

Perceived Instrumentality and Time Management Planning as Predictors of Academic Achievement

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Abstract

Academic achievement has been the subject of extensive investigation, highlighting the importance of individual, cognitive, and behavioral factors that influence students' performance. Among these, the perception of instrumentality and short- and long-term time management planning stand out. The present study, of a cross-sectional nature, aimed to analyze, through a structural equation model, the relationships between these variables and academic achievement, identifying the factors that most contribute to the performance of basic education students. The sample comprised 750 students from the 3rd cycle of Portuguese basic education (7th, 8th, and 9th years). The data collected included information on perception of instrumentality, time management planning, and academic results. Structural equation modelling was used to examine both direct and indirect effects of the variables on academic achievement. The results revealed that both perception of instrumentality and effective time management, as global constructs, showed positive and significant effects on academic achievement. These findings have practical implications for educational guidance and the development of study strategies, emphasizing the need for programs that promote competencies in instrumentality and time management to enhance academic performance. Future research may explore specific interventions for strengthening these competencies and analyze variations in different cultural contexts.

Keywords

Academic Achievement, Perception of Instrumentality, Time Management Planning, Basic Education, Structural Equation Modeling, Utility-Value,

Study Strategies

1. Introduction

Academic achievement has been the subject of a vast number of studies over recent decades, with recognition of its multifactorial nature and the influence of individual, cognitive, motivational, and behavioral variables (Gajda et al., 2017; Lourenço & Paiva, 2025; Lourenço et al., 2025; Trigueros et al., 2019). Among these variables, the perception of instrumentality stands out as a motivational construct that has received increasing attention, although it remains relatively under-explored in the context of basic education.

Perception of instrumentality refers to the value that students attribute to school tasks based on their usefulness for achieving future personal, academic, or professional goals (Eccles & Wigfield, 2020; Gaspard et al., 2015). This perception can play a decisive role in academic motivation, promoting students' engagement in learning activities, the use of more elaborate study strategies, and persistence when facing difficulties (Gaspard et al., 2015; Husman & Lens, 1999; Totonchi et al., 2025). However, despite its explanatory potential, instrumentality remains a little-investigated variable in comparison to other predictors of academic success, especially at earlier ages. Its inclusion in explanatory models may significantly contribute to an understanding of the motivational mechanisms underlying student performance, and guide pedagogical practices that promote greater perceived relevance in school tasks.

In parallel, time management planning is widely recognized as a relevant factor for academic success, particularly due to its association with self-regulation, study organization, and stress reduction (Aeon & Aguinis, 2017; Durán-Aponte & Pujol, 2013; Lourenço & Paiva, 2024). Students with good time management planning tend to manage their school responsibilities more efficiently, which contributes to better academic performance (Macan et al., 1990). Its behavioral nature makes these competences particularly relevant for psychoeducational interventions, as they can be taught and trained throughout the school journey.

In this context, it is also important to consider academic achievement as a relevant construct in itself. According to Steinmayr et al. (2019), more than a mere indicator of school success, academic achievement reflects the degree of mastery of learning, the effectiveness of adopted study strategies, and the interaction between individual and contextual factors. The authors point out that student motivation, including task values (such as the perception of the instrumental utility of content) and competence self-concepts, has significant predictive power over academic achievement, even after controlling for cognitive factors such as intelligence and previous grades.

In addition to task value and competence beliefs, recent research has highlighted the role of causal attributions for success and failure and achievement goal orien-

tations as important motivational determinants of academic engagement and outcomes. For example, [Suter et al. \(2022\)](#) found that the ways in which students explain their successes or failures (whether through internal or external causes) are systematically related to their mastery, performance-approach, performance-avoidance, and work-avoidance goal orientations, which in turn shape their motivation, persistence, and academic performance. Integrating this perspective with perceived instrumentality can provide a broader understanding of how students' beliefs about the causes of achievement outcomes interact with their valuation of tasks to influence learning behaviors and results.

In this study, academic achievement is considered a central construct that reflects mastery of learning, the effectiveness of adopted strategies, and the dynamic interaction between individual and contextual characteristics. Thus, being included as a dependent variable in an explanatory model enables not only the assessment of the effects of other variables, but also a better understanding of its role as an indicator of school adjustment and overall development.

Although both predictor variables show proven relationships with academic achievement, there are few studies that simultaneously analyze the effects of perception of instrumentality and time management planning, especially in basic education. The review by [Wolters et al. \(2025\)](#) highlights the scarcity of research integrating perceived task value and temporal regulation within self-regulation models. Empirical studies, such as those on interest and time management among secondary school students in Indonesia, partially illustrate this combination, but not in the context of basic education. An integrated approach that considers the direct and indirect effects of these variables may offer a more robust understanding of the factors that contribute to academic performance at this stage of schooling.

In this sense, the present study aimed to analyze, through a structural equation model, the relationships between perception of instrumentality, time management planning, and academic achievement in students of the 3rd cycle of basic education. In the present study, academic achievement is operationalized as the students' grades in Portuguese Language and Mathematics, which are considered essential indicators of educational success within the Portuguese education system. With this research, the intention is to contribute to deepening knowledge about the determinants of educational success, with special emphasis on the still under-explored role of instrumentality, and to lay the groundwork for future interventions and studies in diverse educational contexts.

2. Constructs under Study and Development of Hypotheses

A thorough understanding of the variables that influence students' school performance requires a clear and well-founded analysis of the main constructs involved. In this study, three variables assume particular relevance, which, due to their nature and impact on the academic path, deserve a specific theoretical framework: perception of instrumentality, time management planning, and academic achievement. Each of these constructs will be presented individually and succinctly in the

following sections, based on the most recent scientific literature, so as to support their relevance in the proposed model and clarify the mechanisms through which they may influence or be influenced in the educational context.

With this consolidated theoretical framework, the study's hypotheses are developed, aimed at analyzing the direct and mediated relationships between these constructs, thereby contributing to a better understanding of the determinants of academic performance.

2.1. Perception of Instrumentality

Perception of instrumentality refers to the extent to which students believe that school content or tasks are useful for achieving their future goals, whether academic, professional, or personal (Eccles & Wigfield, 2020). It is a central component of the Expectancy-Value Theory of motivation, which postulates that students' effort and engagement are strongly influenced both by their expectation of success and by the value attributed to the task (Eccles & Wigfield, 2024). In the situated model developed by the authors, utility value—corresponding to perception of instrumentality—assumes particular importance by directly influencing academic choices, persistence, and student performance. More recently, Wigfield and Eccles (2023) reinforced the importance of this model by highlighting how situational factors—such as the school environment, pedagogical practices, or educational transitions—shape students' motivational beliefs, including the perception of task utility.

When students recognize that the knowledge acquired at school has practical application or future relevance, they tend to show greater effort, persistence, and use of more effective learning strategies (Hulleman et al., 2017). Perception of utility not only contributes to an increase in extrinsic motivation but may also stimulate deeper forms of cognitive and affective engagement, fostering more meaningful learning.

Despite its theoretical importance, perception of instrumentality remains a relatively underexplored construct, especially in the context of basic education. Most studies have focused on secondary or higher education students, and research analyzing this variable at earlier stages of the academic path is still scarce (Totonchi et al., 2025). This gap is particularly relevant, given that beliefs formed in the early school years can significantly influence students' future academic trajectories.

Moreover, perception of instrumentality can be influenced by multiple factors, such as the sociocultural context, pedagogical practices adopted by teachers, and the clarity with which curricular goals are communicated to students (Rosenzweig et al., 2020). Interventions that emphasize the usefulness of content for real life have shown promising results, particularly in terms of improving motivation and academic performance (Canning et al., 2018).

In this study, perception of instrumentality is analyzed as a variable with direct and indirect impact on academic achievement, assuming a key role in understanding students' engagement and attitudes towards learning.

2.2. Time Management Planning

Time management planning, whether short- or long-term, is currently recognized as a fundamental element for academic success, influencing not only productivity but also psychological well-being and student engagement. A meta-analysis conducted by [Aeon et al. \(2021\)](#), based on over 100 studies, confirmed that these competences show a moderate correlation with academic performance, as well as being significantly associated with reduced stress, increased life satisfaction, and higher levels of self-regulation and motivation. These results reinforce the importance of effective time management as a promoter of academic achievement and students' mental health. This competence involves the adaptive capacity to plan, organize, prioritize, and monitor study activities, adjusting strategies according to the multiple curricular and personal demands ([Lourenço & Paiva, 2024](#)).

More than the mere quantity of hours dedicated to study, the effectiveness of time management planning depends on the quality of organization and the conscious use of self-regulatory strategies. In this regard, [Marcilio et al. \(2021\)](#) underline the importance of practices involving the diagnosis of time use, setting realistic goals, and continuous assessment of progress, showing that effective time management helps students deal with distractions, obstacles, and procrastination behaviors.

Also, the systematic review by [Wolters et al. \(2025\)](#) demonstrates that students who implement structured study routines, set clear goals, and regularly reflect on their time management tend to achieve higher levels of academic performance, greater autonomy, and lower tendencies for procrastination. Moreover, effective time management is also associated with increased psychological well-being and reduced stress.

Effective time management has proven to be a determining factor not only for academic success but also for students' psychological well-being. Practices such as organizing routines, setting clear goals, and monitoring study time are associated with a lower incidence of school stress and greater satisfaction with the educational path. In this regard, the systematic review and meta-analysis conducted by [Ahmady et al. \(2021\)](#) confirms that the development of these competences has a positive impact both on academic performance and students' mental health, emphasizing their relevance for students' holistic development.

The process of time management planning integrates fundamental stages that perfectly align with contemporary models of self-regulated learning: 1) reflection and definition of clear and realistic academic goals; 2) assessment of available time and priority activities; 3) flexible and coherent planning with appropriate prioritization; and 4) continuous monitoring and critical evaluation of results, with strategic adjustments as necessary. This cycle reflects the classic model of [Zimmerman & Moylan \(2009\)](#), encompassing the phases of forethought, performance, and self-reflection.

Beyond its impact on academic achievement, time management planning is

recognized as an essential transversal competence, associated with the promotion of autonomy, adaptability, and lifelong learning, qualities valued in higher education and the current labor market. The Future of Jobs Report 2020 (Zahidi et al., 2020) highlights it as a core part of self-management skills, alongside resilience, active learning, and stress tolerance. The personalisation of time management strategies, adjusted to individual and contextual particularities, is fundamental for the effectiveness of educational interventions. Umerenkova and Gil Flores (2018) identified that students with better academic performance show higher perception of time control, effective self-regulation, and more structured study routines.

Temporal literacy is a dynamic process combining practical skills and reflection, essential for self-assessment and continuous readjustment of school performance. Valente et al. (2024) analyzed the relationship between time management planning and procrastination in students of the 3rd cycle, concluding that more structured strategies are associated with reduced procrastination and promote autonomous and sustainable learning. They also highlight that there is no single effective strategy, making it essential to adapt these competences to the context, difficulties, and individual resources to foster academic success and student well-being. Similarly, Durán-Aponte and Pujol (2013) empirically demonstrate that the capacity to plan and manage time is crucial for students to adapt to multiple tasks, face unforeseen events, and achieve proposed goals, emphasizing that these competences are determinant from the beginning of the university trajectory and have a direct impact on school success.

2.3. Academic Achievement

Students' academic achievement represents the level of performance they show in various school tasks and activities, functioning as a comprehensive indicator not only of the knowledge acquired but also of their ability to apply this knowledge in a practical, collaborative, and effective way (Kyndt et al., 2019). More than just an assessment of accumulated content, academic achievement should be understood as a dynamic and multifaceted process that reflects the competences developed throughout the educational trajectory, namely in time management, resource management, emotional regulation, motivation, and the students' proactive attitude towards learning (Vera Sagredo, 2022).

This academic performance is often assessed using quantitative and qualitative methods, particularly through daily assignments, tests, and exams, in which the way students respond allows the degree of understanding and assimilation of content to be gauged (OECD, 2023). This assessment, however, is the result of a complex interaction between individual factors (e.g., self-efficacy, self-regulation, and volitional processes) and the environmental context, which includes the school environment, family support, and the students' social networks (Fernandes & Lemos, 2020; Lourenço & Paiva, 2025).

Recognizing the reciprocal influence between the individual and their context,

educational institutions should adopt pedagogical approaches that take into account the specific goals, motivations, and expectations of each student, promoting environments that encourage the active and ongoing involvement of students in their own learning (Ks et al., 2023). Motivation and future expectations, shaped by interactions with family, teachers, and peers, play a crucial role in academic performance, reinforcing the need for targeted and personalized strategies (Kulakow, 2020).

In the present study, academic achievement was assessed based on the grades obtained in Portuguese Language and Mathematics, subjects central to the curriculum of the 3rd cycle of basic education in Portugal. These areas were selected due to their fundamental role in the Portuguese education system and their relevance for the development of key cognitive competences such as logical reasoning, effective communication, and problem-solving. Mastery of Portuguese Language and Mathematics is essential not only for success within basic education but also as critical skills influencing students' future academic pathways and professional opportunities. Furthermore, proficiency in these subjects is indispensable for success in national examinations, which determine progression to secondary and higher education levels in Portugal. They often present additional challenges for students and are therefore subject to final cycle exams (OECD, 2023). Consequently, the grades in these subjects provide an objective and transversal measure of academic performance, directly linked to educational success and students' integration into the labor market.

In the Portuguese basic education system, grades use an ascending scale that ranges from insufficient (1 and 2), through sufficient (3), good (4), to very good (5), thus reflecting different levels of mastery and competence in the assessed content.

2.4. Development of Hypotheses

Students' academic achievement is influenced by multiple cognitive, motivational, and behavioral factors that are interrelated throughout their school journey. Among these, the perception of instrumentality stands out, understood as the value students attribute to the practical usefulness of school tasks for their future personal and professional goals, and time management planning, which involves the capacity to effectively plan, organize, and monitor academic activities (Fernandes & Lemos, 2020).

Current literature shows that perception of instrumentality motivates engagement and persistence in school tasks, fostering a more active commitment to learning (Eccles & Wigfield, 2020). At the same time, time management planning is fundamental for students to balance curricular and personal demands, avoiding procrastination and improving academic performance (Wolters et al., 2025). Thus, the interaction between these constructs may significantly contribute to explaining academic achievement, a concept that represents not only knowledge mastery but also the effective application of this knowledge in practical and col-

laborative contexts (Eccles & Wigfield, 2024; Fernandes & Lemos, 2020).

In the present study, we aim to analyze how perception of instrumentality and time management planning are directly related to the academic achievement of students in the 3rd cycle of basic education, also considering possible mediated relationships between these variables.

Accordingly, the following hypotheses were formulated:

Hypothesis 1: Perception of instrumentality has a direct and positive influence on students' time management planning;

Hypothesis 2: Perception of instrumentality manifests a direct and positive effect on academic achievement;

Hypothesis 3: Time management planning has a direct and positive influence on academic achievement;

Hypothesis 4: Time management planning exerts a mediating effect in the relationship between perception of instrumentality and academic achievement.

3. Method

3.1. Study Design

This study was conducted with an explanatory design (Marôco, 2021), which aims to understand the structure of the interrelationships between the variables investigated, as well as to assess the degree of fit of a theoretical model through Structural Equation Modelling (SEM). This methodology allows for an in-depth analysis of the causal links and dependencies between the constructs under study, perception of instrumentality, time management planning, and academic achievement, as well as measuring the magnitude and direction of these relationships. In this way, SEM constitutes a solid statistical tool to confirm the hypotheses put forward, providing detailed insights into the factors that influence students' academic success, as well as the identification of possible mediating and moderating variables that operate in the learning process.

It is important to emphasize that, as this is a cross-sectional study, the relationships identified reflect associations between the variables at a single point in time, and do not allow causal relationships between them to be established (Creswell & Creswell, 2017).

3.2. Participants

The study involved 750 students from public schools in northern Portugal, corresponding to the 3rd cycle of basic education (7th to 9th grade), which typically includes students aged between 12 and 15 years. In the sample, ages ranged from 12 to 17 years ($M = 13.8$; $SD = 1.188$). The distribution across grades was 38.1% in 7th grade, 28.7% in 8th grade, and 33.2% in 9th grade. Among them, 384 (51.2%) were girls. On average, the students dedicated 6.87 hours per week to studying ($SD = 5.484$). The average grades at the end of the 2023/2024 school year were 3.00 in Portuguese Language and 2.79 in Mathematics, reflecting academic performance in the main subjects.

3.3. Instruments

The Questionnaire of Instrumentality for Learning (QIA; Lourenço, 2008) is composed of 10 items distributed into two dimensions: Organization (ORG), $\alpha = .92$ (5 items; e.g., “Establish school objectives and plans to achieve them”), and Evaluation (AVA), $\alpha = .89$ (5 items; e.g., “Evaluate what I did and the results obtained in order to improve my study”). Responses are given on a 5-point Likert scale, from 1 (not at all useful) to 5 (very useful). The Organization dimension assesses the perceived usefulness of setting school goals and structurally planning the necessary actions, such as establishing specific objectives, distributing study over time, and prioritizing tasks. In turn, the Evaluation dimension measures the usefulness attributed to the analysis and reflection on performance, including monitoring results and identifying improvements. Thus, the QIA captures the perception of instrumentality in learning strategies, covering both anticipatory planning (Organization) and retrospective analysis with continuous adjustment (Evaluation).

The Time Management Planning Inventory (TMPI; Lourenço, 2008) includes 12 items divided into two dimensions with six items each: Short-Term Planning (STP), $\alpha = .89$ (e.g., “I dedicate time to organizing my study schedule for each day”), and Long-Term Planning (LTP), $\alpha = .85$ (e.g., “What I do today in my life is important for what will happen to me ‘tomorrow’”). Responses are given on a 5-point Likert scale, from 1 (never) to 5 (always). The TMPI assesses students’ competencies in time management, focusing on the ability to plan, organize, and monitor school activities. Long-Term Planning refers to the frequent use of strategies that structure study over extended periods, such as advance preparation for exams, balanced distribution of weekly tasks, and definition of intermediate goals. Short-Term Planning assesses the use of daily or weekly strategies, such as to-do lists, management of immediate deadlines, and prioritization of urgent activities. Thus, the instrument encompasses both the preventive strategic vision of Long-Term Planning and the immediate operational organization of Short-Term Planning.

The Personal and School Data Form was used to characterize the sample, collecting information on gender, age, school level, weekly study time, and final grades in Portuguese Language and Mathematics. In the proposed model, only academic grades were considered to compose the endogenous variable of academic achievement.

All the instruments used in this study were validated for the Portuguese context, and the reliability coefficients (Cronbach’s alpha) refer to the sample of this study.

3.4. Procedures

With the prior consent of the school leaders and the legal guardians of the participants, all procedures followed the ethical standards of the Declaration of Helsinki (2013). Data collection was carried out in a single session in each school, conducted by the researchers, who explained the study objectives and reinforced com-

pliance with ethical protocols, namely anonymity, confidentiality of responses, and voluntary participation. To be included in the study, participants had to be enrolled in the 3rd cycle of basic education (7th, 8th, or 9th years). Completion of the set of instruments—consisting of self-report questionnaires—took approximately 20 minutes. Despite the advantages of this method for collecting information in a standardized and efficient manner from a large number of participants, it is acknowledged that it may entail risks of social desirability or memory bias (Bryman, 2016). Only fully completed questionnaires were considered valid for analysis.

3.5. Data Analysis

The validity and reliability of the instruments were assessed using the Kaiser–Meyer–Olkin (KMO) index and Bartlett’s test of sphericity, confirming the adequacy of principal component analysis and significant interrelationships between variables. Internal consistency was evaluated by Cronbach’s alpha, with values greater than .70 considered acceptable given the Likert item format (Marôco, 2021). In the preliminary descriptive analysis, rigorous normality criteria were applied, adopting limits of skewness below 2 and kurtosis below 7 (Finney & DiStefano, 2013).

SEM was conducted in SPSS/AMOS 29 (Arbuckle, 2022), focusing on overall model fit and the significance of the estimated regression coefficients. Key fit indices analyzed included: χ^2 ; χ^2/df ; GFI \geq .90 (Jöreskog & Sörbom, 1983); AGFI \geq .90 (Hu & Bentler, 1999); CFI \geq .95 (McDonald & Ho, 2002); TLI \geq .95 (Hair et al., 2019); RMSEA $<$.05 (Byrne, 2016); and Critical N $>$ 200 (Marôco, 2021). Factor loadings equal to or greater than .40 were considered significant (Brown, 2015).

Given the sample size (over 300 participants) and the number of items, the analyses demonstrated adequate internal consistency and stability, ensuring robust results (Marôco, 2021). To assess the mediating effect of time management planning on the relationship between perception of instrumentality and academic achievement, the product-of-coefficients method with standardized coefficients was used (Baron & Kenny, 1986): the indirect effect was calculated by multiplying the standardized coefficients linking the variables, with the total effect being the sum of direct and indirect effects.

Finally, Pearson’s linear correlation (r) was applied to examine the intensity and direction of relationships between constructs, interpreted as follows (Hair et al., 2019): $<$.200 (very weak/negligible), .200 - .399 (weak), .400 - .699 (moderate), .700 - .899 (strong), and \geq .900 (very strong).

4. Results

Regarding the validity and reliability of the instruments, the QIA presented a KMO value of .969, Bartlett’s test of sphericity ($\chi^2_{(45)} = 6137.197$; $p < .001$), and an explained variance of approximately 75.2%. In turn, the TMPI obtained a KMO

index of .926, Bartlett’s test of sphericity ($\chi^2_{(66)} = 4432.753; p < .001$), and an explained variance of about 62.1%.

Table 1 presents the descriptive statistics of the variables of the SEM model. This sample shows that no variable presents extreme conditions, thus validating the adequacy of the fit estimation of the proposed model.

Table 1. Descriptive statistics.

Variable	Min.	Max.	M	SD	Skew	Kurtosis
Organization (QIA)	5	25	19.70	3.758	-0.653	0.258
Evaluation (QIA)	5	25	20.15	3.797	-0.799	0.373
Long-Term Planning (TMPI)	6	30	22.00	5.606	-1.188	1.510
Short-Term Planning (TMPI)	6	30	16.23	6.191	0.303	-0.236
Portuguese Language	1	5	3.00	0.848	0.387	0.047
Mathematics	1	5	2.79	0.960	0.636	-0.004

Note. Min.= Minimum; Max. = Maximum; M = Mean; SD = Standard Deviation.

The global fit indices of the proposed SEM model indicate its robustness [$\chi^2_{(9)} = 15.101; p = .088; \chi^2/df = 1.678; GFI = .994; AGFI = .985; TLI = .994; CFI = .997; RMSEA = .030$ (90% CI: .000 - .056); CN (.05/840; .01/1075)]. The indices obtained show that the proposed model accurately describes the relationships between the variables in the empirical matrix.

The analysis of **Figure 1** and **Table 2** shows, with statistical significance, that students with a higher perception of instrumentality plan the management of their academic activities’ time better ($\beta = .39; p < .001$) and obtain better academic

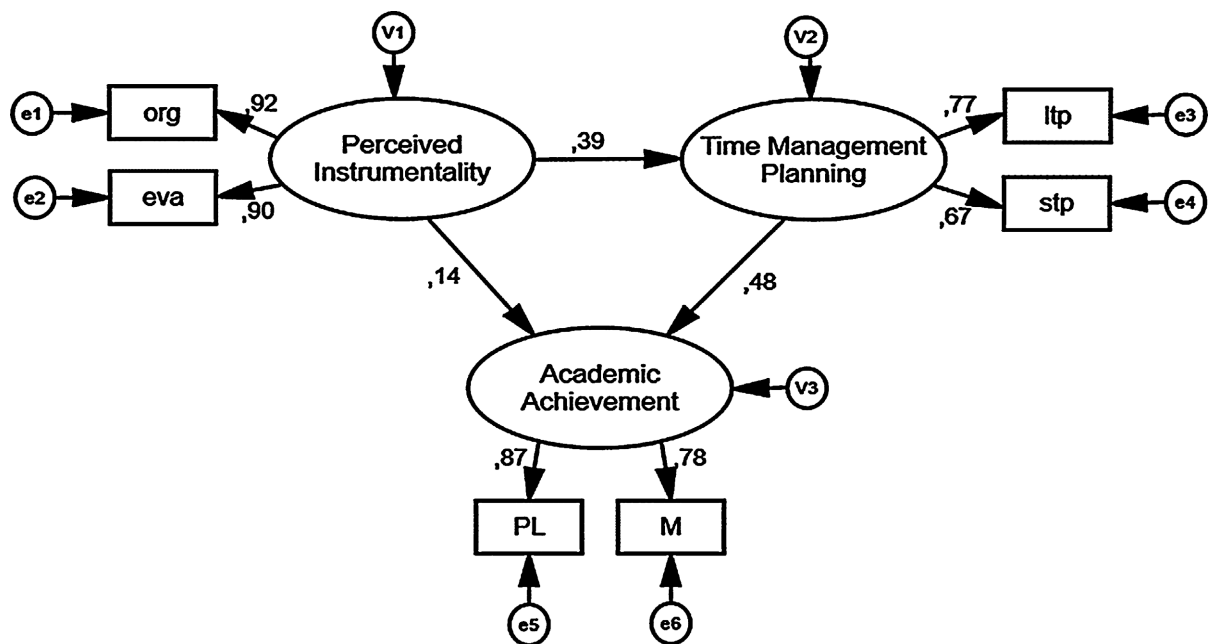


Figure 1. SEM model parameters (n = 750).

Table 2. Results of the sample's predicted covariance structure.

Hypotheses		EnSV	ESV	EE	<i>p</i>
Time management planning	← Instrumentality	.483	.393	.054	***
Academic achievement	← Instrumentality	.030	.141	.010	.001
Academic achievement	← Time management planning	.084	.479	.009	***
Mathematics	← Academic achievement	1.093	.779	.079	***
Portuguese language	← Academic achievement	1.000	---	---	---
Organization	← Instrumentality	1.071	.923	.068	***
Evaluation	← Instrumentality	1.000	---	---	---
Long-term planning	← Time management planning	1.342	.770	.141	***
Short-term planning	← Time management planning	1.000	---	---	---

Note. EnSV= Estimated non-Standardized values; ESV= Estimated standardized values; EE= Estimated errors; *p*= Significance level; *** \leq .001.

achievement ($\beta = .14$; $p < .001$). Students who plan their time management better present higher academic achievement ($\beta = .48$; $p < .001$). It is observed that time management planning acts as a mediating variable in the relationship between perception of instrumentality and academic achievement.

Regarding the variances explained by the constructs, the squared multiple correlations (η^2) indicate that time management planning in academic activities is directly explained by perception of instrumentality by 15% ($\eta^2 = 0.154$). Academic achievement is explained by approximately 30% ($\eta^2 = 0.302$) by perception of instrumentality, with an indirect effect mediated by time management planning. These values highlight the explanatory power of the proposed model.

An additional analysis was carried out to assess the magnitude and direction of the linear correlations between the variables (**Table 3**). It is considered that there is a relationship between two variables when the change in one causes a corresponding change in the other, quantified by Pearson's linear correlation coefficient (*r*). All variables in the model showed statistically significant correlations, with magnitudes ranging from very low ($r < .200$), low ($r = .200$ to $.399$), moderate

Table 3. Pearson's linear correlations.

Variables	1	2	3	4	5	6
1. Organization	1					
2. Evaluation	.835**	1				
3. Short-term planning	.209**	.177**	1			
4. Long-term planning	.311**	.294**	.506**	1		
5. Portuguese language	.261**	.237**	.251**	.380**	1	
6. Mathematics	.265**	.242**	.256**	.356**	.681**	1

Note. **= Correlation is significant at the .01 level.

($r = .400$ to $.699$), and high ($r = .700$ to $.899$). Thus, there is apparent cohesion among the variables studied. The most relevant and high-magnitude association occurred between the organization and evaluation dimensions, which make up perception of instrumentality ($r = .835$; $p < .01$). Other moderate associations were found between the grades in Portuguese Language and Mathematics ($r = .681$; $p < .01$) and between the two dimensions of academic time management planning (short and long term; $r = .506$; $p < .01$). All associations are positive and statistically significant. The remaining correlations showed weak or very low magnitudes, with linear correlation coefficients (r) of less than $.40$, although statistically significant.

5. Discussion

The results obtained in this study confirm Hypothesis 1 that perception of instrumentality is positively associated with academic time management planning ($\beta = .39$; $p < .001$). These data corroborate recent literature, which indicates the perceived usefulness of learning strategies as a determining factor for motivation, commitment, and the adoption of self-regulated academic behaviors (Fernandes & Lemos, 2020; Hulleman et al., 2017). As argued by Hulleman et al. (2017), when students recognize the relevance and practical usefulness of school content for their personal or future goals, they tend to invest more effort in the organization, planning, and regulation of their learning. This value attributed to tasks has a direct impact on the development of time management strategies, since students perceive planning as an effective means of achieving relevant goals (Lourenço et al., 2025).

Intervention in perceived value not only increases extrinsic motivation, but is also associated with the development of self-regulatory competences and deeper cognitive engagement (Gaspard et al., 2015; Totonchi et al., 2025). Studies such as that by Lourenço and Paiva (2024) show that students who perceive usefulness in learning strategies display better planning and organizational competences, which are essential for effectively managing study time.

In the same vein, Umerenkova and Gil Flores (2018) evidenced that the perception of time control and the maintenance of structured routines are closely linked to the consistent adoption of study planning strategies and to better academic results. The review by Wolters et al. (2025) reinforces the importance of integrating task value and temporal regulation, indicating that the combination of these dimensions is associated with better academic results, greater autonomy, and less procrastination.

These results further support the conclusions of Kyndt et al. (2019), who identified perception of instrumentality and self-regulatory competences as transversal and essential factors at all stages of the educational trajectory. Thus, by showing that perception of instrumentality enhances time management planning, the data from this study underline the importance of promoting the sense of usefulness of educational tasks as a psychopedagogical intervention strategy for

school success (Fernandes & Lemos, 2020). Despite these results, it is important to acknowledge that some of the relationships found may partly reflect measurement effects related to the use of self-report questionnaires, which are susceptible to response biases (Bryman, 2016).

Furthermore, considering motivational theory more broadly, recent evidence demonstrates that students' beliefs about the causes of their academic successes and failures—known as causal attributions—play an important role in shaping their achievement goal orientations and academic engagement. Suter et al. (2022) found that students who attribute success or failure to internal, controllable factors such as effort or strategy use are more likely to adopt mastery-oriented goals, which facilitate sustained motivation, positive learning behaviors, and higher academic achievement. In contrast, external or uncontrollable attributions are associated with avoidance orientations and decreased persistence. By combining perception of instrumentality with positive causal attribution patterns, students may strengthen both their willingness to plan and manage their time and their capacity to persist in school tasks, thus further promoting academic success. This suggests that future interventions could benefit from explicitly addressing both the value assigned to school tasks and the underlying attributional processes to maximize student engagement and achievement.

In summary, the confirmation of this hypothesis empirically validates that perception of instrumentality is a central promoter of temporal planning in the academic context, supporting interventions that reinforce the perceived usefulness of learning as a way to improve students' time management competences.

The results of the present study confirm that perception of instrumentality has a direct and positive effect on students' academic achievement (H2), with moderate magnitude ($\beta = .14$; $p < .001$). This finding corroborates the literature emphasizing the value attributed to educational tasks as an essential motivational factor for school success.

According to Hulleman et al. (2017), when students recognize the practical utility and relevance of school content for their personal and professional future goals, they show greater involvement, commitment, and persistence in school activities. This valuing of school content drives extrinsic motivation that directly influences academic performance, promoting an active and collaborative attitude in the learning process.

Gaspard et al. (2015) demonstrate that interventions that increase the perceived value of tasks lead to greater commitment and the adoption of effective self-regulatory strategies, which are reflected in better performance. Fernandes and Lemos (2020) also support that recognizing the value of tasks is associated with better motivation to learn and the use of strategies that favor academic achievement.

Furthermore, Lourenço et al. (2025) empirically confirm, through structural modelling, that perception of instrumentality not only indirectly affects achievement by promoting time management planning and self-regulation but also exerts a direct impact on school grades. This direct effect can be explained by greater

orientation towards academic goals, clearer student priorities, and greater determination to overcome difficulties and challenges.

Although [Umerenkova and Gil Flores \(2018\)](#) do not directly address the perceived value of tasks, their study emphasizes the importance of perception of time control and structured routines for academic performance, behaviors facilitated by valuing tasks and planning. Finally, [Totonchi et al. \(2025\)](#) demonstrate that interventions based on “utility-value”, that is, promoting the value or perceived usefulness of educational tasks, significantly increase students’ motivation, cognitive engagement, and academic achievement, especially in areas such as mathematics. The study confirms that the value attributed to school activities is a key factor for school success, supporting the association between task valuing, persistence, and improved outcomes.

In sum, the confirmation of Hypothesis 2 in this study strengthens the idea that perception of instrumentality directly promotes better academic results, in addition to the mediating effects that occur via time management. Thus, pedagogical strategies that emphasize the practical value of content and stimulate this perception in students can be decisive in improving school performance and supporting educational success.

The results of this study confirm that time management planning exerts a direct and positive influence on students’ academic achievement (H3), with a significant effect ($\beta = .479$; $p < .001$). This value shows that the competences of organization, planning, and control of school activities function as fundamental levers of school success, as has been identified by several authors. [Lourenço and Paiva \(2024\)](#) emphasize that the development of planning strategies allows students to define clear goals, manage tasks according to priorities, and distribute effort over time, making the learning process more efficient and less susceptible to procrastination.

Several studies have highlighted the importance of time management for academic success. [Aeon and Aguinis \(2017\)](#), in a comprehensive theoretical review, highlight that effective time management represents a fundamental self-regulatory process for developing autonomy and self-efficacy in students, enhancing greater motivation and learning by allowing them to organize and strategically adapt the use of time. On the other hand, [Macan et al. \(1990\)](#), through an empirical study with university students, demonstrate that well-developed planning and time control skills are positively associated with academic performance and stress reduction. The authors stress that mastering these strategies favors school achievement and contributes to higher levels of autonomy, thus reinforcing the relevance of time management in the educational context.

Training in these skills further contributes to students’ emotional well-being, by reducing anxiety in the face of academic challenges and facilitating adaptation to different demands throughout the educational journey. According to [Wolters et al. \(2025\)](#), effective study planning and regular progress monitoring are fundamental components of self-regulated learning, which enhance cognitive engagement and promote better academic results. The study shows that students who

plan carefully and continuously monitor their goals present higher levels of motivation, performance, and school success.

Studies such as that of Umerenkova and Gil Flores (2018) show that students with organized routines and consolidated time management strategies have superior academic performance. This effect is observed at different stages of schooling. This demonstrates that temporal planning is an active factor in the quality of learning and knowledge consolidation. Students with better results stand out for setting clear goals, estimating the time needed for tasks, separating study moments from other activities, and reflecting on academic goals by evaluating the time available, meticulously planning tasks, and monitoring progress to adjust strategies and optimize performance. The ability to plan allows the student to adapt to multiple tasks, manage unforeseen events, and meet set goals. According to Durán-Aponte and Pujol (2013), reflective planning is considered essential for academic success, involving clear goals, assessment of available time, task prioritization, and continuous monitoring of progress. Managing time is an active process that directly influences the quality of learning and adaptation to academic demands.

The data obtained thus support that investing in the promotion of time management strategies, through psychopedagogical guidance, curricular practices, and systematic training of these competences, constitutes a proven route to enhancing students' academic success. The confirmation of Hypothesis 3 reinforces that time management planning plays a central and decisive role in school performance, and should be included in any educational programme aimed at improving results and developing more autonomous, organized, and resilient students.

The model results confirm that time management planning plays an important mediating role between perception of instrumentality and academic achievement (H4), which means that the perceived usefulness of academic tasks influences students' performance both directly and indirectly through improving the ability to plan study time. The magnitude of the mediating effect is consistent with the literature that highlights the role of temporal self-regulation as a mechanism by which motivation influences school success.

Although the structural model (Figure 1) establishes links between the global constructs of instrumental value and time management planning, we acknowledge a possible conceptual overlap between the Organization dimension of the instrumentality and the overall time management planning construct. This overlap is not explicitly modelled through links between specific dimensions, so inferences about this relationship are limited to correlations between indicators and the theoretical interpretation of the constructs. Nevertheless, the model enables the distinction of the unique effects of each construct on academic outcomes, demonstrating that despite some interdependence, each contributes distinctly and significantly to student learning. This distinction reinforces the validity of the model and the interpretation of the results within the context of the motivational and regulatory competencies involved in academic success.

According to the structural model analysis, the direct effect of perception of instrumentality on time management planning was estimated at $\beta = .393$ ($p < .001$), and the direct impact of time management planning on academic achievement was estimated at $\beta = .479$ ($p < .001$). The direct effect of perception of instrumentality on academic achievement, discounting mediation, according to the calculation procedure proposed by [Baron and Kenny \(1986\)](#) was $\beta = .14$ ($p < .001$). Thus, the mediated indirect effect can be calculated by multiplying the first two betas: indirect $\beta = .393 \times .479 = .188$. The total combined effect (direct effect + indirect effect) between perception of instrumentality and academic achievement is therefore: total $\beta = .14 + .188 = .328$.

This result indicates that perception of instrumentality contributes substantially to academic achievement, with most of this impact occurring through the mediation of time management planning. That is, the perception that school tasks are useful and relevant motivates students to better structure the time dedicated to study, which, in turn, significantly improves academic performance.

This pattern is consistent with the findings of [Lourenço et al. \(2025\)](#), which highlight the importance of the perceived value of tasks in enhancing self-regulatory strategies such as time management and planning, and with the studies of [Hulleman et al. \(2017\)](#) and [Gaspard et al. \(2015\)](#), which show that interventions that reinforce the perceived value of school activities promote greater motivation, engagement, and effective use of study strategies. [Umerenkova and Gil Flores \(2018\)](#) also support this mediation by emphasizing that time management and the maintenance of structured routines are fundamental for improving academic achievement.

In summary, the confirmation of Hypothesis 4 supports that time management planning is a fundamental mediating process in the causal chain between perception of instrumentality and school success. Therefore, psychopedagogical interventions that increase the perceived usefulness of school tasks should also emphasize the development of time management competences to maximize gains in academic achievement.

Contributions, Limitations, and Future Research

The present study offers relevant contributions to the understanding of the factors that influence academic achievement. Firstly, it provides empirical evidence that perception of instrumentality and time management planning exert positive and significant effects on students' performance, confirming previous findings on the importance of motivational beliefs in triggering self-regulatory behaviors ([Aeon et al., 2021](#)). The mediating effect of time management in the relationship between perception of instrumentality and academic achievement is also evident, suggesting that the value attributed to school tasks translates into greater investment in the organization and planning of study activities ([Umerenkova & Gil Flores, 2018](#)).

Secondly, this work contributes to the literature by focusing on students in the

3rd cycle of basic education, an age and school group often less explored in studies based on the SEM technique. The results have practical implications for educational guidance and the design of intervention programs, reinforcing the role of strategies that simultaneously promote the perception of the usefulness of school tasks and the explicit training of time management competences (Wolters et al., 2025).

Beyond the general recommendations, a concrete intervention is suggested for consideration by teachers: the development of lesson plans that include moments where the curricular content is explicitly related to the pupils' future goals, such as academic and professional pathways, or to real-world current issues. This practice aims to strengthen pupils' perception of instrumentality, helping them to recognize the practical utility of knowledge and to promote greater engagement and motivation in learning. For example, in Mathematics, teachers might present problems applied to current financial, technological or environmental contexts, while in Portuguese Language they might encourage communication projects related to pertinent social or professional challenges. This approach can facilitate the connection between school content and the outside world, supporting the adoption of effective strategies for study time management and planning.

Among the limitations, the cross-sectional nature of the study stands out, which does not allow causal relationships between the variables to be established, as there is no temporal follow-up to verify the precedence of the variables, making it only possible to identify associations (Creswell & Creswell, 2017). The sample was restricted to Portuguese students from a single school level, which may limit the generalization of the results. Furthermore, the use of self-report measures may introduce social desirability or recall biases (Bryman, 2016). Finally, although the instrument includes items on short- and long-term planning, in the present study, the construct was analyzed globally, making it impossible to draw specific conclusions for each time horizon.

For future research, the use of longitudinal designs is recommended to allow monitoring of the evolution of the variables and clarification of the direction of causality. It will also be relevant to apply the model to different educational cycles and cultural contexts, to test its external validity (Kyndt et al., 2019).

Particularly noteworthy is the need to deepen the study of perception of instrumentality, given the still small number of investigations focused on this construct, especially in the levels of basic and secondary education. Greater investment in this line of research will make it possible to better understand how valuing school tasks influences motivation, self-regulatory practices, and academic performance (Hulleman et al., 2017). To this end, it is recommended to use longitudinal designs that make it possible to monitor the evolution of the variables and clarify the direction of the relationships between them, as well as to broaden the samples to other educational cycles and cultural contexts, to test the external validity of models that relate psychopedagogical factors, such as perception of instrumentality, self-regulation, and academic achievement (Lourenço et al., 2025).

In addition, it is suggested that future studies analyze separately the dimensions of short- and long-term planning, to identify possible differences in their impact on academic achievement, a hypothesis that the present study could not confirm due to the option for a global analysis of the construct. Experimental or quasi-experimental interventions could also assess the effectiveness of programs that combine the increase of perception of instrumentality with the training of time management strategies, measuring the effects on students' academic performance and well-being (Ahmady et al., 2021). Finally, the inclusion of mediating or moderating variables, such as self-efficacy, goal orientation, or the use of digital learning technologies, could deepen the understanding of the mechanisms that link motivational beliefs, self-regulation, and academic success.

6. Conclusion

The present study analyzed, using SEM, the relationships between perception of instrumentality, time management planning, and academic achievement in students of the 3rd cycle of basic education. The results confirm that perception of instrumentality exerts a positive and significant effect on time management planning and on academic achievement, with time management also acting as a mediating variable between these dimensions. These findings support recent literature, showing that students who recognize the usefulness of school tasks for their goals tend to be better organized and achieve better academic results.

This research deepens the understanding of the motivational and self-regulatory processes underlying school success, particularly at a level of education that has been little explored by studies of this kind. The data obtained reinforce the importance of implementing pedagogical practices and psychopedagogical programs that combine the increase of the perceived usefulness of learning with the explicit development of time management competences, thus enhancing, in an integrated manner, academic achievement and students' well-being.

Despite the methodological limitations already discussed, this study opens new perspectives for the theoretical and empirical deepening of the role of perception of instrumentality and time management in the educational context. It is recommended that future research use longitudinal designs, diversified samples, and differentiated analysis of temporal planning strategies to validate and expand explanatory models for different educational cycles and cultural contexts.

In summary, the results obtained show that stimulating the value attributed to school tasks and promoting strategic competences in time planning represent complementary and fundamental paths to academic success. Strengthening this approach, supported by further research and well-designed interventions, will make it possible to support the full development of students' potential and contribute to more effective and inclusive educational practices.

Conflicts of Interest

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

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