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Study Time and Academic Performance: Do the Level of Self-Regulated Learning and Impostor Syndrome Matter?

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Abstract

Objective: We investigated the effect of study time on academic performance, mediated by the level of use of self-regulated learning strategies and the imposter syndrome, in undergraduate accounting students.

Method: Our sample consisted of 330 valid questionnaires from undergraduate accounting students from three different federal universities. We analyzed these data through confirmatory factor analysis and structural equation model.

Results: We found that increasing study time does not imply an increase in academic performance, but only when mediated by the level of use of self-regulated learning strategies. Thus, study time does not directly imply academic performance, but indirectly, since it depends on the student's level of use of self-regulated learning. We also found that the imposter syndrome is not a factor that mediates the relationship between study time and academic performance.

Contributions: We empirically found that the level of use of the self-regulated learning strategy is a factor that causes study time to have a positive impact on academic performance. In addition, we show undergraduate accounting students that for study time to be effective for the purpose of achieving higher academic performance, one must increase one's level of self-regulated learning strategy.

Keywords: self-regulated learning; imposter syndrome; study time.

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Introduction

The Brazilian education system relies on grading or ratings to determine whether students will pass or fail a particular subject. In universities, the performance in subjects is considered one of the indicators of a student's success (Mthimunye & Daniels, 2020). This grading system is applied from primary education to higher education, which leads students to develop strategies to achieve, at the very least, the minimum grade required to pass the subjects and continue their studies (Rosário et al. 2000; Monteiro, Vasconcelos & Almeida, 2005). Among these strategies, authors Broadbent and Poon (2015) mention that students tend to increase the number of hours dedicated to studying in order to obtain higher grades or ratings in the subject.

Studies have shown that increasing the number of study hours is associated with improved academic performance and, consequently, higher passing rates (Michaels & Miethe, 1989; Lahmers & Zulauf, 2000; Neroni, Meijs, Gijselaers, Kirschner & de Groot, 2019). For this reason, increasing study hours is an effective strategy to increase the likelihood of passing (Nonis & Hudson, 2010) since it allows students to gain a deeper understanding of the content, consolidating it in their long-term memory. This strategy is also often highlighted by major media outlets when students achieve top scores in important entrance exams or competitions, emphasizing that the increased number of study hours was a determining factor for their success (G1, 2017; Guia do Estudante, 2020; G1, 2021; O Dia, 2022).

While there is evidence that increasing study hours has an effect on improving academic performance, this relationship tends to be not indiscriminately linear because individuals have limited rationality, and cognitive aspects of each individual can interfere in this relationship. Authors like Ericsson (2001) and Plant, Ericsson, Hill, and Asberg (2005) emphasize that the level of use of self-regulated learning strategies should be considered in the relationship between study time and academic performance. This is because simply increasing study time may not induce or be the sole factor leading to improved performance (Plant et al., 2005), as it is necessary for the student to also assimilate the content adequately (Zheng, 2016; Neroni et al., 2019).

The use of learning strategies provides benefits because it implies the student's autonomy in understanding new content and, consequently, achieving the desired academic performance. Chen, Bjorkman, Zou, and Engstrom (2019) and Zhou, Chung, and King (2018) argue that higher levels of learning strategy induce students to take responsibility for planning, executing, seeking personal motivation to understand the content studied in order to achieve a goal. When students have higher levels of learning, they have the ability to determine if they need

help, interactions, and appropriate resources (Dagal & Bayindir, 2016; Okwuduba, Nwosu, Okigbo, Samuel, & Achugbu, 2021) to reach the proposed objective. Given this discussion, studies have shown that learning leads to an increase in academic performance, see Lounsbury, Levy, Park, Gibson, and Smith (2009) and Zhou et al. (2018).

In this context, it is understood that increasing the level of use of self-regulated learning strategies not only leads to an increase in academic performance but can also be a mediating factor that tends to enhance the relationship between study time and academic performance. This is because the higher level of use of self-regulated learning strategies is specific to each individual and can lead the student to have a greater capacity to assimilate content in less study time (Plant et al., 2005). However, personality traits tend to interfere detrimentally with academic performance even if the student has more study time. Among these traits, the impostor phenomenon syndrome stands out (Meriac, 2012; Matos, 2014; Meurer & Costa, 2020b).

The impostor phenomenon occurs when individuals, despite achieving a certain accomplishment, do not consider themselves deserving of said achievement (Parkman, 2016; Silva, Valeretto, Ferreira, Santos & Dal Magro, 2021). The individual sees themselves as a fraud and, as a result, is afraid that others will discover their incompetence in performing tasks (Clance & Imes, 1978). Because of this, the individual attributes their accomplishments to luck or coincidences rather than their skills and competencies (Cowman & Ferrari, 2002; Parkman, 2016; Ramsey & Brown, 2018; Meurer & Costa 2020a; Meurer and Costa, 2020b).

Due to these aspects, Neureiter and Traut-Mattausch (2016) and Meurer and Costa (2020a) argue that the impostor syndrome has a significant impact on individuals' task performance, leading to counterproductive behaviors. Therefore, it may be the driving factor behind Matos's (2014) findings, which demonstrated that the impostor phenomenon is associated with decreased academic performance. Thus, it is evident that this syndrome tends to be a cognitive aspect that hinders students' performance.

Even though the impostor phenomenon influences a decrease in academic performance, it is believed that it can also play a similar role when compared to the mediation of the relationship between study time and academic performance by the learning strategy. However, there is a difference because the impostor syndrome may lead to a decrease in the relationship between study time and academic performance. This happens because, as discussed by Meurer and Costa (2020a) and Matos

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(2014), it is an aspect that involves counterproductive actions and diminishes academic performance. Based on the discussion so far, this study aims to investigate the effect of study time on academic performance, mediated by the level of self-regulated learning strategy use and the impostor syndrome, among undergraduate accounting students.

This research advances the discussion by elucidating a more comprehensive system regarding the relationship between study time and academic performance. Previous studies that discussed this relationship, such as Michaels and Miethe (1989), Lahmers and Zulauf (2000), and Neroni et al. (2019), did not consider metacognitive aspects of the students themselves as potential factors that could interfere with the relationship between study time and academic performance. This point of discussion, although highlighted in a theoretical work by Plant et al. (2005), has not yet been empirically tested.

Therefore, this study does not consider study time, the level of self-regulated learning strategy utilization, and the impostor phenomenon as isolated factors in academic performance. It understands these factors as interrelated and contributing directly to the work of Michaels and Miethe (1989), Lahmers and Zulauf (2000), Lounsbury et al. (2009), Matos (2014), Zhoc et al. (2018), and Neroni et al. (2019). Thus, it aims to understand how study time impacts academic performance and what the interference of individuals' cognitive factors is in this relationship.

To achieve the research objective, questionnaires were administered to undergraduate students in accounting programs at three Brazilian federal universities. The final sample consisted of 330 valid responses. The information from these responses was subjected to descriptive statistics, confirmatory factor analysis, and structural equation modeling. The results of these tests indicated that study time does not directly influence academic performance but only indirectly, when mediated by the level of self-regulated learning strategy utilization. The findings also suggest that the impostor phenomenon does not mediate the effect of study time on academic performance.

These results contribute to both the academic and practical realms. In the academic sphere, they provide empirical evidence supporting the theoretical discussions presented by Plant et al. (2005), as they argued that merely increasing the time allocated to studying course content may not be effective in improving academic performance. According to Plant et al. (2005), metacognitive aspects such as the level of self-regulated learning strategy utilization are a pathway for study time to positively impact academic performance. In practical terms, the findings of this research assist undergraduate accounting students in understanding that simply increasing study time in isolation does not necessarily lead to improved academic performance.

The results of this study also serve as a point of reflection for faculty members in undergraduate accounting programs when developing the course curriculum and conducting classes. Consequently, undergraduate accounting programs may consider incorporating activities within their courses that encourage students to use self-regulated learning strategies. This way, students can more effectively absorb course content, apply the topics covered throughout the course, and achieve better performance in their courses.

In this way, the discussion about self-regulated learning is relevant in the accounting field, recognizing that future accounting professionals need to develop critical thinking skills, lifelong learning abilities, and the capacity to provide decision-making advice. These skills are objectives proposed by the Accounting Education Change Commission (1990) and the American Institute of Certified Public Accountants (2010). Furthermore, authors Becker and Silva, Freitas, Sallaberry, and Flach (2022) observe a lack of effort in the discussion of student competencies for learning purposes throughout the accounting course, justifying the need for further studies.

2 Development and hypotheses presentation

The Bologna Process points to the learning paradigm, considering that study time is essential for the construction of students' and professionals' learning (Monteiro, Leite & Rocha, 2019). This time includes all tasks performed outside of classroom teaching time, identified as the load that the student dedicates to carrying out activities proposed by the teacher related to the assessment process and/or carried out on their own initiative (Nóvoa, 2012).

Discussions often revolve around the influence of students' lifestyles, with little time dedicated to studying, assuming that their academic performance may be compromised (Nonis & Hudson, 2010). Although studies in recent decades have found contradictory relationships, as pointed out by the aforementioned authors (2010), they remain unconvinced and suggest further research focusing on the influence of study time outside the classroom on academic performance.

The authors Sagitova (2014) and Monteiro et al. (2019) argue that a successful learner in modern society should be able to integrate knowledge from different sources, educate themselves, and engage in lifelong learning. When considering accounting, Hebert, Rothwell, Glover, and Lambert (2020) explain that students enter a profession characterized by increasing complexity linked to the growth of knowledge. The authors Monteiro et al. (2019) explain the role of student engagement, which requires a "time investment" to achieve these educational goals to meet the demands of the job market.

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Monteiro et al. (2019) found results that align with this context. In other words, the importance of the student "investing time" in constructing their learning can determine their academic performance. The number of hours allocated to study time seems to be a crucial factor for performance and, in turn, for learning (Broadbent & Poon, 2015). However, an increase in the number of hours only leads to better performance when applied efficiently (Nonis & Hudson, 2010). Thus, it is understood that study time leads to an increase in academic performance, and for this reason, the following research hypothesis was formulated:

H1: The number of hours allocated to study time has a positive and significant effect on academic performance.

Efficiency is necessary for study time to be applied correctly and, consequently, results in better performance. Self-regulated learning strategies play a crucial role in enabling students to study efficiently. Self-regulated learning refers to students' ability to diagnose learning needs, set goals, select resources, and self-assess (Chen et al., 2019; Zimmerman, 1989). This type of learning involves mental, conscious, and deliberate activities aimed at acquiring new knowledge and developing new skills (Silva & Biavatti, 2018).

Learning strategies are closely related to metacognition, which is an educational concept that recognizes the idea of "knowing oneself to be wise," as stated by the Greek philosopher Socrates (Garner, 2009). Metacognition involves individuals thinking about how they learn. When a person understands how they learn, it enables them to acquire knowledge and adapt their learning to meet their needs (Zimmerman, 1989).

Building on the understanding of metacognition, Zimmerman led research on Self-Regulated Learning (SRL) (Silva & Biavatti, 2018). In self-regulated learning, the goal is to achieve autonomy and control by monitoring cognition, behavior, and emotion to reach a predefined goal (Chen et al., 2019). In this context, Zimmerman and Martinez-Pons (1986) found that the use of self-regulated learning strategies is an important tool for achieving academic success.

The importance of this research is relevant in understanding that accounting professionals are increasingly facing challenges and must adapt to meet demands in a timely manner, such as technological advancements and the social and environmental responsibilities of organizations (Lima Filho, Bruni & Lima, 2015). In this context, self-regulated learning strategies, when combined with study time and performance, become important for students (future professionals) to develop skills to deal with a changing landscape and critical thinking.

Therefore, students who are more proficient in the use

of strategies often spend more than 10,000 hours on individual work throughout their academic journey, which is referred to as "deliberate practice" (Ericsson & Charnes, 1994). Thus, it can be concluded that study time is an important tool, especially when the student has a greater use of metacognitive self-regulated learning strategies. However, no studies were found that considered such relationships, especially in the field of accounting. Additionally, fragmented results were found, as indicated by Nonis and Hudson (2010), Monteiro et al. (2019), Silva et al. (2021), and Petratos, Herrera, and Soydemir (2021).

For this reason, self-regulated learning can be a factor that mediates the relationship between study time and academic performance. This is because it is an aspect that enhances the beneficial effect of time usage in achieving a goal and, in turn, improving performance. In light of this understanding, the following research hypothesis was developed:

H2: The number of hours allocated to study time has a positive and significant effect on academic performance when mediated by a higher level of self-regulated learning strategy utilization.

In contrast, insecure students with impostor feelings compensate for their perceived lack of competence through behaviors such as procrastination, high standards of success, and not delegating tasks (Clance & Imes, 1978). Due to this, Clance and Imes (1978) were pioneers in discussions about impostor syndrome and emphasized the importance of conducting significant studies on this personality trait because, according to Meurer and Costa (2020b), it is a syndrome that hinders individual development.

The prevalence of this behavior in the academic environment can substantiate counterproductive attitudes that may have a negative impact on the academic performance of students experiencing impostor feelings (Meurer & Costa, 2020a). Therefore, students with high levels of impostor syndrome tend to dedicate less time to activities that go beyond their formal academic role (Neureiter & Traut-Mattausch, 2016).

According to Chassangre and Callahan (2017), higher levels of impostor syndrome lead students to postpone their tasks to protect their self-esteem in the face of the possibility of failure. Such behaviors may surface individually or manifest through daily habits and neglect (Cummings, Poropat, Loxton & Sheeran, 2017).

From the perspective of accounting students, academic performance may be compromised when considering that the time available for dedicating to the course demands can be insufficient. This attitude goes against professional growth and can harm organizations in various ways

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(Kuna, 2019), as individuals with impostor syndrome have a low propensity to take risks and seek innovations in the organizational management context. They also exhibit counterproductive behaviors by avoiding new challenges, such as assuming leadership positions (Clance & Imes, 1978).

Given all these characteristics outlined about impostor syndrome that imply counterproductive actions (Neureiter & Traut-Mattausch, 2016; Meurer & Costa, 2020a) potentially leading to a decrease in academic performance, it is understood that such a personality trait can exert influence on the relationship between study time and performance. Unlike the level of self-regulated learning, which tends to enhance the relationship between study time and academic performance, the impostor syndrome may play a contrary role as a mediating element that weakens the strength of the relationship between study time and academic performance. In this context, the following research hypothesis is presented:

H3: The number of hours allocated to study time has a negative and significant effect on academic performance when mediated by impostor syndrome.

Figure 1 illustrates the theoretical model of the research, presenting the intrinsic logic that leads to the development of the hypotheses:
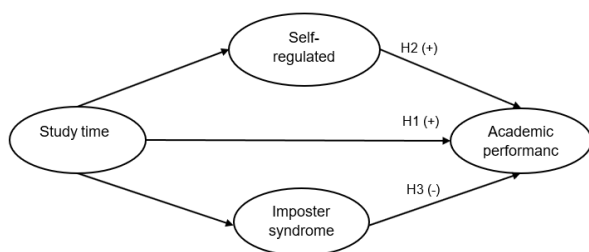

Figure 1: Theoretical Research Model
Source: Developed by the authors (2023).

3 Methodological Procedures

3.1 Sample and data collection

The study population consisted of 403 students, where the initial sample consisted of 355 students from the undergraduate accounting program in the face-to-face model of learning at three Federal Universities who fully responded to the research instrument. Relevance and accessibility criteria were observed, as the institutions met the theoretical assumptions of the study and allowed for the research to be conducted. It should be noted that two of the universities in the study are located in the state of Mato Grosso do Sul, and one is located in the state of Santa Catarina.

The data collection took place between January 22, 2018, and February 3, 2020. The extended period was due to the availability for data collection. The questionnaires were distributed in both printed format and through electronic forms sent via email. The course coordinators at each university provided a list of students and specified the method of approach for the participants.

During the planning, data collection, and analysis phases, ethical research standards in the country were followed, and participants were informed that their responses would be voluntary. Out of the initial 355 completed questionnaires obtained, 25 were not considered valid due to incomplete information that hindered further analysis to achieve the research objectives. Therefore, the final sample consisted of 330 responses.

The instrument used allowed for the collection of basic participant characteristics for sample control, such as name, gender, study time, academic level (in semesters), and age. The students' academic performance data were obtained from the course coordinator. In the data collection instrument itself, there was a question that asked for authorization and requested the enrollment number. Students authorized the use of their academic performance in this research.

The study time variable was also a question present in the questionnaire itself, where the respondent indicated the number of daily hours dedicated to their accounting degree. Subsequently, the individual characteristics data (pseudo-anonymization) were separated from the dataset of self-regulated strategies of interest in the research to avoid any risk of indirect identification.

3.2 Research instruments

3.2.1 Self-regulated learning

The instrument used to assess the level of self-regulated learning strategy use was developed by Zimmerman and Martinez-Pons (1986) and validated by Lima Filho, Lima, and Bruni (2015). This instrument consists of 10 statements with a 7-point Likert scale used to identify the level of self-regulated learning. The instrument is presented in Table 1:

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Table 1: Self-regulated learning strategies instrument

	Statements	Variables
1)	I assess my performance, identify areas for improvement, aiming to prepare for an exam.	Apre1
2)	I always try to create a plan (outline) before starting a task. For example, if I have to do a project on financial reports, I think about the text, the attachments I want to include, where I can find the information, who I can ask for help...	Apre2
3)	If I have an exam, I start studying as early as possible to feel relaxed and calm on the day.	Apre3
4)	Before starting a project, I always turn to the library (and other research sources, whether physical or digital) to gather as much information as possible on the topic.	Apre4
5)	I always try to take as many notes as possible from a text I've read or from the professor's lecture.	Apre5
6)	I always seek an environment that doesn't provide distractions in order to have better concentration.	Apre6
7)	When I take a test, if it goes well, I reward myself; if it goes the other way, I give up something I really wanted.	Apre7
8)	I use strategies to memorize the subject (or formulas) until I know it by heart, for the topic to be studied.	Apre8
9)	When I encounter difficulty and can't solve it on my own, I seek external help (teacher, classmates, others).	Apre9
10)	After completing an assignment, I always double-check to make sure it's good.	Apre10

Source: Adapted from Zimmerman and Martinez-Pons (1986) by Lima Filho, Lima, and Bruni (2015).

3.2.2 Impostor syndrome

Table 2 presents the statements from the instrument used to measure the level of impostor syndrome among the respondents. This instrument consists of 20 statements with a 7-point Likert scale.

Table 2: Impostor syndrome instrument

Statements	Variables
1) I'm afraid of being evaluated by others, and if possible, I avoid evaluations.	Imp1
2) I may give the impression that I am more competent than I really am.	Imp2
3) Many times I succeed in a task, even though I was afraid I wouldn't do it well before I took it on.	Imp3
4) When people praise me for something I've done, I'm afraid I won't be able to meet the expectations they have of me in the future.	Imp4
5) Sometimes I think I've achieved my current success because I happened to be in the right place at the right time and/or because I know the right people.	Imp5
6) I'm afraid that the important people in my life will find out that I'm not as capable as they think I am.	Imp6
7) I tend to remember the incidents where I failed more than those where I did my best (succeeded).	Imp7
8) I rarely perform a task as well as I would like to do it.	Imp8
9) I believe that my success in my life is the result of some kind of error.	Imp9
10) I find it difficult to accept compliments about my intelligence or accomplishments.	Imp10
11) I feel that my success was due to some sort of luck.	Imp11
12) I feel disappointed in my current achievements, and I think I should have done much more.	Imp12
13) I'm afraid that others will find out how much knowledge I lack.	Imp13
14) I'm afraid I might fail at a new task, although I usually do well at what I attempt.	Imp14
15) When I succeeded at something and received recognition for my achievements, I had doubts about whether I could repeat that success.	Imp15
16) If I receive a large amount of praise and recognition for something I have done, I tend to downplay the importance of what I did.	Imp16
17) I often compare my abilities to those of the people around me, and I think they may be smarter than I am.	Imp17
18) I often fear that I won't do well on a test, even if those around me believe I will do well.	Imp18
19) If I'm going to receive a promotion or some kind of recognition, I hesitate to tell others until it's a done deal.	Imp19
20) If I'm not the "best" in situations involving achievement, I feel bad and discouraged.	Imp20

Source: Clance (1985) adapted by Matos (2014)

3.3 Variables and statistical treatment

From the variables used in the study, only the variable called academic performance was collected from the institution to which the student is affiliated. The other variables were collected through a questionnaire administered to the students. Table 3 presents the variables used in this study, providing details about the dependent variable (academic performance); the independent variable of interest (study time); mediating independent variables (self-regulated learning and impostor syndrome); and the control variables (scholarship and gender).

Table 3: Variables used in the research

Dependent variable		
Description	Operationalization	References
Academic performance	Average grades of each student's courses	Katsikas and Panagiotidis (2011)
Independent variables		
Independent variable of interest		
Description	Relational logic	Operationalization	References
Study time	As the student increases the number of hours specifically devoted to studying for the accounting degree, it implies an increase in academic performance.	Number of hours the student dedicates to the accounting degree.	Michaels and Miethe (1989)
Mediating independent variables			
Description	Relational logic	Operationalization	References
Self-regulated learning	The level of utilization of metacognitive self-regulated learning strategies is a factor that mediates, by enhancing, the positive relationship between study time and academic performance.	Result of the confirmatory factor analysis of the instrument consisting of 10 questions on a seven-point Likert scale.	Lima Filho, Lima and Bruni (2015); Silva and Biavatti (2018); Silva et al. (2021)
impostor syndrome	Impostor syndrome is a factor that mediates, by mitigating, the positive relationship between study time and academic performance.	Result of the confirmatory factor analysis of the instrument consisting of 20 questions on a seven-point Likert scale.	Clance (1985); Matos (2014) and Ashrafifard and Mafakheri (2017)
Control independent variables			
Description	Relational logic	Operationalization	References
Scholarship	Students who have scholarships perform better than students who do not have scholarships.	Binary variable: (0) student who does not have a scholarship and (1) student who has a scholarship.	Pinto, Fernandes and Silva (2016) and Rocha, Leles and Queiroz (2018)
Gender	Female individuals have, on average, higher academic performance than male individuals	Binary variable: (0) student who identifies as female and (1) student who identifies as male.	Magalhães and Andrade (2006)

Source: Research data (2023)

To analyze the theoretical model presented in Figure 1, along with the control variables, confirmatory factor

analysis and structural equation modeling were employed. These two analyses were estimated together using the Diagonally Weighted Least Squares (WLSMV) technique, which, according to authors Brown (2006) and Proitsi et al. (2011), is an appropriate estimation method for variables on ordinal scales like those derived from Likert scales.

Despite statistical inference through confirmatory factor analysis and structural equation modeling being the appropriate technique to address the goal of this research, there are necessary assumptions for validating the results that are assessed through specific tests. Thus, for structural model validation, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) tests were conducted.

For adequacy to the structural model, the results of the CFI and TLI tests should have values above 0.90. The tests related to model fit errors, RMSEA and SRMR, should have values below 0.08 and 0.10, respectively. All these values are suggested by Rosseel (2012), Jöreskog, Olsson, and Wallentin (2016), and Keith (2019). As for the constructs of confirmatory factor analysis, the variables that gave rise to the factors of self-regulated learning and impostor syndrome were subjected to the Cronbach's Alpha validation test.

4 Results presentation and analysis

4.1 Descriptive results

Table 4 presents descriptive statistics for the directly observed variables in this study.

Table 4: Descriptive statistics of the variables

Quantitative variables						
Variables	Average	Median	Standard deviation	Minimum	Maximum	Obs.
Academic performance	6,615	6,930	1,692	0,100	9,500	330
Study time	1,712	2,000	1,085	0,000	4,00	330
Qualitative variables						
	Identifies as female		Identifies as male		Total	
Gender	FA	F%	FA	F%	FA	F%
	125	37,88%	205	62,12%	330	100,00%
	Has some scholarship		Doesn't have any scholarship		Total	
Scholarship	FA	F%	FA	F%	FA	F%
	43	13,03%	287	86,97%	330	100,00%

Note: Obs. = observations.
Source: Research data (2023)

In Table 4, it is noted that the majority of research participants identify as male (62.12%). Another result is the predominance of students who do not have any type of scholarship (86.97%). This may indicate that less than 15% of respondents are involved in projects related to extension and/or research activities, especially since scholarships distributed by federal universities are generally linked to these activities, which are pillars of these institutions.

Considering the study time, the average was 1.71. This shows that, on average, students allocate 1 hour and 42 minutes of their day to the contents of the undergraduate program in accounting. Regarding this variable, the median was 2 hours, which is a result close to the average found. It is also worth noting that out of the 330 respondents, 182 (55.15% of the total) indicated that they dedicate at least two hours daily to studying.

Regarding academic performance, the average is 6.61. This finding suggests that, on average, students have performance close to the minimum passing grade in the courses at the universities analyzed, which is 6. It is worth noting that 126 respondents (38.18% of the total) have academic performance between 5 and 7, which means they are within one point of the minimum expected grade for passing the courses. Additionally, only 57 respondents (17.27% of the total) have an average academic performance above 8, with the highest performance among the respondents being a student with an average grade of 9.50 in the courses.

4.2 Inferential analysis

As described in the methodological procedures, confirmatory factor analysis was conducted to measure the latent variables of self-regulated learning and impostor syndrome, performed simultaneously with the structural equation model using WLSMV estimation. The results of the factor analysis indicated that all variables related to the use of self-regulated learning and impostor syndrome formed their respective latent variables. The results related to the assumptions of structural equation validation (CFI, TLI, RMSEA, SRMR) indicated that the model is well-fitted. Therefore, there was no need for any modification to the latent variable.

Table 5 presents the results of the confirmatory factor analysis for the formation of latent variables (self-regulated learning and impostor syndrome):

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Table 5: Confirmatory factor analysis

	Self-regulated learning			impostor syndrome	
Variable	Standardized coefficient	Value Z	Variable	Standardized coefficient	Value Z
Apre1	1,000	NA	Imp1	1,000	NA
Apre2	0,970	8,404***	Imp2	0,671	6,332***
Apre3	1,191	9,998***	Imp3	0,502	6,080***
Apre4	0,999	7,679***	Imp4	1,110	9,269***
Apre5	1,041	9,165***	Imp5	0,814	7,106***
Apre6	1,009	8,380***	Imp6	1,434	10,882***
Apre7	0,770	6,787***	Imp7	1,287	9,178***
Apre8	1,333	8,806***	Imp8	0,852	8,066***
Apre9	0,778	6,593***	Imp9	0,537	6,111***
Apre10	0,744	6,251***	Imp10	1,284	9,385***
			Imp11	0,791	7,934***
			Imp12	1,047	8,623***
			Imp13	1,297	10,599***
			Imp14	1,093	9,329***
			Imp15	1,125	8,999***
			Imp16	1,192	9,575***
			Imp17	1,260	8,870***
			Imp18	0,942	7,815***
			Imp19	0,404	3,694***
			Imp20	1,025	8,630***
Cronbach's Alpha	0,802		Cronbach's Alpha	0,901	

Note: *significance at the 5% level and **significance at the 1% level considering two-tailed estimation.
Source: Research data (2023)

The results in Table 5 indicate that all variables belonging to the constructs of self-regulated learning and impostor syndrome were related to their respective latent variables (self-regulated learning and impostor syndrome) at a significance level of at least 5%. Therefore, there was no need to exclude any variables due to a lack of relation with these latent variables. This result was expected, as previous studies conducted in the Brazilian context also found similar results, as demonstrated by Matos (2014), Lima et al. (2015), Silva and Biavatti (2018), and Silva et al. (2021).

Since the evidence from the CFI, TLI, RMSEA, and SRMR tests indicated that the model is well-fitted, there was no need for adjustment or exclusion of variables from any of the constructs. Additionally, the Cronbach's Alpha for the latent variables self-regulated learning and impostor syndrome were 0.802 and 0.901, respectively. According to Cortina (1993), all these results indicate that both

constructs are valid, as the Cronbach's Alpha values were above 0.80.

With the formation of the self-regulated learning and impostor syndrome variables, it was possible to proceed with the Pearson correlation analysis. The results of the correlation coefficients between the independent variables were below 0.70, indicating the absence of multicollinearity (Fávero & Belfiore, 2017). Based on this result, we were able to proceed to the multivariate estimation model considering the structural equation. Table 6 presents the results of the structural model aiming to investigate the relationship between study time, mediated by self-regulated learning and impostor syndrome on academic performance:

Table 6: Structural model

Variable	Coefficient	Standard error	Test Z	Value-p
Study time	0,054	0,100	0,543	0,587
Study time => self-regulated learning	0,391	0,060	6,549	0,000
Study time =: impostor syndrome	0,004	0,083	0,044	0,965
Self-regulated learning	0,171	0,125	1,367	0,172
impostor syndrome	0,062	0,084	0,748	0,455
Gender	-0,020	0,195	-0,103	0,918
Scholarship	0,098	0,101	0,965	0,334
Observations	330			
CFI	0,9250			
TLI	0,9190			
RMSEA	0,0620			
SRMR	0,0800			

Note: *significance at the 5% level and **significance at the 1% level considering two-tailed estimation.
Source: Research data (2023)

The results of the structural equation model indicated that study time is not related to academic performance (Coefficient 0.054, p-value < 0.587), rejecting H1 and, in turn, going against the discussions of Michaels and Miethe (1989) and Lahmers and Zulauf (2000), who identified that study time implies an increase in academic performance. This finding suggests that when undergraduate accounting students increase the number of hours allocated to studying course content, they do not necessarily experience an increase in their academic performance.

One justification for this lack of relationship is presented in the study by Plant et al. (2005), as the authors explain that a student will not necessarily achieve higher performance if they allocate more time to studying a particular subject. This is because it is necessary for the time spent studying to be efficient and, in this way, help the student improve their academic performance. To ensure efficiency in studying, the authors suggest that a higher level of self-regulated learning strategies can be a way for students to use their

time efficiently and enhance their academic performance. In summary, considering the discussions of Plant et al. (2005), it can be understood that increasing the level of self-regulated learning strategies leads study time to have a positive effect on improving academic performance.

When considering this perspective, the results indicate that study time mediated by the level of self-regulated learning strategies implies an increase in academic performance (Coef. 0.391, p-value < 0.000). This evidence supports H2 and contributes to the work of Ericsson (2001) and Plant et al. (2005). This is because these authors argue that for study time to translate into improved performance, certain characteristics are required, such as a higher level of self-regulated learning strategies. Thus, a higher level of self-regulated learning strategies has a positive impact as a mediating factor between study time and academic performance, as students with higher levels of this strategy possess: (i) greater time planning and management skills; (ii) motivation when setting a goal; and (iii) an understanding of when to seek help in understanding a particular subject (Lima Filho et al., 2015; Zhoc et al., 2018).

From these results, it is evident that the notion often presented in various media outlets (see G1 (2017); Guia do Estudante (2020); G1 (2021); O Dia (2022)) that study time leads to better performance and the achievement of goals cannot be applied to undergraduate students in accounting. Therefore, it is essential to emphasize that this relationship only occurs when students themselves use self-regulated learning strategies to a greater extent and continue to exercise this metacognitive characteristic. Thus, for students to enhance their academic performance, increasing study time alone is not sufficient. It depends on the use of quality-related strategies (such as increasing the level of self-regulated learning).

Although the level of self-regulated learning plays a mediating role between study time and academic performance, the student's own characteristics, such as personality traits, can also influence this relationship. One of these personality traits relates to the impostor syndrome, which, according to Meurer and Costa (2020a), leads to task procrastination and counterproductive behaviors. Therefore, the impostor syndrome can lead to decreased performance (Matos, 2014). Furthermore, by inciting counterproductive actions and avoiding new challenges (Kuna, 2019), it may act in opposition to the metacognitive aspect of self-regulated learning. In other words, instead of intensifying the relationship between study hours and academic performance, it makes this relationship inversely proportional.

The findings presented in Table 6 indicate that the impostor syndrome does not mediate the relationship between study time and academic performance (Coef. = 0.004; p-value <0.965). This implies the rejection

of H3 and contributes, even though it does not accept the third research hypothesis, to the work of Matos (2014), Kuna (2019), and Meurer and Costa (2020a). These contributions occur because, despite the impostor syndrome being linked to counterproductive actions and avoiding new challenges, it does not have the capacity to interfere with the relationship between study time and academic performance.

The results regarding impostor syndrome can be considered beneficial for students. The impostor syndrome does not interact with the relationship between study time and performance, indicating that students with higher levels do not have a disadvantage compared to those who do not have or have milder levels of this syndrome. Therefore, for achieving higher performance, it is important that even with high levels of the impostor syndrome, students engage in actions aimed at increasing the use of self-regulated learning strategies, as this is beneficial in increasing academic performance as they dedicate more study time to the course content in the field of accounting.

Based on the presentation and discussion of the results, the summary of the results considering the hypotheses developed in this research is presented in Table 7.

Table 7: Research results and hypothesis

Hypothe-sis	Description	Result
H1	The number of hours allocated to study time has a positive and signifi-cant effect on academic performance.	Rejected
H2	**The number of hours allocated to study time has a positive and significant effect on academic performance when mediated by a higher level of self-regulated learning strategy utilization.**	**Confirmed**
H2b	The number of hours allocated to study time has a negative and signif-icant effect on academic performance when mediated by the impostor phenomenon syndrome.	Rejected

Source: Developed by the authors (2023)

5 Conclusion

The present study aimed to investigate the effect of study time on academic performance, mediated by the level of self-regulated learning strategy use and the impostor syndrome, among undergraduate accounting students. The results indicated that study time does not have a direct impact on academic performance, but only when mediated by the level of self-regulated learning strategy use. The findings also demonstrated that the personality trait of impostor syndrome does not mediate the relationship between study time and academic performance.

The results of this research bring forth some reflections. First, despite an increase in the number of study hours by undergraduate accounting students, there is no significant improvement in academic performance. This occurs because study time only influences performance indirectly, depending on the level of self-regulated learning strategy use. This result empirically contributes to the discussion

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presented by Plant et al. (2005), as the authors suggested in a theoretical model that metacognitive aspects like self-regulated learning could act as a mediating factor in the relationship between study time and academic performance.

The findings of this research also have practical implications, especially for undergraduate accounting students. This contribution is significant because it emphasizes that during their study time, students should actively exercise their own level of self-regulated learning to improve their academic performance. This gains more relevance when considering the discussions presented by Lima Filho et al. (2015) and Zhoc et al. (2018), as these authors emphasize that students who practice self-regulated learning have a greater ability to plan and manage their time, find motivation through goal-setting, and know their limits, enabling them to seek help from their peers to enhance their understanding of specific content.

In practical terms, the results of this study can also assist teachers in developing the Course Pedagogical Project and in designing teaching methodologies to be used in the course's subjects. Therefore, teachers can adopt methodologies that encourage an increase in the number of metacognitive learning strategies used by students. This practical implication is important considering the recommendations of international accounting organizations, which emphasize that accounting students, as future professionals, need to develop critical thinking skills, a commitment to lifelong learning, and the ability to provide high-quality advice for decision-making.

In turn, these recommendations are directly related to the discussion and practical implication that underpins your proposal for continuing education with the aim of integrating research, education, and professional practice. The American Accounting Association [AAA] (2012) has highlighted recommendations regarding the teaching of the profession, such as curricula that incorporate learning resources, a profession prepared for the future, and strategies for translating thought into action.

Another reflection obtained from the results is that the student's impostor syndrome personality trait does not influence the relationship between study time and academic performance. This directly contributes to the work of Matos (2014), Kuna (2019), and Meurer and Costa (2020a) because, even though impostor syndrome is a characteristic that leads to counterproductive actions and procrastination, it does not interfere with the relationship between study time and academic performance. Thus, students with higher levels of impostor syndrome do not have a disadvantage compared to those who do not have this syndrome in less attenuated levels when allocating more study time to enhance academic performance.

It is worth noting that this study was not without limitations. This is because only undergraduate students from three federal public institutions were analyzed. The study did not consider differences between institutions regarding the course evaluation grade and the education index related to geographical location. It should be noted that other institutions were invited to participate in this research, but there was no response. Another limitation is the data collection period, which was before the pandemic crisis, which could influence the use of learning strategies and the level of impostor syndrome among undergraduate students in Accounting. Therefore, these points may raise further reflections on the topic. Due to these limitations, it is suggested to investigate private universities, both in-person and online, in order to compare the results and understand the effects of personality traits on the relationship between study time and academic performance. Additionally, future research can explore this discussion by considering graduate students and examining their performance in other aspects, such as scientific output, taking into account different quality strata.

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