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Influence of Contingency Factors on the Academic Performance of Accountancy Students

Abstract

Objective: This study aimed to verify the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution (FHEI).

Method: This descriptive research with a quantitative approach of the problem was developed through a survey among the students from an FHEI in the South of Brazil, using a sample of 295 respondents.

Results: The results of the Kruskal-Wallis test appoint that, among the investigated external contingency factors, the father's instruction level, weekly hours of extraclass study and professional experience influenced the academic performance. As regards the institutional environment at the investigated FHEI, the latent variables internal environmental, technical system and strategy of the course's pedagogical project positively influenced the academic performance. The latent variables teaching staff structure and strategy did not show a statistically significant relation. These results provoked concerns and encourage construct validity tests in other institutional environments.

Conclusions: Among the external factors, the variables father's instruction level, weekly hours of extraclass study and professional experience influenced the academic performance. In the institutional environment, the constructs internal environment, technical system and strategy of the course's pedagogical project demonstrated influence on the students' academic performance at the investigated FHEI.

Keywords: Academic performance; External contingency factors: Internal contingency factors: Federal Higher Education Institutions.

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1 Introduction

Higher Education Institutions (HEIs) are constantly challenged to promote high-quality higher education. Therefore, they cannot restrict themselves to simply passing on content, but need to provide support for students to develop their own skills, competences and values in order to generate personal and professional training. The development of these skills and competences already figures on the agenda outlined in the Department of Education's Curriculum Guidelines for undergraduate courses (Silva, 2008).

To achieve this purpose, several factors that can influence the HEIs need to be considered. First, it is necessary to identify their current contingent situation, that is, how the HEI is structured to meet the possible diversities of its environment (Fagundes, Soler, Feliu, & Lavarda, 2008). Among the organizational theories that study the organizational management process, the Contingency Theory refers to this aspect. Nevertheless, no single organizational structure can be effective in all organizations, as their optimization depends on contingency factors (Donaldson, 2001).

The external factors include the variables related to the students' socioeconomic profile. The HEIs' institutional environment, then, includes the internal environment variables, among which the structure, the technical system (the technology used to conduct the course) and the course strategies are highlighted, the strategies being focused on the formulation of the Pedagogical Course Project (PCP) and faculty-related strategies. All of these factors can influence the quality of the course and the students' academic performance.

One of the results of the changes that impact these factors is that the HEIs have operated in a more competitive environment than before. HEIs need to deal with market forces, increased spending and increasingly diverse student associations (Eckel, Couturier, & Luu, 2005). Contingency theory contemplates the relationship between organizations and their environments. Organizational choice and actions are limited by internal pressures and external demands, and HEIs need to be sensitive to these factors in order to survive (Boezerooij, 2006).

According to Contingency theory, there is no single way to deal with environmental pressures (Boezerooij, 2006). For Morgan (1996), everything will depend on the type of activity or the environment the organization in dealing with and the management should be concerned with making the necessary adjustments. Donaldson (2001) emphasizes the importance of adjustments to achieve organizational effectiveness. Thus, in adopting new characteristics, organizations are shaped by contingencies (Boezerooij, 2006).

Pfeffer (2003) warns that problems arise not only because organizations depend on their environment, but also because this environment is unreliable and changes over time. Boezerooij (2006) argues that everything depends on the size of the organization, technology, the stability of its context and external hostility. The author emphasizes the importance of external and internal factors in understanding organizational behavior. Hammond (2003) points out the following influencing factors of HEIs: the political, cultural and social context, national politics, technology development, society's beliefs and expectations about objectives and methods of financing and educational support.

In view of the above, there is a field of research to be explored. Thus, the following guiding question was elaborated for this research: **What is the influence of contingency factors on the academic performance of Accountancy students?** This study aims to investigate the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution (FHEI). The academic performance, in this study, corresponds to the general average of the disciplines taken and the self-assessment of students' performance.

Verifying the influence of the contingency factors on the students' academic performance in Accounting teaching is relevant from a practical and theoretical perspective. From a practical perspective, through its investigation, administrative measures can be outlined to improve the quality of higher education in the area. The fact that Brazil is going through a convergence process with the International Accounting Standards, issued by the International Accounting Standards Board (IASB), stresses the need to rethink Accounting teaching in the Country. This research is expected to contribute to strengthen the Accountancy course at Federal Higher Education Institutions and to be useful for the investigated FHEI, its teachers and students and the community interested in the accounting area.

We also intend to offer theoretical contributions through the development of this research, particularly regarding the influence of contingency factors in Accounting teaching at HEIs. We intend to offer a theoretical construct based on Contingency Theory to advance in future research in the area. Therefore, the study's theoretical contribution refers to the development of constructs that can verify the influence of contingency factors on undergraduate Accountancy students' academic performance at Higher Education Institutions.

2 Theoretical and Empirical Framework

2.1 Contingency Factors

The end of the 1950s was marked as the beginning of the application of the idea of contingency to organizational structures. Pioneering authors, such as Burns and Stalker (1961), Woodward (1965), Lawrence and Lorsch (1967), presented their theories, with comparatives in different organizations. They found that the organizations that adapted their structures to the environment obtained better performance. Thus, studies that previously were concerned with predicting how companies and their members should organize themselves, changed to describe what happens in this process in the organizational environment (Guerra, 2007).

Under the lens of Contingency theory, the environment outlines the organizational structure so that it can match its requirements (Morgan, 1996). The environment variable directly influences the degree of change desired by the organization (internal environment), which, in turn impacts the organizational structure (Donaldson, 1999). The organizational structure, according to Chenhall (2007), refers to the formal specification of the organizational members or task forces' different roles to ensure that the organization's activities are accomplished.

Donaldson (1999, p. 106, authors' translation) explains that "each of the different aspects of the organizational structure is contingent upon one or more contingency factors". Thus, organizations need to be sensitive to so-called contingency factors (Donaldson, 2001). Chenhall (2003) points out strategy, uncertainty and technologies as contingency factors. These, in turn, reflect the influence of the environment the organization is embedded in.

According to Chenhall (2007), strategy is a mechanism by which managers are influenced by the external environment, structural mechanisms, culture and control for decision making. The perceived environmental uncertainty leads managers to outline the strategy to be used as the guiding principle of their business. The adequacy of the technology leads to a performance superior to that of organizations in which the structure is at odds (Woodward, 1965). Technology "refers to how the organization's work processes operate (the way tasks transform inputs into outputs) and includes hardware (such as machines and tools), materials, people, software and knowledge" (Chenhall, 2003, p. 139).

Donaldson (1999) argues that there is some influence of these contingencies, but also a considerable degree of choice by the managers. These choices consist of the company's option to change its strategic position against external contingencies. The author points out that, in the mid-1970s, there was an established paradigm of Structural Contingency theory. Subsequent studies could guide their efforts within this tradition and contribute to the evolution of the literature. Parallel to the criticism against the Structural Contingency theory, other approaches have emerged since the 1970s.

It is pointed out that Contingency theory always seeks to understand and explain how organizations function under different conditions. This operation takes place under the influence of the contingency factors in a wide range of organizations, including Higher Education Institutions. In this case, the study is focused on an FHEI. The contingency factors considered in this research include external factors (related to the students) and internal factors of the institutional environment (internal environment, structure, technical system and course strategies).

2.2 Influence of contingency factors in higher education

In recent decades, HEIs have undergone profound changes in their environment, affecting primary teaching and research processes, as well as their secondary processes: organization, administration and support services (Boezerooij, Van Der Wende, & Huisman, 2007). There is a whole functional logistic chain - from the attractions to the entry of new students until their departure. Therefore, it is necessary to identify the current contingent situation, that is, how the institution is structured, with a view to attending to the diversities of its surroundings (Fagundes, Soler, Feliu, & Lavarda, 2008).

Andriola (2009) emphasizes that every educational institution is inserted in a social context that strongly influences it in established relationships and this context creates both limitations and opportunities. For the author, the educational system is continuously and dynamically interacting with the social context it is immersed in. This is a basic premise of the Contingency theory, so that educational institutions need to respond to environmental contingencies to ensure their continuity.

In order to evaluate the quality of education, it is essential that factors not directly related to the school be investigated, which include, among other aspects, the socioeconomic status of the family, parents' educational level, educational resources in the home and educational activities beyond the school (Vianna, 2000). This socioeconomic profile of the students consists of external environmental factors that lie beyond the school's control.

In the case of college students, as they already have an established personality and individual differences that influence the learning process, the intellectual level, their specific skills, their previously developed knowledge, among other aspects, explain part of their performance in the institution (Gil, 2011). In order to influence external factors in higher education, we have identified some empirical studies published in Brazil and internationally, among which we highlight the studies in Figure 1.

Authors	Theme discussed and results
Caiado and Madeira (2002)	Analyzed the relation between academic performance (entry grade on admission exam) and the influence of Accountancy students' gender and professional experience at two schools in the interior of Portugal. The results revealed that the entry grades to teaching are indicators of future successful academic performance, while gender and professional experience statistically null influence on the academic performance.
Frezatti and Leite Filho (2003)	Studied the students' profile in terms of attitudes and their performance in an Accountancy discipline offered in evening education at a public university. The authors observed a positive relation between the students' behavior in and beyond the classroom and their final performance.
Freitas (2004)	Related demographic variables (color, gender, income, parents' education, secondary school) and their effect on the students' admission exam performance and course output. The research was developed at a private higher education institution, in the Human Resource Administration, Business Management, Journalism and Physical Education programs. The income variable showed a Strong influence on the academic performance. The students gaining up to five national minimum wages obtained lower mean grade than students gaining a Family income of ten or more minimum wages. The study indicated a positive correlation between income and academic performance, with higher income meaning higher scores.
Andrade and Corrar (2008)	Examined the effects of academic, demographic and economic variables (marital status, racial condition, income, work journey, father's education, mother's education, secondary school, access to informatics, number of students per class, library use, hours of extraclass study, teachers' teaching method and academic activities developed at the institution) on the performance of Accounting students in Brazil. The results in a sample of 22,662 undergraduate students indicated that all variables, except for racial condition, are related with the academic performance. The tests of means indicated that all variables, except for library use frequency, contributed to the students' performance.

Figure 1. Research on the influence of external contingency factors on higher education

Source: elaborated by the authors based on the references.

In Figure 1, the influence of different external variables on the students' academic performance is observed. Hence, the HEIs are responsible for adapting their internal processes to the external environment. In response to these external variables, the HEIs can be more thorough in the selection process of the students they intend to receive and in the selection of their teaching staff (Stoll & Fink, 1999). The external factors set limits for the educational institutions' activities. Sometimes, these factors are that narrow that the institutions can do little or nothing to increase their educational efficacy and teaching quality (Murillo, 2003).

The social relationships established inside the teaching institutions represent another influential factor, as they reflect the socioeconomic conditioning factors, diverse histories of the educational community's members, their beliefs and values, among other factors determining the institutional internal environment (Andriola, 2009). Some Brazilian and international empirical studies in this sense have been identified, as demonstrated in Figure 2.

Factors	Approach of internal contingency factors
Internal environment	Rizzatti (2002) observed in his research that one of the factors that require particular attention in universities is the work environment and satisfaction of their members, mainly in administrative functions. An internal environment with motivated serves can enhance the students' satisfaction with the course offered.
	Paiva and Lourenço (2011) investigated the influence of the classroom environment on the academic performance, involving 217 students in the third year of basic education at a public school in Northern Portugal. The authors found that the internal environment exerts positive and significant influence on the students' academic performance. This can expand to the contact with the managers.
Structure	Andriola (2009) investigated the influence of structural factors (classrooms, laboratories, libraries, equipment) in the National Student Performance Exam (ENADE) among the 1,337 students enrolled in 40 programs at an FHEI. The author found that the courses with better structures scored higher. The library and the quality of its collection was highlighted, due to the influence on students' learning and educational quality.
Technical system	Singh, O'Donoghue and Worton (2005) highlight that the Internet is a technological factor that can transform and restructure the traditional higher education models, as it has changed the learning process and allowed universities to establish global educational providers. According to Boezerooij (2006), the challenge teaching institutions face is to integrate the students into the university through workstations and computers that can integrate them into these technological initiatives. Nevertheless, Bates (2003) highlights that the impact of technology on the way the students learn, how the teachers teach and how the administrators manage the institution is complex.
	Weathersbee (2008) investigated the use of technology at 6,654 public schools in the State of Texas, USA, considering children enrolled in the fourth, eighth and eleventh year. Using data from the local Education Agency, the author related the influence of four technological integration areas with the performance on standardized Reading, Mathematics and Science tests. The results indicated that, in teaching and learning, technology use only exerted influence in the 11th year and in all tests. Concerning the preparation and development, the results did not appoint statistical significance in any test modality. In institutional support, the results appointed that technology influence fourth-year students' performance in Reading and Mathematics and eighth-year students' performance in Mathematics and Science tests. In the technological infrastructure, the study showed significant influence only in eighth-year students' Reading tests.
PCP strategy	In the Pedagogical Course Project (PCP), institutional aspects are expressed, such as: academic undergraduate teaching policies, student and teacher allocation across different classes, relevance and appropriateness of content to be taught, pedagogical procedures and learning assessment systems (Andriola, 2009). The PCP should also respect the laws and rules established in the educational system the institution is affiliated with.
Strategy of teaching staff	Andriola (2009, p. 27) alerts "the effect the educational institution adds to the students' education is largely determined by the teacher's actions, by the proper use of knowledge, by the way the activities are conducted in the classroom". This activity, according to Morosini (2000), is characterized by the teacher who masters the subject, integrates it into the curricular and socio-historical context, uses different forms of teaching, masters the body language/gestures and aims for student participation.
	Miranda (2011) investigated the influence of the academic staff's academic qualification on the students' academic performance, represented by the Ph.D. degree. According to the research results, the academic qualification presented a significant regression coefficient and a significant positive correlation with the Enade results.

Figure 2. Research on the influence of internal contingency factors in higher education

Source: elaborated by the authors based on the references.

The theoretical base reveals that, besides the external environmental variables linked to the student group, the HEI is responsible for taking into account and paying special attention to the variables in the institutional environment, specifically the internal environment, structure, technical system, course strategies, subdivided in PCP education strategies and strategies related to the teaching staff. It is important to observe that the HEIs have their own contingency factors. Hence, the management board is responsible for promoting the adaptation of the management process in response to the HEIs' external and internal contingency factors.

2.3 Research hypotheses

The literature cited in the theoretical framework of this study indicates relations between the academic performance and external and internal factors of the institutional environment at the investigated HEIs. In this sense, the following hypotheses were tested:

- H1: There are statistically significant differences between the averages of students' general academic performance and the external factors (gender, marital status, family members, housing, weekly work hours, participation in family income, monthly family income, mother's level of education, father's level of education, secondary school, hours of weekly extraclass study, professional experience) of the FHEI (Caiado & Madeira, 2002; Andrade & Corrar, 2008).
- H2: There is a statistically positive and significant influence of the internal environment factor on students' academic performance (Paiva & Lourenço, 2011).
- H3: There is a statistically positive and significant influence of the structure factor on students' academic performance (Andriola, 2009).
- H4: There is a statistically positive and significant influence of the technical system factor on the students' academic performance (Singh, O'Donoghue, & Worton, 2005; Weathersbee, 2008).
- H5: There is a statistically positive and significant influence of the pedagogical course project factor on the students' academic performance (Andriola, 2009).
- H6: There is a statistically positive and significant influence of the faculty strategy factor on students' academic performance (Andriola, 2009; Miranda, 2011).

The hypotheses formulated seek to test which contingency factors influence the academic performance of the Accountancy students at the FHEI where the study was undertaken.

3. Methodological Procedures

This descriptive study with a quantitative approach was carried out based on a survey among the Accountancy students of a Federal Higher Education Institution, established in the South of Brazil. The choice of this university was due to the access the course coordinator granted to the research data. For the sample, the undergraduate Accountancy program was intentionally chosen.

The research population included the students enrolled in all academic periods of the course. Of the 498 students enrolled, 316 answered the questionnaire, but 17 were excluded from the analysis because they were incomplete, leaving 299 valid questionnaires, representing 60.04% of the total number of students. The questionnaire was applied in direct contact with the student, in December 2013, to obtain a more successful response rate.

3.1 Research variables

The questionnaire developed for the LHEI's student group consisted of seven blocks (external factors, internal environment, structure, technical system, PCP strategy, faculty strategy and self-evaluation of performance). The variables for the construct external factors were extracted and adapted from the socioeconomic questionnaire of the National Student Performance Exam (Enade), while the other independent variables were elaborated according to the research proposal.

In order to guarantee the dimensionality and reliability assumptions of the questionnaire variables, Exploratory Factor Analysis (AFE) was applied, using the main components analysis method, the Kaiser-Meyer-Olkin (KMO) test coefficient and the internal reliability obtained by Cronbach's alpha.

According to Hair, Anderson, Tatham, and Black (2005), exploratory factor analysis demonstrates the structure of interrelations (correlations) between variables, defining a set of shared latent dimensions, called factors. The EFA was performed per latent research variable, the basic assumption of the EFA being that some latent structure does indeed exist in the set of selected variables. In terms of Cronbach's alpha coefficient, this indicator guarantees the internal reliability of the items (variables) in each construct.

In Figure 3, the coding of the variables in the research instrument is displayed.

Constructs		Coding of variables in research instrument
Contingency Factors	**External Factors (EF)**	Gender (EF1)
		Age (EF2)
		Marital status (EF3)
		Family members (EF4)
		Housing (EF5)
		Work journey (EF6)
		Economic and Family participation (EF7)
		Family income (EF8)
		Mother's education level (EF9)
		Father's education level (EF10)
		Secondary school (EF11)
		Hours of extraclass study (EF12)
		Experience in the area (EF13)
	Internal Environment (IE)	Score between 0 and 10 the dedication and care you have received at your institution from:
		Department head or equivalent (IE1)
		Course coordinator (IE2)
		Teaching staff (IE3)
		Employees (IE4)
	Structure (S)	Score between 0 and 10 the quality of the infrastructure at your institution concerning:
		Appropriateness of classrooms (S1)
		Appropriateness of physical facilities at library/ies (S2)
		Quality of bibliographic survey (S3)
		Modernity of informatics laboratories (S4)
	Technical System (TS)	Score between 0 and 10 the quality of the technological resources employed at your institution concerning:
		Didactical resources (multimedia, others) (TS1)
		Teaching software (laboratory) (TS2)
		Internet access (TS3)
		Academic system (TS4)
	PCP Strategy (STR)	Score between 0 and 10 the pedagogical project and curriculum matrix of the course concerning:
		Course organization (disciplines) (STR1)
		Disciplines offered (STR2)
		Integration of curriculum elements (contents/summaries) (STR3)
		Course load of disciplines (STR4)
	Teaching Staff Strategy (STR)	Score between 0 and 10 the teaching staff in the program concerning:
		Qualification (degree) (STR5)
		Mastery of content taught (STR6)
		Teaching practices (STR7)
		Interaction with student (STR8)

Constructs	Coding of variables in research instrument
Performance Self-Assessment (PSA)	Score between 0 and 10 your course performance, considering the following in your self-assessment:
	Punctuality in classes (PSA1)
	Attendance in classes (PSA2)
	Participation in classes (PSA3)
	Interest in classes (PSA4)
	Accompaniment of class contents (PSA5)
	Performance in the solution of exercises (PSA6)
	Time dedicated to extraclass studies (PSA7)
	Performance on exams and tests (PSA8)

Obs.: EFA of **IE:** Explained variance=61.021, KMO=0.683 (p<0.05), alpha=0.7905; **S:** Explained variance=65.511, KMO=0.741 (p<0.05), alpha=0.787; **TS:** Explained variance =62.447 KMO=0.775 (p<0.05), alpha=0.8048; **STR:** Explained variance=37.821, KMO=0.683 (p<0.05), alpha=0.833; **STR:** Explained variance=34.261, KMO=0.833 (p<0.05), alpha=0.8126; **PSA:** Explained variance=50.008, KMO=0.842 (p<0.05), alpha=0.8132.

Figure 3. Coding of variables in research instrument

Source: elaborated by the authors based on the research proposal.

In Figure 3, the research constructs and their variables are displayed. For the operationalization of the dependent variable academic performance, two measures were used: a) general performance, which is the general average of the disciplines taken by an enrolled student, whose information was made available by the course coordinator; and b) self-evaluation of performance, consisting of eight sub-variables of the "self-evaluate" construct, proposed by Freitas and Arica (2008).

Cunha, Cornachione Jr., De Luca and Ott (2010) investigated the relationship between the judgment of self-efficacy and Accountancy students' performance at HEIs from four Brazilian states. The results showed that students' modesty about their performance is higher than the accumulated academic average of those who consider themselves to be inferior. Therefore, the use of two metrics in this research is justified to evaluate the FHEI students' performance.

To measure the constructs in the institutional environment, an 11-point interval scale was used (from 0 to 10). This interval was chosen to standardize it with the dependent variable general performance. In addition, the larger the scale, the better the approximation of the normal response curve and the greater the variability that will be extracted among the respondents (Cooper & Schindler, 2011).

3.4 Data analysis procedures

The data obtained in the survey were organized and typed in an Excel worksheet, and later served as input for SPSS version 19 and Smart PLS 2.0. In the verification of the missing data, outliers and normality of the data, it was verified that there were no lost data situations. Regarding the outliers, the "Graphs Boxplot" routine in SPSS version 19 was used, in which the four most representative outliers were eliminated. The numerical values for normality should correspond to the reliability limits of +/- Z 1.96 for asymmetry and kurtosis (Hair *et al.*, 2005). Thus, the Kolmogorov-Smirnov test was performed by construct and respective variables, and all probability values were below the significance level of 0.05, rejecting the hypothesis that the data are normal. In view of the non-normality of the data, non-parametric tests were used.

In the quantitative analysis of the data, initially, descriptive statistics with frequencies and percentages were used to characterize the respondents. We then analyzed the influence of external factors on academic performance using the Kruskal-Wallis one-way Analysis of Variance test. This test analyzes whether K groups originate from populations of different medians (Siegel & Castellan Jr, 2006). This test was performed in comparison with the variable general performance of the students (general average in the disciplines taken).

In order to determine if the constructs of the institutional environment influence the academic performance or not, the Structural Equation Modeling (SEM) technique was used. The use of this technique is justified, according to Hair *et al.* (2005), because SEM is not limited to the analysis of simultaneous dependence of the data; the technique provides a transition from exploratory analysis to a confirmatory perspective. With this technique of multivariate analysis, one can test empirically a set of dependency relationships by the model that puts the theory in practice.

For Hair *et al.* (2005), the use of SEM is justified when one wants to incorporate latent variables in the analysis, and when one establishes relations of dependence and independence. According to the authors, a latent variable cannot be measured directly, but can be represented or measured by one or more variables. In the study, the latent variables are the constructs of the institutional environment (internal environment, structure, technical system, strategy of the pedagogical course project and strategy of the teaching staff). The causal relation of the variables occurs with the endogenous construct or dependent variable (Hair *et al.*, 2005). The endogenous construct is composed by the eight variables of the students' self-assessed performance and the variable academic performance (general average of the disciplines taken).

Thus, the Structural Equation Modeling (SEM) technique was used, estimated based on the Partial Least Squares (PLS). According to Chin (1995), this technique gained acceptance despite the lack of global fit indices in relation to the proposed models and observed data. The PLS allows education models to be treated with smaller samples and variables that do not adhere to a normal multivariate distribution (Chin & Newsted, 1999). Chin (1995) explains that the PLS only considers aspects such as the average variation extracted and R-square index (R^2) to evaluate the impact of the exogenous and endogenous constructs, and the adequacy of the manifest variables (indicators) as a construct validity measure. The program used in this research for the statistical treatment based on this method was Smart PLS version 2.0.

To validate the statistical techniques, we used: convergent validity, discriminant validity, compound construct reliability, Goodness of Fit index (GOF) and assessment of the significance of each path. The convergent validity verifies the Average Variance Extracted (AVE), which represents the amount of variance shared between the indicators of each of the constructs or latent variables (Hair *et al.*, 2005). The amount of AVE from a construct to assess its convergent validity needs to be higher than 0.5 (Ferreira, Cabral, & Saraiva, 2010).

The discriminant validity also observes the AVE and seeks to ensure that the inclusion of second-order constructs is valid. According to Fornell and Larcker (1981), this procedure is performed to verify if the square root of the AVE of each of its first-level constructs is greater than any of the correlations between the first-level construct and the others. The compound reliability test is an internal consistency measure of the construct indicators (Hair *et al.*, 2005). According to Chin (1995) and Hair *et al.* (2005), this test should surpass 0.7 to assure the adequacy in the PLS estimation.

The Goodness of Fit (GoF) index, proposed by Tenenhaus, Chatelin and Lauro (2005), measures the overall performance of the model based on the calculation of the geometric mean between the mean R^2 and the mean AVE of the constructs. Wetzels and Odekerken-Schröder (2009) recommend that, in the Social and Behavioral Sciences this index should be superior to 0.36. To evaluate the significance of each path of the coefficients or influence of one construct on another, we used the procedure available in SmartPLS called bootstrapping. Hair *et al.* (2005) explain that bootstrapping resamples the original data and calculates parameter estimates and standard errors based on survey data rather than statistical assumptions.

The tests presented in the analysis method are necessary to enhance the credibility of the results. In addition, the construction of all the paths explained here reveals how the data of this research were analyzed.

4. Description and Analysis of Results

4.1 Respondents' profile

In the sample characteristics, it was observed that, in the 295 (299 from the sample - 4 outliers), 128 (43.4%) were male and 167 (56.6%) female. The average age of the survey respondents is 22.86 years; the minimum age is 18 years and the maximum 45 years, the predominant age range varying between 21 and 25 years, with 120 (40.7%) respondents. Regarding marital status, 243 (82.4%) students indicated being single, 41 (13.9%) married, 8 (2.7%) divorced and 3 (1%) widowed. Among the family members living with the sampled students, 123 (41.7%) respondents lived with up to two members, followed by up to four members with 121 (41%) respondents, and 33 (11.2%) respondents who do not live with family members.

As far as the students' workday is concerned, only 28 (9.5%) do not work. The predominant situation is full-time work of 44 hours, with 130 (44.1%) of the cases, followed by those working between 20 and 44 hours with 128 (40%) respondents. Regarding the residence status, the predominant situation is "I live in my own home" with 151 (51.2%) respondents, followed by "I live in my own home with a loan" with 66 (22.4%) and "I live in a rented home" with 55 (18.6%).

Concerning participation in family income, the predominant situation is "I work and earn a living" with 114 (38.6%) respondents, followed by "I work and contribute to family support" with 83 (38.6%) respondents. Regarding family income, the situation analysis indicates that the sample is concentrated in 11 national minimum wages or more with 76 (25.8%) respondents, followed by six to ten national minimum wages with 75 (25.4%), and four to five national minimum wages with 71 (24.1%).

As for the mother's education level, there was one case of a mother without any schooling; at the other end, there were 96 respondents (32.5%) whose mother had a university degree, followed by a high school diploma with 76 (25.8%). Regarding the father's level of education, the extremities in the sample are highlighted, as there were six situations in the sample in which the father does not have schooling, and 100 (33.9%) respondents whose father holds a higher education degree, followed by 84 (28.5%) with a high-school degree.

In relation to the high school the students attended, the predominant situation is completely in public schools, with 160 (54.2%) respondents, followed by completely in private schools with 88 (29.8%). For the variable "weekly extraclass study hours", the predominant situation is one to two hours with 102 (34.6%) respondents, followed by three to five hours with 97 (32.9%). It should be noted that 46 (15.6%) respondents do not engage in extra-class studies and only attend classes.

Regarding the experience in the area, the prevailing situation is "I have never worked in the area" with 94 (31.95%), followed by one year of experience in the area with 80 (27.1%) respondents.

4.2 Influence of external factors on students' academic performance

In the analysis of the relationship between students' general performance (average of disciplines studied) and external factors, the non-parametric Kruskal-Wallis one-way analysis of variance test was used. This is useful to decide whether K independent samples come from different populations. Sampling values almost always differ, and the question is whether the differences mean genuine differences between populations or whether they represent the kind of variation that would be expected between random samples from the same population (Siegel & Castellan Jr, 2006).

The hypothesis to be rejected is that there are no statistically significant differences between averages of general performance and external factors. If the probability value is less than $p < 0.05$, there is at least one pair of different population medians. The variable EF2 (age) is not included in the construction of the hypotheses, as this was a continuous variable in this research. Thus, we chose to relate it separately. The Kruskal-Wallis test pointed out that there are no statistically significant differences between academic performance and age ($p = 0.362$).

Table 1 presents the Kruskal-Wallis test for the relationship between academic performance and variables EF1 (gender) and EF3 (marital status).

Table 1

Kruskal-Wallis test of the relation between academic performance and the gender and marital status variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF1	Gender			0.218	1	0.641
	Male	128	145.35			
	Female	167	150.03			
	Total	295				
EF3	Marital status			1.963	3	0.580
	Single	243	145.79			
	Married	41	153.16			
	Divorced	8	186.56			
	Widowed	3	154.00			
	Total	295				

As verified in Table 1, according to the Kruskal-Wallis test for EF1 (gender), there is no statistically significant difference ($x^2 = 0.218$, $p = 0.641$) between the medians of general performance and gender. Differently from this result, Freitas (2004) found in her study that women's performance was superior to that of men, considering both admission exams and course performance. The author justified the better performance of women by better secondary education and greater dedication in undergraduate course disciplines.

For the variable EF3 (marital status), there are no statistically significant differences ($x^2 = 1.963$, $p = 0.580$) between the medians of general performance and marital status. These results do not agree with those of Andrade and Corrar (2008), in which the performances differed significantly ($p = 000$), with single students presenting better academic performances.

Table 2 presents the Kruskal Wallis test for the relationship between academic performance and external socioeconomic variables: EF4 (family members), EF5 (residence status), EF6 (work day), EF7 (participation in family income) and EF8 (monthly family income).

Table 2

Kruskal-Wallis test of relation between academic performance and socioeconomic variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF4	**Lives with family members**			5.473	4	0.242
	None	33	168.65			
	Up to two	123	147.60			
	Up to four	121	143.64			
	Up to six	16	154.81			
	More than six	2	41.50			
	Total	295				
EF5	**Place of residence**			4.158	4	0.385
	I live in a rented home	55	135.58			
	I live in a student dorm and share expenses with other people	12	188.25			
	I live in my own home with a loan	66	145.63			
	I live in my own home fully paid	151	149.47			
	Other	11	160.18			
	Total	295				
EF6	Work journey			2.038	4	0.729
	I work full-time 44 hours	130	147.11			
	I work between 20 and 44 hours	118	143.46			
	I work up to 20 hours	14	152.04			
	I work occasionally	5	181.20			
	I do not work	28	163.30			
	Total		295			
EF7	**Participation in family income**			5.660	4	0.226
	I work and am the main family provider	25	145.62			
	I work and contribute to family support	83	131.06			
	I work and make a living	114	152.24			
	I work and receive financial help	44	157.24			
	I do not work and my family funds my expenses	29	167.84			
	Total	295				
EF8	**Monthly family income**			7.729	4	0.102
	Up to one national minimum wage	5	108.10			
	Between two and three national minimum wages	68	147.88			
	Between four and five national minimum wages	71	145.20			
	Between six and ten national minimum wages	75	133.01			
	Eleven or more national minimum wages	76	168.15			
	Total	295				

As verified in Table 2, according to the Kruskal-Wallis test, there are no statistically significant differences ($x^2 = 5.473$, $p = 0.385$) among the medians of general performance and family members for variable EF4 (family members). The same occurred for variable EF5 (housing status), in which the tests showed $x^2 = 4.158$ and $p = 0.385$ for the relation with academic performance.

For EF6 (work day), there are no statistically significant differences ($x^2 = 2.038$, $p = 0.729$) between the medians of general performance and the weekly workday. The results of this research differ from those found by Andrade and Corrar (2008), in which, for students who during most of the course had a paid job, the test suggested significant differences ($x^2 = 342.26$; $p = 0.000$). The authors justified the results by the greater motivation of working students, which gives them better grades.

For EF7 (participation in family income), there are no statistically significant differences ($x^2 = 5.660$, $p = 0.226$) among the medians of general performance and participation in family income.

For EF8 (monthly family income), there are no statistically significant differences ($x^2 = 7.729$, $p = 0.102$). These results differ from Freitas (2004), who observed in his study that, in all the courses studied, the higher-income students perform better, indicating a positive correlation between income and performance. The results also differ from Andrade and Corrar (2008), where the family income test suggested significant differences ($x^2 = 592.31$, $p = 0.000$) among the salary ranges, indicating that students with lower family incomes obtained lower performances.

Table 3 presents the Kruskal-Wallis test for the relation between academic performance and the variables of education level: EF9 (mother's level of education), EF10 (father's level of education), EF11 (secondary school), EF12 (weekly hours of extra-class study) and EF13 (professional experience).

Table 3

Kruskal-Wallis test of the relation between academic performance and education level variables

Variable	External Factor	N	Mean Rank	Chi-Square	Df	Asymp. Sig.
EF9	**Mother's education level**			8.651	6	0.194
	None	1	194.00			
	Unfinished primary education	42	115.56			
	Finished primary education	33	153.56			
	Unfinished secondary education	24	163.48			
	Finished secondary education	76	144.68			
	Unfinished higher education	23	152.8			
	Finished higher education	96	157.41			
	Total	295				
EF10	**Father's education level**			15.660	6	0.016*
	None	6	183.75			
	Unfinished primary education	37	105.73			
	Finished primary education	30	150.02			
	Unfinished secondary education	11	149.73			
	Finished secondary education	84	141.95			
	Unfinished higher education	27	143.28			
	Finished higher education	100	167.06			
	Total	295				
EF11	**Secondary school**			1.990	4	0.738
	Fully public school	160	144.36			
	Mostly public school	25	136.46			
	Fully private school	88	153.76			
	Mostly private school	20	163.82			
	Other	2	171.50			
	Total	295				
EF12	**Weekly hours of extraclass study**			26.725	5	0.000**
	None, I simply attend class	46	107.80			
	One to two	102	142.54			
	Three to five	97	148.83			
	Six to eight	32	185.19			
	Nine to ten	4	226.00			
	More than ten	14	206.82			
	Total	295				
EF13	**Professional experience**			11.540	5	0.042*
	I have never worked in the area	94	156.86			
	One year	80	160.84			
	Two years	54	151.20			
	Three years	37	115.76			
	Four years	12	126.38			
	More than four years	18	115.72			
	Total	295				

Where: *Significant p<0.05 / **Significant p<0.01.

As verified in Table 3, according to the Kruskal-Wallis test, there are no statistically significant differences ($x^2 = 8.651$, $p = 0.194$) between the medians of general performance and the mother's education level for the variable EF9 (mother's level of education). These results differ from the study by Freitas (2004), in which a total effect of this variable was verified for the student's admission test performance, demonstrating the importance of the mother in the orientation of the children's studies along the school trajectory. This was not evidence in the undergraduate course output though, revealing that the students' learning success in this phase depends much more on their effort than on their mother's interference. In the study by Andrade and Corrar (2008), the test indicated significant differences ($x^2 = 12.48$, $p = 0.01$) for the mother's education, with the students with the highest grades figuring in the range of mothers holding a higher education degree.

For the variable EF10 (father's level of education), there are statistically significant differences ($x^2 = 15.660$; $p = 0.016$) between the medians of general performance and the father's education. The mean rank analysis for this variable revealed the highest coefficient for the range without education, with an average of 183.75, which is surprising. In the study by Freitas (2004), the results were different. The statistical test for the father's education on the course performance showed that there is no interference of this variable in academic performance, but an interesting point highlighted by the author is that, often, the average income of students whose father has a low education level is higher than for students whose father holds a higher education degree. This statement supports the results found in this research. On the other hand, the results by Andrade and Corrar (2008) are similar in relation to the father's education. The test showed significant differences ($x^2 = 47.85$, $p = 0.000$). In this study, the variable "father with a higher education degree" was responsible for performance differences among the students.

For the variable EF11 (secondary school), there are no statistically significant differences ($x^2 = 1,990$, $p = 0,738$) among the medians of general performance and secondary school. These results differ from Andrade and Corrar (2008) in relation to students' performance and secondary school background. Significant differences were observed in the means ($x2 = 172.19$; $p = 0.000$), and the authors deduce that students from private schools perform better than students in public schools.

For the variable EF12 (weekly hours of extraclass study), there are statistically significant differences ($x^2 = 26.725$; $p = 0.000$) between the medians of general performance and the weekly hours of extraclass study. In the mean rank analysis, there was a gradual increase, as the number of hours of study increased. The range "none, I only attend classes", with a mean rank of 107.80, and the range "over ten hours of study", mean rank of 206.82, reveal the importance of this variable in academic performance. Therefore, students who are more dedicated perform better. These results are in line with Andrade and Corrar (2008), where the test indicated that the number of hours dedicated to the studies is directly related to the academic performance ($x^2 = 178.79$; $p = 0.000$).

For the variable EF13 (professional experience), statistically significant differences ($x^2 = 11.540$; $p = 0.042$) exist between the medians for general performance and professional experience. These results differ from the study by Caiado and Madeira (2002) because, in that study, the linear correlation coefficients between the final course average and professional experience were not statistically significant and close to zero.

Based on the results of the statistical significance tests, resulting from the Kruskal Wallis analysis, the following can be deduced about the test of the first research hypothesis: H1 - There are statistically significant differences between the averages of the students' general academic performance and the FHEI's external factors. The hypothesis can partially be accepted because there is a statistically significant relation between academic performance and the following external factors: father's level of education, weekly hours of extraclass study and professional experience. The other external factors (gender, marital status, family members, residence status, work hours, participation in family income, monthly family income, mother's education level, secondary school) did not indicate a statistically significant influence on academic performance.

4.3 Structural Equations Modeling

The model proposed with R^2 coefficients is displayed in Figure 4, defined by the covariance estimation technique SEM-PLS.

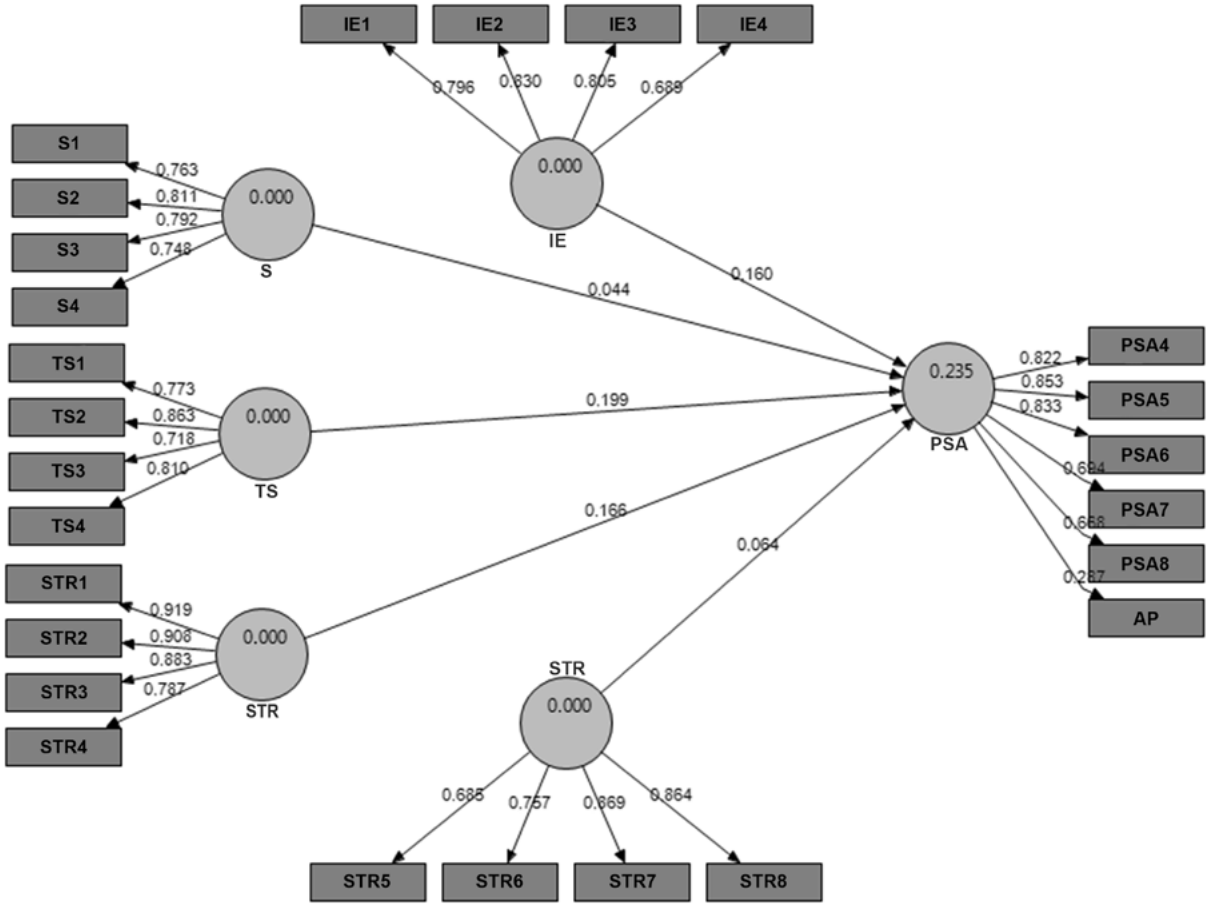

Figure 4. Proposed model with R^2 coefficients – SEM/PLS

The variables PSA1 (punctuality in classes), PSA2 (class attendance) and PSA3 (participation in classes) were removed from the model due to insufficient convergent validity. After these adjustments, the measuring tests of the model were undertaken

4.4 Validity and fit tests of the SEM-PLS model

In Table 4, the reliability indicators of the SEM-PSL model - average variance extract (AVE) and compound reliability are displayed. According to Hair *et al.* (2005), these estimates serve to assess whether the specified indicators are sufficient to represent the latent variables. The recommended coefficient is 0.50 for AVE and 0.70 for compound reliability.

Table 4
Fit indices of the SEM-PLS model

Construct	AVE	Compound Reliability	*R Square*	*Cronbach's Alpha*	Communality	Redundancy
Int. Environment	0.6114	0.8623	0.000	0.7905	0.6114	0.000
Structure	0.6067	0.8604	0.000	0.7870	0.6067	0.000
Technical System	0.6067	0.8708	0.000	0.8048	0.6286	0.000
PCP strategy	0.7673	0.9293	0.000	0.8983	0.7673	0.000
TS strategy	0.6363	0.8739	0.000	0.8126	0.6363	0.000
Acad. Perform.	0.5179	0.8566	0.2355	0.8132	0.5179	0.0413

In Table 4, in relation to the fit indices of the model for convergent validity, there are no indicators inferior to 0.50 for the average variance extracted (AVE), permitting the acceptance of the model. Regarding the compound reliability coefficients, all indicators are superior to 0.70, which represents 50% of the variance, considering the sample size of 295 cases. These coefficients are significant at 0.05, as prescribed by Hair *et al.* (2005). To test the discriminant validity, we verified the correlation between the latent variables, as shown in Table 5. According to Hair *et al.* (2005), the correlations between the variables should be lower than 0.95.

Table 5
Correlation coefficients of first-order constructs

Description	Internal Environment	Structure	Technical System	PCP strategy	TS strategy	Academic Performance
Int. Environment	1.000	0.000	0.000	0.000	0.000	0.000
Structure	0.3302	1.000	0.000	0.000	0.000	0.3211
Technical System	0.3056	0.6281	1.000	0.4811	0.4229	0.3807
PCP strategy	0.4983	0.4697	0.000	1.000	0.5408	0.3763
TS strategy	0.5734	0.3656	0.000	0.000	1.000	
Acad. Perform.	0.348	0.000	0.000	0.000	0.000	1.000
AVE	0.6114	0.6067	0.6067	0.7673	0.6363	0.5179

As verified in Table 5, there is no correlation superior to 0.95 between the first-order constructs that exceed the square root of the AVE in magnitude, indicating the discriminant validity of the model. To finish the fitness of the model, the Goodness-of-Fit Index proposed by Tenenhaus *et al.* (2005) was calculated. In this study, the SEM-PLS model reached an index of 0.3821, superior to the minimum of 0.36, as recommended by Wetzels and Odekerken-Schröder (2009) for the Social and Behavioral Sciences. After these validation steps, the structural model and the hypothesis test are discussed.

4.5 Path analysis

The test of the Structural Model is evaluated according to the adjustment indices and coefficients obtained. These tests show significance based on the coefficients corresponding to the "t" test for the path used in the model, with coefficients superior to 1.96 being considered acceptable according to Hair *et al.* (2005). The bootstrapping analysis was applied, generating N = 2000 different sub-samples, each with n = 295 observations, as recommended by Hair *et al.* (2005). The path analysis is demonstrated in Table 6.

Table 6

Calculated coefficients of structural model

Structural Relation	Coefficient	t-value	Hypothesis	p-value
Internal Environment → Academic Performance	0.160	2.190	H2	0.029*
Structure → Academic Performance	0.044	0.635	H3	0.525
Technical System → Academic Performance	0.199	3.009	H4	0.003**
PCP Strategy → Academic Performance	0.166	2.002	H5	0.045*
TS Strategy → Academic Performance	0.064	0.848	H6	0.396

Where: *Significant p<0.05 / **Significant p<0.01.

According to Table 6, the coefficients superior to 1.96 for the path analysis are: internal environment with t-value = 2.190, technical system with t-value = 3.009 and strategy of the pedagogical course project with t-value = 2.002. The constructs structure (t-value = 0.635) and faculty strategy (t-value = 0.848) were not significant. Based on the results found, one can analyze the hypotheses elaborated for this research.

The internal environment factor exerts statistically significant and positive influence on students' academic performance, with p-value = 0.029, thus accepting H2. Although the latent variable presents low statistical significance, with a direct effect of 0.16, the results corroborate the results by Paiva and Lourenço (2011), which obtained a direct effect of 0.22 with p-value = 0.004. In this study, however, we intended to investigate the entire internal institutional environment, while the authors quoted set out to analyze the classroom environment only.

No statistically significant and positive influence was found for the structure factor in the students› academic performance, with p-value = 0.525; thus, H3 is rejected. This result is not in line with the study by Andriola (2009) that better institutional structures provided higher grades in the National Student Performance Examination (Enade).

There is a statistically significant and positive influence of the technical system factor on students' academic performance, with p-value = 0.003; thus, H4 is accepted. The research reinforces part of the results by Weathersbee (2008), which related the technological structure to the students' performance in Reading, Mathematics and Science tests. In the three situations, there was a significant influence (p = 0.000) in the Reading tests of eighth-grade students.

There is a statistically significant and positive influence of the pedagogical course structure factor on students' academic performance, with p-value = 0.045; thus, H5 is accepted. Despite the low coefficients (0.166), the results reinforce the research by Araújo, Camargos and Camargos (2013), as the variables related to the formulation of the disciplines are positive and significantly correlated with the academic performance.

There is no statistically significant and positive influence of the factor teaching staff strategy on the students› academic performance, with p-value = 0.396; thus, H6 is rejected. Miranda (2011) found a significant regression coefficient and a positive and significant correlation between academic qualification and performance in Enade, which cannot be confirmed in this study.

5. Final Considerations

This study aimed to verify the influence of contingency factors on the academic performance of Accountancy students at a Federal Higher Education Institution. Among the variables related to external factors, the ones that influenced the academic performance of the students under analysis were: father's education level ($x^2 = 15.660$; $p = 0.016$); weekly hours of extraclass study ($x^2 = 26.725$; $p = 0.000$); and professional experience ($x^2 = 11.540$, $p = 0.0402$). The other external variables were not influential. Thus, H1 was partially accepted.

These results are in line with Andrade and Corrar (2008), who found a statistically significant influence on the variables "father's education" and "weekly hours of extraclass study". On the other hand, they do not converge with the results by Freitas (2004) for the variable "father's level of education" because, in that study, the author did not find a statistically significant influence on academic performance. They do not agree either with the study by Caiado and Madeira (2002) that, for the variable professional experience, in this study, the linear correlation coefficients between the final average for the course and professional experience were not statistically significant and close to zero.

Among the institutional environment factors of the investigated FHEI, the hypotheses H2 (internal environment), with a direct effect of 0.16 and p = 0.029; H4 (technical system), with a direct effect of 0.166 and p = 0.003; and H5 (strategy of pedagogical course project), with a direct effect of 0.199 and p = 0.045 were confirmed, indicating the influence on students' academic performance. Therefore, the influence of H3 (structure) and H6 (faculty strategy) on the academic performance of Accountancy students at the investigated FHEI was not confirmed. It is noteworthy that the variable teaching staff did not indicate influence on the students' academic performance, especially if considering that more than 50% of the faculty at this HFEI holds a Ph.D.

Thus, it is concluded that, among the contingency factors surveyed, in relation to the external factors, the variables that influence the students' academic performance are the father's education, weekly hours of extraclass study and professional experience. Regarding the institutional environment of the investigated HFEI, the factors of the internal environment, technical system and pedagogical course project strategy demonstrated their influence on the Accountancy students' academic performance. These conclusions should take into account the cut made in the data collection and cannot be extended beyond the respondents of the research, not even to other courses at the investigated HFEI.

Future research is recommended to verify the constructs' validity in other institutional settings. Other variables can be included, such as types of disciplines, performance on discursive and objective questions, students' motivational aspects and professional activities. It is also recommended to expand the study to higher education institutions in other regions of the country, public or private, in order to verify the influence of these variables on these HEIs and for the sake of comparative analysis. Additionally, the data collected in this research can be analyzed using different perspectives and statistical techniques, in order to verify if this leads to different conclusions.

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