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Psychopedagogical Factors and Academic Achievement: Empirical Study Using Structural Equation Models

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Abstract

Understanding the psychopedagogical factors that influence achievement has been central to educational research. Among these factors, self-regulation of learning, perceptions of self-efficacy for learning, and effective time management in school activities are key determinants of academic success. The main objective of this study was to analyze the relationship between self-regulation procedures, perceptions of self-efficacy for learning, and academic time management strategies, as well as their impact on academic achievement in basic school students from Portuguese schools. The research used questionnaires to assess the

variables under study. A structural equation model was applied to test the theoretical model integrating these variables. The results indicate that students who use more self-regulation strategies are those who exhibit higher perceptions of self-efficacy. Furthermore, it was found that students with higher levels of self-regulation and self-efficacy are the ones who plan their time management the most, both in the short and long term, in their school activities. Finally, the data show that these same students - who combine strong self-regulation, high self-efficacy, and strategic time management - achieve better academic results, confirming the importance of integrating these factors into academic success. Future research is recommended to investigate other mediating or moderating variables in this relationship, such as the role of motivation or academic coping strategies. Additionally, longitudinal studies that enable the analysis of the development of these skills throughout the school journey are suggested.

Keywords: Self-regulation of learning, Self-efficacy, Academic time management, Academic achievement, Structural equation models, Students

1. Introduction

Students' academic achievement has been a central focus of educational research in recent decades, particularly in the context of primary education, where the foundations for long-term academic success are established. Among the various psychopedagogical variables that influence academic performance, self-regulated learning (SRL), perceptions of self-efficacy, and school time management stand out. In this study, time management is analyzed in two dimensions: short-term and long-term. These factors are crucial not only for promoting autonomous learning but also for strengthening students' confidence in their abilities, which directly impacts their motivation, engagement, and persistence in achieving academic goals (Zimmerman, 2002; Bandura, 2002).

SRL refers to the process by which students systematically plan, monitor, and adjust their learning strategies to achieve more effective performance (Zimmerman, 2008). This process includes key decisions, such as selecting study strategies, assessing progress, and, notably, organizing and managing the time available for school activities. In turn, perceptions of self-efficacy relate to a student's belief in their ability to successfully complete academic tasks. Bandura (1997, 2002) emphasizes that the higher this perception, the greater the effort exerted and the persistence shown in the face of challenges.

With regard to school time management, it can be understood as the ability to organize tasks and temporal resources. In this study, it is differentiated into short-term planning, which focuses on immediate goals and deadlines, and long-term planning, which is oriented towards distant objectives over a longer period. Research shows that students who master both dimensions of time management tend to be more productive, meet deadlines more effectively, and reduce levels of anxiety and procrastination (Lourenço & Paiva, 2024; Valente et al., 2024).

The literature indicates that these three variables are deeply interconnected, but most studies have analyzed their impact in isolation. It is therefore necessary to understand how these

dimensions interact to enhance academic success (Marcilio et al., 2021; Schunk & Zimmerman, 2023; Wolters & Brady, 2021). The present study aims to address this gap by investigating, in an integrated manner, the relationship between SRL, perceptions of self-efficacy, and the two aspects of time management, short-term and long-term, on the academic achievement of students in the 3rd Cycle of Basic Education (7, 8, 9th grades).

To this end, we used the structural equation modelling (SEM; Arbuckle, 2022) methodology to map the direct and indirect relationships between the variables. The relevance of this study is highlighted by data from the Programme for International Student Assessment (PISA; OECD, 2023), which reveal students' widespread difficulties in applying self-regulation strategies and efficiently managing their time, compromising their performance in core subjects such as mathematics, native language (Portuguese), and natural sciences. This scenario demonstrates the urgency of developing studies that not only deepen these relationships but also contribute to the development of more effective educational programs.

Thus, this study aims to analyze how the combination of SRL, self-efficacy, and time management, differentiated into short-term and long-term, influences students' academic achievement. The formulated hypotheses will aim to test whether students who possess higher levels of these competencies achieve better academic results.

Next, a thorough theoretical review of the variables under analysis is presented, along with the definition of the research hypotheses, the methodology used, as well as the discussion of the results and their implications for pedagogical practice and the formulation of educational policies that encourage more autonomous and effective learning.

2. The Constructs Under Study

2.1 Self-Regulated Learning

In today's educational contexts, marked by complexity and the need for constant adaptation, the attention given to the variables that shape academic success is increasingly relevant. Poor academic performance, particularly in fundamental skills such as reading, logical reasoning, and problem-solving, has been widely associated with deficits in motivation, engagement, and students' self-regulation abilities (Lourenço & Paiva, 2024). These difficulties affect not only academic performance but also students' personal and social development, with implications that extend beyond the boundaries of the educational space (Gianfelice et al., 2024).

In light of this scenario, it becomes essential to understand academic achievement not just as a result of mastering content, but as a process that integrates cognitive, emotional, and behavioral skills. Research has shown that successful learning requires more than the acquisition of knowledge; it also involves the ability to manage and regulate one's own learning processes, strategically mobilizing internal resources (Valente et al., 2024; Zimmerman, 2008).

One of the main concepts that helps explain this dynamic is SRL, which refers to students' ability to plan, monitor, and adjust their actions, emotions, and thoughts to achieve

educational goals (Efklides et al., 2018; Zimmerman & Schunk, 2011). This competence is essential for promoting the autonomy and active involvement of students in school tasks, thereby fostering more effective and lasting learning (Muis et al., 2016; Lourenço & Paiva, 2025).

The SRL model integrates different components, ranging from goal setting and monitoring the strategies applied to adjusting them based on the results obtained (Schunk & Zimmerman, 2023). Effective time management, as one of the pillars of self-regulation, plays a central role in this process. The distinction between short-term and long-term time management reflects the different ways in which students plan and execute their school tasks, being essential for both meeting immediate goals and achieving long-term objectives (Zimmerman, 2002; Schunk & Zimmerman, 2023).

Students with a higher level of self-regulation not only monitor and adjust their behaviors and cognitive strategies but also demonstrate a superior ability to manage time strategically, both in the short term, through efficient execution of daily tasks, and in the long term, with more robust and sustainable planning of their academic journey (Costa et al., 2022; Valle & Connor, 2019). According to some studies, students also show greater self-control and executive skills that enable them to maintain focus on tasks, even in the face of distractions or difficulties (Hoyle & Dent, 2018; Zachariou & Whitebread, 2019).

Research also reveals that the early manifestations of self-regulation are strongly linked to the development of executive skills and self-control, influencing not only academic performance but also students' social adaptation (Blankson et al., 2017; Diamond, 2016). Furthermore, the ability to manage time effectively throughout the school cycle, both in the short and long term, is closely linked to the capacity to anticipate and overcome obstacles, underscoring the importance of integrating pedagogical practices that foster strategic time management (Valente et al., 2024).

According to Lourenço and Paiva (2016), the integration of pedagogical practices that promote metacognition, self-efficacy, and effective time management, both in the short and long term, constitutes a solid path to strengthening students' autonomy and academic competence. Arcoverde et al. (2022) emphasize that SRL is not only a cognitive skill but also an emotional and motivational skill, reflected in students' academic performance. The promotion of these skills should, therefore, be central to contemporary educational approaches, ensuring that students not only learn but also know how to organize their time and adapt their strategies to achieve academic success in an effective and sustainable way.

2.2 Perceptions of Self-efficacy for Learning

The perception of self-efficacy for learning is situated within the theoretical framework of Bandura's Social Cognitive Theory (1986, 1997), which emphasizes the reciprocal interaction between personal, behavioral, and environmental factors in human development. Self-efficacy for learning is defined as the perception that an individual has of their ability to organize and execute actions necessary to achieve specific outcomes, directly influencing choices, effort, persistence, and resilience in the face of difficulties (Bandura, 1997). In the

academic context, this perception becomes one of the most robust predictors of self-regulated behaviour, affecting how students engage in learning and face academic challenges (Fior et al., 2022).

Self-referent thinking emerges as a fundamental mediating element, regulating and monitoring what the individual thinks, feels, and does (Bandura, 1997). This mediation translates into a constant evaluation of one's abilities, affecting the interpretation of success or failure experiences. Students with high self-efficacy tend to adopt more effective cognitive and metacognitive strategies, set more challenging goals, and maintain greater perseverance in complex tasks (Zimmerman & Schunk, 2011). In contrast, low levels of self-efficacy are often associated with procrastination, giving up in the face of obstacles, and adopting superficial or avoidance strategies (Júnior et al., 2023).

The perception of self-efficacy for learning plays a central role in academic success by directly impacting not only academic performance but also motivation, emotional regulation, and students' self-esteem (Honicke & Broadbent, 2016). When students believe in their competence, they approach tasks with greater optimism and less anxiety, demonstrating a greater ability to cope with the pressure and stress inherent in the academic journey (Paananen et al., 2019). In this sense, self-efficacy functions as a psychological buffer, mitigating the emotional impact of difficulties and failures, and promoting a growth mind-set.

Moreover, the literature has shown that self-efficacy directly influences how students manage time in the academic context, both in the short term (through the efficient execution of daily tasks and the management of immediate deadlines) and in the long term (through strategic planning of future goals and organization of the academic journey; Schunk & DiBenedetto, 2022). Students with higher self-efficacy tend to demonstrate better time management in both time horizons, contributing to more consistent and effective engagement in learning.

Self-efficacy is not a static belief; it is a dynamic construct that evolves over time and throughout the academic journey. Accumulated experiences of success, feedback received from teachers, peers, and family members, as well as observing significant role models, contribute to strengthening or weakening this perception (Schunk & DiBenedetto, 2022). Literature indicates that from primary education to higher education, students with higher levels of self-efficacy show greater SRL and a greater tendency to set realistic goals and persist in achieving them (Barros et al., 2019).

By enhancing effective time management in both the short and long term, self-efficacy thus plays an important mediating role in maximizing academic performance and building successful learning trajectories. Therefore, promoting educational contexts that favor the development of positive beliefs in self-efficacy for learning is essential to foster sustainable and autonomous academic success. Strategies such as the use of constructive and personalized feedback, the promotion of progressively challenging tasks, and the development of SRL skills are fundamental to this process (Zimmerman & Schunk, 2011).

Understanding and intervening in the development of students' self-efficacy not only improves their academic performance but also contributes to more resilient academic

trajectories and deeper, more meaningful learning.

2.3 Time Management Planning

In the contemporary school context, the way students organize and use their academic time plays a decisive role in academic success (Valente et al., 2024). The ability to manage time effectively is revealed as one of the essential skills for good performance in educational activities and for the development of solid study habits (Lourenço & Paiva, 2024). This management is not limited to immediate tasks but spans short-term planning, such as the daily execution of school activities, and long-term planning, related to the organization of goals and projects over time. In this sense, time management planning has become established as one of the pillars of SRL strategies, being widely recognized by recent research as a key factor in enhancing academic performance.

Specialized literature points to time management planning as a structured and goal-oriented behaviour that allows students to anticipate challenges, organize their tasks, and optimize their available time. Casiraghi et al. (2020) describe this process as a practice that is linked with the perception of effort and goal setting, catalyzed by students' intrinsic motivation (Callan et al., 2022). In turn, Lourenço and Paiva (2016) argue that SRL strategies, in which time management planning is included, should function as a structuring axis of daily academic activity.

Both in the short term, in planning weekly activities and managing immediate deadlines, and in the long term, in organizing larger projects and setting annual academic goals, effectiveness in time management proves decisive in avoiding task accumulation and reducing the impact of academic stress (Matta, 2019; Casiraghi et al., 2020).

Pedagogical practice thus requires increased attention to student diversity and their specific needs, making it essential to adopt methodologies that promote autonomy and the ability to organize personal study. Poor time management can trigger counterproductive dynamics, such as the progressive worsening of academic difficulties, often referred to as a "snowball effect" (Vega & Beyebach, 2023), where procrastination and task accumulation compromise the balance between effort and performance.

Empirical evidence shows that students with a higher perception of control over their time tend to exhibit lower stress levels and greater task effectiveness (Casiraghi et al., 2020; Noro & Moya, 2019). The results of Valente et al.'s (2024) study indicate that students who focus on short-term time management planning for study tend to procrastinate more in preparing for assessment exams; whereas students who plan their time management in the long term are less likely to procrastinate when studying for exams. The study also indicates that students who are more careful in their long-term time management planning for studying tend to procrastinate less in their daily study. These students demonstrate consistent study habits, systematic organization of content, and the use of diversified strategies (Matta, 2019).

In this regard, Casiraghi et al. (2020) also emphasize that effective time management should be complemented by practices such as self-assessment, self-monitoring, and the setting of clear goals. However, factors such as concentration difficulties, inadequate study spaces, and

lack of structured planning can limit the effectiveness of this skill (Teles et al., 2020; Silva et al., 2020). Studies like those by Lourenço and Paiva (2016) and Froehlich et al. (2016) highlight the importance of providing pedagogical tools that help students develop organized study habits.

In this context, the importance of teaching students to distinguish and articulate short-term and long-term planning strategies is highlighted, promoting more effective time management and better adaptation to school demands at different time horizons (Marcílio et al., 2021; Thibodeaux et al., 2017).

Thus, time management planning emerges as a structuring element of SRL, being essential for academic success and for the overall development of the student.

2.4 Academic Performance

Academic performance translates into the level of achievement students demonstrate in school activities and involves more than the mere acquisition of knowledge. It also reflects the practical application of learning, collaboration, time and resource management, as well as a proactive attitude. It thus results from the interaction between contextual factors, such as the school environment and family support, and individual characteristics, such as self-regulation and self-efficacy beliefs, which directly influence how students engage and progress in their educational journey (Fernandes & Lemos, 2020). It is commonly evaluated through tasks, tests, and exams, where students' responses indicate their understanding of the material.

Despite the predominance of quantitative indicators, literature has also emphasized the relevance of qualitative dimensions, namely social and interpersonal factors, which, in interaction with individual and contextual variables, significantly contribute to explaining academic performance (Chen et al., 2020). In this regard, it is understood that school performance results from a dynamic articulation between context-related factors, such as the school environment or family support, and individual student characteristics, such as self-regulation skills or self-efficacy beliefs (Fernandes & Lemos, 2020).

Considering the student as an agent embedded and active in a broader social system, it is understood that the school must adopt a responsive stance, adjusted to the multiple realities and goals of students, creating learning environments that foster the full development of their abilities and achieve consistent academic performance. In this sense, the goals set by students, as well as their intrinsic and extrinsic motivations, are deeply influenced by a set of contextual factors, such as family expectations, interpersonal relationships with peers and teachers, and perspectives on future academic and professional paths (Ribeiro et al., 2022).

In the present study, academic performance was operationalized based on the school grades obtained in the subjects of Mother Tongue (Portuguese), Mathematics, English, and Natural Sciences. The choice of these subjects is based on the fact that they are compulsory curriculum components in Portuguese basic education, have higher school failure rates (OECD, 2023), and are subject to national exams at the end of the 3rd cycle, in the 9th year of schooling (Portuguese and Mathematics). In 2024, the national exams for Portuguese and Mathematics in the 3rd cycle were the subjects where students presented the lowest average,

with only half of the students achieving a pass in Mathematics, while 76% of students passed Portuguese (Agência Lusa, 2025).

2.5 Study Objective and Hypotheses

The academic performance of students is determined by psychopedagogical factors that influence, in an articulated manner, their school performance (Lourenço & Paiva, 2016). The literature highlights the central role of SRL and self-efficacy perceptions in the construction of successful school trajectories (Callan et al., 2022). At the same time, the ability of students to plan and manage their time effectively in academic activities (both short-term and long-term) is an essential variable in the process of optimizing academic performance (Matta, 2019; Thibodeaux et al., 2017).

Thus, the present study aims to analyze the relationships between SRL procedures, self-efficacy perceptions, and time management in academic activities (short-term and long-term strategies), and the combined impact of these variables on the academic performance of students in the 3rd cycle of Basic Education.

Through the application of structural equation models, the goal is to validate a theoretical model that clarifies these direct and indirect relationships and deepens the understanding of the underlying mechanisms of academic success. According to the theoretical review carried out, the following research hypotheses were outlined:

Hypothesis 1: The SRL procedures adopted by students have a direct and positive influence on their self-efficacy perceptions for learning;

Hypothesis 2: The SRL procedures have a direct and positive effect on short-term time management;

Hypothesis 3: The SRL procedures have a direct and positive effect on long-term time management;

Hypothesis 4: The self-efficacy perceptions for learning have a direct and positive impact on short-term time management in school activities;

Hypothesis 5: The self-efficacy perceptions for learning have a direct and positive impact on long-term time management in school activities;

Hypothesis 6: Short-term time management has a direct and positive influence on long-term time management;

Hypothesis 7: Short-term time management has a direct and positive impact on students' academic performance; and

Hypothesis 8: Long-term time management has a direct and positive impact on students' academic performance.

By structuring the model with this temporal segmentation (short-term and long-term), the aim is to capture the specifics of time management strategies and how they contribute differently to school performance. This approach will also allow for the identification of potential

intervention pathways to assist students in building more effective study routines and consolidating self-regulatory skills throughout their academic journey.

3. Method

3.1 Design

The present study is framed within an explanatory design (Ato et al., 2013), aiming to examine the relational structure between the variables under study and assess the fit of a theoretical model, using Structural Equation Modelling (SEM). This statistical technique allows for an in-depth analysis of causal and dependency relationships between the constructs of SRL, self-efficacy perceptions, time management, and academic performance, enabling the measurement of the intensity and direction of these interactions. SEM, recognized for its robustness and ability to integrate multiple variables into a single explanatory model, serves as an essential tool for validating the proposed hypotheses. In addition to clarifying the mechanisms that underpin academic success, this approach also allows for the identification of relevant mediating and moderating variables in the learning process, offering an integrated and rigorous view of the dynamics that influence school performance.

3.2 Participants

In this study, a non-probabilistic convenience sampling method was used. A total of 1531 students [804 (52.5%) were female and 726 (47.4%) were male] of Basic Education 3rd Cycle (7th, 8th and 9th grades) from Portuguese public schools participated in this study. Regarding the distribution by educational levels, 558 students (36.4%) were in the 7th grade, 446 (29.1%) were in the 8th grade, and 527 (34.4%) were in the 9th grade. The age range of the participants was between 12 and 16 years (M_{age} = 13.8; SD = 1.085).

Concerning academic performance, the averages recorded in the assessed subjects were as follows: Portuguese Language, with an average of 2.98 (SD = 0.861); English, with 3.00 (SD = 1.025); Mathematics, with 2.83 (SD = 1.002); and Natural Sciences, with an average of 3.07 (SD = 0.840).

3.3 Instruments

The self-regulation of students' learning was assessed using the Self-Regulated Learning Process Inventory (SRLPI; Rosário et al., 2010), an instrument composed of nine items distributed into three dimensions: Planning (α = .84; *e.g.*, "Before starting a task, I make a plan. I think about what I will do and what is necessary for its completion"), Execution (α = .77; *e.g.*, "During lessons or while studying at home, I analyze my behavior to identify aspects to improve and achieve my goals") and Evaluation (α = .85; *e.g.*, "Whenever I receive a grade, I reflect on what I can adjust to improve my performance"). Responses were recorded on a five-point Likert scale, from 1 (never) to 5 (always). The SRLPI aims to measure students' self-regulation processes based on their individual characteristics and the learning contexts they are part of.

The perception of self-efficacy for learning was measured using the Self-efficacy for Learning Questionnaire (SLQ; Rosário et al., 2012), composed of ten items organized into

two dimensions: Organization (α = .79; *e.g.*, "Taking notes and expanding them to later learn the material in depth") and Evaluation (α = .79; *e.g.*, "Using strategies to comprehensively memorize study materials"). The scale, in a five-point Likert format (1 = never; 5 = always), allows the evaluation of how students feel capable of mobilizing effective study strategies, managing time efficiently, and self-regulating their learning process.

The planning of academic time management was assessed using the Time Management Planning Inventory (TMPI; Lourenço, 2008). This instrument consists of 12 items, divided into two dimensions: Short-Term (α = .89; *e.g.*, "I make a daily list of tasks I need to complete") and Long-Term (α = .82; *e.g.*, "I organize my study according to the test schedule"). The scale, in a five-point Likert format (1 = never; 5 = always), allows the measurement of how students organize and manage the time dedicated to studying, both in the immediate horizon and in medium- and long-term planning, as well as their attitude towards this management.

Academic performance was measured based on the final grades obtained in the subjects of Portuguese Language, Mathematics, English, and Natural Sciences. The selection of these curricular areas is justified by their mandatory nature in the Portuguese education system, their relevance to the academic trajectory of students, and the high incidence of failures (OECD, 2023), in addition to the requirement of a national exam (Portuguese and Mathematics) in the 9th grade. In the grading system in force in basic education in Portugal, grades are awarded on a five-point scale: levels one and two correspond to insufficient; level three to sufficient; level four to good; and level five to very good.

It is worth noting that all instruments are validated for the Portuguese context, ensuring the validity and reliability of the instruments used.

3.4 Procedures

After obtaining formal authorization from the director, guardians, and students, the questionnaires were administered in the participating schools. The administration took place in person, under the direct supervision of the researcher, and students were asked to respond honestly and completely to all items. The confidentiality of the responses was fully ensured, student participation was voluntary, and all ethical procedures were strictly followed. This study was conducted in accordance with the principles of the Helsinki Declaration (2013) and with the ethical standards established by the American Psychological Association (APA). The inclusion criterion was that the students attended the 3rd cycle of basic education.

3.5 Data Analysis

To ensure the validity and reliability of the instruments, the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity were calculated, confirming the adequacy of principal component analysis and the significant interrelationships between variables. Internal consistency was evaluated using Cronbach's alpha, considered acceptable for values greater than 0.70 (Marôco, 2021), given the Likert format of the items.

In the preliminary analysis, rigorous criteria for data normality were defined, with skewness

values below 2 and kurtosis values below 7 (Finney & DiStefano, 2013). The modelling (SEM) was performed in SPSS/AMOS 29 (Arbuckle, 2022), evaluating the overall model fit and the significance of regression coefficients.

The main fit indices were analyzed, including: χ^2; χ^2/df; GFI ≥ 0.90 (Jöreskog & Sörbom, 1983); AGFI ≥ 0.90 (Hu & Bentler, 1999); CFI ≥ 0.95 (McDonald & Ho, 2002); TLI ≥ 0.95 (Hair et al., 2019); RMSEA < 0.05 (Byrne, 2016); and Critical N greater than 200 (Marôco, 2021). Factor loadings equal to or greater than 0.40 were considered significant (Brown, 2015).

Given the sample size (over 300 participants), Cronbach's alpha values above 0.70 ensured the stability and robustness of the analyses (Marôco, 2021). Finally, Pearson's correlation (r) was used to explore the intensity and direction of relationships between constructs, interpreted as follows (Hair et al., 2019): < 0.200 (very weak/negligible), 0.200-0.399 (weak), 0.400-0.699 (moderate), 0.700-0.899 (strong), and ≥ 0.900 (very strong).

4. Results

Table 1 presents the descriptive statistics of the variables included in the SEM analysis, including mean, standard deviation, skewness, and kurtosis. The results show that all variables remain within acceptable limits, ensuring the stability of the data and the adequacy of the tested model.

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

Variable	Min.	Max.	Mean	SD	Skewness	Kurtosis
self-regulated learning	9	45	35.39	8.324	-1.278	1.487
self-efficacy for learning	10	50	36.60	7.365	-0.844	0.568
academic achievement	7	20	11.95	2.491	0.564	-0.016
tmpi1st	1	5	2.50	1.315	0.404	-0.937
tmpi2st	1	5	2.75	1.296	0.188	-0.995
tmpi3lt	1	5	3.69	1.264	-0.760	-0.448
tmpi4lt	1	5	4.05	1.179	-1.236	0.708
tmpi5lt	1	5	3.82	1.367	-0.840	-0.609
tmpi6st	1	5	2.42	1.366	0.563	-0.934
tmpi7lt	1	5	3.37	1.293	-0.334	-0.946
tmpi8st	1	5	2.57	1.259	0.355	-0.841
tmpi9lt	1	5	3.98	1.209	-1.148	0.407
tmpi10st	1	5	3.12	1.267	-0.249	-0.892
tmpi11lt	1	5	3.14	1.191	-0.179	-0.710
tmpi12st	1	5	2.64	1.379	0.309	-1.103

Note. tmpi = time management planning inventory; st = short-term; lt = long-term; Min. = Minimum; Max. = Maximum; SD = Standard Deviation.

The global fit indices of the proposed SEM model demonstrate significant robustness [$\chi^2(85) = 115.279$; $p = 0.016$; $\chi^2/df = 1.356$; GFI = 0.984; AGFI = 0.978; TLI = 0.964; CFI = 0.971; RMSEA = 0.015 (90% CI: 0.007-0.022); Critical N (0.05/1428-0.01/1570)], confirming that the model reflects the relationships between the variables analyzed in the empirical matrix. The interpretation of Figure 1 and Table 2 reinforces the validity of the proposed hypotheses, all of which are statistically significant.

The results confirm the formulated hypotheses, showing that students with higher levels of SRL exhibit superior perceptions of self-efficacy for learning (H1; $\beta = 0.124$; $p < 0.001$), in addition to demonstrating a greater tendency to plan their time both in the short term (H2; $\beta = 0.136$; $p < 0.001$) and in the long term (H3; $\beta = 0.122$; $p < 0.001$). Similarly, higher perceptions of self-efficacy for learning are significant predictors of greater short-term (H4; $\beta = 0.298$; $p < 0.001$) and long-term planning (H5; $\beta = 0.195$; $p < 0.001$). There is also a direct and positive association between short-term and long-term time management (H6; $\beta = 0.483$;

$p < 0.001$), indicating that the consistent adoption of short-term strategies also facilitates the structuring of more extended plans over time.

Regarding the impact on academic performance, the analysis shows that effective time management has a direct and positive influence on academic achievement, both in the short-term (H7; $\beta = 0.123$; $p < 0.001$) and in the long-term (H8; $\beta = 0.204$; $p < 0.001$). These findings support the relevance of the temporal segmentation (short and long-term) in the proposed model, allowing a more differentiated capture of the specificities of time management practices and how they affect academic performance.

Finally, the analysis of the regression coefficients confirms the statistical significance of the relationships between the latent variables ($p < 0.05$), empirically supporting the robustness of the model. The inspection of residuals and modification indices (MI) did not identify relevant discrepancies, further reinforcing the adequacy and good fit of the proposed structure to the relationships between the constructs under analysis.

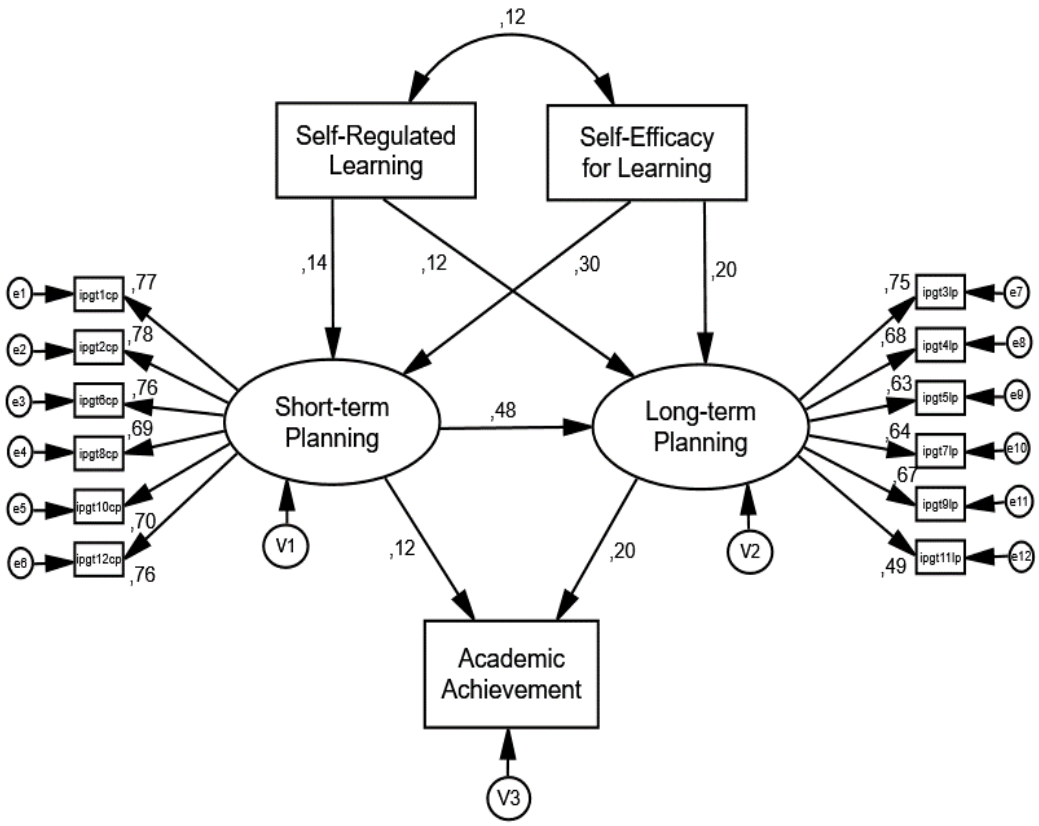

Figure 1. SEM model (n = 1531)

The additional results support the stability and consistency of the model, ensuring the validity of the associations established between the constructs. Compliance with the defined parameters allows us to conclude that the model accurately and coherently reflects the

dynamics identified in the data, demonstrating a robust fit to the empirical evidence.

Table 2. Descriptive statistics of the model variables

			UEV	SEV	SE	p
short-term planning	<---	self-regulated learning	0.017	0.136	0.003	***
short-term planning	<---	self-regulated learning	0.040	0.298	0.003	***
long-term planning	<---	self-regulated learning	0.015	0.195	0.002	***
long-term planning	<---	self-regulated learning	0.009	0.122	0.002	***
long-term planning	<---	short-term planning	0.282	0.483	0.026	***
tmpi1st	<---	short-term planning	1.000	---	---	---
tmpi8st	<---	short-term planning	0.857	0.691	0.025	***
tmpi5lt	<---	long-term planning	1.452	0.625	0.078	***
tmpi7lt	<---	long-term planning	1.390	0.642	0.074	***
tmpi9lt	<---	long-term planning	1.354	0.669	0.074	***
academic achievement	<---	long-term planning	0.868	0.204	0.149	***
academic achievement	<---	short-term planning	0.306	0.123	0.084	***
tmpi12st	<---	short-term planning	1.043	0.763	0.026	***
tmpi10st	<---	short-term planning	0.892	0.703	0.027	***
tmpi6st	<---	short-term planning	1.019	0.757	0.024	***
tmpi2st	<---	short-term planning	1.000	0.784	0.024	***
tmpi3lt	<---	long-term planning	1.559	0.749	0.081	***
tmpi4lt	<---	long-term planning	1.335	0.675	0.073	***
tmpo11lt	<---	long-term planning	1.000	---	---	---
Covariance						
self-regulated learning	<--->	self-efficacy for learning	7.729	0.124	1.769	***

Note. st = short-term; lt = long-term; UEV = unstandardized estimated values; SEV = standardized estimated values; SE = standard errors; p = significance levels; *** = $p < 0.001$.

Based on the proposed theoretical model, the squared multiple correlations indicate that SRL processes and self-efficacy explain approximately 12% of the variance in short-term time

management planning ($\eta^2 = 0.117$) and around 37% in long-term planning ($\eta^2 = 0.372$). Academic performance, in turn, is directly explained by time management (both short- and long-term) and indirectly by SRL processes and self-efficacy, with an explained variance of approximately 9% ($\eta^2 = 0.085$).

Additionally, an analysis of the linear relationships between the variables (Table 3) was conducted using Pearson's correlation coefficient to measure the strength and direction of these associations. The results demonstrated positive and statistically significant correlations between all the model variables, although of weak magnitude. Notable relationships include those between long-term planning and self-efficacy for learning ($r = 0.375$; $p < 0.01$), as well as with short-term planning ($r = 0.374$; $p < 0.01$). Despite being modest, these correlations confirm a statistically robust connection between the constructs analyzed.

Table 3. Pearson correlations of the model variables

	1	**2**	**3**	**4**	**5**
1. self-regulated learning	1				
2. self-efficacy for learning	0.126**	1			
3. long-term planning	0.245**	0.374**	1		
4. short-term planning	0.143**	0.303**	0.375**	1	
5. academic achievement	0.069**	0.146**	0.152**	0.054**	1

Note. **Significant correlation at the level of < 0.01.

5. Discussion

This study aimed to analyze the influence of psychopedagogical factors, such as SRL, perceptions of self-efficacy for learning, and time management planning (both short- and long-term), on the academic performance of students in the 3rd Cycle of Basic Education. Using the SEM modeling technique, eight hypotheses were tested regarding the interaction of these variables and their impact on academic achievement. The results confirmed the relevance of these factors for school success, offering implications for future educational practices.

The SEM analysis demonstrated a good fit to the proposed model, with indices aligning with the criteria recommended in the literature (Byrne, 2016; Hair et al., 2019; Hu & Bentler, 1999), highlighting its robustness and adherence to empirical data.

The results confirm hypothesis H1, revealing that the higher the level of SRL, the greater their perceived self-efficacy for learning. The positive and significant relationship found aligns with the reviewed literature. As proposed by Zimmerman (2002), SRL involves a process of monitoring and controlling one's own learning strategies, where students become

more aware of their abilities and limitations. This self-regulation process, which includes goal setting, planning, and self-evaluation, contributes to the development of a sense of self-efficacy—*i.e.*, the student's belief in their ability to successfully complete academic tasks.

Students who control the learning process, adjusting their strategies as needed, are more likely to believe that they can succeed in their academic activities, which is related to Bandura's (1997) concept of self-efficacy. Self-efficacy, in turn, is an important predictor of academic performance, as it motivates students to continue studying and persevere in the face of challenges (Ribeiro et al., 2022).

The relationship found in this study is also supported by the work of Schunk (1990), who highlights that self-regulation can serve as a means to develop a greater belief in one's abilities. When students can monitor their progress and adjust their learning approaches, they become more confident in their ability to achieve success (Barros et al., 2019). This confidence, in turn, strengthens their self-efficacy, creating a positive cycle of increased academic performance.

The literature suggests that strengthening self-efficacy is influenced by personal success experiences, observing others with similar or superior abilities, receiving positive feedback, and exercising self-control in learning (Bandura, 1997; Blankson et al., 2017). In the context of our study, self-regulation provides students with the tools to organize their learning strategies more effectively, which enhances success experiences and, consequently, raises their self-efficacy.

The data obtained in hypotheses H2 and H3 suggest that SRL is strongly associated with the ability to plan and manage time, both in the short and long term. Hypothesis 2 shows that students with higher levels of SRL are more likely to plan their time effectively in the short term. The literature reinforces this relationship, highlighting that SRL involves setting goals, monitoring progress, and adapting learning strategies (Schunk & Zimmerman, 2023), as well as enabling efficient time organization (Lourenço & Paiva, 2024).

Similarly, hypothesis H3 confirms that students with a higher level of SRL tend to be more capable of planning time in the long term. The ability to set goals and long-term study strategies is a fundamental component of self-regulation and aligns with the literature that emphasizes the importance of a broader temporal perspective for academic success (Marcilio et al., 2021, Schunk & Mullen, 2012).

The regression values of hypotheses H2 and H3 are similar, indicating a strong and significant association between SRL and time planning, reinforcing the importance of these skills in improving academic performance. These results underscore the need for pedagogical interventions that focus on developing these skills, enabling students to plan and adapt their learning approaches throughout their entire educational journey.

The analysis of hypotheses H4 and H5 highlights the predictive role of perceptions of self-efficacy in time planning, both in the short and long term. The results show that students with higher levels of self-efficacy for learning tend to plan their time better, which is in line

with the literature on the subject (Schunk & DiBenedetto, 2022). Regarding H4, the higher regression value suggests that self-efficacy has a particularly strong influence on the organization of tasks and goals in the more immediate time horizon, corroborating the studies by Bandura (1997), which emphasize that individuals with high self-efficacy are more likely to engage in proactive behaviors of organization and meeting deadlines.

Hypothesis 5, in turn, confirms that self-efficacy also contributes to long-term planning, albeit with a moderately lower intensity compared to short-term planning. This result is consistent with what Schunk and Mullen (2012) argue, stating that students with high self-efficacy are able to set and maintain long-term goals, adjusting strategies and behaviors as they face new challenges in their academic journey. Zimmerman (2008) also emphasizes that self-efficacy allows students to develop a strategic view of learning, essential for effective long-term time management.

The results related to hypotheses H4 and H5 reinforce the relevance of self-efficacy not only as a motivational factor but also as a driver for adopting organizational behaviors that optimize time use (Fior et al., 2022; Zimmerman & Schunk, 2011). This evidence suggests that intervention programs that strengthen students' perception of self-efficacy may have a positive impact on their planning ability, with direct effects on academic performance.

The confirmation of hypothesis H6 reveals a significant and positive relationship between short-term and long-term time management, demonstrating that students who are able to plan their tasks effectively in the short term tend to also structure and implement more extended time management strategies. This result suggests that the ability to organize time in daily or weekly tasks serves as a foundation for a strategic and sustainable view of time management throughout the academic journey.

These data align with what Zimmerman (2008) argues, who describes time management as a staged and cumulative process, where effectiveness in short-term planning creates the necessary conditions for students to design and act on long-term goals. Organizing daily or weekly tasks not only promotes immediate efficiency but also contributes to the development of routines and habits that sustain effective management over broader academic cycles.

Studies highlight that students who can align short-term actions with more distant goals exhibit greater consistency and persistence in their academic behavior, maintaining focus and adapting better to future challenges (Casiraghi et al., 2020; Ribeiro et al., 2022). This behavioral pattern is reflected in the data of the present study, which demonstrates a robust association between these two dimensions of time management.

The results obtained for hypotheses H7 and H8 reveal that effective time management, both short-term and long-term, has a direct and positive impact on academic achievement. Although the regression values indicate a stronger association in the case of long-term planning, both results validate the premise that the ability to manage time in a structured way contributes to better school outcomes.

Regarding hypothesis H7, the data suggest that students' ability to organize and complete immediate and short-term tasks enhances their academic achievement, allowing for greater

efficiency and meeting deadlines in more immediate school contexts. This result aligns with Zimmerman (2008), who emphasizes the importance of self-regulation strategies in completing tasks and achieving immediate academic success.

On the other hand, hypothesis H8 highlights that long-term planning has an even stronger association with academic achievement, suggesting that students who develop a broader temporal view and structure long-term goals and strategies tend to achieve better results throughout their academic journey. This evidence reinforces the perspective of studies that emphasize the importance of alignment between long-term goals and sustained academic development (Schunk & DiBenedetto, 2022; Schunk & Mullen, 2012).

In general, the results confirm that the temporal segmentation in the model (short and long-term) allows for a differentiated understanding of the relevance of each dimension of time management, pointing to the importance of promoting skills that integrate both horizons into students' academic routines, with a view to maximizing their academic achievement.

5.1 Contributions, Limitations, and Future Research

This study reinforces the relevance of SRL, self-efficacy, and time management in explaining academic achievement in the 3rd Cycle of Basic Education, highlighting the mediating role of time management in this relationship. The data obtained underline the importance of fostering, in the educational context, practices that develop these self-regulatory skills, thereby contributing to students' academic success.

Despite the robustness of the results, the study has some limitations. The cross-sectional nature of the methodological design prevents the analysis of the evolution of these variables over time, limiting causal inferences. Additionally, although the sample was diverse, it was confined to a specific geographical context, restricting the generalization of the results. Furthermore, the use of exclusively self-report measures may have introduced biases related to social desirability or students' subjective perceptions.

From a practical standpoint, the results offer relevant clues for the design of psychopedagogical intervention programs focused on strengthening self-regulation, self-efficacy, and time management skills, thereby promoting academic achievement. Schools and education professionals could benefit from the systematic integration of strategies that enhance these dimensions in their educational projects.

For future research, it is recommended to conduct longitudinal studies that allow for tracking the development of these skills throughout the school journey, as well as to include other mediating or moderating variables, such as motivation and academic coping strategies, to deepen the understanding of the complexity of the processes underlying academic success.

6. Conclusions

This study reinforces the importance of research on self-regulatory competencies, such as SRL, self-efficacy, and time management, within the school context. These constructs play a crucial role in students' academic achievement, demonstrating that self-organization skills and confidence in one's abilities directly influence academic success. The results of this study

help to better understand how different dimensions of the learning process interrelate, offering valuable contributions to the development of more effective educational practices. Promoting self-regulation skills, particularly in areas such as time management, should be a priority in educational policies and intervention programs, with a view to strengthening the educational environment and continuously improving students' academic performance.

Moreover, ongoing research in this area not only deepens knowledge about the factors that contribute to academic success but also allows for the adaptation of teaching strategies to meet students' needs, creating more inclusive and effective spaces for their academic and personal development.

Finally, conducting future studies that explore different dimensions of this process, such as the role of motivation or coping strategies, is essential for expanding the understanding of the mechanisms that underpin academic performance, enabling the construction of a more robust educational system that is tailored to students' realities.

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AA and OP were responsible for the study design and data collection. AA and SV drafted and revised the manuscript. All authors contributed equally to the study.

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