REVISTA EVIDENCIAÇÃO CONTÁBIL & FINANÇAS
João Pessoa, v. 10, n. 3, p. 137-150, Set/Dez.2022. ISSN 2318-1001
DOI 10.22478/ufpb.2318-1001.2022v10n3.61498
Disponível em: http://periodicos.ufpb.br/ojs2/index.php/recfin

RELATIONSHIP BETWEEN ACADEMIC PERFORMANCE AND THE LEVEL OF USE OF METACOGNITIVE STRATEGIES FOR SELF-REGULATED LEARNING[1]

RELAÇÃO ENTRE O DESEMPENHO ACADÊMICO E O NÍVEL DE UTILIZAÇÃO DAS ESTRATÉGIAS METACOGNITIVAS DE APRENDIZAGEM AUTORREGULADA

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ABSTRACT
Objective: Analyze the relationship between academic performance and the level of use of metacognitive self-regulated learning strategies by accounting students.
Method: The study approach was quantitative, using exploratory factor analysis and Structural Equation Modelling to answer the research question. The sample of the study initially comprised 107 undergraduate accounting students in the modality of face-to-face teaching of three public Universities that fully answered the research instrument.
Results: The data were first processed through an exploratory factorial analysis, which allows the indication of the necessary factors to define the constructs used in the structural equations. In addition, a multiple regression was performed to verify the strategies that influence the performance.
Conclusions: Indicate that students who self-evaluate and seek help from teachers, colleagues, or specialists are the ones who achieve the best academic performance. Thus, it can be concluded that

[1] Artigo recebido em: 25/11/2021. Revisado por pares em: 23/11/2022. Reformulado em: 16/01/2023. Recomendado para publicação: 08/03/2023 por Iago França Lopes (Editor Adjunto). Publicado em: 30/04/2023. Organização responsável pelo periódico: UFPB

academic performance may be related to the level of use of the metacognitive strategies of self-regulated learning.

Keywords: Academic Performance. Metacognitive Self-Regulatory Learning. Accounting students.

RESUMO

Objetivo: Analisar a relação entre o desempenho acadêmico e o nível de uso de estratégias metacognitivas de aprendizagem autorreguladas por estudantes de contabilidade.

Metodologia: A abordagem do estudo foi quantitativa, utilizando análise fatorial exploratória, e modelagem de equações estruturais para responder à pergunta da pesquisa. A amostra do estudo compreendeu inicialmente 107 estudantes de Contabilidade na modalidade de ensino presencial de três universidades públicas que responderam integralmente ao instrumento de pesquisa.

Análise de resultados: Os dados foram processados primeiro por meio de uma análise fatorial exploratória, que permite a indicação da quantidade necessária de fatores, para definir os construtos utilizados nas equações estruturais. Além disso, uma regressão múltipla foi realizada para verificar as estratégias que influenciam o desempenho.

Conclusões: Indicam que os alunos que se autoavaliam e procuram ajuda de professores, colegas ou especialistas são os que obtêm o melhor desempenho acadêmico. Assim, pode-se concluir que o desempenho acadêmico pode estar relacionado ao nível de uso das estratégias metacognitivas da aprendizagem autorregulada.

Palavras-chave: Desempenho Acadêmico. Aprendizagem Metacognitiva Autorregulada. Estudantes de Contabilidade.

1 INTRODUCTION

The increasing amount and complexity of information accountants must deal daily and the rapid transformation of the profession demanded accounting organizations (e.g., the American Accounting Association and the American Institute of Certified Public Accountants) to discuss strategies for the future of accounting education (Behn et al., 2012). In this sense, the development of metacognitive self-regulated learning skills allows a better adaptation to the contexts of academic and professional change in accounting, such as learning unknown content, which enables academic and professional success (Smith, 2001; Becker, 2013).

The self-regulated learning concept is multidimensional, as reflected in the numerous theories or structures put forth to describe it. Traditionally, self-regulated learning is defined as an active process of the learner in the learning process regarding the behavioral, motivational, and metacognitive aspects (Zimmerman, 2001). Self-regulated learning involves a self-conscious and intentional approach to academic achievement or learning success. Essentially, successful students are those who have a high degree of metacognitive self-regulation, motivational self-regulation, and behavioral self-regulation (Schleifer & Dull, 2009).

The focus of this research is the metacognitive aspect of self-regulated learning. Metacognition can be understood as a set of internal mechanisms that promote, produce, record, and consider information, as well as monitor and self-regulate its own intellectual processing (Lima Filho et al., 2015).

Although there are studies that investigated the role of self-regulated learning, such as Schleifer and Dull (2009), Byrne et al. (2009), Becker (2013), Lima Filho et al. (2015), Silva et al. (2016) and Kraus et al. (2017), they did not consider the impact that the level of use of metacognitive self-regulated learning strategies can have on academic performance, as suggested by Schleifer

and Dull (2009). Meanwhile, Zonatto et al. (2021) indicate that the use of self-regulation in learning improves the understanding of certain accounting concepts.

In this context, we have the following research problem that guides the present study: What is the relationship between academic performance and the level of use of metacognitive learning strategies self-regulated by accounting students? To answer the research question, the study seeks to analyze the relationship between academic performance and the level of use of metacognitive self-regulated learning strategies by accounting students.

The contribution of the research stems from the analyzes of the combined relationships between the variables in a structured and simultaneous way, as the method of structural equations allows, so it would be possible to empirically verify and possibly confirm the influences of the various self-regulated strategies on student performance. This contribution is essential in the light of the recognition that students, future accounting professionals, need to develop critical thinking skills, continuous learning and the ability to provide quality advice for decision making, a goal also instigated by the AAA (American Accounting Association, 2012). In this respect, a still incipient number of studies have been observed (Ravenscroft et al., 2012; Lima Filho et al., 2015; Silva & Biavatti, 2018). Evidence from accounting literature on the subject is still inconclusive. Schleifer and Dull (2009), for example, found positive associations between better educational performance and greater knowledge about metacognitive strategies. Ravenscroft et al. (2012) on the other hand found that students who overestimated metacognitive skills were related to poor academic performance.

This study contributes to practical and social aspects, with critical reflections on the development of the teaching-learning process of accounting students, as well as raises questions on the stimulation of the abilities of these students, in order to make them effective decision-makers. Educational development and its self-regulation are aligned with the construction of skills throughout life (Becker, 2013). According to Becker (2013), the observed shortage of studies related to learning competencies for the purpose of lifelong learning in the course of accounting justifies the realization of new studies.

2 THEORETICAL BACKGROUND

Zimmerman (1990) attributes self-regulated individuals as metacognitive and proactive students in the formation of their learning path. Self-regulated learning refers to the process of reflecting on one's own learning (National Research Council, 2001). Students and accounting professionals must develop accurate insight into their technical and interpersonal skills, continuously assess their own skills, seek improvement opportunities, and commit to lifelong learning (Ravenscroft et al., 2012).

Zimmerman (2000) considers the social aspect to be very important in the evolution of student learning. In his work, the author analyses the psychological processes involved in the various phases of self-regulation: the anticipation and preparation phase (planning), the execution and control phase (realization), and the self-reflection phase (evaluation). His instrument has been widely used in student research on learning strategies and motivation in different countries (Beck, 2013). According to their findings, the self-regulated learning process takes place dynamically, openly, and cyclically.

In this sense, Zimmerman and Martinez-Ponz (1986) developed 14 possible strategies of self-regulated learning, which are already recognized in the literature. For Aguiar and Silva (2017), and Lima Filho et al. (2015), the use of these strategies gives the student a valuable tool, since its use is highly correlated with academic success indexes and the opinion of the teachers about their degree of self-regulation in the classroom. The strategies of Zimmerman and Martinez-Ponz (1986) are: a) Self-evaluation; b) Organization and transformation; c) Planning and the Settlement of ob-

jectives; d) Information search process; e) Notes; f) Environmental Structure; (g) Self-claims; h) Repetition and memorization; i) Teachers' help; j) Close peer support; k) Expert help; l) Review of Notes; m) Review of tests and n) Review of the bibliography.

The student with a desirable degree to self-regulate learning tends to use the 14 categories of self-regulation strategies, which are: self-assessment, organization, and transformation, planning and goal setting, information search, note monitoring and maintenance (Zimmerman & Martinez-Ponz, 1986), and time management (Rosário, 2004). In addition, students who tend to exhibit greater self-regulated learning exhibit higher academic achievement and better perceptions of self-efficacy (Zimmerman, 1990). In consideration of Tuysuzoglu and Greene (2015), a 'self-regulated' student is an individual committed to his / her goals and commitments, who adopts strategies to achieve the established goals.

The results of different studies have shown that there is a difference among the students who use the metacognitive strategies of self-regulated learning. According to Zimmerman (2001), self-regulators are determined, strategic, persistent, and capable of evaluating their processes, whereas non-self-regulated ones do not have definite educational objectives, thus possessing a greater cognitive dependence. Also, acording to Zimmerman (1990), several laboratory and field research indicate the important role that students' use of self-regulated learning strategies plays in their academic performance.

It is worth noting that in the field of metacognitive self-regulated learning strategies, some studies have focused on investigating the subject in accounting education, such as Schleifer and Dull (2009), Becker (2013), Ravenscroft et al. (2012), Lima Filho et al. (2015), Silva et al. (2016) and Kraus et al. (2017). All these studies study metacognitive strategies in accounting, although only a few of them sought to understand how these strategies can be reflected in academic performance. The exceptions are Schleifer and Dull (2009) who discussed the association between dichotomized metacognition in metacognitive knowledge and meta-regulation with academic performance and Ravenscroft, Waymire and West (2012), who investigated metacognition associated with performance, calibration error and mentality.

Becker (2013) also found that classroom time can be spent ‘‘learning about learning’’ without compromising the acquisition of course content knowledge. In addition, in general, students who had time to learn how to learn performed better than students who did not have this intervention in the experiment carried out by the authors. These students may have benefited from the study strategies and because of that, they were more efficient in the learning process. The authors, however, also identified that this perceived benefit does not occur uniformly among students. It was evidenced that students who already have a better academic performance tend to benefit the most from the application of these metacognitive strategies.

However, the findings on the level of self-regulated learning metacognitive strategies and performance were inconclusive. Schleifer and Dull (2009) found that higher metacognitive knowledge was associated with higher grades, while at each level of meta-cognition, meta-regulation of students was negatively related to course scores (Ravenscroft et al., 2012), whose finding indicates that students who overestimate their metacognitive abilities had a poor academic performance.

These mixed results reinforce the idea that there is no consensus in the literature about the relationship between performance and the level of metacognitive strategies used by students. However, there is belief among educators that metacognitive skills are related to academic performance (Ravenscroft et al., 2012; Sperling et al., 2004; Zonatto et al., 2021). Therefore, these theoretically linked elements motivate this research, which seeks to explain what self-regulated strategies relate to the academic performance of accounting students.

3 METHOD

To analyze the relationship between academic performance and the level of use of self-regulated metacognitive learning strategies by accounting students, documentary procedures and the use of data from questionnaires applied to students were adopted. The study approach was quantitative, using statistical procedures to answer the research question.

The sample of the study comprised 107 students of accounting in the modality of face-to-face teaching at three Federal Universities that fully answered the research instrument. Data collection was carried out between January 22, 2018, and November 30, 2018. The questionnaires were administered to the students both in printed format and by e-mail. The criteria of relevance and accessibility were observed, as the institutions meet the theoretical assumptions of the study and allowed the research to be carried out.

During the planning, collection, and analyzes of the data, we followed the ethical standards of research in the country, indicating to the participants that the responses would be voluntary. The instrument applied allowed the collection of basic characteristics of the individual for sample control, such as name, gender, study time, academic level (in semesters), and the student's age, for statistical analyzes and for collating with academic performance data with the coordination, with the consent of the students. It is noteworthy that the Academic Performance of the students was obtained from the faculty coordination. The students authorized the use of their academic performance for this study. In the sequence, we separate the data of individual characteristics (pseudo-anonymization) from the data set of the self-regulated strategies of interest in the research, to avoid any risk of indirect identification. Response data were grouped into categories for the individual's qualitative classes, such as gender, and numerically into continuous data for the intensity of study time, academic period, and age.

We used the instrument elaborated by Zimmerman and Martinez-Ponz (1986), which includes ten statements regarding the use of metacognitive self-regulated learning strategies, as described by Lima Filho et al. (2015) and Aguiar and Silva (2017), as follows: E1. I evaluate my performance, see what I must improve, and try to overcome difficulties detected (Self-evaluation); 2. I always try to draw up a plan (schematic) before starting a job (Organization and transformation); 3. If I have a test, I start to study as soon as possible, to be rested and calm in the day (Planning and the Settlement of objectives); 4. Before starting work, I always go to the library (and other means of research, be it physical or digital) to separate as much information as I can about the subject (Information search process); 5. I always try to write down the maximum of a reading or a teacher's lecture (Take Notes); 6. For better concentration, I always look for the environment that does not distract (Environmental Structure); 7. When I do a test, if it does well, I offer a reward; in case otherwise, I give up something I wanted so badly (Self-claims); 8. I use strategies to memorize the subject (or formulas), until knowing by color, the subject to be studied (Repetition and memorization); 9. When difficulties arise and I cannot solve myself, I seek outside help (Teachers' help; Close peer support; Expert help); 10. After completing an academic project, I review it to make sure it is correct (Review of Notes; Review of tests, and Review of the bibliography). The selection of this instrument was based on the frequency analyzes of its use in the literature, according to previous studies discussed in the Theoretical Background.

To respond to statements about their respective self-regulatory strategies, students were required to assign a value to the frequency of use of these strategies on 7-point Likert additive scales, similar to the procedures applied by Silva et al. (2018). After obtaining the use of metacognitive strategies for self-regulated learning, we sought to analyze its relationship with academic performance.

Thus, the data were first processed through an exploratory factorial analyzes with the aid of SPSS22 software, which allows the indication of the necessary amount of factors to define the

constructs used in the structural equations. Although the questionnaire has already been validated in the literature, it was decided to estimate the factorial analysis in order to ensure the adequacy of the variables in the present sample. After that, the software SmartPLS was used. In addition, a multiple regression was performed to verify the strategies that influence in the performance, through the software Stata13. This individualized analysis contributes to a better understanding of the effects of each strategy, also independently.

The exploratory factorial analyzes was carried out using the SPSS software, with the analyzes of the component matrix to determine the number of components and the factors of each component (Hair Jr. et al., 2009) specified during the analyzes of the data. The size of the sample is initially satisfactory in view of assumptions that the size should preferably be equal to or greater than 100 and have at least 5 times more observations than variables to be analyzed (Hair Jr. et al., 2009).

The analyzes by structural equations is based on the Average Variance Extracted (AVE), as evidenced by the shared variance between the indicators of each of the latent variables of the model (Hair Jr. et al., 2009). The sample quantity was previously calculated with a sufficient sample size for a model with two independent variables, median effect of 0.15 (F2) and test power of 95%, corresponding to a significance level of 5% (F test, LMR, SD 0, a priori), which required a minimum sample of more than 104 valid responses, based on the application of the G*Power software (Faul, Erdefelder, Buchner, & Lang, 2009; Hair Jr. et al., 2009; Cohen, 1998).

This step was operationalized through SmartPLS 3. In addition, the values of the composite reliability, the discriminant validity, Cronbach's alpha, and consequently the application of the R^2 model and the relations or paths (Path) should be analyzed, which verifies the established relationship between two constructs and their statistical significance (Hair Jr. et al., 2009).

Finally, to identify individuals and allow a better analyzes of the relevant strategies, a linear regression process was developed aiming to estimate the expected value for a dependent variable 'performance' (Oliveira et al., 2009; Schleifer & Dull, 2009; Ravenscroft et al., 2012), from the variation of other variables, called explanatory - in this case, the self-regulatory learning strategies (Schleifer & Dull, 2009; Byrne & Flood, 2009; Becker, 2013; Lima Filho et al., 2015; Silva et al., 2016; Kraus et al., 2017).

4 RESULTS AND DISCUSSIONS

The descriptive analyzes of the data presented in this chapter allows us to better understand the selected sample and its average perceptions about self-regulated learning. In Table 1, students participating in this research are characterized.

As shown in Table 1, there is a balance between genders. When analyzing the age group, the predominance was 21 to 25 years (43.93%), 39, 25% for up to 20 years, 8, 41% from 26 to 30 years, 4, 67% from 31 to 35 years and only 3.74% above 35 years. In relation to the academic semester, the majority (34.58%) is in the second semester and 20, 56% in the last semester. Students who study less than 30 minutes a day predominate (35.51%), while 18.69% do not study, and only 2.80% study more than 4 hours a day.

Table 1. Descriptive analyzes of data

Sample				
Fi 107		Fi% 100		
Gender				
Female		Male		
54		53		
50.47		49.53		
Age				
Up To 20	21 to 25	26 to 30	31 to 35	> 35
42	47	9	5	4
39.25	43.93	8.41	4.67	3.74
Semester				
	2º	4º	6º	8º
Fi	37	20.56%	56.07%	22
Fi%	34.58	23.36	19.63	20.56
Academic Performance				
Average	Minimum	Maximum	SD	
6.97	2.76	8.94	1.23	
Daily study time (hour)				
Zero	30 Min.	1 Hour	2 to 3	4
20	38	28	18	3
18.69%	35.51%	26.17%	16.82%	2.80%

Note: Developed by author (2023).

We also identified the metacognitive self-regulated learning strategies used by students to carry out their academic activities. It should be noted that in the last two columns the aggregate frequencies are presented in two different groups: responses smaller than four and responses greater than four, as shown in Table 2, being disregarded the perceptions identical to four, which would be those indifferent to the aforementioned metacognitive strategy.

Table 2. Descriptive analyzes of self-regulation perceptions

Strategies	Value < 4	Value > 4	Mean	SD	Min.	Max.
E1	20	69	3.90	1.26	1	5
	18.69%	64.48%				
E2	40	46	4.18	1.89	1	7
	37.38%	42.99%				
E3	49	33	3.75	1.55	1	7
	45.79%	30.84%				
E4	39	57	4.48	1.99	1	7
	36.45%	53.27%				
E5	22	60	4.90	1.60	1	7
	20.56%	56.07%				
E6	22	60	5.97	1.78	1	7
	20.56%	56.07%				
E7	83	15	2.19	1.50	1	6
	77.57%	14.02%				
E8	41	52	4.35	1.83	1	7
	38.32%	48.60%				
E9	15	78	5.26	1.64	1	7
	14.02%	72.90%				
E10	21	72	5.16	1.56	2	7
	19.63%	67.29%				
Performance			6.89	1.23	2.76	8.94

Note: Developed by author (2023)

As a result, it was found that the metacognitive strategies that students preferentially use to face their academic activities were E9 (social help), E10 (data review), and E1 (self-evaluation). These are concentrated between the phases of execution and self-reflection. It is worth noting that the predominance of metacognitive strategies is above the mid-point, except for E2 (organization and transformation), E3 (objectives and planning), E7 (self-consequence), and E8 (repetition and memorization). These findings were convergent with the studies of Lima Filho et al. (2016), Silva and Biavatti (2018), and Silva et al. (2016).

Results suggest that accounting students do not use goal setting and planning as well as self-claims. When considering that the process of self-regulation takes place in an open and cyclical way, the non-use of these strategies can compromise the other phases (execution and control, and self-reflection) (Silva & Biavatti, 2018). For Demetriou (2000) and Lima Filho et al. (2015), active participation in the teaching-learning process implies the establishment of objectives, recognition of the goals and needs to achieve these objectives, as well as continuous monitoring throughout the process, for reassessment and establishment of new goals and necessary strategies.

The results suggest that academic performance may be related to the level of utilization of the metacognitive strategies of self-regulated learning, according to Schleifer and Dull (2009). For grouping categories of self-regulated learning strategies into empirical constructs, an exploratory factorial analyzes was developed to indicate the common strategies that could compose the factors.

Hair Jr.et al. (2009) suggest that the extraction should continue until the researcher has captured 60% of the variance. Other assumptions need to be validated, such as the identification of high-factor loads in components. The reasons are due to the fact that factor analyzes is a simple structure of its components, and a variable cannot contribute to the construction of different factors. Factor analyzes required the exclusion of variables (Hair Jr. et al., 2009), among them the E7 factor presented reduced coefficients of correlation, while the factors E2 and E4 maintained high factor loads in both components. This exclusion only limits the interpretation of the strategy individually with the rest of the traditional literature, because for the purpose of the research, the constructs maintain a grouping of variables correlated with each other.

The correlation matrix, although presenting low coefficients, was considered satisfactory from at least one of the coefficients (> 0.3 acceptable), accompanied by a Kaiser-Meyer-Olkin (KMO) test of 0.719 and the Bartlett test result significant at the 0.000 level

These results in relation to sample adequacy are satisfactory when considering the parameters of Hair Jr. et al. (2009), whose interpretation indicates that values from 0.80 are admirable and from 0.70 are medium, but only below 0.50 would be unacceptable. Even with the exclusion of factors, the total variance accumulated by the two components increased to 59%, almost matched by the 60% criterion of Hair Jr. et al. (2009), validated by the Scree Plot criterion. With this, the factors presented coefficients in the matrix rotated in relation to only one component each and independently, demonstrating better statistical parameters for determining the components.

Thus, it was established as research constructs, proposed for the determination of the variable Academic Performance, two variables formed by seven factors (Table 3), which we call in this work action and control.

Table 3. Coefficients

Construct	Factor	Coefficient	Items
1 Action	E_3	.594	If I have a test, I start to study as soon as possible, to be rested and calm during the day
	E_5	.619	I always try to write down the maximum of a reading or a teacher's lecture.
	E_8	.674	I use strategies to memorize the subject (or formulas), until knowing by color, the subject to be studied.
	E_9	.760	When difficulties arise and I cannot solve them myself, I seek outside help (teachers, colleagues, others).
	E_10	.813	After completing an academic project, I review it to make sure it is correct.
2 Control	E_1	.872	I evaluate my performance, see what I must improve and try to overcome difficulties detected.
	E_6	.763	For better concentration, I always look for an environment that does not distract me.

Note: Developed by author (2023) and items by Lima Filho et al. (2015).

Considering the categories of Zimmerman (2000) and that E5, E8, E9 and E10 are associated with the Execution and Control phase and E3 is related to the Planning phase (lower parameter), we could understand Factor 1 as a predominant factor of Execution and Control. However, Factor 2 is divided between Evaluation (E1) and again attributes of the Execution and Control phase (E6).

Following the results from the factor analyzes, we used the method of the structural equation. Structural equation modeling applies to more complex, non-normal, few data, or many constructs and variables distributions based on partial last square (PLS) (Hair Jr. et al., 2009; Ringle et al., 2014). The PLS-SEM regression method uses a sequence of regressions represented by paths and their coefficients (Ringle et al., 2015).

The calculations show higher results than the minimum criteria, whose values were 0.51 and 0.69, higher than the criteria of Fornell and Larcker (Fornell & Larcker, 1981; Henseler et al., 2009) (> 0.50). Thus, it is accepted that the model converges to a satisfactory result to guarantee Convergent Validity.

The internal consistency is evaluated through Cronbach's Alpha and Composite Reliability. Cronbach's alpha is based on the intercorrelations of the variables and it depends on the number of variables of each construct, the more the better (Ringle et al., 2014). These are criteria used to assess the perception of the scale in the sample of individuals who answered the questionnaire, in a reliable and bias-free manner, which would be demonstrated with values above 0.60 and 0.70, respectively, for exploratory research, which is fully met in this model according to the Table 4.

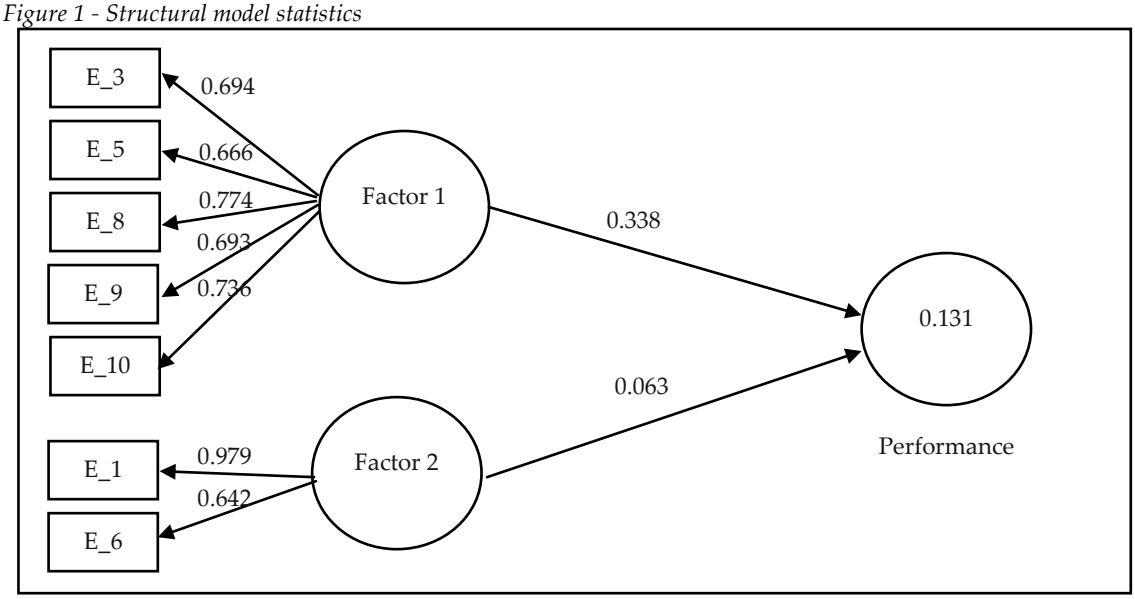
Table 4. Quality Criteria

Variable	AVE	Cronbach	CR	Discriminant Validity			Coef.	P-
Criterion	>0.50	>0.60	>0.70	Dep.	Factor 1	Factor 2	Paths	valor
Dependent	1.000	1000	1000	1.000	-	-	-	-
Factor 1	0.510	0.761	0.807	0.358	0.714	-	0,338	0,001
Factor 2	0.686	0.643	0.856	0.168	0.312	0.828	0,063	0,488

Note: Developed by author (2023).

The discriminant validity of the model is also evaluated using the criterion of Fornell and Larcker (1981), which indicates that the square roots of latent variables must be higher than with other variables. According to Ringle et al. (2014), the aforementioned criteria guarantee the adjustment of the measurement model, remaining the analyzes of the results of R^2 and of the coefficient of paths, which can be visualized in Figure 1.

Figure 1 - Structural model statistics



Note: Developed by author (2023)

The coefficients of determination of Pearson and R2 indicate the portion of the variance which are explained (Ringle et al., 2014). In the present case, with R2 of 0.131 (13%) it is possible to indicate that the effect of latent constructs on performance is of medium size, in the context of social and behavioral sciences (Ringle et al., 2014).

To test the statistical significance of these results, resamples are performed, created with observations extracted randomly by the algorithm, from the original data of the sample. This number of subsamples needs to be large (Ringle et al., 2015), with at least 300 samples (Ringle et al., 2014). In the present case the resampling was done using 500 subsamples.

After evaluating the quality of the fit of the model, the final step is the interpretation of the path coefficients. The path coefficients are interpreted as betas of the regressions, in which the increase of the explanatory variable increases the dependent variable. In the present case, only Factor 1 – of the action - demonstrated a statistically significant coefficient of path, that is, capable of explaining academic performance.

From the results, it can be seen that there is a dimension of 0.338 between Factor 1 and Academic Performance variables. Thus, the increase of the specific self-regulated strategies of Factor 1 increases the academic performance by 34%. This finding converges with that of Schleifer and

Dull (2009), who found that a higher metacognitive level on the part of the students was associated with higher grades. It is worth noting that these strategies are distributed among the three phases of self-regulation of learning, which allows to conclude that the self-regulated student has higher academic performance, according to Ravenscroft et al. (2012).

This finding contributes to the contradictory and mixed results of previous studies regarding the increase of metacognitive strategies of self-regulated learning, according to the evolution of the educational scale, such as Rosario (2001), Sperling et al., (2004), Schleifer and Dull (2009), Lima Filho et al. (2015), Silva et al. (2016) and Kraus et al. (2017). This result suggests that the level of analyzes should consider the reflection of the increase in the level of utilization of the strategies with academic performance. However, Ravenscroft et al. (2012) explain that students who overestimate their metacognitive abilities have poor academic performance. Having scholarships and dedicating more time to study are also factors that positively impact academic performance, which is to be expected, since students with scholarships are generally the ones who have the possibility to devote more time to study.

The result of the F statistic presented was 6.44, which at 7 degrees of freedom (degrees of freedom) shows that the parameters of the model are statistically significant, with a probability of 95% confidence. Thus, the proposed model, which includes several metacognitive strategies of self-regulated learning, managed to present a power of explanation of 32.64% (R^2) of students' academic performance.

5 FINAL CONSIDERATIONS

The domain of knowledge about how the use of metacognitive strategies of learning can greatly aid the learning process or performance of the students, which already justifies the relevance of the present research. Although the present sample has not proven the relationship of all metacognitive strategies to student performance, other studies may be better understood by either distinct indicators or differentiated external conditions.

The descriptive analyzes demonstrated that the metacognitive strategies of self-learning are employed by the students, however, the students present gaps in relation to the use of strategies related objectives and planning, and mainly of self-sequencing. The Factorial analyzes identified two groups of explanatory factors of performance, but only one significantly explained student performance, the one that determines the student's Action (factor 1) in adopting metacognitive strategies.

From the theoretical point of view, this research contributes with new results to the body of literature that proposes to explain the causes of the academic performance of accounting students. In addition, by finding some divergent results and others in line with the literature, this research reinforces the need for the subject to continue to be explored by future research.

The contribution is clear when indicating that the strategies need to go beyond the field of planning and control, and reach the individual's action factor. This was the factor strongly related to performance. Writing down the teachers' comments, studying in advance, trying to memorize, interactive control with the exercise of the activity, and seeking support proved to be a cluster positively related to greater academic performance.

From a practical point of view, the results found here are expected to mobilize teachers to encourage these strategies to be used by accounting students, especially in self-assessment and seeking help with teachers, peers, and specialists. It is hoped that by working on these strategies, students can improve academic performance.

For future research, we suggest expanding the sample to a larger universe of accounting students, seeking to also integrate students from private universities, since these may have characteristics that are different from those of students from public universities. In addition, other teach-

ing strategies can be added to the model, seeking a greater explanatory power of academic performance.

We believe that new qualitative studies carried out with non-significant variables could provide evidence and ways to explain why such strategies E2, E4 and E7 did not show specific relationships, or broad relationships with different factors. Related to other variables external to the model, they may pose challenges to the good performance of students.

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