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Influence of teaching-learning factors on the academic performance of accounting students

Influencia de los factores de enseñanza-aprendizaje en el rendimiento académico de los alumnos del curso de ciencias contables

Influência de fatores de ensino-aprendizagem no desempenho acadêmico dos discentes do curso de ciências contábeis

Authors

Ana Cristina Oliveira Aragão
Bachelor's degree in Accounting from the Federal University of Delta do Parnaíba (UFDPar). Address: São Sebastião Avenue, 2819 - Nossa Sra. de Fátima – Zip Code: 64202-020 – Parnaíba/PI, Brazil. Telephone: (88) 99784-8361. Identifiers (ID):
ORCID: https://orcid.org/0009-0005-5226-7780
Lattes: http://lattes.cnpq.br/7956015977848004
E-mail: aragaocristina81@gmail.com

Maria Andressa Silva Dourado
Bachelor's degree in Accounting from the Federal University of Delta do Parnaíba (UFDPar). Address: São Sebastião Avenue, 2819 - Nossa Sra. de Fátima – Zip Code: 64202-020 – Parnaíba/PI, Brazil. Telephone: (88) 99784-8361. Identifiers (ID):
ORCID: https://orcid.org/0009-0002-6762-4785
Lattes: http://lattes.cnpq.br/7454407211401538
E-mail: andressadourado04@gmail.com

Aldir Dias de Amurim
Master's degree in Controllership from the Federal Rural University of Pernambuco (UFRPE). Professor Assistant at the State University of Piauí (UESPI), Floriano/PI campus. Address: BR-343, s/n - Campo Velho, Zip code: 64800-000 – Floriano/PI. Telephone: (88) 99413-2785. Identifiers (ID):
ORCID: https://orcid.org/0000-0003-2776-680X
Lattes: http://lattes.cnpq.br/9747345070913858
E-mail: profaldirdias@gmail.com

José Jonas Alves Correia
PhD in Accounting Sciences from the Federal University of Pernambuco (UFPE). Adjunct Professor at the Federal University of Delta do Parnaíba (UFDPar). Address: São Sebastião Avenue, 2819 - Nossa Sra. de Fátima – Zip Code: 64202-020 – Parnaíba/PI, Brazil. Phone: (81) 98692-4495. Identifiers (ID):
ORCID: https://orcid.org/0000-0003-4552-7263
Research Gate: https://www.researchgate.net/profile/Jose-Correia-7
Google: https://scholar.google.com/citations?user=3jPQzv4AAAAJ&hl=pt-BR
Lattes: http://lattes.cnpq.br/2582627606928274
E-mail: jonas.correia@ufdpar.edu.br

Abstract

Purpose: To analyze the influence of teaching-learning factors on the academic performance of students in the accounting course.

Methodology: The research is classified as quantitative and descriptive, with a survey use. The study population consisted of all students enrolled in the third semester or higher of the accounting course at a Federal Higher Education Institution in the Northeast of Brazil, with a final sample of 128 respondents. Structural Equation Modeling (SEM) was used to process the data, using Partial Least Square (PLS) algorithm with SmartPLS 4 software.

Results: The professor factor has a positive and significant influence on student performance, suggesting that the qualifications and teaching methods of professors are decisive for academic performance. It is concluded that the study satisfactorily met the proposed objective, showing that the academic performance of students can be intensified by continuous qualification of professors and by the adoption of more active methodologies.

Contributions of the Study: This study contributes to the literature by integrating the constructs of teaching-learning and academic performance, strengthening the environment of accounting education in HEIs. Furthermore, the results provide support for improvements in the Accounting Science course, helping to identify gaps in the teaching process from the perspective of students and generating positive impacts in the academic and professional environment.

Keywords: Teaching-Learning; Academic Performance; Accounting.

Resumen

Objetivo: Analizar las influencias de los factores de enseñanza-aprendizaje en el rendimiento académico de los estudiantes de la carrera de Ciencias Contables.

Metodología: La investigación se clasifica en cuantitativa y descriptiva, como el uso de encuestas. La población de estudio estuvo compuesta por todos los estudiantes matriculados en el tercer período de la carrera de Ciencias Contables de una Institución Federal de Educación

Superior, establecida en la región Nordeste de Brasil, con una muestra final de 128 encuestados. Para procesar los datos, se adoptó el modelado de ecuaciones estructurales (SEM), utilizando el algoritmo de mínimos cuadrados parciales (PLS) con software SmartPLS 4.

Resultados: El factor docente tiene una influencia positiva y significativa en el desempeño de los estudiantes, lo que sugiere que las calificaciones y habilidades docentes de los docentes son decisivas para el rendimiento académico. Se concluye que el estudio cumplió satisfactoriamente con el objetivo propuesto, demostrando que el rendimiento académico de los estudiantes puede intensificarse mediante la calificación continua de los docentes y la adopción de metodologías más activas.

Contribuciones del Estudio: Este estudio contribuye a la literatura al integrar los constructos de enseñanza-aprendizaje y rendimiento académico, fortaleciendo el ambiente de educación contable en las IES. Además, los resultados ofrecen apoyo para mejoras en la carrera de Ciencias Contables, ayudando a identificar brechas en el proceso de enseñanza desde la perspectiva de los estudiantes y generando impactos positivos en el entorno académico y profesional.

Palabras clave: Enseñanza-Aprendizaje; Rendimiento Académico; Contabilidad.

Resumo

Objetivo: Analisar as influências de fatores de ensino-aprendizagem no desempenho acadêmico dos discentes do curso de Ciências Contábeis.

Metodologia: A pesquisa é classificada como quantitativa e descritiva, com o uso do levantamento (*survey*). A população do estudo foi constituída por todos os discentes matriculados a partir do terceiro período do curso de Ciências Contábeis de uma Instituição Federal de Educação Superior, estabelecida na região Nordeste do Brasil, possuindo como amostra final 128 respondentes. Para tratamento dos dados adotou-se a Modelagem de Equações Estruturais (*Structural Equation Modeling* - SEM), por meio do algoritmo de Mínimos Quadrados Parciais (*Partial Least Square* - PLS) como o auxílio do *software* SmartPLS 4.

Resultados: O fator professor possui uma influência positiva e significativa no desempenho dos alunos, sugerindo que a qualificação e a didática dos docentes são determinantes para o desempenho acadêmico. Conclui-se que o estudo atendeu de forma satisfatória o objetivo proposto, evidenciando que o desempenho acadêmico dos discentes pode ser intensificado por uma qualificação contínua dos professores e pela adoção de metodologias mais ativas.

Contribuições do Estudo: Este estudo contribui para a literatura ao integrar os construtos de ensino-aprendizagem e desempenho acadêmico, fortalecendo o ambiente da educação contábil nas IES. Ademais, os resultados oferecem subsídios para melhorias no curso de Ciências

Contábeis, ajudando a identificar lacunas no processo de ensino sob a perspectiva dos alunos e gerando impactos positivos no meio acadêmico e profissional.

Palavras-chaves: Ensino-Aprendizagem; Desempenho Acadêmico; Contabilidade.

1 Introduction

Technological innovations have brought significant changes for various professionals, including accountants (Andreassen, 2020). As a result, constant updates have become mandatory for accountants to remain competitive in the job market (Bicca & Monser, 2020). So, the teaching of Accounting Science has turned to debates about new methodological approaches, focusing on prioritizing participatory learning, in which students take an active role in building their knowledge (Silva et al., 2018).

Accounting professionals become more recognized when they have higher academic performance (Araújo et al., 2014). Based on this premise, Kruger and Ensslin (2013) consider that building a good professional career is based on the knowledge acquired in the academic environment, since when students enter university, they use this place as a precursor to the beginning of their professional life. Thus, accounting training needs to be solid, given that the work of an accountant requires varied skills and knowledge for the best performance of their activities (Costa, 2023).

From this perspective, it is necessary to have knowledge about the causes that influence academic performance (Silva et al., 2015), which contribute to greater consistency in the designation of techniques that facilitate teaching and learning (Arantes & Silva, 2015). According to Lemos (2019), there are influential factors within the learning environment, which can be internal or external in nature, such as the relationship among professor, student, subject, and institution, which confirm the existence of knowledge development.

In order to guarantee the teaching-learning process, it is essential to understand its constituent elements, such as the institution, the professor, and the subject matter. Once this stage has been completed, it becomes imperative to establish effective means for achieving satisfactory results (Pavione et al., 2016; Silva, 2016). To this end, Lima (2021) advocates the adoption of new methodologies that prepare students, as the main agents of their own education, with the skills necessary to succeed in specific professional contexts.

In the study conducted by Costa (2023), which analyzed the perception of undergraduate accounting students regarding the types of assessments used in the teaching-learning process, the findings indicated that students consider the assessments to be in line with international standards, but suggest greater proximity to accounting practice. In addition to it, the analysis of the Pedagogical Curriculum Proposals (PPCs) showed few updates in assessment methods, which led the author to suggest improvements in teaching guidelines to train professionals who are better prepared for the market.

Arantes and Silva (2015) identified a lack of research addressing aspects that impact learning development in the accounting field. A study conducted by Amaro and Beuren (2018) sought to identify the impacts of contingent factors on the academic performance of students in the Accounting Sciences course. Among the results, they found that the technical system and strategy of the pedagogical project influence student performance. Thus, the researchers identified a gap in the need to analyze these and other constructs in other Higher Education Institutions (HEIs) to analyze whether there is an influence and, given this, make a comparison between the studies.

This this study addresses the following problem question: **What are the influences of teaching and learning factors on the academic performance of students in the Accounting program?** Thus, this study aims to analyze the influences of teaching-learning factors on the academic performance of students in the Accounting program.

The rationale for this research lies in the need to improve the quality of higher education in Accounting, given a scenario marked by increasingly complex regulations and high market demand for critical and ethically prepared professionals. Thus, understanding the influences of teaching-learning factors on academic performance is a fundamental step in supporting the reformulation of pedagogical projects and the use of more effective teaching practices, aiming not only to improve pass rates, but above all to train more competent accountants who are aligned with the demands of society.

From an academic standpoint, this research offers a substantive contribution by filling a gap in the specific literature on accounting education, shifting the focus from purely technical content to the pedagogical processes that permeate it. By investigating and systematizing the causal relationship between teaching-learning factors and student performance, the study generates an analytical model that can be tested and adapted in other educational institutions, serving as a basis for future investigations and for the theoretical enrichment of discussions on teaching in higher education in this area.

In terms of professional contributions, the study provides valuable insights for the continuous evolution and enhancement of the accounting profession itself. By identifying the factors that lead to better academic performance, the research provides educational institutions and professional bodies, such as the Regional Accounting Council, with the tools to promote guidelines and professor development programs that are more aligned with market needs. The study also contributes to the training of accountants who are better prepared for practical challenges, which not only increases the employability of graduates, but also raises the prestige and credibility of the entire profession in the eyes of society.

In the social sphere, the research makes a significant contribution by seeking ways to train more qualified and technically sound accounting professionals, which is a direct benefit to society. Accounting science is an essential tool for transparency and economic health in companies and the public sector; therefore, raising the standard of training for these professionals means strengthening confidence in financial information systems, promoting corporate governance, and ultimately contributing to a more stable and ethical economic environment.

2 Theoretical Framework

2.1 Teaching-Learning Process

The term teaching can be conceptualized as a facilitator in the process of learning and moral and intellectual growth, providing situations designed so that students can take sufficient advantage of them to bring about desired changes in the way they think and act (Cavalcante & Toledo, 2024). In relation to learning, Silva (2017) conceptualizes it as a mental process of assimilation and reasoning, in which the subject obtains knowledge and becomes competent to relate to society.

Delving into the teaching-learning process, Fonseca (2019) defines it as a conversational and correlative project among those who share knowledge and those who benefit from it. Furthermore, Rocha and Vasconcelos (2016) argue that the teaching-learning process is

necessary for the educational system to act in such a way that people are included in the process, as well as in the dialogue among professors and students. Thus, the major obstacle to this process is the need to adapt in order to understand the new requirements that arise as mechanisms to assist in the process of quality teaching and learning (Schmitz (2016).

In this context, for the teaching-learning process to exist in the educational context, there must be an interrelationship among the factors of professor, student, subject, and institution (Ribeiro et al., 2022). Thus, the compatibility of the institution and the professor, as well as the methodologies adopted within the educational sphere, will ensure good student performance (Cavalcante & Toledo, 2024).

According to Costa (2023), it is clear that, in addition to cognition, professors need to be resourceful in order to ensure quality in the transfer and consolidation of learning. Furthermore, Ribeiro et al. (2022) argue that when the connection among faculty and students is not positive, it leads to results that are contrary to those desired for the student, as they feel unsupported and unmotivated, which often results in rejection of educators and the subjects they teach, and can also cause dropouts or delays in graduation.

According to research conducted by Barros (2017), when it comes to the "professor" factor, teaching requires diverse skills, emphasizing pedagogical knowledge, which allows professors to develop appropriate instructional tactics for the development of student learning. Thus, professors need to innovate throughout their teaching process in order to adequately assist students, providing support so that they can appropriate the knowledge acquired (Cavalcante & Toledo, 2024)

With regard to the "subject" factor, Gil (2023) argues that the topics covered in the course must meet the learning demands of the students and not be chosen for the convenience of the professor. Bordenave and Pereira (2012) and Ribeiro et al. (2022) list the main problems related to this factor: lack of integration among the subjects covered in the courses; lack of adequate planning regarding the time to be spent on each topic; and the organization of studies that are designed without taking into account various factors, such as the economic scenario, the social group to which they belong, and the region. Thus, authors point out that the main components to be investigated would be the structure of the material adopted in the subjects, the proposed learning categories, and the order in which the content is presented (Beck & Rausch, 2015.

Regarding the "institutional" factor, according to Silva (2017), HEIs represent the appropriate environment for the development of student learning, as well as their personal growth. Bordenave and Pereira (2012) argue that the involvement of institutions in the development of learning is mainly associated with ensuring appropriate spaces for professors to perform their duties effectively, as well as suitable locations for conducting classes and providing equipment.

2.2 Academic Performance

Considering the changes that have taken place in accounting education, Cornachione et al. (2010) argue understanding academic performance has become indispensable for research in the field of education. In addition, Mallmann et al. (2021) emphasize student performance in higher education has been highlighted as a crucial component for the creation and evolution of a well-qualified and competitive labor market.

Regarding academic performance, Veiga et al. (2014) understand this as school performance and evidence of what the student has understood during the training period. Other

aspects may also be considered influential in academic performance (Silva, 2023). Among these elements are motivation, personal effort, number of hours of study, class attendance, students' prior knowledge, professors' pedagogical training, and the institution's infrastructure (Sousa et al., 2019).

Rivkin et al. (2005) emphasize that academic performance is an accumulation of experiences in the family, community, and school environments. In turn, Lindholm-Leary and Borsato (2006) define academic performance as the skills in communication, mathematics, science, social interaction, and thinking that contribute to a student's success in their personal and professional life. Corroborating this idea, Jara et al. (2008) argue that academic performance is seen as a person's ability to respond to stimuli and achieve previously established educational goals and purposes.

However, for Ferreira et al. (2022), student performance stems from the learning process, which is shaped by the mutual influence among professors and students, even though not all learning comes exclusively from the professor's performance. So, the exercise of teaching activities is one of the fundamental factors for academic performance. However, to be understood as an influential factor, it is necessary to consider that the professor is not a simple mediator, but rather that they play a crucial role in the teaching-learning process (Cruz et al., 2008)

Araújo et al. (2014) argue that academic performance evaluation should be viewed as a management tool for measuring the efforts of HEIs in the pursuit of quality, excellence, and usefulness, whether by professors or administrators, and that student performance is therefore fundamental to the institution's reputation. It is clear, therefore, that in addition to understanding how factors may or may not be related to academic performance, it is necessary to analyze how this academic performance is studied in the teaching-learning process (Paula & Farias, 2023).

2.3 Theoretical Mapping and Hypothesis Construction

For Osti and Tassoni (2019), professors' guidance in the academic environment directly influences the teaching and learning process of students. Thus, the professor's role is of great relevance to accounting, since, in addition to transmitting their knowledge, they contribute to the ability to analyze and discuss problems in an intelligent and rational way (Silva, 2017).

In a survey conducted at the State University of the Midwest, Morozini et al. (2008) concluded that approximately 57.8% of the 209 students who responded to the questionnaire felt more motivated to study depending on the methodology applied. Furthermore, this same study showed that 15.79% of respondents believe that the professor is a facilitator in the transfer of knowledge, while 26.79% report that this transfer has not been carried out in a clear and understandable manner.

Silva and Ribeiro (2020) sought to understand how the professor-student relationship occurs and its relevance in teaching and learning. This research found that a lack of affinity among professors and students tends to have a negative impact on academic performance. In research conducted in undergraduate accounting courses at universities in southern Brazil, Zonatto et al. (2014) concluded that universities with higher proportions of professors with stricto sensu training obtained better scores in the National Student Performance Exam (ENADE). Furthermore, Morais et al. (2021), in a study conducted at the Federal University of Paraíba (UFPB) with 128 individuals from the Accounting program, concluded the reduction in affinity among professors and students is linked to the complexity of understanding the subjects and the use of less dynamic procedures for teaching the content.

The study by Melo et al. (2023), whose purpose was to investigate professor training and professional development and its relationship with academic performance in Accounting courses at Brazilian Federal Universities, concluded that factors related to professor training and development are linked to academic performance. Furthermore, statistical analysis, using Pearson's correlation, showed that the variables of gender, qualifications, work regime, mastery of classroom content, availability outside the classroom, and teaching methodologies used were statistically significant in relation to the overall score obtained in ENADE, thus confirming that there is a relationship with student performance.

With the aim of comparing the performance of undergraduate accounting students in Brazil, taking into account certain aspects of teaching and physical educational resources, Cruz et al. (2008), using the Mann-Whitney test, found that professors had an influence on their students' performance. Furthermore, the findings indicate that students who were taught by professors with up-to-date knowledge demonstrated superior performance compared to other students whose classes were taught by professors who were not up to date. In view of the above, this study presents the first research hypothesis.

H1: There is a statistically positive and significant influence of the professor factor on students' academic performance.

According to Silva (2017), the subject factor comprises several important variables that directly influence the teaching-learning process. Among these variables, we can highlight the way in which the content is approached, the organization and structure of the information, as well as the logical sequence that will be followed throughout the educational process. Furthermore, it is common for academics to perform poorly or show greater aversion to certain subjects, not necessarily because they are more challenging, but because they require different pedagogical approaches in their teaching (Matos et al., 2021).

Beck and Rausch (2015) sought to understand the perception of students in the Accounting program at the Regional University of Blumenau regarding the factors that influence the teaching-learning process. Among the variables analyzed by the authors, specifically the subject factor, it was identified through the Best-Worst scale (assigning importance to a given attribute) that the variable types of learning required, belonging to this factor, is one of those that exert the greatest influence on the teaching-learning process.

Morozini et al. (2008) sought to verify which factors most influence and hinder the teaching-learning process from an academic perspective, specifically in the opinion of students in the Accounting Program at the State University of the Midwest. In this study, among the results found, when asked which teaching strategy adopted by the professor contributes most to understanding and interest in the subject studied, of the 209 respondents, 20.10% stated that addressing topics that are of interest to everyone contributes to better learning. Furthermore, when asked what is considered a determining factor in facilitating learning, 14.35% responded that the approach to the subject is important for this process. Thus, the second hypothesis of the study is formulated.

H2: There is a statistically positive and significant influence of the subject factor on students' academic performance.

For Paiva and Lourenço (2011), it is essential students are in a place that provides them with security when exposing their knowledge and skills, since, in a harmonious environment, students find it easier to report their difficulties, thus improving their learning. Thus, HEIs aim to educate students so that they become professionals with extensive knowledge and motivation, with critical analysis skills, so that in their lives in society they are able to create solutions and take on responsibilities (Silva, 2017).

In a study conducted by Amaro and Beuren (2018), which aimed to investigate the influence of contingency factors on the academic performance of students in the Accounting course at an HEI, it was inferred that there is a statistically positive and significant impact of the internal environment factor on students' academic performance. Furthermore, the same study concluded that the technical system has a statistically positive and significant influence on students' academic performance.

In a study conducted by Melo et al. (2022), which aimed to analyze the correlation between institutional support and academic performance in Accounting courses at Brazilian Federal Universities, using a sample of 40 Accounting courses that underwent ENADE in 2012, 2015, and 2018, the findings showed that students were satisfied with the institutional support offered by HEIs, such as available resources, physical facilities, library, conditions for participation in events, support from monitors and tutors, and extracurricular activities. In addition, the variables showed statistical significance and presented a moderate relationship with the academic performance of the courses examined.

Andriola (2009) investigated the impact of structural factors (classrooms, laboratories, libraries, bathrooms, and equipment) on 40 courses at an educational institution in ENADE. Among the results found, it was concluded courses with good infrastructure tend to obtain higher scores. However, in a study conducted by Hill and Epps (2010), whose purpose was to investigate the impact of the classroom environment on the perception of business administration students and their satisfaction with the structure, using a sample of 237 respondents, they found although students consider the relationship between infrastructure and course performance and learning in the teaching environment to be positive, when the desired grades were analyzed, it was found that the structure of HEIs did not affect student performance. Even in the face of divergent findings in the literature, this investigation postulates the third hypothesis of the research.

H3: There is a statistically positive and significant influence of the institution factor on students' academic performance.

3 Methodology

With regard to the proposed objective, the research is descriptive in nature, since, according to Prodanov and Freitas (2013), descriptive research records and describes the events examined, without interfering with them, with the purpose of describing the attributes analyzed, as well as the relationships among the variables. The study in question aims to highlight the variables that will provide a basis for analysis and evidence of the elements observed. Regarding the approach to the research problem and the nature of the data, it has a quantitative approach. For Correia (2023), quantitative studies focus on indicating numerical results appropriate for drawing inferences about the population under investigation. Thus, the proposal investigated shows the influences of factors related to teaching and learning on student performance.

As for the procedures, the study used a survey, which was conducted using a questionnaire. The questionnaire was administered online (web survey), created using Google Forms, and the link to the questionnaire was shared in the WhatsApp groups of the classes studied from September and October 2024. The population of this study consisted of all students enrolled in the third semester or later of the Accounting course at a Federal Higher Education Institution, located in the Northeast region of Brazil, assumed the knowledge acquired by them is more enriching than the experiences of students in the first and second semesters. From this,

a final sample of 128 valid responses was obtained, which was sufficient for the objectives of this research as calculated by the free software G*Power (Ringle et al. 2014), which showed a minimum size of 77 respondents. The sampling method used was accessibility sampling.

The research instrument consisted of three blocks, the first comprising questions related to factors that influence the teaching-learning process, developed by Pavione et al. (2016). This construct comprised statements from three dimensions: seven statements related to the professor dimension, five related to the subject dimension, and five related to the institutional dimension. Respondents were instructed to indicate the degree of importance of each statement, assigning a score from 0 to 10, considering that 0 (zero) means that you consider the factor totally irrelevant to your learning process in a subject and that 10 (ten) implies that you consider the factor extremely important to your learning process.

The second block presented questions related to academic performance, developed by Amaro and Beuren (2018). The construct comprised questions about self-assessment of performance, containing eight questions. Research participants rated questions on a scale of 0 to 10, where 0 = totally irrelevant and 10 = extremely relevant. Additionally, the third block verified the profile of the respondents, with six questions. It should also be noted that the questionnaire was accompanied by a Free and Informed Consent Form (FICF).

To analyze the data, descriptive statistics were initially used, a stage that involved identifying the summary of the distribution of the information obtained, mapping and describing the characteristics of the sample studied. Subsequently, to analyze the influence of teaching-learning factors on academic performance, Structural Equation Modeling (SEM) was adopted, using the Partial Least Square (PLS) algorithm (Hair Jr. et al., 2023).

According to Hair Jr. et al. (2023), a PLS-SEM model consists of two stages: the measurement model and the structural model. The measurement model defines how latent variables (or constructs) are evaluated, considering the internal reliability and consistency of the constructs, in addition to analyzing the convergence of the model to be verified. In contrast, the structural model explains the similarities among these latent variables, clarifying both the constructs and the structural paths that link them. The results and discussions of the study will be presented in the next section.

4 Analysis and Discussion of Results

4.1 Descriptive Statistics

The study included 128 students from the Accounting course at a higher education institution in the Northeast region of Brazil. In the sample design, it was noted that 63 (49.2%) of the respondents identified themselves as female, while 64 (50%) self-identified as male, and only 1 (0.8%) abstained from answering. The data collected shows that there is no significant difference in terms of the gender of the students analyzed.

Regarding age group, 118 (92.2%) of respondents are aged 25 or younger, which is the age group with the highest number of participants. Seven (5.5%) students were from 26 and 30 years old, and the age groups with the lowest participation were those from 31 and 35 years old (1, or 0.8%), from 36 and 40 years old (1, or 0.8%), and over 40 years old (1, or 0.8%). Regarding marital status, 124 (96.9%) students stated they were single, and only 4 (3.1%) were married. Inherent to the type of secondary education institution, 93 (72.7%) of the sample studied at public schools, and 35 (27.3%) at private institutions.

Furthermore, regarding working hours, 58 (45.3%) stated that they did not have a job, i.e., the majority of respondents, while only 13 (10.2%) work full-time, 44 hours per week. Given this, it is clear that almost half of the students analyzed do not have a job, which suggests that students tend to have more time to devote to their studies, which can have a positive impact on their academic performance. This result contrasts with the one found by Amaro and Beuren (2018) in their study, in which the majority of respondents claimed to work full-time.

Regarding professional experience in accounting, 78 (60.9%) responded that they had never worked in the field, i.e., the majority of respondents. Thirty-three (25.8%) claimed to have worked for one year, eight (6.3%) stated they had worked for two years, six (4.7%) indicated they had worked for more than three years, and only three (2.3%) had three years of experience. Next, we will discuss the descriptive statistics of the teaching-learning factors in the dimensions of professor, subject, and institution, as well as academic performance.

Table 1
Professor Factor

Assertive	Average	Standard deviation	Minimum	Maximum
Teaching methods (how the professor conducts the class, interacts with students, and provides a learning environment) (EAP1)	8.98	1.62	3	10
Level of difficulty in tests consistent with what was taught in class (EAP2)	8.44	1.62	3	10
Use of appropriate language in the classroom, with no communication involving irony or sarcasm on the part of the professor in order to maintain control of the environment (EAP3)	7.89	2.49	0	10
Humble and submissive attitudes toward the class (reduction of assignments, easier tests, turning a blind eye to absences, tolerance of indiscipline) (EAP4)	6.73	2.86	0	10
Vocation for teaching (they are in the classroom due to life circumstances) (EAP5)	7.67	2.53	0	10
Mastery and enjoyment of the subject taught (EAP6)	8.69	1.83	1	10
Have a good relationship with students (try to understand their habits and customs, take an interest in getting to know them, listen to them, and understand them) (EAP7)	8.53	1.89	0	10

Source: Survey data (2024).

Based on the responses of the students assisted in the research, the results shown in Table 1 indicate that the professor's teaching methods (EAP1) and mastery and enjoyment of the subject taught (EAP6) are the most important factors for their learning process, as they had the highest averages. It is noteworthy that respondents scored EAP1 at an average of 8.98, making it the highest-rated aspect, which suggests that the way professors convey content influences student learning. In addition, the low variability (standard deviation of 1.62) indicates that the positive perception is consistent among students. The research findings are consistent with the results of the study conducted by Pavione et al. (2016), which suggests that the professor's teaching methods compromise student learning. The EAP6 variable obtained an average of 8.69, the second highest average, and a standard deviation of 1.83. This finding highlights the importance of competent professors to teach the subjects, which, according to Marion (2001), are essential attributes of a higher education professor.

On the other hand, the variables that obtained the lowest averages were aptitude for

teaching (EAP5) and humble and submissive attitudes toward the class (EAP4). It should be noted that students scored an average of 7.67 and a standard deviation of 2.53 for variable EAP5, suggesting that, in general, students consider this characteristic to be relatively important for teaching work. Regarding this assertion, Freire (2015) emphasizes that professors must have knowledge and skills that contribute to educational purposes and, therefore, must seek constant improvement in their professional practice. Furthermore, variable (EAP4) obtained the lowest mean among the variables analyzed, with 6.73 and a standard deviation of 2.86, which indicates that this is a variable that has little impact on the learning process and that there is greater variability in students' opinions. Corroborating this result, Bordenave and Pereira (2012) mention that subordinate behaviors may be associated with a lack of didactic preparation on the part of the professor.

Table 2
Subject Factor

Assertive	Average	Standard deviation	Minimum	Maximum
Course content structure (EAA1)	8.66	1.62	3	10
Interaction among programs in different disciplines (EAA2)	7.87	2.01	2	10
Wide range of elective courses (increasing students' options for choosing an area of interest) (EAA3)	7.73	2.45	0	10
Well-planned course program (time well distributed among topics) (EAA4)	8.52	1.69	2	10
Affinity of programs with everyday facts (EAA5)	8.13	1.99	1	10

Source: Survey data (2024).

Table 2 shows that the statements suggested for the study of the subject dimension demonstrate a significant appreciation by students for their learning. Among the variables studied, the variables course content structure (EAA1) and well-planned course program (EAA4) stand out with the highest means, obtaining 8.66 mean and 1.62 standard deviation and 8.52 mean and 1.69 standard deviation, respectively. Regarding EAA1, according to the findings of Araújo et al. (2014), the program content impacts student performance, leading them to expend greater effort in the courses and, thus, improve their performance. Regarding the EAA4 variable, Bordenave and Pereira (2012) indicate that one of the impasses in higher education is the improper planning of course programs, since, in most cases, professors devote more time to the first chapters of the subject, causing acceleration in the final contents, impacting the effective learning of students. In contrast, the indicators that obtained the lowest averages were interaction among programs from different disciplines (EAA2) and a wide range of elective courses (EAA3). Regarding the EAA2 variable, its mean and standard deviation were 7.87 and 2.01, respectively, indicating that despite its relevance, when analyzing the standard deviation, there is a significant variation in the responses. In addition, it is important to note that there was a drop in relation to the other means, suggesting that students do not consider interaction among programs to be as important. These results contradict those of Peleias et al. (2007), who argue that interdisciplinarity is essential for adding to students' knowledge. The EAA3 indicator had the lowest mean, at 7.73. It is worth noting that, in relation to the others, it had the highest standard deviation, 2.45, indicating a wide dispersion in the responses, that is, there is variation in the importance of this factor for students. Therefore, it is interpreted that, for students, the offer of elective courses, despite being valued, is not the main determining factor for the quality of their learning.

Table 3

Institutional Factor

Assertive	Average	Standard deviation	Minimum	Maximum
Availability of teaching assistants and monitors, especially in subjects with many students (EAI1)	7.83	2.49	0	10
Assistance for professors in preparing teaching materials and providing pedagogical guidance (EAI2)	7.95	2.20	0	10
Psychological and vocational assistance and guidance for students (EAI3)	7.25	2.97	0	10
Airy classrooms equipped with audiovisual resources (EAI4)	8.55	2.28	0	10
Library equipped with an extensive collection of books and adequate facilities (EAI5)	8.84	1.78	1	10

Source: *Survey data (2024)*

Based on the results shown in Table 3, the variable library equipped with an extensive collection of books and adequate facilities (EAI5) obtained an average score of 8.84, being the most highly rated aspect. In addition, there was low variability in relation to the others (standard deviation of 1.78), highlighting that the positive perception is consistent among students. Regarding this variable, Pavione et al. (2016) advocate the importance of having an appropriate place to continue the teaching-learning process, located outside the classroom but belonging to the field.

Regarding the statement "well-ventilated classrooms equipped with audiovisual resources" (EAI4), respondents gave an average rating of 8.55 with a standard deviation of 2.28, which was the second highest average. It is noted that students consider this variable relevant to the teaching-learning process; however, it is evident that there was a significant variation among the responses, that is, despite its importance, not all students consider this indicator to be essential. In line with this finding, Tharani et al. (2017) found that the scarcity of resources in the classroom and access to facilities, in addition to making student performance more challenging, compromises emotional well-being.

In contrast, the variables related to the existence of teaching assistants and monitors, especially in subjects with many students (EAI1), and psychological and vocational assistance and guidance for students (EAI3) had the lowest averages. The EAI1 indicator obtained an average of 7.83 and a standard deviation of 2.49. Regarding this assertion, according to Santos et al. (2023), in the academic environment, there is greater interaction among students than with professors, and explanations among them can facilitate learning, thus encouraging this interaction through the tutoring program. Finally, with regard to the EAI3 assertion, it showed an average of 7.25 and a standard deviation of 2.97, which was the highest among the variables analyzed.

Table 4

Academic performance

Assertive	Average	Standard deviation	Minimum	Maximum
Punctuality in classes (DAC1)	8.28	2.02	0	10
Class attendance (DAC2)	8.59	1.72	2	10
Class participation (DAC3)	7.70	2.30	0	10
Interest in subjects (DAC4)	8.42	1.77	0	10
Monitoring of class content (DAC5)	8.45	1.75	0	10

Performance in solving exercises (DAC6)	8.05	1.99	0	10
Time devoted to extracurricular study (DAC7)	7.31	2.44	0	10
Performance on tests and exams (DAC8)	8.10	1.80	0	10

Source: *Survey data (2024)*

According to Table 4, the statement that obtained the highest average was "class attendance (DAC2)", with 8.59 and a standard deviation of 1.72. This average suggests that, in general, students attend classes regularly. Furthermore, it should be noted that the standard deviation is the lowest presented in the table. Although the research findings point to high attendance by students, a study conducted by Araújo et al. (2014) found that the number of absences does not interfere with academic performance. Regarding the variable "following class content (DAC5)," respondents scored it as the second highest average, with 8.45, which indicates that students, in most cases, effectively follow the content, which may represent clarity in classes and appropriate teaching materials. In addition, it presented a relatively low standard deviation (1.75), indicating that there is uniformity in the ability to follow the content, with most students demonstrating a good understanding.

In contrast, the statements "participation in classes (DAC3)" and "time devoted to extra-class study (DAC7)" obtained the lowest averages. It is evident that the DAC3 indicator had an average of 7.70, revealing an acceptable level of participation, indicating that, although present, some students may not actively participate during classes, which justifies the relatively high standard deviation (2.30) with some students participating actively and others being more reticent. Finally, there is the DAC7 variable, with an average of 7.31 and a standard deviation of 2.44, indicating that the time dedicated to studying outside the classroom is lower than other activities. Furthermore, it is the highest standard deviation among all the statements, suggesting a large variation in the amount of time students dedicate to extracurricular study. Furthermore, contributing to this finding, according to Andrade and Corrar (2008), students who devote more hours to their studies tend to perform better than those who study less.

4.2 Modeling Analysis and Hypothesis Testing

To outline the evaluation and validation of the study's relational model, the analysis was conducted using PLS-SEM. At this stage, the measurement model was evaluated, verifying reliability, convergent validity, and discriminant validity (Hair Jr. et al., 2019). In the structural model, the structural relationships were verified and the hypotheses were tested, reporting the results generated from the SmartPLS 4 software.

The application of PLS-SEM occurs through several tests in the measurement model with reflective constructs, with the purpose of assessing the compatibility of the model, thus analyzing the reliability of internal consistency, convergent validity, and discriminant validity. Initially, convergent validity was assessed through external factor loadings, which refer to how much an item is related to a construct, and indicators with factor loadings equal to or greater than 0.700 were prioritized, following the recommendations of Hair Jr. et al. (2019). Given this, indicators related to the following constructs were excluded from the model: Teaching-Learning factors (EAP2, EAP3, EAP4, and EAP7) and academic performance (DAC1 and DAC2). It is important to note that the indicators were removed because they increased the convergent validity and composite reliability (CR) of the model (Hair Jr. et al., 2019). Figure 1 shows the final measurement model after the aforementioned adjustments.

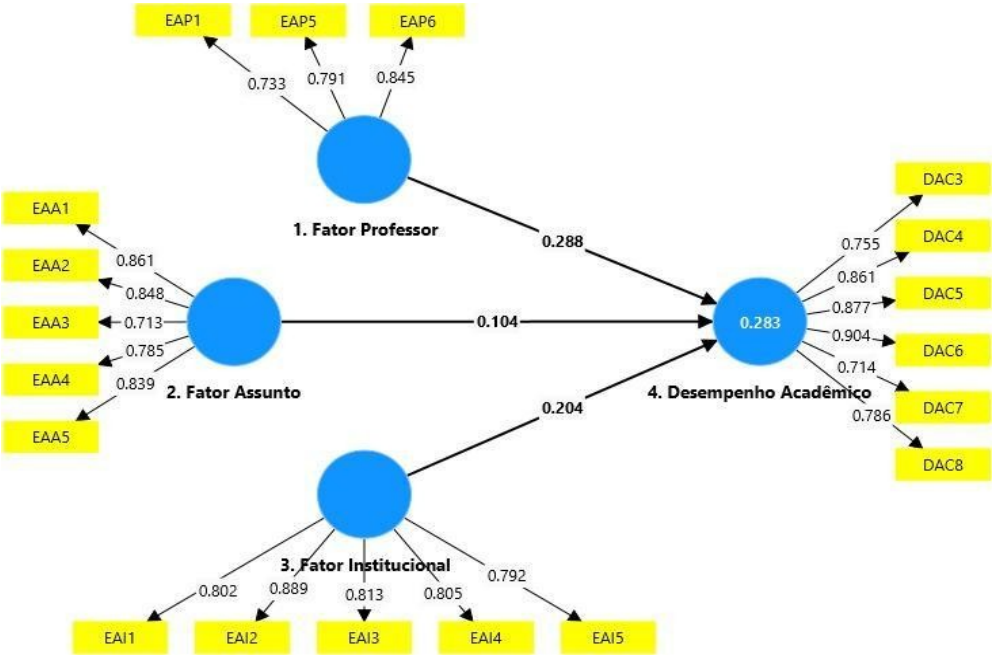

Figure 1 *Final Measurement Model*
Source: *Survey data (2024)*

Subsequently, convergent validity was analyzed using the average extracted variance (AVE), where values above 0.50 indicate that the elements analyzed converge to explain the constructs (Hair Jr. et al., 2017). In addition, through CC and Cronbach's Alpha (CA) intervention, it was possible to validate the reliability of internal consistency, indicating that the values of each construct should be greater than 0.70 (Hair Jr. et al., 2019).

Table 5
Reliability and convergent validity tests of constructs

First-Order Constructs	AC ≥ 0,70	CC ≥ 0,70	AVE ≥ 0,50
Professor Factor	0,700	0,833	0,626
Subject Factor	0,871	0,905	0,658
Institutional Factor	0,879	0,912	0,674
Academic Performance	0,900	0,924	0,671

Source: *Survey data (2024)*

Table 5 presents the results of the measurement model identifying the reliability and convergence of the constructs. The findings listed in Table 5 show that the reliability and convergence criteria for the constructs of teaching-learning factors and academic performance were met, since the values are higher than the minimum criteria set forth by Hair Jr. et al. (2017; 2019). Regarding CA, the variable with the lowest value was the "professor" dimension (0.700) of the Teaching-Learning construct. Regarding CC, all variables had values above 0.80, indicating that the study sample is unbiased and that the responses to the statements that measured the constructs are reliable (Hair Jr. et al., 2019).

Furthermore, when examining the AVE, it was identified that the variable with the lowest value was the "professor" dimension, which had a coefficient of 0.626. This value indicates that the indicators associated with the "professor" factor have a correlation of 62.6% with the Teaching-Learning construct. Based on the results obtained regarding reliability and

convergent validity, it can be stated that the constructs evaluated reached acceptable levels, which supports the adequacy of the structural model for the proposed tests. Thus, the indicators demonstrated sufficient consistency to proceed with the structural analysis of the model.

Table 6

Discriminant validity according to the Heterotrait-Monotrait (HTMT) and Fornell Larcker criteria

Panel A - Heterotrait-Monotrait (HTMT) Criterion				
Constructs	**1**	**2**	**3**	**4**
1. Professor Factor	----			
. Subject Factor	0.858	----		
3. Institutional Factor	0.795	0.944	----	
4Academic Performance	0.599	0.506	0.518	----
Panel B - Fornell Larcker criterion				
Constructs	**1**	**2**	**3**	**4**
1. Professor Factor	0.791			
2. Fator Assunto	0.680	0.811		
Institutional Factor	0.622	0.810	0.821	
4 .Academic Performance	0.485	0.466	0.468	0.819

Source: *Survey data (2024)*

The final stage of the measurement model evaluation consisted of testing and assessing discriminant validity, which aims to analyze how truly distinct a construct is from other constructs by empirical standards (Hair Jr. et al., 2017). Thus, two criteria were established for the analysis, the first being Heterotrait-Monotrait (HTMT) proposed by Henseler et al. (2015) and the second being Fornell Larcker, proposed by Fornell and Larcker (1981).

With regard to HTMT, Hair Jr et al. (2017) conceptualize it as the ratio among correlations of traits and correlations within traits. HTMT analysis is considered an estimate that represents the true correlation between two latent constructs, if these constructs were measured perfectly and had total reliability (Correia, 2023). For Hair Jr. et al. (2017), this true correlation is also known as unattenuated correlation, where values close to 1 indicate a lack of discriminant validity. Thus, to verify the results of the constructs in Table 6, the criteria specified by Hair Jr. et al. (2019) were used for the HTMT, namely: i) for conceptually different constructs, HTMT < 0.85; ii) for conceptually similar constructs, HTMT < 0.90; and iii) in general, HTMT less than 1.

The findings in Table 6 indicate that the HTMT ratio criterion was met. The correlation values are less than 1, demonstrating that all constructs are explicitly independent of each other. Furthermore, it should be noted that the highest HTMT value was between the "subject dimension" and the "institutional dimension" (0.944). So, it was found that discriminant validity achieved HTMT values lower than 1 in the relationships between the constructs.

Furthermore, still in discriminant validity, the criterion proposed by Fornell and Larcker (1981) was used, which compares the square roots of the AVE values with the correlations of the latent variables. Hair Jr. et al. (2017) argue that the square roots of the AVEs of each construct need to be greater than their highest correlations with any other construct. According to the results found in Table 6, it was observed that the discriminant validity of all latent variables was met, since the criterion of Fornell and Larcker (1981) was fulfilled. Upon completing the evaluation and validation of the measurement model, the next step consisted of analyzing the structuring model, with the purpose of ascertaining the relationships established in the research hypotheses and outlined in the theoretical model. In general, the

structural model aims to test the strength of the variables by examining collinearity (VIF), the coefficient of determination (adjusted R2), predictive relevance (Q2), effect size (f2), and the relationships in the structural model (hypothesis testing) (Hair Jr. et al., 2019)

Table 7

Collinearity analysis using VIF and coefficients of determination and predictive validity of the model

Panel A – Ratio					**VIF**
Professor Factor → Academic Performance					1.903
Factor Subject → Academic Performance					3.569
Institutional Factor → Academic Performance					3.130
Panel B – VIF of Indicators					
EAP1	1.274	EAA5	2.179	DAC4	3.198
EAP5	1.406	EAI1	2.305	DAC5	3.298
EAP6	1.553	EAI2	3.078	DAC6	3.737
EAA1	2.285	EAI3	2.325	DAC7	1.750
EAA2	2.089	EAI4	2.089	DAC8	2.092
EAA3	1.635	EAI5	2.053	----	----
EAA4	1.992	DAC3	1.913	----	----

Panel C - Coefficients of determination and predictive validity of the model	**Adjusted R2**	**Q^2**
Academic Performance	0,266	0,189

Source: *Survey data (2024)*

The first assessment made in the structural model was about collinearity, as shown in Table 7. In this analysis, an examination of the Variance Inflation Factor (VIF) values was carried out, following the suggestions of Hair Jr. et al. (2019), which emphasizes that VIF values need to be greater than 0.20, but less than 5.00, since any VIF value greater than 5.00 suggests that the model has multicollinearity problems.

According to the results, all construct indicators and research relationships were within the expected value ranges, being less than 5.00, which is classified as the threshold value in the literature (Wong, 2013; Hair Jr. et al., 2019). It is worth noting that the "DAC6" indicator had the highest VIF (3.737), but it is still within the limits expected by the literature. Furthermore, the findings indicate that there is no collinearity problem between the exogenous constructs, which function as independent variables within the model, so there is no need to remove any independent variables from the model.

After this analysis, Pearson's coefficient of determination (adjusted R^2) and the predictive validity (Q^2) of the endogenous variables were verified. Correia (2023) argues that R^2 analyzes the joint effect of exogenous constructs on endogenous ones. Regarding adjusted R^2, Cohen (1988) points out that it is a modification of R^2 that adjusts the value according to the number of indicators in the model, penalizing the insertion of variables that do not contribute significantly to explaining data variability. According to Hair Jr. et al. (2017), there is no ideal value considered valid for R2, since the values, in most cases, consider the context of the study, the latent variables, and the complexity of the model

To verify the adjusted R2, we will use the method proposed by Cohen (1988), which recommends that in research in the social and behavioral sciences, R2 = 0.02 be classified as a small effect, R2 = 0.13 as a medium effect, and R2 = 0.26 as a large effect. According to Table 8, it can be observed that the academic performance construct has an explanatory power of 26.6%, which is considered a large effect.

Furthermore, an approach was adopted to verify the predictive validity (Q2) of the model, carefully checking the indicator points in the endogenous reflective measurement models, where the values must be greater than 0 (zero). With regard to this approach, the construct analyzed was found to be consistent with what is suggested in the literature, indicating a value of 0.189, which signals that the model is accurate. Thus, the findings indicate that the explanatory and predictive capacity of the model is satisfactory, assisting in the analysis of structural relationships and decision-making regarding the conjectured hypotheses.

Table 8

Results of hypothesized relationships

Hypotheses	Structural Relationship	Path coefficients (β)	Value - t	f^2	Value-p	Decision
Hypothesis Testing						
H_1	Professor Factor → Academic Performance	0.288	0,061	1.951	**0.050***	**Accepted**
H_2	Factor Subject → Academic Performance	0.104	0,004	0.556	0.578	Rejected
H_3	Institutional Factor → Academic Performance	0.204	0,019	1.143	0.253	Rejected

Note: *(*) 5% significance level.*
Source*: Survey data (2024).*

Considering that teaching-learning factors can influence students' academic performance, the first hypothesis analyzed was whether the professor factor influences students' academic performance. Based on the results shown in Table 8, hypothesis H1 is confirmed (β= 0.288; t-value = 0.061; p-value = 0.050).

Qualified, motivated professors who use an effective method tend to impart greater knowledge, which, in theory, should be reflected in student performance. The results shown in Table 8 confirm this expectation. This can be attributed to several factors, including the professor's teaching skills and mastery and enthusiasm for the subject taught, since when professors are qualified and engaged, students feel more involved in academic activities, resulting in superior performance. Thus, the findings highlight the importance of professors in education, as they are a fundamental component in the learning process.

The effects of this interaction are consistent with those pointed out by Osti and Tassoni (2019), who argue that the interaction and instructions provided by professors have a direct impact on the teaching-learning process, as they contribute to the intellectual and critical development of students. Furthermore, the results of H1 are in line with the findings of Silva and Ribeiro (2020), who investigated the importance of the relationship among professors and students for the teaching-learning process, concluding that a lack of interaction among professors and students negatively impacts academic performance, indicating that a harmonious and collaborative relationship is essential for students to feel motivated and engaged in learning.

Furthermore, the results reinforce the findings of Zonatto et al. (2014), which indicate that the level of professor training impacts student academic performance by ensuring a more qualified teaching approach. Furthermore, the research by Melo et al. (2023) agrees that professors significantly influence students' academic performance. The authors found that factors such as qualifications, teaching methodology, and content mastery impact students' ENADE scores. Both findings highlight the importance of investing in professor training and pedagogical practices to improve academic performance.

The findings reinforce the importance of professors for student performance, since they are essential for students' academic and professional development. In addition, it should be emphasized that qualified professors tend to contribute more to student learning and, consequently, influence their performance. Thus, this result points to the need for greater attention to professor training.

Regarding the second hypothesis, we verified whether there is a statistically positive and significant influence of the subject factor on students' academic performance. According to the research findings, there is no significance, considering the levels of 1%, 5%, and 10% (β= 0.104; t-value = 0.004; p-value = 0.578), therefore hypothesis H2 is rejected.

Hypothesis H2 is based on the conjecture that if the content is useful, relevant, and well structured, it can spark students' interest and contribute to more effective learning, which is reflected in academic results. Based on the results, the hypothesis was rejected, indicating that the content, although essential, has no direct impact on academic performance. This result demonstrates the difficulties encountered in the learning process. Thus, it is evident that the way the subject is taught and the interaction between professor and student have a greater influence

The results contradict Silva's (2017) view, who argues that the subject dimension influences learning, especially when there is a good structure that facilitates student understanding. This lack of a significant relationship in the analysis suggests that, despite the importance of these factors, they are not seen as sufficient to ensure a direct influence on the academic performance of the sample studied. Furthermore, the research findings do not converge with the view of Matos et al. (2021), who argue that the way content is conveyed can impact student performance.

The research conducted by Morozini et al. (2008) concluded that interest in the subject matter facilitates student understanding. Conversely, it shows that although students consider these factors important, there may not be a direct impact on academic performance. The results indicate that the importance of content is not only related to the subject matter, but also to the way it is conveyed.

As for the third hypothesis, which sought to verify whether there is a statistically positive and significant influence of the institution factor on students' academic performance, the results showed that the conjecture of hypothesis H3 was rejected, since there is no significance in this relationship (β= 0.204; t-value = 0.019; p-value = 0.253).

The rejection of the third hypothesis indicates that, although infrastructure and institutional resources are important in the educational context, they do not in themselves guarantee better academic performance. Therefore, effective education is more related to experiences and interactions in the classroom than to the institution's material resources.

This conclusion contrasts with several studies, such as that by Amaro and Beuren (2018), which identified a positive influence of the internal environment and technical system on the academic performance of the students surveyed, proposing that a favorable location contributes to academic performance. The rejection of hypothesis H3, therefore, indicates that, in the context of this research, institutional factors may not have a direct impact on student performance, possibly because they are not the main motivators of academic performance.

Furthermore, Melo et al. (2022) observed in their study that students indicate they are satisfied with the institutional support offered, including resources, facilities, and extracurricular activities. However, although students point to a correlation between these factors and academic performance, the findings of this study indicate that institutional support does not directly impact student performance. Given this, it is understood that although students

benefit from the infrastructure and support offered by the institution, these components do not relate to academic performance if other factors, such as teaching quality and professor involvement, are not taken into account.

Studies such as those by Andriola (2009) and Hill and Epps (2010) also help to clarify this contradiction in results. Andriola (2009) identified that courses with adequate infrastructure usually achieve better grades, pointing to a relationship between the quality of physical structure and academic performance. However, Hill and Epps (2010) showed that, although students were satisfied with the institution's infrastructure, this did not directly impact academic performance when studied in relation to the grades obtained. Given this, the results of hypothesis H3 are in line with the thinking of Hill and Epps (2010), suggesting that infrastructure, although important for the teaching environment, may not be related to students' academic performance.

5 Conclusion

This study aimed to analyze the influences of teaching-learning factors on the academic performance of students in the Accounting course. To achieve this objective, a survey was conducted with students enrolled in the third semester of the Accounting course at a Federal Higher Education Institution located in the Northeast region of Brazil. The survey predicted that teaching-learning factors influenced the academic performance of students. Given this, hypotheses were developed based on the literature to test the relational model and statistically verify the interfaces of the variables surveyed.

Therefore, the result obtained was that the professor factor has a positive and significant influence on student performance, suggesting that professor qualifications and teaching methods are decisive for academic performance. This finding highlights the importance of professor qualifications and involvement in the educational process, indicating that well-prepared professors who use effective methodologies contribute significantly to learning and, consequently, to student performance.

In summary, the results of this research categorically demonstrate that professors are the central element in the teaching-learning process in Accounting Sciences. The rejection of hypotheses related to the “subject factor” and the “institutional factor” suggests that the quality of learning is not merely a reflection of the content taught or the available infrastructure, but is predominantly shaped by pedagogical action. Therefore, it is evident that investments in professor development, updating their methodologies, and stimulating their mediation skills in the classroom represent the most effective way to improve student performance and course excellence.

In conclusion, it can be said that the study satisfactorily met its proposed objective, demonstrating that students' academic performance can be enhanced through continuous professor training and the adoption of more active methodologies. The finding that professors play a key role in promoting learning highlights the need for continuous investment in professor training and the development of pedagogical practices.

This study has implications for the literature by jointly exploring the constructs of teaching-learning and academic performance. In addition, the findings contribute to strengthening the accounting education environment in HEIs and generating positive impacts in both academic and professional circles. Furthermore, they help identify gaps in the teaching-learning process from the students' perspective, thereby assisting in discussions and improvements in the Accounting Sciences course.

The research was limited to studying only the Accounting course at a public university. For future research, it is recommended to expand the study to higher education institutions in other regions of the country, both public and private, in order to verify whether these variables have an influence on these HEIs and to make a comparison. In addition, to deepen knowledge about the influence of educational factors on performance, it is recommended that future research expand the scope to cover other areas and educational contexts. Complementarily, the results of this research can be analyzed from different perspectives and statistical techniques to ascertain whether this results in different conclusions.

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