IMPACT OF PERSONAL, INSTITUTIONAL FACTORS AND LEARNING STYLES ON ACADEMIC PERFORMANCE: AN ANALYSIS WITH ACCOUNTING STUDENTS

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ABSTRACT

The research aims to verify the influence of personal, institutional factors, and learning styles on accounting students' academic performance in the disciplines with the highest failure rate in a Higher Education Institution. Data collection took place through a questionnaire applied to students of the 2nd, 3rd, and 4th years, and 229 valid responses were obtained. To test the hypotheses, descriptive and multivariate statistics (regression.) were used. The results indicate that some of the personal factors, such as shift, high school, marital status, experience in the area, extra-class study hours, age group, working hours, family members, housing, family economic participation, and family income, showed a statistically significant relationship with performance. Of the institutional components, the strategy of the course's pedagogical project had an influence, while structure, internal environment, technical system, and strategy of the faculty were not confirmed. Finally, the learning styles were found to be significant only in the discipline of Accounting Laboratory. Students with a converging style had a higher average than the other styles. Identifying these variables (characteristics pertinent to students and the institution) allows the coordination of the Accounting Sciences course and professors to study strategies to improve the academic results of these disciplines, which are the ones with the highest failure rate. It is also expected to contribute to an improvement in the National Student Performance Exam and Sufficiency Exam scores in the long run.

Keywords: Academic Performance. Personal Factors. Institutional Factors. Learning Styles.

1 INTRODUCTION

Accounting education is responsible for training competent professionals to exercise accounting practices (Amaro, 2014). However, the professor deals with a diversity of students within the classroom: introverted students; extrovert; those who only observe the exhibits; those who write down all the observations made by the professor; those who deal well with theories; those who deal well with experiences and examples; those who can understand well through images; those who find it easy to concentrate; those that are easily dispersed; among other behaviors (Nogueira, 2009; Truong, 2016).

Besides the diversity of students, for Higher Education Institutions (HEIs) to achieve their goals, it is necessary to identify the scenario in which they operate, that is, how their environment is structured to meet the likely variations in their environment (Fagundes, Soler, Feliu, & Lavarda, 2008). Several factors interrelate and influence an individual's academic performance, which can be related to personal issues of students, professors, and educational institutions (Sousa, Ferreira, & Miranda, 2019).

As for the academic performance of students in higher education, Barahona (2014) argues that it is related to two extensions: personal determinants (class attendance, gender, degree of access to education, among others); and social (family environment, socioeconomic context, parental education, among others). Besides personal and social determinants, Andriola (2009), Ayeni and Adelabu (2012) state that the facilities are essential to facilitate both teaching and student learning, and include physical resources: adequate classrooms, laboratories, libraries, bathrooms, equipment, conveniences, offices, real estate items and other buildings (in proper conditions of use), considered in this study as institutional factors.

In addition to these factors, identifying students' learning styles can assist professors in teaching, regarding the use of methods that encourage different forms of learning (Nogueira, 2009; Yousef, 2016). Learning styles help identify how students understand, interact, and respond to the learning environment, making them an important tool for professors and educational institutions (El-Hmoudova & Milkova, 2015; Schmitt & Domingues, 2016). Therefore, several models have been developed to allow individuals to be classified into a specific type of student (Peter, Bacon, & Dastbaz, 2010). Among the best known is *Kolb's learning style inventory* (KLSI), by David A. Kolb, which presents a different panorama of learning from behavioral theories of learning, supported by an empirical epistemology (Kolb, 1984).

However, as exposed by Sousa *et al.* (2019), the performance of bachelors in Accounting Sciences in the first four editions of the National Student Performance Exam (Enade) (2006, 2009, 2012, and 2015) and in the Sufficiency Exam, which assess the knowledge acquired in the course, was low, with an average approval rate of 37.24% and 35.64%, respectively. The results are noteworthy, as they reflect the students' learning.

Many researchers were interested in studying the various variables that affect student learning (Cepeda, 2018), among them, the studies of Araújo, Camargos, Camargos and Dias (2014), Ballester (2012), Boezerooij (2006), Cerqueira (2000), Dolado and Morales (2009), Ferreira (2015) and Rodrigues, Resende, Miranda, and Ferreira (2016) stand out. However, the results are still divergent, and further studies are needed.

The study by Borges (2016), for example, investigated the influence of contingency factors and learning styles on the academic performance of students in the Accounting Sciences course at a State Higher Education Institution and, as a limitation, the author explains that with the use of the VARK model, a more targeted verification of the predominant learning styles was not possible, requiring further investigation.

Amaro (2014) investigated the influence of contingency factors: internal (institutional) environment; structure; technical system; course strategy (Course Pedagogical Project (CPP)); course strategy (teaching staff); gender; age; marital status; family members; housing; working hours; family economic participation; family income; father's education level; mother's education level; high school; and hours of extra-class study, in accounting teaching at two federal higher

education institutions. The author did not observe the influence of learning styles and recommends checking and validating his research constructs in other institutional settings, that is, expanding the study to institutions in other regions.

Thus, besides considering the variables used by Amaro (2014), this study adds other factors: grade of access in the entrance exam; the form of admission to the institution (through the Serial Evaluation Process (PAS), universal vacancies or social quotas); and the shift taken by students at an HEI, which have already been studied by other authors, but considering that the results are divergent, further discussions on the topic are necessary.

To acquire knowledge about the factors and learning styles that may be influencing the performance of students or even their withdrawal from disciplines in the Accounting course, this study presents the following research question: what is the influence of personal and institutional factors and learning styles in the academic performance of Accounting students in the disciplines with the highest failure rate in an HEI? In turn, the objective is to verify the influence of personal, institutional factors, and learning styles on the academic performance of Accounting students in the disciplines with the highest failure rate in an HEI.

Knowing these factors associated with performance will allow those responsible for developing policies, aiming to improve students' academic quality (Barahona, 2014). Also, one of the academic environment's concerns is the "success" of students at Enade, because it is an indicator that represents the quality of teaching and because it indicates the factors that interfere in achieving good performance and improving it (Magdalena, 2015). Analyzing student performance and the consequences of the different factors involved is a way of controlling and driving the effects education provides (Hromcová & Agnese, 2018; Magdalena, 2015). Therefore, knowing the factors that interfere with the students' performance demonstrates implications for students' learning and success (Magdalena, 2015).

With the development of this study, we intend to identify the variables that explain the students' performance so that the coordination and professors can outline strategies, considering that the disciplines of the course with the highest failure rate will be analyzed. In the long term, an improvement in the Enade and Sufficiency Exam indices is also expected.

2 THEORETICAL BACKGROUND

2.1 Learning Styles

Psychology is responsible for the first studies on learning styles (Branco, 2010), and, regarding the definition of "learning styles", the researchers did not reach a consensus (Yanardöner, Kiziltepe, Seggie, & Sekerler, 2014). Keefe and Ferrell (1990) refer to the term as being a gestalt that adapts internal and external actions coming from the individual's neurobiology, personality, and growth process, reflecting on his/her behavior.

On the other hand, DeBello (1990, p. 203) synthesizes the term "learning styles" as being "the way people absorb, process, and retain information". From the perspective of Lopes (2002), learning styles are not "good" or "bad". They represent a preferred mode of learning, while Bergil (2017) states that they are related to how individuals want to use their skills.

Assuming that there are different learning styles, it is convenient, after identifying them, to combine them with different forms of teaching, resources, and learning plans (Coffield, Moseley, Hall, & Ecclestone, 2004). Thus, knowledge is acquired, internalized, and used in a way that achieves value in the context of situated learning (Hsu, 2017), because when the content taught to students is exposed in a way that matches their learning style, besides interfering in academic performance, it also intervenes in the attitude towards learning (Cheng, Chiu, Wu, & Tsaih, 2017).

It is not just students who learn differently. The methods that professors use to teach also vary (Felder & Silverman, 1988). Therefore, it is necessary to teach classes considering the different learning styles (Coffield *et al.*, 2004). Some professors teach expository classes, others demonstrate or discuss, some carry out practical applications, others emphasize memory and

understanding, that is, how much the student learns during a class is guided by the compatibility of his learning style and the style that the professor teaches (Felder & Silverman 1988).

Students' learning styles and factors that influence their learning preferences have been used in numerous studies published in journals in recent decades (Yousef, 2016). Considering the interest in research in this sense, and also that students have preferences regarding the learning process, a variety of models were developed to identify and assess learning styles.

Coffield *et al.* (2004) identified 71 models of learning styles and then, adopted criteria, categorized 13 models as main. Among the existing models, the instrument developed by Kolb in 1969, 1985, 1993, 1999, 2005, is used for university students (Cerqueira, 2000).

According to McCarthy (2010), the Experimental Learning Theory (ELT), by David A. Kolb, and the instrument based on this theory (Inventory of Learning Styles (ILS)) are the theory and the instrument most used in research. Also, Kolb's proposal is one of the most influenced works carried out on models to identify learning styles (Coffield *et al.* 2004). Therefore, and considering that this research's objective is to study the learning styles of university students, the Kolb model was chosen.

David A. Kolb developed ELT using theoretical scientific bases and research from previous researchers, beginning with research on the development of thought and knowledge (Cerqueira, 2000). The theory is based on the work of researchers of the 20th century – namely John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers, among others (Cerqueira, 2000; Kolb & Kolb, 2005).

Kolb (1984, p. 38) considers that ELT defines learning as "the process by which knowledge is created through the transformation of experience". Experiential learning is a process of building knowledge, going through a four-stage cycle (McCarthy, 2010). The four stages of the learning cycle, that is, the four learning modes can be understood according to Table 1.

Table 1
The four stages of the learning cycle and their main characteristics

Concrete Experience (CE)	**Word that represents the learning mode**	**Activities**
At this stage, the student tends to trust his/her feelings more than a systematic approach to problems and situations. He/she tends to be more sensitive to other people's feelings. In a learning environment, he/she relies more on his/her ability to adapt to changes.	• Feel.	Laboratories, observations, reading of primary text, simulations/games, movies, fieldwork, and examples.
Reflective Observation (RO)	**Word that represents the learning mode**	**Activities**
He carefully observes before making a judgment and seeks meaning from things. In a learning situation, the student trusts patience, objectivity, and his/her own thoughts and feelings to formulate opinions.	• Observe.	Questions for reflection, discussions, rhetorical questions, newspapers.
Abstract Conceptualization (AC)	**Word that represents the learning mode**	**Activities**
It involves the use of logic and ideas, more than the use of feelings. In general, he/she relies on systematic planning and develops theories and ideas to solve problems, acting intellectually in a situation.	• Think	Readings, papers, projects, construction model, analogies.
Active Experimentation (AE)	**Word that represents the learning mode**	**Activities**
Ability to accomplish tasks. Learning is active, the student experiences to influence or modify situations, has an interest in things that really work instead of merely observing a situation. He/she admires the fulfillment of things and likes to see the results of his/her influence.	• Do	Simulations, case study, laboratory, fieldwork, projects, homework.

Source: Adapted from Cerqueira (2000), Kolb (1984), and Svinicki and Dixon (1987).

As shown in Figure 1, the model is described by two polar opposite dimensions of Concrete Experience (CE) and Abstract Conceptualization (AC) and two opposite dimensions of Reflective Observation (RO) and Active Experimentation (AE).

In the learning cycle, there are two different learning dimensions, the first being perception, that is, some people perceive information better through concrete experience (touch, see, hear), and others perceive it better in an abstract way (mental or visual concepts), thus constituting the AC × CE opposition (Silva, 2006). The second concerns processing, that is, some people process information better by doing some experimentation, while others process it better by reflective observation (thinking about things), thus making the AE × RO opposition (Silva, 2006).

As much as learning is formed by the four skills, due to life experiences, environmental and genetic demands, individuals develop a dominant way in each of the dimensions and, when using certain skills more than the others, the learning style is determined (Kolb & Kolb, 2008; Leitão, 2006). After identifying between concrete or abstract and between active or reflective, the instrument makes it possible to identify individual learning styles in four categories of students: diverging, accommodating, assimilating, and converging (Kolb & Kolb 2008; McCarthy, 2010).
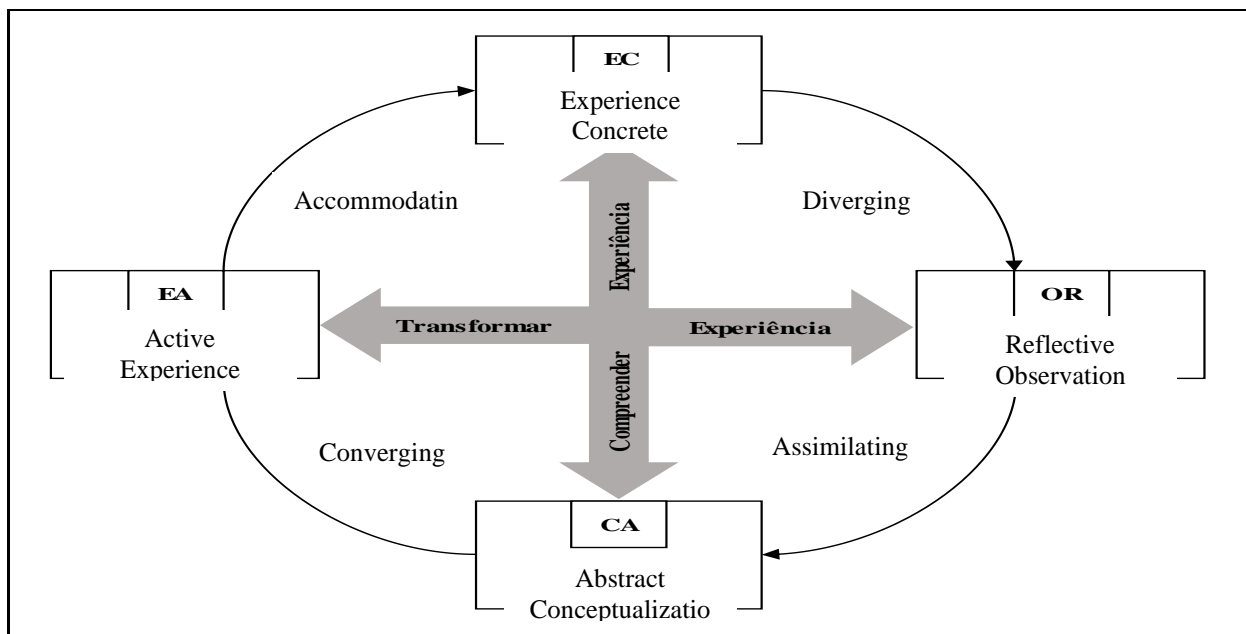
Figure 1. The experiential learning cycle
Source: Adapted from Kolb (1984).

The predominant characteristic of the divergent is the imaginative capacity, generation of ideas (*brainstorming*), and awareness of values. They also like to collect information. In formal learning situations, they are interested in working in groups. They like to get involved with people, are sentimental, have broad cultural interests, and tend to qualify in the arts (Kolb, 1984; Kolb & Kolb, 2005).

Individuals with an accommodating learning style are objective, that is, they have skills to learn from "practical" experience (Kolb & Kolb, 2005; McCarthy, 2010). They are opposed to assimilators and emphasize CE and AE (Kolb, 1984). The accommodating style's main attribute is that they make plans, get involved in new and challenging opportunities, test new approaches, and adapt to immediate changes. They also prefer to perform tasks with other people, develop fieldwork. They are more oriented towards "action", being people with preference in marketing or sales (Kolb, 1984; Kolb & Kolb, 2005).

The dominant competences in AC and RO are individuals with an assimilation style (Kolb, 1984; Kolb & Kolb, 2005). They are better at understanding a lot of information and putting it concisely and logically and, unlike accommodators, are less focused on people and more focused on ideas, preferring lectures, readings, like to think about things and analytical models, this being an interesting style for the area of information and science (Kolb, 1984, Kolb & Kolb, 2005).

The convergent learning style, on the other hand, consists of the main skill of AC and AE (Kolb, 1984; Kolb & Kolb, 2005). Problem-solving, decision-making, and the execution of practical ideas are dominant in individuals with this style. As well as having preferences in dealing with technical tasks instead of social and interpersonal issues, they like new ideas, simulations, being important skills in professions related to technology (Kolb, 1984; Kolb & Kolb, 2005).

From the ELT, the *Learning Style Inventory* – KLSI – was designed to measure the degree to which individuals present different learning styles (Kolb & Kolb, 2005). In itself, the instrument is an operational explanation of the theory (Kolb & Funk, 2002). There are five versions of the *learning style inventory* (LSI). They all present a brief questionnaire with nine items for *Kolb Learning Style Inventory* (KLSI), version 1, a work created in 1969, and 12 items for the following versions, asking respondents to rate four endings of sentences that portray the four ways of learning - CE, RO, AC, and AE (Kolb & Kolb, 2005).

Regarding the use of the method in research, Kolb and Kolb (2008) cited some studies, such as Clarke (1977), Jervis (1983), Loo (2002), and Rowe and Waters (1992), and concluded that accountants tend to be converging, but research carried out in Brazil showed other results. Hamann (2011) and Nogueira, Espejo, Reis, and Voese (2012) demonstrated that students in the Accounting course tend to be assimilators. Likewise, Santos, Colauto, Gassner, Antonovz, and Correa (2014) observed, in their research, that the assimilating and accommodating profiles were dominant in Accounting students (Undergraduate, Specialization, and Master's courses). Barbosa (2017) also identified the predominant assimilation profile in Accounting students who participated in his sample.

In Europe, a study conducted at Aksaray University by Polat, Peker, Özpeynirci, and Duman (2015) measured the influence of learning styles on the performance of Accounting students and found that students do not have the same way of learning and traits of personality, suggesting that there are individual differences during learning. They stressed that professors must be informed about students' styles to determine teaching methods, approaches, and materials, considering the different learning styles. The authors adapted the inventory developed by Honey and Munford from 1992, which, according to them, inspired David A. Kolb's ELT, and found a relationship between learning styles and performance, concluding that pragmatic students perform greater than others. The pragmatist style corresponds to individuals who like to discuss in groups act practically (Polat *et al.*, 2015) and resemble diverging and converging students.

From the divergences found in the studies mentioned above and the importance of identifying students' learning styles, we have the following research hypothesis: **There is a statistically positive and significant influence of learning styles on student performance.**

2.2 Personal, Institutional Factors, and Performance

The goal of achieving good results and reducing the number of students dropping out of the course is a constant concern for many higher education institutions (Pérez, Pérez-López, & Rodríguez-Ariza, 2011). Also, teaching is a service that seeks to develop students' skills, with the educational sector's efficiency usually determined by its impact on student performance (Win & Miller, 2005).

Identifying the effect of variables on students and their performance is an auxiliary tool for educational institutions to take corrective or preventive measures about teaching (Amaro, 2014). It is of interest not only to professors but also to coordinators, pedagogical consultants, and students, studies that present the understanding of students' performance, and the impacting variables that can interfere with their results (Andrade & Corrar, 2008).

Win and Miller (2005) state that student performance can be seen from two factors: (i) one originating from the individual: the link between the socioeconomic and skills elements of each academic; (ii) and the other having its origin in the educational institution: how knowledge is transmitted and organized within these institutions.

Related to the personal factors of the students, Araújo *et al.* (2014) identified whether the performance (measured by the final grade in the disciplines) of Accounting students at a University of Belo Horizonte is explained by the variables: class attendance; age; gender; nature of the discipline (qualitative or quantitative); type of discipline (basic or specific training); and the situation at the end of the course (approved, failed, or locked). As conclusions, they found that the number of absences did not interfere in the performance, presenting even an improvement in the qualitative disciplines and that the younger students presented a better performance, the female students presented higher grades than the male and the students had higher grades in qualitative disciplines and those specific to the course.

Kamal, Asrar, Younes, and Chishti (2014) developed a study in Asia and analyzed some factors that could be related to students' low performance. One of the factors analyzed was the students' economic profile, which demonstrated a statistically significant relationship with the students' performance, thus concluding that the students' "poverty" affects their performance. The explanatory variables "professors' contribution" and "parents' contribution" also indicated positive signs, suggesting that these variables influence student performance.

In summary, in the field of characteristics relevant to the individual, national, and international research has shown that age (Araújo *et al.*, 2014; Caiado & Madeira, 2002; Guney, 2009), gender (Baccaro, 2014; Campbell, 2007; Ferreira, 2015; Oliveira, 2011), income (Amaro, 2014; Kamal *et al.*, 2014; Oliveira, 2011) and previous performance (Caballero, Ruiz, Rodríguez, & Ruiz, 2015; Baccaro, 2014; Caiado & Madeira, 2002) explain the performance of students.

Considering that the characteristics and personal differences of each one are factors that can influence the students' performance (Amaro, 2014; Borges, Miranda, & Freitas, 2017; Ferreira, 2015; Uribe, Gómez, & Elorza, 2011), was elaborated the following research hypothesis: **There are statistically significant differences between the performance of students with personal factors in the educational institution.** This hypothesis was subdivided into the following:

- There are statistically significant differences between the performance of students with the way of entering the institution;
- There are statistically significant differences between students' performance with the shift and the school attended during high school;
- There are statistically significant differences between the performance of students with experience in the area and working hours;
- There are significant differences in academic performance according to extra-class hours of study;
- There are significant differences in academic performance according to students' gender, age group, and marital status;
- There are significant differences in academic performance according to the number of family members and the education level of the person in charge; and
- There are significant differences in academic performance according to family economic participation and family income.

As for institutional factors (internal environment, structure, technical system, CPP, and strategy of the teaching staff), Paiva and Lourenço (2011) highlight the importance of an environment in which students feel comfortable and safe to present their ideas, and that can perceive effective progress in their learning. Furthermore, in an environment of good coexistence, the authors state that the student easily exposes his/her doubts, thus improving learning.

Regarding the internal environment, Rodrigues (2016) points out that, among the significant variables that explain the students' performance, there is the title of the coordinator and the incentive to participate in scientific initiation, in events, and in congresses, which reinforces the importance of professional qualification and the interaction between the coordination and the students.

In his study, Amaro (2014) identified a statistically positive and significant relationship between the "internal environment" factor and the students' performance. On the other hand, Borges (2016) sought to verify this same relationship and concluded that the hypothesis could not be tested, suggesting adjustments in the construct for future analysis. With this, through the students' perception, given the attention received by them from the department head, course coordinator, teaching staff, and employees, the following research hypothesis was elaborated: **There is a statistically positive and significant influence of the "internal environment" factor on the academic performance of students**.

Some facilities are essential to facilitate student learning, which include physical resources, such as adequate classrooms, laboratories, libraries, bathrooms, equipment, conveniences, offices, real estate items, etc. (in proper conditions of use) (Andriola, 2009; Ayeni & Adelabu, 2012). Although Andriola (2009) observed that the educational environment (classrooms, libraries, laboratories, work, and study environments) influences students' performance, Amaro (2014) and Borges (2016) did not find any statistically positive influence of the factor structure in the performance of students.

Hill and Epps (2010) also analyzed the classroom environment's influence on Administration students' perceptions and their satisfaction with the structure. Two hundred thirty-seven students answered the questionnaire. Although the students evaluated the use of the course and classroom learning as positive when the infrastructure is adequate, the authors analyzed the grades expected in the course. They concluded that the characteristics of the environment did not affect performance. Considering the importance of an adequate environment, the following hypothesis was elaborated: **There is a statistically positive and significant influence of the "structure" factor on the students' performance**.

Another factor that significantly affects the educational environment is technology (Douglass, 2005; Stoll, Fink, & Earl, 2005), which can be positively related to student achievement, including performance (Hurst, 2005). Stoll *et al.* (2005) consider that technology combined with research and critical analysis skills becomes an important tool for the learning process and encourages students to explore and understand the world around them.

There are technology integration areas that positively affect students' performance from educational institutions (Amaro, 2014). This effect can be seen in four areas of technology integration that must be tested, which are (i) teaching and learning; (ii) professional development of educators; (iii) administration and support; and (iv) infrastructure (Weathersbee, 2008; Amaro, 2014). Amaro (2014) found a statistically significant influence between the technical system and student performance, while Borges (2016) found no relationship. Thus, the following hypothesis was elaborated: **There is a statistically positive and significant influence of the "technical system" factor on the students' performance**.

Another element that deserves to be highlighted is the CPP, which presents relevant aspects related to the educational institution, such as: academic policies directed to the teaching of Undergraduate and Postgraduate Studies; the incentive to research and extension; adequacy of the contents taught; pedagogical methods oriented to instruct; and learning assessment systems (Soares, 2002; Andriola, 2009). The strategies developed in the CPP are related to the appropriate use of technological, financial, physical, and human resources to avoid institutional problems (Amaro, 2014).

Borges (2016) identified a positive relationship between the "CPP" factor and student performance. Amaro (2014) also pointed out a statistically positive and significant influence between the same factors. From this, the following hypothesis was elaborated: **There is a statistically positive and significant influence of the "CPP" factor on the students' performance**.

Professors must consider the educational and material resources needed for instruction in various disciplines, both quantitative and qualitative (Andriola, 2009). Also, professors' teaching tools and strategies must motivate and involve students for learning (Mazzioni, 2013). The professor's performance in the classroom, his/her qualification, the way of conducting the class,

and the mastery of the content taught can influence the performance of the students (Miranda, 2011; Amaro, 2014). Borges (2016) found the influence of the factor "strategy of the teaching staff" on student performance, while Amaro (2014) concluded that there is no influence. The contradictory results lead to the hypothesis: **There is a statistically positive and significant influence of the factor "strategy of the teaching staff" on the students' performance**.

Table 2 presents the results of some more national and international studies that addressed the influence of personal and/or institutional factors on student performance. In the third column are the studies' findings, that is, the variables that influenced performance. Among them, the personal factors of the students stand out, such as gender and shift. However, other variables, not much explored, also explain performance, such as, for example, participation in academic activities (scientific initiation, junior enterprise, tutoring), attributes of the course coordination, and whether or it is a quota student.

Table 2
Summary of studies

Author(s) (Year), Country	Objective	Variables that influence performance
Oliveira (2011), Brazil	Examine the factors that influence students' academic performance at the Federal University of Paraíba (UFPB).	Gender, high school, family income, parental education level, work, and marital status.
Miranda (2011), Brazil	Investigate the relationship between student performance and professor qualification (academic, professional, and pedagogical) in Accounting.	Academic professor qualification (professor preparation for research).
Baccaro (2014), Brazil	Analyze the relationship between entrance exam performance and students' academic performance at a public university in São Paulo.	Performance in entrance exams, gender, ethnicity, number of possessions, elementary school, high school, and number of entrance exams.
Ferreira (2015), Brazil	Identify the significant variables in the explanation of the Enade 2012 result in Accounting Sciences.	Student level: gender, marital status, ethnicity, income, scholarship, the form of entry, mother's education, high school (public or private), type of high school (traditional or professional), number of books, hours studied, scientific initiation, monitoring, extension activities; and Institution level: HEI administrative category, region, number of graduates participating in Enade, the grade of freshmen (through the National High School Exam (ENEM)), percentage of masters, percentage of infrastructure, and percentage of didactic-pedagogical organization.
Pereira (2017), Brazil	Investigate whether there is a difference in academic performance between quota students and non-quota students at the conclusion of the undergraduate course at federal universities in the Northeast region at Enade.	Social quotas.
Borges (2017), Brazil	Analyze the relationship between academic performance and motivation of students in the Accounting course at a public university.	Shift, participation in academic activities (scientific initiation, junior enterprise, tutoring), and work.
Caiado and Madeira (2002), Portugal	Determine the relevant demographic and academic factors in the final grade of the Accounting course.	Age and grade of the entrance exam.

Win and Miller (2005), Australia	Examine the factors that influence university students' academic performance, focusing on the role of background and school factors.	High schools and student characteristics.
Arquero, Byrne, Flood, and Gonzalez (2009), Spain	Analyze the influence of intrinsic and vocational factors on academic performance in the first module of Accounting.	Gender, interest in Accounting, experience of the discipline at school, academic self-confidence, and university access rates.
Garkaz, Banimahd and Esmaeili (2011), Iran	Study what factors can affect academic performance.	Gender, type of diploma, and work.
Uribe *et al.* (2011), Colombia	Identify the factors that may be associated with the loss of student status due to poor academic performance.	Gender, shift, high school, housing, and form of entry.
Ballester (2012), Spain	Examine the effect of demographic, institutional, economic, and academic factors on students' academic performance.	University access grade, course the student is taking, gender, disciplines previously attended, the professor's stay at the university, and shift.
Wentworth and Middleton (2014), United States	Investigate the use of technology, gender, and employment status in academic performance.	Gender and work.
Chies, Graziosi and Pauli (2014), Italy	Analyze the factors that influence dropout in the second year of the bachelor's degree at the University of Trieste.	Gender and work.

Source: Prepared by the authors.

3 METHODOLOGY

3.1 Ethical Procedures

According to Resolution No. 466, of December 12, 2012, of the National Health Council (CNS), research involving human beings must respect the relevant ethical and scientific foundations. Thus, with respect to the participants and their autonomy, the study was submitted to a **Permanent Research Ethics Committee** with **Human Beings** (Copep).

The required documents (research project, research brochure, questionnaire, authorization from the department in which the research would be carried out, authorization from the Department of Academic Affairs (DAA) for the use of grades, Free and Informed Consent Form (FICF), among others) were submitted through Plataforma Brasil. This work was approved in its first version and had its final opinion No. 3,092,395.

3.2 Research Characterization and Methodological Aspects

As for the objectives, this research is characterized as descriptive, and, about procedures, it is defined as a *survey.* The data were collected by applying a research questionnaire in person with the students of the Accounting Sciences course of an HEI in Paraná.

For data collection, two research questionnaires were used. The first instrument is the KLSI v. 3.1, administered by Hay Group®. The company has the right to use the instrument, and, to obtain it for this study, contact was made with Hay Group® by email. After filling in the forms required by the organization, such as information about the research and submission of the

curriculum, the investigation was approved by the commission, and those responsible sent the instrument translated and revised in Portuguese.

It is an instrument that describes how the individual learns and deals with the circumstances of everyday life, consisting of 12 phrases with a choice of endings, that is, the respondent classifies the endings for each of the sentences as best matches the learning mode. From recent situations in which the interviewee had to learn something new, he/she makes the classification "4" at the end of the sentence that describes how he/she learns best, until "1" at the end of the sentence that looks less like the way of learning. After the classification, the respondent fills in the values he/she assigned in each sentence and adds them up.

Therefore, as explained in the "Theoretical Reference" in "Learning Styles", in addition to allowing the identification between being concrete or abstract and between being active or reflective, this instrument enables the identification of individual learning styles (diverging, accommodating, assimilating, and converging) through the graph showing the experiential learning cycle (Figure 1) (Kolb & Kolb 2008; McCarthy, 2010).

The second questionnaire, adapted from the study by Amaro (2014), has five questions on the Likert Scale with an interval of 11 points (score from 0 to 10), and each one represents a factor analyzed: internal environment; structure; technical system; PPC strategy; and faculty strategy. Also, there are also two more questions, one for dedication to the course and another for self-assessment (performance), as well as questions that relate to the respondent characterization. It is important to highlight that, for the student's performance, the grades provided by the university were used.

To analyze the average time to answer the questionnaire, make changes, and improve the language of the questions, a pre-test was made with 13 volunteers, who are students of the 2nd, 3rd, and 4th years of the Undergraduate course in Accounting, but who did not participate in the final sample of the research. The students answered the questionnaire in an average time of 15 minutes. During the application, the students made suggestions regarding the language used in the learning style block, recommending putting a less formal explanatory text to improve understanding. In the question about "experience in the area", they suggested adding an alternative for those who had less than a year of experience and, in the question about "working hours", they suggested changing "work eventually" to "work sometimes".

With the pre-test data collected, the reliability test (Cronbach's alpha) was performed on the Likert scale questions, using the Stata MP-64 software. This test varies from 0 to 1, with values above 0.70 considered acceptable (Hair, Black, Babin, Anderson, & Tatham, 2005). The value found for Cronbach's alpha was 0.9081, above the required parameter, reinforcing the research instrument's reliability.

After the pre-test, the questionnaires were applied to students of the 2nd, 3rd, and 4th years, considering that they are the ones who attended the disciplines that represent the highest failure rates, being: Accounting Laboratory; Accounting and Cost Analysis; Accounting and Government Budget I; General Accounting I; General Accounting II; Preparation of Financial Statements; and Introduction to Accounting Research. Two hundred twenty-nine valid responses were obtained.

To obtain the students' grades, it was necessary to request it from the DAA, which was carried out personally by the researchers through a written request and with an annex of the approval opinion by the Research Ethics Committee (REC). After the director's approval, a meeting was held with the heads of the HEI Data Processing Center (NPD) to answer questions regarding collection and research. Finally, the data with the students' grades were received via e-mail.

The data obtained were entered into an Excel® spreadsheet and analyzed statistically with the aid of the software Statistica version 13.2 single user and Stata MP-64. Initially, the reliability test (Cronbach's Alpha) was performed on the Likert Scale questions for each campus (the HEI works on two campuses, I and II). This test ranges from 0 to 1, with values above 0.70 considered acceptable (Hair *et al.*, 2005). The value found for Cronbach's Alpha in the Campus I database questions was 0.9105 and, in the Campus II, it was 0.9004, both above the required parameter.

Descriptive statistics was used to describe a population data set (Triola, 2012). Initially, the descriptive measures were calculated: mean; standard deviation for quantitative variables (age and year of the course); and single and double entry frequency tables for qualitative variables (gender, marital status, working hours, high school, etc.).

In the questions on the Likert Scale (institutional factors), confirmatory factor analysis was performed to test the constructs' validity. Factors with a coefficient greater than 0.5 showed convergent validity, while those with a lower coefficient were excluded and analyzed in isolation. Also, to analyze the significance of the factorial loads, the command for adjusting the model equation was made. From this, the reliability test was performed on each research construct, with values above 0.70 considered acceptable.

In the General Accounting I discipline, only the factors "structure", "CPP," and "strategy of the teaching staff" went through the regression model, as they presented reliability indexes above 0.70. The remaining items were added to the model in isolation. In the disciplines of General Accounting II, Introduction to Accounting Research, Accounting Laboratory, Public Accounting and Government Budget I, and Accounting and Cost Analysis, the factors "structure", "technical system (CPP)" and "strategy of the teaching staff" presented reliability indexes above 0.70. Only in the discipline of Preparation of Financial Statements, all factors (internal environment, structure, technical system, strategy of the teaching staff, and CPP) presented reliability indexes above 0.70.

After performing the confirmatory factor analysis, identifying the significance and the reliability of each construct, the quantitative variables were transformed into dummy variables to be grouped within the regression model. The first regression model was composed of all the explanatory variables (institutional factors, personal factors, and learning styles), to verify their possible relations on the dependent variable (final grade in the discipline). However, each regression model has been refined and adjusted.

To refine each regression model (one for each discipline), it was observed, through the first regression model, which variables were less significant ($p > 10\%$), which were gradually excluded because what could previously appear to be less significant with the exclusion of a variant, may be significant at this stage.

Considering that the study addresses the influence of personal, institutional factors, and learning styles on students' performance, the following variables were defined (dependent and independent):

- Dependent (y): student performance, measured from the grade of the disciplines with the highest failure rate;
- Independent (x): personal factors, which are the characteristics of the students (form of admission, shift, year of the course, high school, marital status, experience in the area, hours of extra-class study, gender, age, working hours, family members, housing, education level of the person in charge, family economic participation, and family income);
- Independent (x): institutional factors, which refer to the educational institution (structure, technical system, course strategy (CPP), and course strategy (teaching staff)); and
- Independent (x): students' learning styles identified from LSI Version 3.1, by David A. Kolb.

Table 3 presents the tested hypotheses, retrieved from the theoretical framework, and the expected relationship on student performance.

Table 3
Tested hypotheses

	Hypothesis	Expected relationship
H1	There are statistically significant differences between student performance and personal factors in the educational institution.	
H1a	There are statistically significant differences between the performance of students and the way of entering the institution.	
H1b	There are statistically significant differences between student performance and the shift and school attended during high school.	
H1c	There are statistically significant differences between student performance and experience in the field and working hours.	+/-
H1d	There are significant differences in academic performance according to extra-class hours of study.	
H1e	There are significant differences in academic performance according to gender, age group, and marital status of students.	
H1f	There are significant differences in academic performance according to the number of family members and the education level of the person in charge.	
H1g	There are significant differences in academic performance according to family economic participation and family income.	
H2	There is a statistically positive and significant influence of the "internal environment" factor on student performance.	+/-
H3	There is a statistically positive and significant influence of the "structure" factor on student performance.	-
H4	There is a statistically positive and significant influence of the "technical system" factor on student performance.	+
H5	There is a statistically positive and significant influence of the "CPP" factor on student performance.	+
H6	There is a statistically positive and significant influence of the factor "strategy of the teaching staff" on student performance.	+/-
H7	There is a statistically positive and significant influence of learning styles on student performance.	+

Source: Prepared by the authors.

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Descriptive Analysis

The first part of the study concerns the respondent's characterization. Out of the 229 students participating in the research, 105 are from the 2nd year, 62 from the 3rd year, and 62 from the 4th year of the Undergraduate course. There are three ways to enter HEI: (i) taking the entrance exam and applying for one of the universal vacancies; (ii) through a vacancy reserved for social quotas; and (iii) by PAS, a process by which the student takes a test at the end of the 1st, 2nd and 3rd years of high school. Out of the 229 students, 68.6% (n = 157) entered through universal vacancies, 21% (n = 48) entered through PAS and the rest, 10.5% (n = 24) of students, were approved through social quotas.

As for gender, 58% (n = 133) are female and 42% (n = 96), male. Regarding the respondents' age group, the predominance profile was the age between 18 and 23 years old, approximately 78% (n = 179) of the total sample. In comparison, only 6.1% (n = 14) correspond to students who are over 30 years old. Regarding high school education, the majority of students were trained in a public school 73.4% (n = 168), 21.8% (n = 50) studied in a private school, while the others, 4.8% (n = 11), took part in a public school and another in a private school.

Out of the 229 students, 47.2% (n = 108) work full time (44 hours per week). For extra-class hours, 38.9% (n = 89) and 32.5% (n = 75) responded to dedicate 1 to 2 hours and 3 to 5 hours, respectively. Most of the students 46.3% (n = 106) answered that they live with up to four people and 55.5% (n = 127) live in their own and paid home. As for experience, 37.6% (n = 86) of the respondents have no experience in the Accounting area.

The following item presents an analysis of the learning preferences identified.

4.2 Learning Dimensions

The weights attributed by students in the alternatives found in the ILS are added up and represent four indexes: CE; RO; AC; and AE. Learning preferences are indicated by combining the AC × CE and AE × RO scores, resulting in two learning dimensions, which will indicate whether the student has a converging, diverging, assimilating, or accommodating style.

After analyzing the frequency in each phase of the learning cycle, it was noted that for the students of Campus I, there is no broad difference between the ways of capturing the experience of CA (thinking) and CE (experimenting), since 58% (n = 45) learn by thinking and the others, 42% (n = 33), by experimenting. For Campus II, this difference was greater since AC learning mode was predominant for 81% (n = 123) of students, while only 19% (n = 28) demonstrated that they tend to capture information by CE.

Another frequency observed is the dimension of the transformation of experience, which is characterized by reflexive observation (observing) and active experimentation (doing). Both on Campus I and Campus II, there was a predominance of reflective observation, which demonstrates that the majority observes before making a judgment. In a learning situation, the student tends to be patient and objective (Cerqueira, 2000; Kolb & Kolb, 1984). In a learning environment, he/she prefers to discuss the content, questions that generate reflection, and rhetorical questions (Svinicki & Dixon, 1987).

Similar to this study's findings, Nogueira (2009) also found the predominance of reflective observation (78% of cases) when analyzing the transformation dimension in his sample.

As much as learning is formed by the four skills, due to life experiences, environmental and genetic demands, individuals develop a dominant way in each of the dimensions and, when using certain skills more than the others, they determine the learning style (Kolb & Kolb, 2008; Leitão, 2006). Therefore, it is discussed below about identifying the students' learning styles that make up the research sample.

4.3 Learning Styles

After identifying the dimensions of AC × CE and AE × RO, it was possible to identify (using the learning style determination graph) the assimilating learning style on both campuses. Second, the style most frequently identified was diverging. However, in Campus II, this difference was small, considering that students on this campus tend to be assimilators and divergent. The accommodating style is the one that occurs less frequently (32 students) among the 229 students in the sample.

Although Kolb and Kolb (2008) presented some studies, such as Clarke (1977), Jervis (1983), Rowe and Waters (1992), and Loo (2002), who concluded that accountants tend to be convergent, the results found in this research were different. Still, they are in line with the study by Cerqueira (2000), in which the author identified the predominance of the assimilation style in students in Applied Social Sciences. The studies by Nogueira (2009) and Hamann (2011) also identified the predominant assimilating learning style among Accounting students, and the less frequent as accommodating.

The predominance of the assimilating style, both for this research and those previously mentioned, may be due to the respondents' age range (predominantly generation Z, of digital natives), due to the characteristics of less focused on people and more focused on ideas. While the

oldest studies (predominantly Generation X) presented the convergent profile "more focused on testing theories".

Likewise, Santos *et al.* (2014) observed that the assimilating profile is dominant among Accounting students at the Undergraduate, Specialization, and also at the Master's courses, as well as Yanardöner *et al.* (2014) identified this profile among students at the University of Istanbul.

However, in the analysis of the Accounting Laboratory Discipline, converging students obtained the best means. Also, the study by Lizote, Alves, Teston, and Olm (2019), which used both the VARK and Kolb method to identify how students concentrate, absorb, and transform the information received into knowledge, in 257 students of the Accounting course of a community university in southern Brazil, there was a predominance of the converging style (43.6%), followed by the assimilating (40.1%), while the diverging was the least representative in the sample.

When analyzing the two learning styles prevalent in the sample**,** assimilating and **diverging**, together, represent 67% of students. As recommended by Polat *et al.* (2015), professors should be informed about learning styles so that they can organize themselves in the educational environment to determine teaching methods, approaches, and materials, so that students can make better use of the exposed content and increase the level of learning.

Assimilators are less focused on people and more focused on ideas, prefer lectures, enjoy reading, and mainly think about analytical models and things (Kolb, 1984; Kolb & Kolb, 2005). They are better at understanding a lot of information and putting it concisely and logically, being more interesting, for them, the logical meaning of a theory than its application in practice (Kolb, 1984; Cerqueira, 2000; Kolb & Kolb, 2005). As for the **divergent**, one of its predominant characteristics is the imaginative capacity, generation of ideas (Kolb & Kolb, 2005). Also, they like to collect information, like to work in groups, and get involved with people, that is, they do not appreciate individual studies (Kolb, 1984; Cerqueira, 2000; Kolb & Kolb, 2005).

When preparing their classes and teaching techniques, professors should consider the various learning styles and the different characteristics of students (Yanardöner *et al.*, 2014). However, considering that, in this sample, students tend to be assimilating and diverging, it is suggested that teaching professionals work with texts that generate reflections on the discipline addressed and encourage group discussions (Nogueira, 2009).

4.4 Interpretation of Results

After refining the regression model (Table 4) in each of the disciplines, considering a significance level of 5% ($p < 0.05$) and, in some cases, 10% (p 0.10), through Table 5, it is possible to observe the analyzed disciplines, the number of respondents for each discipline and a summary of the results and relationships found.

Table 4
Regression model of the disciplines

Introduction to Accounting Research						
N = 201	F(8, 192) = 6.33	Prob > F = 0	R² = 0.2088		Adj R² = 0.1759	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Modernity of computer labs	0.1460461	0.0541096	2.7	0.008*	0.0393206	0.252772
Marital status (others)	− 3.183896	0.8084596	− 3.94	0.000*	− 4.778499	− 1.58929
Age group (18 to 23 years)	0.9473494	0.3632748	2.61	0.010*	0.2308274	1.663871
Extra-class hours (1 to 2 hours)	0.9633127	0.3397964	2.83	0.005*	0.2930994	1.633526
Extra-class hours (3 to 5 hours)	1.123278	0.3479033	3.23	0.001*	0.4370746	1.809481

	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Extra-class hours (9 to 10 hours)	1.168487	0.6650796	1.76	0.081**	− 0.1433139	2.480288
Family economic participation (work and contribution)	− 0.6735983	0.2813676	− 2.39	0.018*	− 1.228567	− 0.11863
Experience in the area (7 to 12 months)	− 0.8594588	0.3311054	− 2.6	0.010*	− 1.51253	− 0.20639
_cons	5.139563	0.4886866	10.52	0.000	4.17568	6.103447

Accounting Laboratory						
N = 119	F (10, 108) = 4.20	Prob > F = 0		R² = 0.2799	Adj R² = 0.2132	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Age group (18 to 23 years)	1.157909	0.4558853	2.54	0.013*	0.2542653	2.061553
Family members (up to two)	2.036629	0.8382225	2.43	0.017*	0.3751267	3.698132
Family members (up to four)	1.8066	0.8265075	2.19	0.031*	0.1683183	3.444881
Family members (up to six)	2.190009	1.140087	1.92	0.057*	− 0.0698406	4.444881
Family members (none)	3.228369	1.080262	2.99	0.003*	1.087101	5.369636
Extra-class hours (1 to 2)	1.380867	0.5110409	2.70	0.008*	0.3678949	2.393838
Extra-class hours (3 to 5)	1.557555	0.5563431	2.80	0.006*	0.4547867	2.660324
Extra-class hours (9 to 10)	2.099085	0.9059322	2.32	0.022*	0.3033698	3.894799
Shift (morning)	− 0.9975016	0.416582	− 2.39	0.018*	− 1.823239	− 0.1717637
Learning styles (convergent)	1.272771	0.4877795	2.61	0.010*	0.3059077	2.239635
_cons	2.495575	1.054162	2.37	0.020	0.4060442	4.585106

General Accounting I						
N = 207	F(13, 193) = 5.02	Prob > F = 0		R² = 0.2528	Adj R² = 0.2025	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Course Coordinator	0.1848595	0.0604471	3.06	0.003*	0.0656377	0.3040813
Marital status (others)	2.79434	1.048035	2.67	0.008*	0.7272676	4.861412
Age group (30 years or older)	− 2.017084	0.6396958	− 3.15	0.002*	− 3.278776	− 0.7553915
Work between 20 and 44 hours	1.275661	0.4788487	2.66	0.008*	0.3312123	2.220109
Work up to 20 hours	0.6467535	0.3052339	2.12	0.035*	0.0447309	1.248776
Don't work	2.652982	1.197011	2.22	0.028*	0.2920785	5.013885
High school (mostly private school)	− 1.925024	0.849037	− 2.27	0.024*	− 3.599606	− 0.2504412
High school (all in private school)	-0.6519375	0.331003	− 1.97	0.050*	− 1.304785	0.0009103
Family members (other people)	0.9605503	0.2706431	3.55	0.000*	0.4267524	1.494348
Extra-class hours (1 to 2 hours)	1.060203	0.332818	3.19	0.002*	0.4037754	1.71663
Extra-class hours (3 to 5 hours)	0.7522331	0.3407032	2.21	0.028*	0.0802534	1.424213
Extra-class hours (more than 10)	1.972733	0.8891512	2.22	0.028*	0.2190318	3.726434

Economic participation in the family (does not work)	− 3.044286	1.128275	− 2.70	0.008*	− 5.269617	− 0.8189539
_cons	4.408631	0.5469941	8.06	0.000	3.329778	5.487485

General Accounting II						
N = 205	F(8, 196) = 6.01	Prob > F = 0	R² = 0.1970		Adj R² = 0.1642	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Marital status (divorced)	− 3.695815	0.9549331	− 3.87	0.000*	− 5.579078	− 1.812552
Age group (18 to 23 years)	0.9490084	0.3780129	2.51	0.013*	0.2035135	1.694503
Extra-class hours (1 to 2 hours)	1.116422	0.4231323	2.64	0.009*	0.2819449	1.950898
Extra-class hours (3 to 5 hours)	0.9631416	0.4243381	2.27	0.024*	0.1262869	1.799996
Extra-class hours (6 to 9 hours)	1.467306	0.563508	2.60	0.010*	0.3559883	2.578623
Extra-class hours (9 to 10 hours)	2.001989	0.6758087	2.96	0.003*	0.6691987	3.334779
Extra-class hours (more than 10)	1.76612	0.9411994	1.88	0.062**	− 0.090058	3.622298
Shift (morning)	− 1.552596	0.4380105	− 3.54	0.000*	− 2.416414	− 0.6887773
_cons	5.494277	0.5183803	10.60	0.0000	4.471958	6.516596

Preparation of Financial Statements						
N = 137	F(7, 129) = 13.44	Prob > F = 0	R² = 0.4218		Adj R² = 0.3904	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Marital status (divorced)	− 6.811812	1.443535	− 5.14	0.000*	− 9.667881	− 3.955744
Age group (30 years or older)	− 2.351504	0.613638	− 3.77	0.000*	− 3.565602	− 1.137407
Age group (18 to 23 years)	0.5771031	0.3284244	2.03	0.081**	− 0.072693	1.226899
Family members (more than six)	− 1.307851	0.7369242	− 1.67	0.078**	− 2.765874	0.1501712
Extra-class hours (more than 10)	2.125389	1.031725	1.87	0.041*	0.0840949	4.166682
Housing (rented)	− 0.8406243	0.3773876	− 2.45	0.028*	− 1.587295	− 0.0939537
Shift (morning)	1.227152	0.2727392	3.77	0.000*	0.6875305	1.766773
_cons	6.811812	0.3274054	18.92	0.000	6.164032	7.459592

Accounting and Cost Analysis						
N = 214	F(11, 202) = 7.15	Prob > F = 0	R² = 0.2803		Adj R² = 0.2411	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Course Pedagogical Project (PPC)	0.1569003	0.0843458	1.86	0.064**	− 0.0094109	0.3232114
Marital status: Married	0.9489049	0.4910489	1.93	0.055*	− 0.0193342	1.917144
Works up to 20 hours	1.006346	0.4396003	2.29	0.023*	0.1395518	1.87314
Family members (more than six)	− 3.605915	1.970406	− 1.83	0.069**	− 7.491117	0.2792872
Extra-class hours (1 to 2 hours)	3.097234	0.4539814	6.82	0.000*	2.202084	3.992384
Extra-class hours (3 to 5 hours)	3.084516	0.4615169	6.68	0.000*	2.174508	3.994525
Extra-class hours (6 to 9 hours)	2.940108	0.6175343	4.76	0.000*	1.722467	4.157748
Extra-class hours (9 to 10 hours)	3.380192	0.7992022	4.23	0.000*	1.804343	4.956041

Extra-class hours (more than 10)	4.355798	0.8827046	4.93	0.000*	2.6153302	6.096295
Family income (11 minimum wages or more)	3.496865	0.9541571	3.66	0.000*	1.61548	5.37825
Family income (4 to 5 minimum wages)	0.7099703	0.3014059	2.36	0.019*	0.115665	1.304276
_cons	3.39504	0.4157339	8.17	0.000	2.575306	4.214775

Public Accounting and Government Budget I						
N = 224	F(10, 213) = 7.01	Prob > F = 0	Adj R² = 0.2476		Adj R² = 0.2122	
Grade in the Discipline	Coef.	Std. Err.	T	P	[95% Conf. Interval]	
Age group (30 years or older)	− 1.42954	0.5563848	− 2.57	0.011*	− 2.526266	− 0.3328146
Working hours (up to 20 hours)	1.343262	0.3696094	3.63	0.000*	0.6147008	2.071822
Extra-class hours (1 to 2 hours)	1.965355	0.4078865	4.82	0.000*	1.161344	2.769366
Extra-class hours (3 to 5 hours)	2.331662	0.4142418	5.63	0.000*	1.515124	3.148201
Extra-class hours (6 to 9 hours)	1.694095	0.6066473	2.79	0.006*	0.498294	2.889897
Extra-class hours (9 to 10 hours)	2.807454	0.8178684	3.43	0.001*	1.195301	4.419606
Extra-class hours (more than 10)	2.692951	0.8130797	3.31	0.001*	1.090237	4.295664
Housing (rented)	0.8024543	0.3646553	2.2	0.029*	0.083659	1.52125
Experience in the area (2 years)	0.6706518	0.3459859	1.94	0.054*	− 0.011343	1.352647
Family income (11 minimum wages or more)	1.823306	0.6052008	3.01	0.003*	0.6303562	3.016256
_cons	4.668412	0.3769181	12.39	0.000	3.925445	5.41138

Note. * 95% confidence; ** 90% confidence.
Coeff = Coefficient, Std. ERR = Standard Error, Conf. Interval = Confidence Intervals

Table 5
Results summary

Discipline	N	Results Interpretation
Introduction to Accounting Research	201	**a) modern computer labs:** positive relationship, the better the lab, the better the performance; **b) marital status:** students with "single" and "married" status tend to have the best performance; **c) age group:** students who are between 18 and 23 years old have higher averages than those of other ages; **d) extra-class hours:** students who study at least one to two or three to five extra-class hours showed a better performance than those who do not study any; **e) family economic participation:** students who work and contribute to the family economy tend to underperform others; **f) experience in the area:** students with experience in the area of seven to 12 months were those who obtained the lowest performance.
General Accounting I	207	**a) course coordinator:** positive relationship, the better the attention received from the coordination, the better the students' performance; **b) marital status:** students who answered "others" to the question about marital status performed better than other groups; **c) age group:** students aged 30 or over tend to underperform; **d) working hours: students who do not work** tend to have the lowest performance; **e) high school:** students who attended all or most of the high school in a private school tend to have the lowest performance; **f) family members:** students who live with other people, who are not family members, tend to have the best performance; **g) extra-class hours:** students who do not study any extra-class hours tend to perform poorly; **h) economic participation in the family:** students who do not work and receive financial aid tend to have the lowest performance.

General accounting II	205	a) **marital status:** divorced students tend to have the lowest performance; b) **age group:** younger students (18 to 23) tend to perform better than the others; c) **extra-class hours:** students who do not study any extra-class hours tend to perform poorly; d) **shift:** night students tend to perform better than the morning students.
Preparation of Financial Statements	137	a) **marital status:** divorced students tend to have the lowest performance; b) **age group:** students aged 30 years or more tend to have an inferior performance while students who are between 18 and 23 years old have higher averages than those of other ages; c) **extra-class hours:** students who dedicate more than 10 hours tend to have the best performance; d) **shift:** morning students tend to have the best averages; e) **family members:** students who live with more than six people tend to underperform others.
Accounting and Cost Analysis	214	a) **pedagogical course design (CPP):** positive relationship, students with the best grades in this discipline tend to evaluate CPP better; b) **marital status:** married students were the ones who had the best averages; c) **working hours:** students who work 20 hours a week tend to outperform those who work full time (44 hours a week); d) **family members:** students who live with more than six people tend to underperform others; e) **extra-class hours:** students who do not study any extra-class hours tend to perform poorly; f) **family income:** students whose family income is five minimum wages or 11 minimum wages or more tend to perform better.
Public Accounting and Government Budget I	224	a) **age group:** students aged 30 and over tend to underperform; b) **working hours:** students who work 20 hours a week tend to outperform those who work full time (44 hours a week); c) **extra-class hours:** students who do not study any extra-class hours tend to perform poorly; d) **housing:** students residing in rented homes tend to perform better; e) **experience in the field:** students who have two-year experience in the field tend to have the best performance; f) **family income:** students whose family income is 11 minimum wages or more tend to have the best performance.
Accounting Laboratory	119	a) **age group:** students who are between 18 and 23 years old have higher averages than those of other ages; b) **family members:** students who live with more than six people tend to underperform the others; c) **extra-class hours:** students who do not study any extra-class hours tend to perform poorly; d) **shift:** night students tend to outperform the morning students; e) **learning styles:** convergent style students obtained the best averages.

4.5 Discussion of the Hypothesis Test

Based on the results, it is possible to accept the first hypothesis of the research partially, as there is a statistically significant relationship between student performance and personal factors: shift; high school; marital status; experience in the area; hours of extra class study; age group; working hours; members of the family; home; family economic participation; and family income. The other factors –form of admission, gender, and level of education of the person in charge – did not indicate any influence on students' academic performance in any of the disciplines analyzed.

The results reinforce the findings of: Amaro (2014), which indicate that there are significant relationships between student performance, **monthly family income,** and extra-class **hours of study**; those by Win and Miller (2005) and Borges *et al.* (2017), who identified that the **shift** interferes in the students' performance; and by Uribe *et al.* (2011), who state that **housing** interferes with students' grades. Students who have a better family income tend to have the best grades, but students who live on rent also performed better, making the relationship with income contradictory. Therefore, further research on this factor is recommended.

Concerning the shift, night students showed a better performance. However, students from two campuses were analyzed, one of whom (Campus II) only offers vacancies for the night period. Thus, only Campus I has students enrolled in the morning, which suggests further investigations to confirm this finding. Generally, night students are expected to perform less than day students. Still, many night students work during the day in accounting activities, helping the relationship

between theory and practice. As shown in the descriptive statistics, out of the 229 students, 47.2% (n = 108) work full time. Therefore, they are night shift students.

Even though Amaro (2014) and Caiado and Madeira (2002) did not identify significant relationships between the variables **"experience in the area ", "high school,"** and **"family members"** and the students' performance, in this study, it was identified a significant relationship between these variables and the students' grade, which suggests new research. Students who have experience in the Accounting area demonstrated superior performance to those who never had practical contact with the profession, reinforcing the result of the relationship between the night shift and performance, that is, many night students work in activities in the Accounting area.

Students who studied part or all the high school in a private school showed lower performance than the others. That is, in this study, it was confirmed that public school students had better performance. For Baccaro (2014), the fact that they enter a recognized public university, which is the case of the university where the study is being conducted, they strive and seek high academic performance. However, this result is also contradictory to the family income variable. Still, it is in line with the housing variable, considering that students who study in public schools and live in rent have a lower income. Therefore, these results require further studies.

Students who live with other people who are not their family performed better, while students who live with six or more people tend to perform poorly. This result can be explained by the fact that the university where the study was conducted received students from other cities and other states. These students usually rent houses with other students. This situation of living with strangers, being away from the family, and having expenses to support themselves (housing, food, travel, etc.) can cause a feeling of obligation to obtain positive learning results.

Although Ferreira (2015) identified in his study that students entering through some other policy than the traditional selection process tend to perform better than the others, the **"form of entry into the institution"** factor did not show a statistically significant difference in the student performance in none of the disciplines analyzed. This suggests that the entry of students through social quotas does not interfere with their performance. During the application of the questionnaires and in conversations with professors from the Department of Accounting Sciences, it was evident that students entering through social policies see, in higher education, an opportunity for career and qualification.

In this study, in accordance with Amaro (2014), Guney (2009), and Papageorgiou and Halabi (2014), no significant relationship between **gender** and student performance was identified, that is, regardless of gender, students showed the same performance. Although Amaro (2014), Andrade, and Corrar (2008), and Chow (2010) identified relationships between students' performance and the **level of education of those in charge**, in this study, there was no influence of this variable in any of the disciplines.

Even though Amaro (2014) and Paiva and Lourenço (2011) identified a statistically significant influence between the variables "internal environment" and "performance", in this study, this relationship was not identified. The researchers' attention drew the fact that many students asked who the course coordinator and/or the department head was during the questionnaire's application. Therefore, many students do not even know who the course coordinator and/or the department head is and their duties. Therefore, the second hypothesis (H2) is rejected. It is noteworthy that the construct **"internal environment "** has not been validated, and with that, the factor items were analyzed in isolation within the regression model. Considering a significance level of 5% (p <0.05), it was found that the variable **"course coordinator"** influences the score of students in the General Accounting discipline I, that is, the better the attention received by the coordination, the better the student's grade.

In hypothesis 3 (H3), the objective was to verify the influence between structure and performance. The **structure** concerns the physical conditions for the operation of the Undergraduate course: adequacy of the classrooms; physical space of libraries; quality of the bibliographic collection; and modernity of computer labs. As in Borges's (2016) research, this factor did not influence the students' performance, thus rejecting the **third hypothesis**. Although

there was no positive relationship from the statistical tests, students reported that classrooms and computer labs have great inefficiency, especially in terms of technology (computers, projectors), lighting, and various materials (chairs, tables, blackboard, etc.).

From the students' reports, not foreseen in the study, but which served to understand the discipline better, each item of the factor was analyzed in isolation within the regression model. From the analysis, a statistically significant relationship was identified between the component **"modernity of computer labs"** (p = 0.008) and students' performance in the discipline **of Introduction to Accounting Research**. Under the students' perception, the better the computer lab, the better their performance, that is, it confirms the students' reports about the inefficiency of modern computer labs.

In this study, the **"technical system"** factor refers to didactic resources, teaching software, internet access, and the academic system. When testing hypothesis 4 (technical system and academic performance), it was possible to reject it, as the factor had no statistically significant influence on the students' scores in any of the disciplines analyzed. The results do not confirm the findings of: Borges (2016), who identified a relationship between the variables at a significance level of 10% (p <0.10) in students of the Accounting course; Weathersbee (2008), who analyzed the technological structure with student performance in mathematics, reading and science disciplines; and Amaro (2014), who also analyzed the influence of this factor on the performance of Accounting students. The results of this variable also need to be deepened, considering that the teaching resources can involve the student more in the learning process, improving their performance,

When hypothesis 5 (H5) was analyzed, considering a significance level of 5%, the factor did not influence the students' grades. However, as well as in the study by Borges (2016), when it increased to a level of 10%, it proved to be a factor that interferes in the students' performance in the discipline **of Accounting and Cost Analysis** (p = 0.064), with that **H5** was not rejected, that is, concerning the **Course Pedagogical Project**, the better the integration between the disciplines and the more adequate the organization and course load of each discipline offered, the better the student's performance.

Considering a significance level of 5%, the factor **"strategy of the teaching staff" (H6)** did not influence the students' grade. Thus, hypothesis 6 is rejected. This study corroborates those of Amaro (2014), who concluded, in his research, that the strategy of the teaching staff does not interfere in the students' performance. This result is strange, considering that qualification (title), mastery of the content taught, teaching practices, and interaction with students, which are important factors in the learning process, have no influence on performance. However, the research by Borges (2016) identified a negative correlation, that is, the higher the evaluation of students concerning the strategies of the teaching staff, the lower their performance, which suggests new investigations.

As for the last hypothesis (**learning styles** and performance), it was concluded that there is a statistically significant difference (p <0.05) of the **convergent** learning style in the grade of students who attended the discipline of **Accounting Laboratory**. Thus, hypothesis 7 (H7) is not rejected, as the results indicated that students of this style had higher averages than the others.

Unlike other disciplines, which are theoretical-practical and theoretical, Accounting Laboratory is the only one classified as "practical," and its techniques are congruent with the preferences of the converging learning style since the execution of practical ideas and decision making are dominant in individuals with this style, as well as having preferences in dealing with technical tasks instead of social and interpersonal issues, and they like new ideas and simulations (Kolb, 1984; Kolb & Kolb, 2005).

5 FINAL CONSIDERATIONS

Several factors influence learning, and they interrelate and end up influencing an individual's academic performance. Such factors involve students' personal internal issues, family and social issues, and even issues related to the institution the student attends (Suehiro, 2006). Another factor associated with the student's academic performance is the learning style, and identifying it makes it possible to use teaching methods and activities that stimulate the student's different preferences.

First, it was necessary to verify the influence of personal factors, specifically the students' characteristics in their academic performance. The relationship of these factors was observed in each of the disciplines analyzed, and only "form of entry", "level of education of the person in charge," and "gender" did not show statistically significant differences in the students' performance. It is worth mentioning that gender, which is a variable widely used in national and international studies, has not shown any relevance here. Many studies have shown a relationship between it and the students' grades, while studies have also been found that, like this one, did not present.

The night shift students showed statistically higher performance in the disciplines of General Accounting II and Accounting Laboratory. In contrast, the morning students showed higher averages in the discipline of Preparation of Financial Statements. Although students in the night course generally work full time, it is assumed that the time to devote to studies is less. On the other hand, these students often work in the accounting area, facilitating the relationship between theory and practice. It is concluded that there is a need for further investigations.

Marital status proved to be a variable that influences student performance in five of the seven disciplines analyzed, namely: Initiation to Accounting Research; General Accounting I; General Accounting II; Preparation of Financial Statements; Accounting; and Cost Analysis. Overall, students with divorced status had lower averages. Students whose **working** hours correspond to 44 hours per week have lower performance than students who work with a reduced workload. Also, students who are concerned with working and contributing to **family expenses** had the lowest average.

Students who attended most or all the **high school** in a private school had a statistically inferior performance compared to those who studied in a public school. In conversations with the professors of these students, they believe that students who came from public schools take the opportunity to pursue higher education, dedicate themselves more, and, consequently, perform better. Those who answered that they do not dedicate any **extra-class hours** have statistically lower scores than those who dedicate at least one extra hour per week, which shows the importance of reinforcing the content exposed in the classroom. Students who live with more than six people showed, in general, the lowest performance. Regarding the **age group**, younger students (18 to 23 years old) tend to have the best averages, and this can be explained by the fact that the student is used to the high school study routine and goes directly to college, or is a delimitation of the sample in question, which suggests further research to confirm this finding. Students whose family income is 11 minimum wages or more also had the best averages.

The influence of institutional factors was also verified. The hypothesis H5 (CPP strategy) was confirmed, indicating that CPP has a statistically significant influence on student performance, while H2 (internal environment), H3 (structure), H4 (technical system), and H6 (strategy faculty) have not been confirmed. Some studies, such as Ferreira (2015), have shown that the teaching staff has a significant relationship with students' performance, which suggests new research and investigation regarding this variable.

Finally, the influence of learning styles on students' academic performance was also verified. In the Accounting Laboratory discipline, students of the **converging** style had statistically significant higher average grades than students of the other styles. Thus, H7 is not rejected, as there was a statistically positive and significant influence of learning styles on students' grades. Based on this finding, it was possible to observe the relationship between the discipline's

characteristics and the converging style. Students of this learning style tend to prefer practical activities, a characteristic of the discipline in question. Lizote *et al.* (2019), Oliveira *et al.* (2011), and Miranda *et al.* (2007) emphasize the importance of teaching techniques appropriate to the students' learning styles.

The identification of these variables (shift, high school, marital status, experience in the area, hours of extra-class study, age group, working hours, CPP) allows the coordination of the Accounting course and professors to study strategies to improve the academic results of these disciplines, which are the ones with the highest failure rate. In the long term, it is also expected to contribute to an improvement in the Enade and Sufficiency Exam indices.

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