. In G. R. Hancock & R. O. Mueller (Eds.), *Structural equation modeling: A second course*. (pp. 439–492). Information Age Publishing.
- [50] Rosário, P., Lourenço, A., Paiva, M. O., Núñez, J. C., González-Pienda, J., & Valle, A. (2011). Inventário de processos de autoregulação da aprendizagem (IPAA) [Inventory of self-regulation processes of learning (IPAA)]. In M. M. Gonçalves, M. R. Simões, L. S. Almeida & C. Machado (Eds.), *Instrumentos e Contextos de Avaliação Psicológica* (pp. 159–174). Almedina.
- [51] Lourenço, A. A. (2007). *Processos auto-regulatórios em alunos do 3.º Ciclo do Ensino Básico: Contributo da auto-eficácia e da instrumentalidade* [Self-regulatory processes in students of the 3rd cycle of basic education: Contribution of self-efficacy and instrumentality]. PhD Thesis, University of Minho.
- [52] Leite, R. (2008). *Estratégias de controlo volitivo e processos de auto-regulação em alunos do terceiro ciclo* [Volitional control strategies and self-regulation processes in third-cycle students]. Master's Thesis, University of Minho.
- [53] 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(1), 118–127. <https://doi.org/10.1017/S1138741600001530>
- [54] World Medical Association Declaration of Helsinki. (2013). Ethical principles for medical research involving human subjects. *JAMA*, 310(20), 2191–2194. <https://doi.org/10.1001/jama.2013.281053>
- [55] Bartram, D., Grégoire, J., Hambleton, R., Muñiz, J., & van de Vijver, F. (2018). ITC guidelines for translating and adapting tests (Second edition). *International Journal of Testing*, 18(2), 101–134. <https://doi.org/10.1080/15305058.2017.1398166>
- [56] Arbuckle, J. L. (2012). *IBM® SPSS® Amos™ 21 user's guide*. USA: Amos Development Corporation.
- [57] Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2013). *Multivariate data analysis*. UK: Pearson Education.
- [58] Pestana, M. H., & Gageiro, J. N. (2008). *Análise de dados em ciências sociais* [Data analysis in social sciences]. Portugal: Sílabo.
- [59] Marcilio, F. C. P., Blando, A., Rocha, R. Z., & Dias, A. C. G. (2021). Guia de Técnicas para a Gestão do Tempo de Estudos: Relato da Construção [Guide of techniques for study time management: Report of construction]. *Psicologia: Ciência e Profissão*, 41, e218325. <https://doi.org/10.1590/1982-3703003218325>
- [60] Schunk, D. H., & Zimmerman, B. J. (2023). *Self-regulation of learning and performance: Issues and educational applications*. UK: Routledge.

How to Cite: 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(3), 113–122. <https://doi.org/10.47852/bonviewIJCE42022392>