ANALYSIS OF THE RELATION BETWEEN ACADEMIC PERFORMANCE AND LEARNING STRATEGIES OF UNDERGRADUATE STUDENTS IN DISTANCE EDUCATION

SAMUEL DE OLIVEIRA DURSO
Universidade Federal de Minas Gerais
Address: Avenida Presidente Antônio Carlos, 6627 | Pampulha | 31270-901 | Belo Horizonte/MG | Brazil.
 https://orcid.org/0000-0003-0016-3611
sodurso@gmail.com

SONIA ROSA ARBUES DECOSTER
Faculdade FIPECAFI
Address: Rua Maestro Cardim, 1170 | Bela Vista | 01323-001 | São Paulo/SP | Brazil.
 https://orcid.org/0000-0002-0081-347X
sonia.decoster@fipecafi.org

ABSTRACT

This research aimed to identify the relations between the learning strategies adopted by distance education accounting students and their academic performances. In the context of the pandemic caused by Covid-19, several Higher Education Institutions (HEIs) needed to invest in technologies that facilitate the introduction and dissemination of the distance education. Despite the similarities in content between face-to-face and distance education, the learning process is different between the modalities, making it necessary to understand the strategies that help explain the performance of these students. To achieve the objective proposed by the research, a survey was carried out with 174 students of accounting undergraduate course in the distance education modality of a private HEI based in the city of São Paulo. The data used in this research was based in quantitative techniques, such as test of means, analysis of principal components and simple and multiple linear regressions. From the research results, it was possible to identify a positive correlation between the main strategies used by the students and the performance in the course, corroborating the literature consulted. Cognitive strategies, specially, proved to be more important for students in the research sample. The study results help to understand how accounting students use strategies that help their academic performance, which can be useful for course managers, students in the area, professors, and for the conduction of educational polices by the accounting association.

Keyword: Learning Strategies. Academic Performance. Distance Education. Higher Education. Accounting Undergraduate.

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1 INTRODUCTION

The current moment, resulting from the social isolation caused by Covid-19, has enabled *online* education, previously an option in the form of distance learning (DL), to reach a greater number of people, consolidating itself as a teaching modality. Even before the start of the pandemic, the National Institute for Study and Educational Research Anísio Teixeira (Inep) had already disclosed a 378.9% increase in the number of enrollment in distance undergraduate degrees in the period from 2009 to 2019 (Inep, 2019). In addition, in 2020, for the first time, the number of DL level entry was higher than that of the in-person modality (Ministry of Education [MEC], 2022).

All undergraduate and graduate courses conducted in the DL modality in Brazil are regulated by MEC through Law 9.394 of December 20, 1996, which establishes the guidelines and bases of national education. In addition, the specific provisions for distance education in the country are set out in Decree 9.057 of May 25th of 2017. The decree in question underwent an update, still in 2017, which facilitated the opening of the DL centers that complement the Virtual Learning Environment (AVA) with the objective of strengthening the DL bases.

In this scenario, in which *online* education is highlighted, a continuous evaluation of the quality and effectiveness of previously established educational guidelines is required. Despite presenting flexibility as one of the great attractions(Dhawan, 2020; Fortes & Nacarato, 2020; Mill, 2015), in the DL, the AVA requires the development of interactive and complementary actions that allow the support of teaching-learning processes, which will not necessarily occur synchronously. The specificities of the modality in question therefore generate the need for a greater understanding of the use of teaching-learning strategies used by both professors and students in the educational process (Oliveira, Boruchovitch, & Santos, 2010).

Kardash and Amlund (1991) define learning strategies as hidden and visible information processing activities that learners/apprentices use at the time of coding to facilitate the acquisition, storage and retrieval of information to be learned. The generalized assumption is that the main strategies are positively associated with effective learning, which tends to translate into the students' academic performance (Boruchovitch, 1999; Palitot et al., 2017).

In this sense, the theoretical *framework* initially developed by Warr and Allan (1998) highlights three large groups of strategies, namely: cognitive, behavioral and autoregulatory. In the research of Zerbini and Abbad (2008), for example, the organization and repetition strategies (both cognitive) were dominant in the students' learning in the study sample. Subsequently, Zerbini, Abbad, Mourão and Martins (2015) found evidence that the strategies of elaboration (cognitive) and emotion control (self-regulatory) were more significant for the students-workers' learning.

Regarding the teaching strategies, Bzuneck (2010) points out that such actions are substantial for promoting and maintaining student motivation in learning situations, which is also reinforced by Acevedo, Torres and Tirado (2015). For Guri-Rosenblit (2009), the professors are essential for building meaningful learning in the DL context. According to the author, misinterpretations about the role of professors/tutors in AVA may impair student performance by assuming that learning occurs automatically.

Nevertheless, for Martins and Zerbini (2014), research in the school context has demonstrated that teaching learning strategies to students tends to promote greater personal autonomy and increase awareness and responsibility on the learning process itself, improving the student's academic performance. According to Silva (2003), when it comes to online teaching , the strategies are mediated by the use of interactive tools, such as forums, *chats*, e-mails and others, which are made available in AVA. Beluce and Oliveira (2016) note that the particularities of *online* education require the professor to use educational resources that help the use of strategies for learning management. Strategies that contribute to the promotion of motivation, which provides

the student with the leverage of their own development. The technological tool (teaching resource) alone, however, does not guarantee the quality of learning (Guri-Rosenblit, 2009).

Martins and Zerbini (2014) point out that despite the increasing number of courses offered in the DL modality, most studies about the use of learning strategies are still applied in the face-to-face context in both the educational and professional environments. Therefore, this study is justified in seeking to fill the gap and to dedicate itself to learning Brazilian university students within the AVA context, aiming to respond to the following research problem: *What is the relation between learning strategies and academic performance obtained by the DL accounting graduates?* The general objective of this study is, therefore, to identify the relation between the learning strategies adopted by DL accounting graduates and their respective performances. In order to make the objective of the research feasible, an investigation was carried out in a private IHE with headquarters in the city of São Paulo, whose Accounting Sciences DL course is currently evaluated with the maximum score in MEC.

The justification for delimiting the course of Accounting Sciences results from the fact that this training area is among the most sought in the DL modality in recent years (Union of Sponsoring Entities of Higher Education Institutions in the State of São Paulo [Semesp], 2022). In addition, the literature in the area has raised concerns regarding the quality of the accountants training of this type of teaching, with a view to the DL students' performance obtained in formal assessments of the State (Caetano, Cardoso, Miranda, & Freitas, 2016; Nasu, Silva, Borges, & Melo, 2021). In this sense, the research in question is useful for several agents interested in accounting training, such as class council, professors and IHE, in addition to contributing to the literature on learning within the DL.

2 THEORETICAL BASIS

2.1 Learning Strategies

Warr and Allan (1998) elaborated an empirical and conceptual research that proposes three types of learning strategies (cognitive, behavioral and autoregulatory), which can be applied both in a school and organizational context (Warr & Downing, 2000). It should be pointed out that, in their study, Warr and Downing (2000), following Warr and Allan (1998), used nine dimensions for educational strategies, which were segregated in the three groups, namely: a) cognitive: mental repetition, organization and elaboration; b) behavioral: search for interpersonal help, search for help in teaching material and practical application; and c) autoregulatory: control of emotion, control of motivation and monitoring of understanding.

Learning strategies have been identified by literature as fundamental for the explanation of academic performance at the most diverse educational levels (Boruchovitch, 1999; Oliveira et al., 2010; Palitot et al., 2017). Different contents may require the student to have a set of strategies that best fit the learning needs. In this context, Boruchovitch (1999, page 361) already emphasized that "the role that learning strategies play, both for effective learning and self-regulation, has been increasingly recognized by the educators".

In the DL context this situation is no different. Previous research, based on multiple theoretical approaches, points out that learning styles help to understand the performance obtained by students in their respective educational contexts (Acevedo et al., 2015; Bacan et al., 2020). These strategies, however, may vary depending on the students' profile . In the research carried out with DL students of undergraduate and extension courses, for example, Versuti, Andrade and Zerbini (2020) find evidences that extension students tend to use cognitive, regulatory and emotion control strategies more than teaching undergraduate degree students. Whereas Zerbini et al. (2015) highlight cognitive and self-regulatory strategies as predominant in the learning process for a sample of DL students-workers. Understanding the different categories of Warr *and* Allan

framework (1998) becomes relevant, therefore, for a better distinction of the strategies that can be used by the professors in the DL context.

2.1.1 Cognitive Learning strategies

Repetition. It concerns strategies related to the act of repeating to oneself the material to be learned. This strategy exemplifies a superficial approach to learning (Richardson, 1990), but tends to be directly related to academic performance as a result of the student's memorization process (Fisher & Ford, 1998; Pintrich, Smith, Garcia, & McKeachie, 1993).

Organization. It is related to strategies to identify the main issues, the creation of mental structures and interrelated elements to be learned. This process involves the elaboration of a summary of the selected themes and is usually associated with good academic performance (Fisher & Ford, 1998; Pintrich & Garcia, 1993; Pintrich et al., 1993). In some cases, as in the research by Zerbini et al. (2015), the organization strategies tend to be applied in conjunction with repetition strategies.

Elaboration. It concerns actions that examine the implications and seek to make mental connections between the material to be assimilated and the existing knowledge. It is a strategy that goes beyond the organization, as it aims to increase understanding of a particular topic. The literature has indicated that the design strategy tends to be positively associated with performance (Fisher & Ford, 1998; Pintrich & Garcia, 1993; Pintrich et al., 1993). In the research of Zerbini et al. (2015) in particular, this strategy presented one of the highest averages for students inserted into the labor market.

2.1.2 Behavioral Learning Strategies

Interpersonal Help Search. It refers to procedures to obtain support from others, which involves proactive behavior to seek understanding in asking for help. About this group of strategies , Zimmerman and Martinez-Pons (1986) reported positive associations with the level of the course in which the student was present, but the correlations were not statistically significant in the studies reported by Pintrich and Garcia (1993), Pintrich et al. (1993), Ryan and Pintrich (1997) and Warr, Allan and Birdi (1999).

Teaching Material Support Search. It refers to strategies for obtaining information from written, prepared and/or indicated documents by the institution. In the DL context, teaching materials represent important tools for the teaching-learning process in asynchronous moments (Rosalin, Cruz, & Mattos, 2017). Despite this factor , Zerbini et al. (2015) found evidences that the actions of this group were not relevant to the DL students of an executive education course, which may be related to the format of the course offered, according to the authors.

Practical Applications. These are procedures used to apply knowledge in the real world. For students inserted in technicist courses, in particular, this group of strategies may prove effective for performance, since it allows better knowledge assimilation (Warr & Downing, 2000). In the DL context, however, strategies of this group have presented little suitability for different samples (Martins & Zerbini, 2014; Zerbini & Abbad, 2008).

2.1.3 Self-regulatory learning strategies

Control of Emotion. It refers to the control of anxiety and, consequently, to the prevention of the problems resulting from it, such as dispersion of concentration and negative emotions. This type of strategy also tends to vary among DL students groups. Versuti et al. (2020), for example, found evidences that extension courses students tend to use this strategy more than students from undergraduate courses, which may retain a relation with the maturity of individuals.

Motivation Control. It concerns procedures to maintain motivation and attention, even in tasks where the individual has low interest. Studies reported by Pintrich and Garcia (1993),

Pintrich et al. (1993) and Zimmerman and Martinez-Pons (1986) point out that the procedures for controlling motivation are associated with the success of learning, either with students from elementary school or university.

Understanding Monitoring. It involves procedures that evaluate the degree of knowledge acquired by the individual and strategies that aim to change the learning process, when necessary. Zerbini et al. (2015) found evidences of low use of this strategy for the context of the study sample, which may, according to the authors, result from greater exposure to other lifelong learning strategies, which require less complexity of use.

2.2 Virtual Learning Environments (AVA)

AVAs are defined as virtual spaces that promote the development of skills for independent learning, because they consider time, space and the pace of learning, through a set of Teaching resources adapted to technologies and multiple media (Carswell & Venkatesh, 2002). As reinforced by Beluce and Oliveira (2016), there is an incipient number of studies investigating the motivation to learn in the context of the AVA (Fiuza, Sarriera, & Bedin, 2013; Giesbers et al., 2013; Hartnett, George, & Dron, 2011). Normally, the existing studies sought to study the correlation between students' motivation to learn and the different dimensions, such as autonomy, competence and engagement in the accomplishment of a certain task with the use of synchronous or asynchronous tools (Bicalho & Oliveira, 2012; Wander, Gomes, & Pinto, 2020).

In this sense, the study carried out by Zerbini and Abbad (2008) sought to contemplate the self-regulatory dimensions within the DL, based on the Warr and Downing *framework* (2000). To this end, the learning strategies used by participants of the course "Starting a Small Big Business" (IPGN) of the Brazilian Micro and Small Business Support Service (Sebrae), offered at a distance, with a population of 4,719 enrolled, were evaluated. Data collection occurred through a digitized instrument, available in *an online* environment. Based on statistical techniques of major and factor components, the authors identify seven factors from the instrument applied, with the component "Repetition" and the "Organization" forming a single factor and the component "practical application" not being significant for the sample context, what can be related to the fact that the IPGN course does not request the practical application of the content throughout the training.

Martins and Zerbini (2014), in turn, analyzed the learning strategies used by students from the higher education of a private institution who participated in a hybrid (blended) course. To this end, the authors applied a questionnaire built from the Warr and Downing *framework* (2000) in 916 students of the Scientific Methodology course and 433 of Economics course (both blended modality). Based on factorial analysis techniques and internal consistency, the study finds evidence that goes against previous research, signaling for the formation of four groups: cognitive strategies, emotion control, self-regulatory strategies and search for interpersonal help.

In general, studies on the subject carried out under the DL show that the strategies used by students to promote learning are multiple. Factors such as the course students' profile and the structure of the IES may, however, influence these actions adopted (Versuti et al., 2020; Zerbini et al., 2015). Kashora, Van Der Poll and Van Der Poll (2016) highlight the need for e *-learning* courses to be structured in such a way as to allow knowledge to be absorbed in the educational process. Thus, identifying the existing relations between the learning strategies adopted by DL accounting graduates and their respective performances becomes indispensable for quality assurance in the area training.

3 METHODOLOGICAL PROCEDURES

The present study can be classified as descriptive in relation to the objectives, according to the procedures, as *a survey*, and, by the approach of the problem, as quantitative (Martins & Theóphilo, 2009).

3.1 Research Instrument

For the construction of the research instrument, the *Learning strategies scale* (LSS) developed by Warr & Downing (2000) was used as a basis and constructed from previous theoretical structures on the learning process (Warr & Allan, 1998). For the Brazilian context, the instrument was initially validated by Zerbini and Abbad (2008). LSS was chosen for application in this study due to its wide use and effectiveness in the evaluation of the student strategies within the DL (Andrade & Zerbini, 2019; Zerbini et al., 2015).

The validation performed by Zerbini & Abbad (2008) was conducted for the version of 34 items of the LSS, of which two did not present relevance for the construction of the seven factors obtained for the sample used for the validation of the instrument. For the context of the present study, it was chosen to use the 32 items validated by Zerbini & Abbad (2008). Additionally, in order to reflect the context of the institution in which the questionnaire was applied, a new sentence was added, obtaining a final instrument with 33 items. It is also important to emphasize that textual adaptations were made in the original sentences, aiming to update them to the recent educational context and to the format of the courses existing in the institution in which the research was conducted. In Table 2, presented in the subsequent topic, the final instrument used by the research is evidenced. In view of the changes made, new validation procedures were performed for the instrument.

Considering the ethical requirements in research with human beings, the questionnaire used by the present study initially presented a Free and Informed Consent Term (TCLE), in which the participants' rights of the research and the explanations about the objective of the study were presented. In addition to this item, the instrument had three other steps. In the first, sentences related to learning strategies from the LSS were presented. In the second, statements stood out on the students' performance in the course and questions related to the respondents profile. Finally, in the last stage of the questionnaire, an open voluntary question was presented in which participants could write some complement related to the topic under investigation.

3.2 Target population and Study Sample

The present study was conducted in a private, non-profit IHE, based in the city of São Paulo, after the approval of the research by the entity's managing body. When carrying out the research, the institution concerned presented significant quality indicators, such as: i) private IHE with greater approval in the adequacy examination of the Federal Accounting Board (CFC) for the course in the EAD modality; (ii) presence in the top 10 of the best Brazilian HEIs according to the General Index of Courses of 2018; (iii) Obtaining a maximum score on the Courses Concept of DL modality courses evaluated until the completion of the research. In addition, the IES presented approximately 800 active students in DL modality. Of this amount, about 80% were from the Accounting Sciences course, 15% from Financial Management and 5% from Administration.

Before applying the questionnaire, a pre-test was carried out with five graduate masters and doctoral students in the area, who also operate as researchers. After making small adjustments to the students' profile questions suggested in the pre-test, the instrument was made available in *Google forms* and forwarded *online* to all active students in the DL Accounting Sciences course of the IES. The estimated time in the pre-test for instrument response was approximately 10 minutes. The questionnaire was applied between March and April 2021. In all, three invitations to participate in the survey were sent. After the period described, it was possible to obtain 174 valid questionnaires (approximately 27% of students enrolled in the DL Accounting Sciences course of the IES).

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3.3 Data Analysis Procedures

As previously described, to answer the research question, the analysis of the study data was performed using quantitative techniques and using Excel® *and* Stata13® *software*. For the validation of the research instrument, in addition to the responses descriptive analysis attributed by the study participants, Cronbach's alpha was calculated. In addition, the components that help explain the learning styles of the research sample were estimated through the Principal Component Analysis (PCA). Finally, simple and multiple linear regressions were estimated through the technique of Ordinary Least Squares (OLS) in order to identify the relationship between learning strategies (independent variables) and performance (dependent variable) obtained by the students. The characteristics of students as control variables were used in the estimates in order to identify other factors that help to better understand the performance obtained by the study participants. Equation 1 shows the econometric model used by the research.

$$Desempenho_i = \beta_0 + \sum_1^n \beta_n Componente_{ni} + \sum_k^j \beta_j Controle_{ji} + \varepsilon_i \text{ [Equation 1]}$$

The dependent variable, performance, refers to the student's perception of his or her own performance. For this purpose, the research instrument had a statement that asked the student to assign a score, from 0 (zero) to 10 (ten), for his or her overall performance in the course until then, the minimum score being an indicative of negative performance and the maximum score being an indicative of positive performance.

Additionally, seeking to validate the data obtained for the dependent variable, the instrument had another question in which the respondent had to point out among three options that best represented his or her perception about his or her own performance in the course until then, namely: i) My performance is below what I expected before I started the course; ii) My performance is in line with what I expected before I started the course, and iii) My performance is above what I expected before I started the course. From these two questions it became possible to triangulate data related to the students' performance, helping in the process of validating the results. This performance verification strategy was previously used in the literature (Cornacchione Junior, Cunha, De Luca, & Ott, 2010; Mujica et al., 2019), showing useful for studies on the subject.

For the realization of the estimation, the stepwise technique was used with the robust White test, which seeks to remedy the problems of non-homoscedasticity of residues. The significance limit of up to 10% was considered for the acceptance of the coefficients. In addition to the components generated by the PCA, all variables presented in Table 1 (controls) were used in regression. The *Variance Inflation Factor* (VIF) test was used to identify the multicollinearity.

4 RESULTS

According to the data presented in Table 1, the sample distribution is mostly female (51%). In addition, 63% of the study participants are seniors of the Accounting Sciences course and 77% are students who had completed a degree before starting the course at the IHE in question. Thus, it was possible to note that the research participants have a higher age group than expected for a higher degree course. The participants' mean age in the survey was 34.17 (standard deviation of 10.29). The youngest student was 17 years old when he or she answered the survey questionnaire and the oldest one was 82 years old.

It should also be pointed out that 91% of the sample was in the labor market when the research was carried out. These results are in line with the profile of DL students in the country, which allows greater flexibility for the reconciliation of work and study (Dhawan, 2020; Mill, 2015). Finally, according to the data presented in Table 1, it is possible to notice that 36% of the

sample presented the father with at least full higher education and 36% of the participants had the mother with this same educational level.

Table 1
Descriptive analysis of the research sample

Group	Frequency	Group	Frequency
Gender		**Father's schooling**	
Male	77 (44%)	Did not complete the elementary education	35 (20%)
Female	89 (51%)	Full elementary education	20 (12%)
Not declared/Other	8 (5%)	Full high school	44 (25%)
		Full technical education	6 (4%)
Period		Full higher education	32 (18%)
Entering students	65 (37%)	Post-graduated	32 (18%)
Seniors	109 (63%)	I do not know	5 (3%)
Works		**Mother's schooling**	
Yes	158 (91%)	Did not complete the elementary education	29 (17%)
No	16 (9%)	Full elementary education	25 (14%)
		Full high school	46 (27%)
Schooling		Full technical education	11 (6%)
First course	21 (12%)	Full higher education	30 (17%)
Already started, but has not finished another course	20 (11%)	Post-graduated	33 (19%)
Is already graduated	133 (77%)	I do not know	-

Table 2 presents descriptive analyzes of the sentences of the research instrument, used to understand the learning strategies. For these questions, the respondent was asked to assign a value from zero to ten for each sentence in view of the strategies they used to follow up the course. The maximum value indicated that the strategy in question was widely used by the student and the minimum value that it was not used until the moment of the instrument application. Cronbach's alpha for this stage of the instrument, used as a measure of reliability, was 0.8494, which indicates good internal consistency and is in line with previous studies that used as the basis the LSS for the DL context (Warr & Downing, 2000; Zerbini & Abba, 2008).

For the 33 learning strategies presented, it was possible to identify the assignment by the students of the maximum and minimum value used in the research. The sentence "4. I expressed my ideas in the discussion forums during the course" presented the lowest average (2.72) among the statements presented, despite the importance of the discussion forums for the courses functioning of the DL modality (Bicalho & Oliveira, 2012; Wander et al., 2020). On the other hand, the statement "19". I read the content of the course in the virtual format" presented the highest average (8.90) among the strategies, indicating that the participants of the research present a preference for the study from the reading materials made available by the professors in the AVA. The standard deviation of the statement ranged from 1.89 to 3.78, showing that in the context of the sample there is a great diversity of learning strategies. As a result, it is possible to notice that the coefficient of variation of sentences ranged from 23% to 106%.

Table 2
Descriptive analysis of the assigned scores by sentence (N=174)

Sentence	Mean	Standard Deviation	Coefficient of Variation	Minimum	Maximum
1. I searched other sites related to the course content	6.26	3.16	0.50	0	10
2. I searched for other sources of research, outside the internet, related to the course	5.08	3.67	0.72	0	10
3. I expressed my ideas during the class-chat throughout the course	4.53	3.32	0.73	0	10
4. I expressed my ideas in the discussion forums throughout the course	2.72	2.82	1.04	0	10
5. I exchanged messages (through WhatsApp or other application) with my classmates, participating in a learning network throughout the course	5.61	3.78	0.67	0	10
6. I have exchanged information with classmates on the content of the course	5.45	3.78	0.69	0	10
7. I have exchanged information with professors/tutors about the course content	3.17	2.94	0.93	0	10
8. I sought help from the professor/tutor to clarify my doubts about the content of the course	3.57	3.21	0.90	0	10
9. I have carried out the mandatory activities proposed at the end of the books throughout the course	8.12	2.49	0.31	0	10
10. I have reviewed the contents of the exercises in which I made mistakes throughout the course	7.86	2.47	0.31	0	10
11. I made notes about the course content	8.28	2.48	0.30	0	10
12. I have repeated the course content mentally	6.89	2.98	0.43	0	10
13. I have designed layouts to study the course content	6.15	3.37	0.55	0	10
14. I have associated the course content to my previous knowledge	8.55	2.15	0.25	0	10
15. I have associated the course content to my previous experiences	8.48	2.18	0.26	0	10
16. I have summarized the course content	6.54	3.48	0.53	0	10
17. I have identified on my daily basis situations for applying the course content	7.21	3.04	0.42	0	10
18. I have read the course content on the printed material	3.94	4.14	1.05	0	10
19. I have read the course content in virtual format	8.90	2.10	0.24	0	10
20. I have kept calm before the possibility of things getting difficult	7.55	2.66	0.35	0	10
21. I have repeated to myself that everything would go well at the end of the course	8.26	2.43	0.29	0	10
22. I have kept calm before the possibility of having a performance in the course below the expected	6.44	3.01	0.47	0	10
23. I have kept calm before he possibility of making mistakes when carrying out the course activities	6.93	2.87	0.41	0	10
24. I have kept calm before the possibility of things going wrong along the course	6.60	2.98	0.45	0	10
25. Throughout the course, I have done my best to pay attention when I felt tired	8.24	1.89	0.23	0	10

26. I have paid a lot of effort, throughout the course, when I realized I was losing the concentration	8.07	1.93	0.24	0	10
27. I have increased my efforts throughout the course when I was not interested in the subject	6.99	2.44	0.35	0	10
28. I have paid a lot of effort, throughout the course, when I realized I was losing interest	7.03	2.65	0.38	0	10
29. I have questioned myself, throughout the course, how much I had learned	7.99	2.28	0.29	0	10
30. I have asked questions to test my understanding of the course content	6.02	3.30	0.55	0	10
31. I have reviewed the subject to see how much I mastered the course content	7.11	2.79	0.39	0	10
32. I have developed extra questions, tests and evidence to stimulate my learning throughout the course	3.13	3.31	1.06	0	10
33. I have paid a lot of effort to strengthen my understanding of the content taught throughout the course	7.47	2.36	0.32	0	10

Note. Cronbach's alpha = 0.8494

Table 3, in turn, contains the descriptive analysis for the two questions regarding the perception of performance obtained by students in the course, as explained earlier in the methodology chapter (see sub-item 3.3). As you can see, much of the research sample (64%) considered that the performance was in line with what the student expected at the beginning of the undergraduate course. For this group of individuals, the mean attributed in the second question regarding performance was 7.65 points (SD=0.98). On the other hand, 26% of the sample considered that the performance obtained was below what the student expected before starting the course. For this set of students, the mean obtained in the second question was equal to 5.87 points (SD=1.14). Finally, 17 students considered that their performance in the course was higher than expected, which represented 10% of the research sample. For the latter group, the mean of the score assigned to the performance was 8.64 points (SD=0.99).

The coefficients of variation presented for the scores attributed to performance indicate that there is little dispersion among the respondents in each group (Martins & Domingues, 2014). It was also possible to identify that there are statistical differences among the scores declared by the students in each group, both by Student's T test and by Kruskall-Wallis. The results obtained by triangulation of the two questions on the performance of the questionnaire indicate that there is consistency for the students' performance perception, validating the collection performed by the research.

After the descriptive analyzes were carried out, the PCA was estimated, from the 33 sentences used to obtain the learning strategies of the study participants. The main purpose of the PCA is to generate components that simplify the data obtained, allowing the creation of variables that are not correlated with each other (Fávero & Belfiore, 2017). Using the research data, the estimation Kayser-Meyer-Olkin (KMO) statistics recommended the use of the PCA results. Similarly, the Bertelett's sphericity test also concluded by the use of estimations. Therefore, from the procedures performed, it was possible to find nine components that obtained eigenvalues higher than one. The first component was mostly formed by sentences 10, 11, 12 and 16 (see Table 2), with factor loads ranging from 0.3389 to 0.4295. The "Component 1" was called "Repetition and Organization - Content", since it presented a strong presence of the sentences that represented cognitive strategies related to the repetition and organization of the content administered in the course.

Table 3
Descriptive analysis for performance perception (N=174)

Sentence	Frequency	Score Mean Attributed	Standard Deviation (SD)	Coefficient of Variation	Minimum Score Attributed	Maximum Score Attributed
My performance is below what I expected before I started the course	45 (26%)	5.87	1.14	0.19	3	8
My performance is in line with what I expected before starting the course	112 (64%)	7.65	0.98	0.13	5	10
My performance is above what I expected before I started the course	17 (10%)	8.64	0.99	0.11	7	10

Note. Groups statistically different according to Student's T and Kruskall-Wallis tests.

The second component, in turn, was mostly formed by sentences 20, 22, 23 and 24, with loads ranging from 0.4232 to 0.4964. The "Component 2" was called "Emotion Control", since it had a strong presence of the self-regulated learning strategies of this nature. The third component was formed by sentences 25, 26, 27 and 28, with loads ranging from 0.4207 to 0.5042. The "Component 3" was called "Motivation Control", since it presented a strong presence of self-regulated strategies of this nature. The fourth component, in turn, was mostly formed by sentences 14, 15, 23 and 17, with loads ranging from 0.4232 to 0.5531. Thus, the "Component 4" was called "Elaboration", since it was strongly related to the presence of cognitive strategies of this type.

The fifth component was formed by sentences 3, 4, 7 and 8, with loads ranging from 0.3128 a 0.5572. Thus, the "Component 5" was called "Interpersonal Aid - tutors", since it presented a greater presence of behavioral strategies of this nature. The sixth component, in turn, was mostly formed by sentences 29, 30, 32 and 33. In this context, the "Component 6" was named "Monitoring Understanding," since it strongly relied on self-regulating strategies of this nature.

The seventh component was mostly formed by sentences 5 and 6, with charges of 0.6295 and 0.6057, respectively. The "Component 7" was therefore called "Interpersonal help - Classmates," since it had questions on this nature. The eighth component was formed by sentences 1, 2, 7 and 9, with loads ranging from 0.3227 to 0.6356. In this sense, the "Component 8" was called the "Application to Teaching material" because it contained behavioral sentences of this nature. Finally, the ninth and last component was mostly formed by sentences 18 and 19, with loads of -0.6053 and 0.6759, respectively. In this sense, the "Component 9" was called the "Organization – Teaching Material", because it contains greater presence of questions related to the cognitive organization strategies related to the reading of the Teaching material.

It is important to highlight that sentences 21 and 31 were not important for the formation of any of the nine components for the context of the research sample. Both sentences are self-regulatory strategies, being the first of the type of emotion control and the second of comprehension monitoring. It was also possible to note that sentences related to behavioral learning strategies related to practical application were reallocated to Components 8 and 1, to the context of the research sample, which may reflect the proper functioning of the investigated IHE disciplines. The results found for the formation of the components as well as the loads presented are in line with the findings of previous studies that used as a basis the LSS (Warr & Downing, 2000; Zerbini et al., 2015).

Table 4 contains the results of the individual regressions performed for each of the nine components obtained through the PCA and the score regarding the performance perception of each of the students in the sample. As it can be seen, only the "Component 8 – Aid to Teaching Material" and "Component 9 – Organization – Teaching Material" did not show a statistically

significant correlation with the performance variable at the significance level of at least 10%. This result can be a direct reflection of the structure of the courses in the analyzed IHE, which has weekly synchronous virtual classes for all the disciplines of the curriculum, which can reduce, for the students, the importance of learning strategies focused on the teaching material. This result is in line with the findings of Zerbini et al. (2015), who also used a sample of students inserted in the labor market.

Table 4
Individual regression between performance perception and components (N=174)

Variable	Coefficient	SD	p-value	R²
Component 1 – repetition and Organization – Content	0.2806	0.0493	0.000	0.1587
Component 2 – emotion Control	0.1874	0.0519	0.000	0.0704
Component 3 – Motivation Control	0.1086	0.0596	0.070	0.0189
Component 4 – Elaboration	0.3309	0.0588	0.000	0.1556
Component 5 – Interpersonal Help – Tutors	0.2560	0.0628	0.000	0.0880
Component 6 – Monitoring Understanding	0.1914	0.0681	0.006	0.0439
Component 7 – Interpersonal Help – Workmates	0.1260	0.0692	0.071	0.0189
Component 8 – Aid for Teaching Material	0.0927	0.0766	0.228	0.0085
Component 9 – Organization – Teaching Material	0.0476	0.0820	0.563	0.0020

Additionally, it is important to say that "Component 3 – Motivation Control" and "Component 7 – Interpersonal Help – Classmates" only showed statistical significance at the level of 10%. All the others were statistically significant at 1%, according to data presented for p-value of the coefficients. Also, by analyzing the data presented in Table 5, it is possible to notice that all components presented positive coefficients, indicating a directly proportional correlation between the existence of the learning style obtained by the component and the performance. Nevertheless, the results obtained for the coefficient of determination (R^2) indicate that the "Component 1 – Repetition and Organization – Content" and the "Component 4 – Elaboration" are the ones that present the greatest explanatory power for the variation in performance perception scores.

Table 5 shows the results obtained for multiple regression among the dependent variable regarding the score obtained for the perception of students' performance and the independent variables related to the CPA components and the students' sociodemographic variables in the sample. The *stepwise* technique was used to identify the independent variables that were statistically significant for the explanation of the dependent variable. It is important to point out that the number of observations for this estimation was reduced to 165 due to missing data from the gender-related sociodemographic variable, which were eliminated by the aforementioned estimation technique.

As it can be seen, the estimated model explained approximately 30% of the performance perception of the study participants. Among the statistically significant components, the "Component 1 – Repetition and Organization – Content", the "Component 2 – Emotion Control", the "Component 4 – Elaboration" and the "Component 7 – Interpersonal Help – Classmates" stood out. Among the sociodemographic variables, however, only the variable "Entering students" presented statistical significance at the level of up to 5%. In view of the negative result obtained for the variable, it can be inferred that students from the first semester of the study sample experienced greater difficulties related to the learning process, when compared to seniors

The results obtained through regression may be a reflection of the sample's own selection, since the main cases of dropout tend to occur in the first periods (Branco, Conte, & Habowski, 2020). Thus, among the seniors, the selection of students with better performance, who use more appropriate learning strategies, may have already been accomplished by dropout. It is also important to highlight that the VIF test performed did not indicate a multicollinearity problem (mean VIF of 1.12).

Table 5
Stepwise multiple regression with robust White test for performance (N=165)

Variable	Coefficient	SD	p-value
Component 1 – repetition and Organization – Content	0.2478	0.0538	0.000
Component 2 – emotion Control	0.1440	0.0570	0.005
Component 4 – Elaboration	0.1667	0.0668	0.014
Component 7 – Interpersonal Help – Workmates	0.1399	0.0600	0.021
Entering student	-0.3825	0.1935	0.050
Constant	7.4428	0.1068	0.000

Note. R^2 = 0.3028 and Test F = 0.0000

The final step of the research instrument also presented an open question in which the participant could add additional information on the teaching-learning process in the DL context. In this sense, much of the contributions highlighted the difficulty reconciling the DL academic demands with the student's routine outside the academic environment. External factors that interfere with the follow-up of the course, such as the impacts of Covid-19, as well as the need for self-regulation in the teaching-learning process were points highlighted by students who were already in the labor market and/or had a family structure with multiple demands.

The information reported by the students in this last phase of the instrument meets what has already been mapped by the literature. This is because the DL modality has as one of the great attractions for students the flexibility to follow up the course and perform activities (Mill, 2015), becoming attractive to older individuals, with family demands and high professional insertion(Souza, Franco, & Costa, 2016). At the same time as flexibility represents a possibility of including a public that is alien to higher education, it can generate a trap for the academic objectives completion. On that, Dhawan (2020) points out that in the DL there is so much flexibility that the students never find time to catch up on the course. In this same line, Forte and Naacarato (2020, page 422) state that "this same flexibility can be a trap for students who do not have or cannot build a study routine." DL learning requires specific strategies and often distinct from those required in face-to-face education, so that students can develop according to the assumptions established in their respective courses.

In general, therefore, the research results make it clear that the learning process within the DL for the sample used is marked by a multiplicity of strategies that influence the performance obtained by the students. Among the most important are those belonging to the cognitive group, according to the description of Warr and Downing (2000), namely: Repetition, Organization and Elaboration. In addition to presenting the highest coefficients in the multiple regression performed, the components 1 and 2, referring to such strategies, presented the highest R^2 in the individual regressions.

In the DL context, the student profile itself may make it difficult to use learning strategies aimed at interpersonal relationships or use of study materials. This is because most of the students of this modality are also workers, as highlighted in the sample of this research, presenting a routine that makes it impossible to implement the strategies. The course structure itself (teaching strategies) can also favor certain learning actions, as highlighted by Zerbini et al. 2015. For Kashora et al. (2016), it is necessary to seek a course structure that allows students to acquire knowledge, which requires the use of technologies and content appropriate to the students' reality. If the HEI does not charge practical applications in its disciplines, or if peer work is not encouraged in AVA, for example, some learning strategies may be less used by the students.

5 CONCLUSION

The objective of this Article was to identify the relation between the learning strategies adopted by DL accounting graduates and their respective performances. For this purpose, questionnaires were applied in 174 students from a private IHE with headquarters in the city of São Paulo. Based on the structured methodological approach for the Article, it was possible to perform some inferences for the context of the study sample.

First, it was identified that the profile of the DL students in the analyzed IES is in line with surveys carried out in previous studies, with emphasis on older students and with high insertion in the labor market. This reality is directly linked to the flexibility existing in the DL, which allows students with multiple demands to accomplish higher education, which would be incompatible with the face-to-face modality. Nevertheless, despite the benefit of flexibility, the research results make it clear that, in order to achieve a good educational result in the DL, it is necessary to use several strategies linked to the personal organization so that the excess flexibility of the modality does not cause damage to academic performance.

In this sense, the *survey* performed allowed to identify the importance of a variety of learning strategies used by the students in the sample, with occurrences of the three types predicted by the literature: cognitive, behavioral and autoregulatory. Whereas regarding the perception of academic performance, the survey carried out allowed to identify that a large part of the research participants (64%) considered that their performance was in line with that expected when starting the undergraduate course, 26% of the students considered that the performance was below the target initially and only 10% of the sample considered that the performance was above the desired performance at the beginning of the undergraduate degree.

Based on the analyzes performed, it was possible to identify that, for the sample context, cognitive learning strategies related to the repetition and organization of the content administered were more effective in obtaining better performance. Among these strategies are actions such as reviewing exercise content where the student made mistakes, repeating the course content mentally, and performing summaries, for example. Also regarding cognitive strategies, those focused on the elaboration process were also important for a better perception of the students' performance in the sample. In this group are actions such as the associations of course content to previous knowledge and experience, for example.

The behavioral strategy focused on the interpersonal support of classmates (peers) was also important for the explanation of the performance perception of the study sample. In this respect, actions such as maintaining contact with students, via communication applications, and the exchange of information with peers were statistically significant for a better academic result. This evidence, in particular, is important, especially because the DL presents restrictions for the contact among the students in the same course. Finally, self-regulated learning strategies aimed at controlling emotions were also statistically significant for the performance perception in the context of the research sample. Among the strategies of this group are actions such as keeping calm in the face of difficulties or when obtaining a result below what was initially expected.

The results of the research allow us to advance the understanding of the students' learning process, by highlighting strategies that are important for the academic performance of accounting students of this modality. This article is therefore useful for the students, IHE managers, students inserted or interested in DL courses and, in particular, for the formulation of educational policies by the accounting class. Identifying the most effective strategies for the students' academic performance of this modality may be useful, for example, for the professors and IHEs to rethink the structures of the course disciplines, aiming to create teaching strategies that are in line with those of learning. For those students who have entered or who will be included in the DL, knowing the strategies that generate better performance can contribute to their educational objectives being realized.

As the main limitation of the research, we have the context of only one IES has been used. Different scenarios from the one verified in this institution may present different results from the findings by the study. For future research, it is suggested to analyze how the IHEs that offer courses in the DL modality can foster and/or hinder the learning strategies that are effective for the students. The increasingly present use of artificial intelligence in the DL, for example, can reconfigure the learning processes, requiring students to take new actions to follow up the course.

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