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Editor's Word

Dear reader, we are delivering the fourth issue of the year 2019. In this issue, we present the editorial of Prof. Eliseu Martins, from the University of São Paulo. At my request, the professor generously comments on the article written by Professor David Godsell on the consequences of capital xenophobia on financial reporting. It is interesting to see how our country participated at certain times in the characteristics that are now studied in the United States.

About the articles, the first was written by Ilse Maria Beuren, Viviane Theiss, Renata Mendes de Oliveira, Silvana Mannes and Thiago Tomaz Luiz. The article analyzes the association of information sharing with the risk and performance of the cooperative strategic alliance, mediated by knowledge sharing and information leakage. The results show that information sharing is directly associated with knowledge sharing, but the association of variables is not observed in the interaction between information sharing and information leakage.

The second article was written by Prof. Claudio de Araújo Wanderley, PhD. This study aims to identify and discuss the central elements of the management accounting change process in an organization to serve as a theoretical framework and explain the management accounting change process as a result of the interrelationship between exogenous and endogenous factors. Based on Institutional theory and the four elements of change in management accounting, an integrated theoretical framework is developed to capture and examine the dynamics at the macro and micro levels of change in management accounting.

The next article was written by the authors Michele Urrutia Heinz, Alexandre Costa Quintana and Ana Paula Capuano da Cruz. The article aims to evaluate the cognitive and affective development achieved when using the case method teaching technique, based on Bloom's Taxonomy, in Accounting students from a Federal Higher Education Institution. The results show that the use of an active teaching technique, as a complementary tool, can influence the level of cognitive and affective development students achieve, also stimulating decision making, communication and problem solving.

The fourth article, also in the area of Education, was written by Karla Luisa Costa Sabino, Jacqueline Veneroso Alves da Cunha, Romualdo Douglas Colauto and José Roberto de Souza Francisco. These authors sought evidence to identify the relationship between the academic performance of undergraduate students in accounting and their perception of academic justice, distinguishing among the distributive, procedural and interactional dimensions. The findings show that, overall, the students associate justice in the learning environment mainly with the figure of the teacher.

The fifth article is entitled "An approach to assessing the quality of the research process in Accounting". The article, very well written by the professors and researchers José Renato Sena Oliveira and Gilberto de Andrade Martins, associates the attributes of research quality with those perceived in the process of building the scientific production in accounting. The researchers realized that approximately 3/4 of the scientific quality propositions received a strong level of agreement. Attributes that reached low or moderate levels though include items that may compromise the quality and integrity of research, such as those related to ethical principles, errors and biases, and the impacts of team participation on outcomes.

Finally, the article written by the researchers and professors Gabriela Vasconcelos de Andrade and Fernando Dal-Ri Murcia seeks to identify the types of the main additional adjustments made through disclosures of the non-GAAP "Adjusted EBITDA" measure in the largest Brazilian listed companies and to analyse the adequacy of these adjustments from a critical perspective of their nature. Evidence from this study support IASB's position on the importance of non-GAAP measures currently discussed by IASB in actions to improve financial reporting, including the use of non-GAAP information in accounting statements.

I would like to emphasize and always report that REPeC is not only related to the area of education, but to several areas, as shown in its objectives, whether Financial, Managerial, Public, Audit, Taxes, among others.

Thank you to all the researchers who have submitted their articles to REPeC. Congratulations to those who had their articles approved, as the demand is quite high and the road to final publication quite hard.

Sem mais, agradeço por todos os pesquisadores que submeteram seus artigos à REPeC. Parabéns para os que tiveram os artigos aprovados, pois a demanda é bastante alta e o caminho até a publicação final bastante árduo.

My sincerest thanks to the readers, once again, and I hope you will enjoy this new issue.

Academic greetings.

Gerlando Lima, PhD.
Editor-in-chief

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Xenophobia and accounting

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The last editorial of this prestigious magazine, written by Prof. David Gosell, reminded me of past episodes, some good and others not that much. But I thought it was fantastic. I talked about this and the reason for my opinion to Prof. Gerlando and, like every big mouth, I ended up with a task: to pass on to this editorial what I had discussed with him.

It is interesting to link Accounting to xenophobia, which at first sight seems to be totally meaningless. But let me remember some very vivid moments on this subject.

In the 1960s, not only in Brazil, but in many, many countries, there was a strong political reaction against the American influence on everything: the economy, the cinema, the music, the customs, and especially against the products of that country. The end of the world war 15 years earlier had led to the strong flourishing of that country's influence on almost every country in the world. And it gave rise to political developments and even fierce and violent reactions against this influence, and especially against the expansion of transnational corporations (in fact, in some places against European ones as well).

The strong expansion, mainly of US companies around the world, triggered enormous reactions. For example, a Brazilian book called *Um Dia na Vida do Brasilino*, still available in second-hand bookstores, described the life of this character who used foreign soap, foam and razor from a foreign company (no matter if they were produced here), etc. Thus, we could follow everything he did in one day, highlighting the influence of the foreign culture and products, especially from North America. And a movement was instigated not only not to consume these products, but mainly to prevent the entry of these companies. Everything should be done with genuinely Brazilian companies.

This culminated, in combination with other allegations, in very strong political movements, such as those in France, Brazil and other places, such as those of 1968.

Another strong movement started in some countries: requiring the financial statements of foreign companies to be much more detailed than those required of domestic companies, regardless of their legal form. To know "how much was stolen" from there. That is, Accounting turned into another activity area of the group for which xenophobia was practically its rationale.

This is not to be confused with more modern movements about the disclosure of large companies' financial statements, because this is due to the so-called unfair competition of limited liability companies, which do not disclose anything when compared to the corporations. But, to my knowledge, nothing is mentioned today about discrimination between Brazilian and foreign companies. The disclosure of this information is sought because society seeks access to the assets of publicly traded companies and privately held corporations and how they change, but not of limited liability companies. This information is sometimes vital for a given economic segment, for a huge set of employees, to support some cities, etc.

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By the way, this matter of large limited companies' information disclosure is almost a police issue; please excuse my burst, but I am outraged by this contempt towards the Brazilian society: they are using the country's human, natural, social and financial resources on an extremely large scale, but they are not accountable. And we are not at all dealing with individual or medium-sized or small businesses that really do not have to be accountable to society at all.

Outside Brazil, some successes have been achieved with regard to these discriminatory requirements. In our country, we also had this movement, but it never got into accounting legislation or standardization. This movement decreased in Brazil during the 1970s, but not necessarily in so many other places. It was still so strong that, by the end of this decade, several North American and European companies and governments took the problem to the United Nations.

And many discussions happened without anything effective actually taking place until 1982, when the UN decided to set up an organization called the ISAR Group - The Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting, linked to the United Nations Center on Transnational Corporations (UNCTAD) of the UN.

The main objective of this group was to issue accounting and disclosure standards that could be required from international and national companies, but on an equal basis with national ones, also taking the opportunity to try to converge accounting standards around the world. But the important thing was to discourage certain countries from demanding more than those standards. These documents are virtually unknown today, but some of them are fantastic, such as Objectives and Concepts Underlying Financial Statements, dealing with the effects of inflation (much better than IAS 29, CPC 42 - Accounting for Hyperinflationary Economics in force today) and others.

In the early 1980s, a professor who was viscerally against US accounting and the North Americans themselves was indicated to be the Brazilian representative. Unfortunately, his performance went that far beyond the behavior required in such a diplomatic body that the US delegation withdrew from the group and the Brazilian government was asked to no longer appoint him.

The worst was that Brazil appointed, after that, a diplomat secretary for the representation. The country almost definitely lost its seat.

In 1986, while I was serving on the Brazilian Securities Commission (CVM), I was invited to represent Brazil, which I did until 1990. By that time, those political movements had already greatly diminished until, in the last year I was there, I suggested, that the group be closed and that it should support the IASC (now IASB) at the UN, a suggestion that was accepted. The group did not finish but, on the initiative of my successor, Prof. Nelson Carvalho, it started to take care of other objectives, such as Education, Environmental Accounting, etc. No more accounting standards were issued.

And the interesting thing is that, not only in Brazil, but in most of these non-Saxon countries, is that the xenophobic environment was not limited to disclosure, but to the very way of positioning US Accounting. It became a craze to write against US accounting principles, audit advice from that country, statements presented differently there when compared to continental Europeans, etc.

For long, this thinking against Anglo-Saxon accounting was also present in Brazil. But all was not bad; amidst this ideological and even accounting fight, a fact occurred in our country.

The good side of the story: In the early 1960s, Brazilian Accounting teaching was entirely founded on Italian and, why not, also French *aziendalismo*, the study of corporate accounting. The Accounting course began with Homeric discussions of theories such as comtism, personalism, neocomtism, controlism, etc., often without the student even getting acquainted with a balance sheet. And they also discussed the different forms of societies, bonds and documents, with scholarly lectures on their legal aspects, and all without yet presenting the student to a balance sheet. And the fiscal influence even gained more solid ground, to the extent of dominating the accounting standards of so many of these countries (any similarity is no coincidence).

After the retirement of a chair of General Accounting at FEA/USP in 1963, Prof. José da Costa Boucinhas, who occupied another chair, Prof. Alkindar de Toledo Ramos took control of Accounting and was charged with starting, as early as in his first year, to teach Accounting in the form of the American school, also because this teacher had already pronounced himself strongly in favor of this branch.

And a different course started: first, presenting the balance sheet, with successive operations, the income statement, then learn debt and credit and the formal construction of financial statements. Legal presentations passed to the disciplines of law.

And the at the time called "generally accepted accounting principles" of Anglo-Saxonism (basically the quantitative characteristics of today's accounting information - entity, continuity, competence, relevance/materiality and others) were being discussed during this evolution. In the end, yes, discussion of this theory, none of those Europeans that, at bottom, really did not add to the domain of Accounting.

And, since the first year, the great emphasis: Accounting has to start by being an information system focused primarily on management; then to lenders and investors. The side of the management use was almost venerated, and this movement was accentuated when Prof. Sergio de Iudicibus took over the chair.

And that started a movement (of which I was a guinea pig in 1964 when I joined FEA, but which encouraged me to move to Accounting). But a certain xenophobic feeling took hold of so many schools and so many teachers: adopt the American model? That was inadmissible. We came to be publicly called "the USP bunch" by a famous teacher at the time. We experienced for ourselves the weight of this whole Brazilian movement against, but "Introductory Accounting" (under the leadership of Prof. Sergio), the only book in this area at the time, was slowly advancing.

But the movement really changed more completely in 1976, with the Corporation Law (Law No. 6.404/1976) bringing here all the best of US accounting standards (so we suffered little to get into international standards, so strongly based on English philosophy, in 2008/2010 - we were among the best prepared countries for this purpose). From then on, the opposition movement copied down, but it seems that it has cooled down well only in the last ten years. But the fight against this law was also enormous, and one cannot claim that this way of thinking stopped existing; we still find some of them out there.

But what is interesting is that, in the most political part and in the disclosure of financial information, xenophobia was widespread against foreigners, although mainly turned against US influences. But in the teaching of accounting and in the practice of the profession, it was a xenophobia that encompassed Brazil plus Italy and France against North Americanism.

What has happened in recent times is a movement that can be valid either exclusively on the economic side, or on the national security side (reasons that approached that they may be genuinely valid sometimes), without knowing whether there is any xenophobic basis either, at least partially.

For example, discrimination against foreign capital is widespread, including in some political parties. International transfer pricing and foreign profit distribution and taxation policies are sometimes overseen with apparent movement along these lines, even when pure and simple reading of the standards does not show this in any way, which is a major factor in accounting.

And most recently, still in the year 2019, something very interesting occurred on the occasion of the implementation of IFRS 16 - Leases, in Brazil represented by CPC 06 (R2) - Leasing Operations.

I think the vast majority of us did not know that it is forbidden for foreigners not only to acquire land in our country, but also to practice leasing. That is why foreign companies enter into contracts of a different nature, but in essence they are covered by this standard, because it deals not only with leasing, but also with rents, partnerships, franchises, usage rights in general. But there has fear, which still exists, that if such a transnational corporation meets this standard, some will consider this a violation of the law that prohibits foreign leasing. Because of the fact, the CPC has spelled out recently and more clearly, that although the title contains the word tenancy, it is used in a way familiar to English-speaking people, that is, in a much broader sense than we usually understand as leasing.

That is, it seems silly at first sight to talk about xenophobia in Accounting or prowling around Accounting, and Prof. Gosell very rightly broached the subject. This can always happen again. That was the reason for this initiative to comment on the matter, and in this distant country called Brazil.

Let us remain always open. It is not because it is foreign that we should not, out of pride, use it; and it is foreign that it is good in and of itself and we automatically have to subordinate ourselves. Let us always perform a proper technical and dispassionate analysis first; Let us always measure the pros and cons and decide each time what is best for the country. By the way, this was what happened when the international standards were adopted in 2008/2010, and the good consequences are there with a new stereotype of the high-quality accountant, a new image of accounting and our companies' decreasing cost to raise capital, from third parties as well as their own.

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Association of information sharing with the risk and performance of cooperatives' strategic alliance

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Abstract

Objective: This study analyzes the association of information sharing with the risk and performance of cooperatives' strategic alliance, mediated by knowledge sharing and information leakage.

Method: A survey research was conducted in agricultural cooperatives listed in the Organization of Brazilian Cooperatives [OCB] (2018), involving managers (manager, supervisor, coordinator and controller) registered in the LinkedIn network. The questionnaire was sent through the SurveyMonkey platform to the 516 managers who accepted the invitation and the final sample totaled 96 valid responses. To test the research hypotheses, the structural equation modeling technique was applied.

Results: The results showed that information sharing is directly associated with knowledge sharing, but the association of variables is not observed in the interaction between information sharing and information leakage. Information leakage is directly associated with the risk of the strategic alliance, as is knowledge sharing with alliance performance. Knowledge sharing presented partial mediation in the relationship of strategic alliance risk-information sharing and alliance performance, while information leakage did not meet the mediation requirements.

Contributions: The study contributes by highlighting the association of information sharing with knowledge sharing in cooperatives' collaborative environment. It also provides indications on the consequences of information sharing and information leakage. It also highlights the importance of strengthening strategic alliances to reduce risk and increase performance.

Keywords: Information Sharing; Risk of strategic alliance; Alliance performance.

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1. Introduction

Information is seen as a source of power in the business world, and deciding which information to share or not can lead the organization to gain competitive advantages or disadvantages (Fawcett, Osterhaus, Magnan, Brau & McCarter, 2007). For Connell, Kriz, and Thorpe (2014), information is an important element in the process of creating environments aimed at collaborative and innovative development. This importance increases when all partners involved can gain from information sharing situations (Cheng, 2011).

Research shows that when greater integration and more information sharing exist between alliance partners, there is better collaboration and coordination and, hence, the alliance performs better (Goodhue, Wybo & Kirsch, 1992; McLaren, Head & Yuan, 2002). Wu, Chuang, and Hsu (2014) found that collaboration plays an important role in the performance of alliance partners through information sharing, while information sharing is directly reflected in the performance of alliance partners.

Information sharing among cooperation members contributes to knowledge generation and socialization among organizational partners. By sharing knowledge, organizations encourage mutual understanding, enabling the construction of an environment of trust (Ahmed, Ragsdell & Olphert, 2014). When organizations decide to explore collaboration to expand their knowledge, stakeholders can benefit from increased performance-driven information (Massaro, Moro, Aschauer & Fink, 2019).

On the other hand, one should be aware that, by sharing information, its leakage may be encouraged. Tan, Wong and Chung (2016) describe that information leakage can be seen as an incentive to obtain monetary benefits, acquire technology, gain reputation, explore better competitive advantage and guarantee a higher sales volume. When misused, however, information leakage can result in opportunistic behavior that undermines the goals of strategic alliance members (Massaro *et al.*, 2019).

Alliances are important strategic mechanisms for organizations, but with risky configurations and high percentages of failed alliances (Christ & Nicolaou, 2016). Such failures are associated with the risk of strategic alliance when cooperatives provide each other with access to private and proprietary information, such as costs, demands, and customer lists, which is likely to be used for harmful purposes (Christ & Nicolaou, 2016).

In the literature, it is observed that the reflections of information sharing in constructs, such as the risk and performance of the strategic alliance, are not yet sufficiently clarified, indicating a research gap to be explored. Thus, we seek to answer the following research question: How is information sharing associated with the risk and performance of the strategic alliance of cooperatives and what are the effects of mediation of knowledge sharing and information leakage in this relationship? It is assumed that this type of organization, through the guiding cooperative principles, experiences the daily sharing of information.

The results of this research contribute to the existing literature on information and knowledge sharing as it reveals an association between these constructs, which corroborates the benefits of social interactions for strengthening strategic alliances (Hueth & Marcoul, 2006; Ritala, Olandera, Michailovab & Hustedb, 2015). Sharing skills and experiences, joint problem solving, and other possible interactions reinforce the benefits of sharing information and knowledge on the performance of alliance partners (Wang & Hu, 2017).

The risks to the strategic alliance in case of information leakage outweigh the expected benefits of information sharing (Marshall, 2015; Tan *et al*., 2016). Situations of loss of competitive advantage, inability to identify the causes of the problem, lack of knowledge and information handling skills are risks that can stimulate or mitigate a strategic alliance (Das & Teng, 1996; 2001; Ahmed *et al*., 2014 ; Christ & Nicolaou, 2016). This dichotomy appears in the literature and requires unraveling through theoretical-empirical research on arrangements in the form of strategic alliances.

In practice field, research can contribute to the cooperatives under analysis by highlighting the benefits of the collaborative environment and, at the same time, the risk of information leakage in this context. Mojo, Ficher and Degefa (2015) perceive information sharing as the main benefit, noting that the impact of cooperatives on their members' share capital may be related to frequent meetings and subsequent information sharing by different means, which may enhance members' trust, commitment and participation.

2. Literature Review and Background of Hypotheses

2.1 Information sharing and knowledge sharing

The purpose of information sharing is to ensure that all stakeholders in the process obtain information of interest to them in a timely manner, considering the heterogeneity of each member's needs (Hu, Xu, Zhang & Liu, 2017). Tomaél and Marteleto (2006) warn that information and knowledge can represent different aspects of the same situation, considering that knowledge can be interpreted as information processed by the brain, and that, when the individual articulates knowledge for the sake of transmission, this becomes information.

In the absence of information sharing, according to Khan, Hussain and Saber (2016), stakeholders will independently determine, for example, the selling price, the number of deliveries per cycle or period and the size of the shipment. In an information sharing situation, the buyer and supplier may also share information about potential yield losses, production uncertainty, lack of capacity, equipment problems, quality issues and / or insufficient inventories (Khan *et al*., 2016).

Hueth and Marcoul (2006) modeled information sharing between different future situations that may occur in companies. Among the results, they showed that information sharing tends to outweigh the profits for producers by inducing stronger competition between intermediary companies. This is true even when companies face the dilemma of not reporting their information. This can be avoided if companies enter into an ex ante contract that requires full disclosure of the information as soon as the signals have been received.

Evans and Weninger (2014) applied Nash's Bayesian equilibrium to a fishermen's cooperative to analyze the dynamics of information sharing, with uncertainty about payoffs and competitors' fishing locations. The modeling results confirmed that uncooperative fishermen engage in an inefficient search for information. When information is shared among a group of cooperated fishermen, however, there is the benefit of sharing information about fishing locations. Thus, simultaneously, the sharing of knowledge occurs.

Khan *et al*. (2016) presented a mathematical formulation for the reduction of buyer unit price and supply chain improvement due to information sharing. They noted that sharing information resulted in improved annual profit for all involved. On the other hand, they found that this gain depends on the unit price and on the environmental and social cost parameters the buyer takes into account. This suggests knowledge of the elements associated with environmental and social cost.

An initiative commonly mentioned in the literature is information sharing among partners in a supply chain (Lee, So & Tang, 2000). Fawcett *et al*. (2007) alert though that for a supply chain to benefit from information integration and sharing, there needs to be a high degree of participation by all stakeholders. This can also favor knowledge sharing among participants.

From this perspective, one can see the extension of the concept of information sharing. For Alves and Barbosa (2010), this is a voluntary process on the part of the knowledgeable individual, able to promote integration between those involved, open to continuous learning and the mutual transmission of concepts and skills, to promote knowledge and innovation. From this perspective, the first hypothesis of the research was formulated:

- $\mathbf{H_1}$: Information sharing is directly and positively associated with knowledge sharing.

2.2 Information sharing and information leakage

From an intraorganizational perspective, Ansari (1977) alerted to the limited research available in the literature regarding the amount of information shared between managers and subordinates about a given event. Moreover, it is unclear how this information affects the relationship between the parties, and which are the impacts on the choice of structural features, such as the number of points at which information is transformed before it reaches its destination, and how information actions are integrated at various levels of the organization.

Similar concerns can be observed in interorganizational relationships. Information sharing is expected to help save costs by reducing inventories and lot size, productivity gains, and other measures (Marshall, 2015). Strategic alliances tend to gain competitiveness, access to resources from partners, markets, technologies, capital and people (Van den Abbeele, 2016). On the other hand, depending on who receives the information or the circumstances in which it is transmitted, leakage may occur, intentionally or unintentionally, to an unauthorized party, favoring potential opportunistic behavior.

By sharing information with alliance partners, such as cost, demand, and customer lists, companies become vulnerable to potential opportunistic behavior by their partners (Christ & Nicolaou, 2016). Marshall (2015) exemplifies the leak as the tendency of the manufacturer to leak the information shared by the retailer to other competing manufacturers. The pursuit of organizational incentives can also drive the leakage of critical and confidential information to third parties for monetary benefits, technology acquisition, reputation gains, exploitation of competitive advantage, and so on. (Tan *et al*., 2016).

Tan *et al*. (2016) warn that information leakage and improper knowledge sharing cause companies to lose competitive advantage in their respective fields or even lead to the inability to identify the causes of the problem, due to lack of knowledge and skills in information handling. Unsurprisingly, most serious information security breaches occur because of the failure to combine information that is exposed to technologies, people, and processes (Ahmed *et al*., 2014).

Among the factors that influence information leakage in a strategic alliance, Tan *et al.* (2016) highlight the sharing of information. For the authors, the greater the sharing of information between alliance partners, the greater the confidential information exchanges, and this combination can lead to greater risks of information leakage. That is, when sharing information, a member of a relationship may (consciously or not) be leaking information (Tan *et al.*, 2016).

In a case study conducted with five companies, Tan *et al.* (2016) found that former employees who had information from internal information systems leaked it to their competitors and thus caused them to lose competitive advantage. In this perspective, the second hypothesis was formulated:

- **H_2**: Information sharing is directly and positively associated with information leakage.

2.3 Information leakage and risk of the strategic alliance

In designing the information sharing platform between members of a strategic alliance, when failures occur in the design of the control system, with faults and vague boundaries, there is a great possibility of information leaking beyond the collaborative environment (Tan *et al.* , 2016). The author warns that such failures are usually due to limited resources for monitoring and controlling information sharing platforms. Information leakage, whether due to technological, human or hybrid problems, is a risk of the strategic alliance.

Concerns about information leakage are growing in organizations, especially due to privacy aspects and information disclosure online (Gopal, Hidaji, Patterson, Rolland & Zhdanov, 2018). But alliances are efforts with some degree of risk. Thus, trust in the cooperation and knowledge of partners is necessary to achieve the objectives of the alliance (Das & Teng, 1996; 2001). Alliance conflicts can occur when alliance members' goals are achieved at the expense of the alliance, and similarly when alliance objectives are incompatible between different partners and conflicts exist between the participants in the strategic alliance (Christ & Nicolaou, 2016).

Companies may be reluctant to share information due to the negative effects on their revenues and profits as a result of the potential risk of confidential information leakage (Kong, Rajagopalan & Zhang, 2013). Tan *et al.* (2016) add that information leakage is usually described as the dark side of integration data. In this sense, Fawcett *et al.* (2007) point out that even when an organization has sufficient capacity to share information, managers may not be willing to do so for issues related to lack of trust in alliance members.

Research does not clearly show how managers perceive and assess the risk of information sharing (Tran, Childerhouse & Deakins, 2016). These authors also point out that little research addresses how organizations deal with such risks, and that studies tend to examine aspects of risk management and information sharing separately. Relational risk may increase due to partner opportunism (Christ & Nicolaou, 2016) and the risk of intentional data sharing (Lechler & Wetzel, 2017), among other factors.

Among the various proposed relationships, Chist and Nicolaou (2016) investigated the impacts of perceived risks on information exchange in the strategic alliance risk. The authors define perceived risk of information exchange as the possibility that one partner will use the information opportunistically (for example, by leaking it), leading to the inability of the other party to use that information appropriately. The survey results indicated that the higher (lower) the risk of information exchange, the greater (lower) the risk of the strategic alliance.

This study focuses on the risks of information exchange between strategic alliance partners, situations of failure to achieve cooperation objectives, misinterpretation and communication, as well as unavoidable failures. Such risks show whether partner companies opportunistically use information to promote internal objectives as a form of conflict with alliance partners (Christ & Nicolaou, 2016). Given the above, the third hypothesis of the research was formulated:

- **H_3**: Information leakage is directly and positively associated with the risk of the strategic alliance.

2.4 Knowledge sharing and performance of the alliance

Christensen (2007) defines knowledge sharing as the process of exploiting existing and accessible knowledge, transferring and applying this knowledge in search of improvement, making the process of solving specific tasks faster and cheaper. Knowledge sharing can be related to the creation of new knowledge through different combinations of existing knowledge or by improving the exploitation of existing knowledge (Christensen, 2007).

According to Riege (2005), knowledge sharing is acknowledge as a practice that can provide companies with a competitive advantage, helping to achieve business objectives, often serving as a key component of knowledge management programs. Chen, Chuang and Chen (2012) highlight that knowledge management is crucial to improve performance, gain competitive advantage and innovation by sharing learning that leads to continuous improvement of the company, allowing the integration of resources and capabilities.

Cruz-González, López-Sáez and Navas-López (2015) point out that supply chain partners, for example, can gain information, know-how and perspectives from each other, and that knowledge sharing acts as a mechanism that assists in the process of realizing the benefits of collaborative knowledge for performance and innovation. Given reciprocity, trust and respect in a collaborative environment, knowledge sharing can yield long-term benefits, which improves innovation performance and profitability (Wang & Hu, 2017).

For Wang and Hu (2017), in an environment where there is knowledge sharing, the development of new skills and the management of knowledge assets of the supply network take place. In this sense, shared information can be used to diagnose and monitor alliance performance by enabling the identification of potential failures (Christ & Nicolaou, 2016). Failures in the performance of the alliance may be due to poor communication issues, ineffective management or difficult market conditions.

Greater integration and sharing of information between alliance partners results in better alliance coordination and performance (McLaren *et al.*, 2002). According to Sheu, Yen, and Chae (2006), when information sharing and collaboration are closely related to alliance success, in the case of the supply chain, it is important to identify the fundamentals of contributions to partnership exchange beliefs.

Ritala *et al.* (2015) found in their research that knowledge sharing is beneficial for companies' innovation outcomes by providing improvements in innovation performance. For these authors, this relates to the principles of positive reciprocity, which argues that the more the company shares knowledge, the more knowledge the company will receive in return. Thus, the fourth hypothesis was formulated:

- **H_4**: Knowledge sharing is directly and positively associated with alliance performance.

2.5 Knowledge sharing and information leakage as mediators of the interaction between informationg sharing and performance/risk of the alliance

Hueth and Marcoul (2006) noted in their research that information sharing can offer benefits to consumers and producers by allowing them to increase the accuracy of the future demand. Khan *et al.* (2016) highlight the sharing of information as a basis for the development, maintenance and strengthening of the process of managing the environmental and social impacts of the supply chain.

Information sharing enables better integration of information systems, which can have positive and negative effects on risk among the allied members of the supply chain and consequently affect the alliance performance (Christ & Nicolaou, 2016). It can also be useful to improve supply chain efficiency, especially by reducing inventory costs and reducing inventory shortages when demands are correlated (Lee *et al.*, 2000).

According to Das and Teng (2001), problems with alliances may occur, such as lack of cooperation, risk of poor performance, alliance or partners. The opportunistic behavior of the stakeholders in the alliance can lead to conflicts due to differences of opinion, or individual interests not matching those of other partners (Das & Teng, 2001). Even if alliances are perceived to be relevant to the organizational strategy, partnership formation presents risks and a high probability of failure due to inefficient communication, inefficient management or difficult market conditions (Christ & Nicolaou, 2016).

Information leakage can be reflected in partnership performance. It involves the disclosure of competitor-sensitive information about strategy and performance by both alliance partners and individuals working in the company (Massaro *et al.*, 2019). Information leakage can happen unintentionally (Von Rheinbaben & Ruckes, 2004) as a result of employee frustration with the organization in terms of policies, organizational barriers, lack of trust (Casimir, Lee & Loon, 2012), or due to of interests of unfaithful and unethical workers / partners (Massaro *et al.*, 2019).

In the same sense, there is knowledge sharing, which involves the risk of uncertainty about the behavior of individuals and their business partners, so that the recipient may harm the issuer, whether due to information leakage or abuse for its own benefit (Massaro *et al.*, 2019). Thus, the fifth hypothesis of the research is formulated, segregated in two:

- $\mathbf{H_{5a}}$: Knowledge sharing positively mediates the interaction between information sharing and alliance performance.
- $\mathbf{H_{5b}}$: Information leakage positively mediates the interaction between information sharing and strategic alliance risk.

Figure 1 presents the theoretical research model, with the constructs and the direction of the hypotheses.

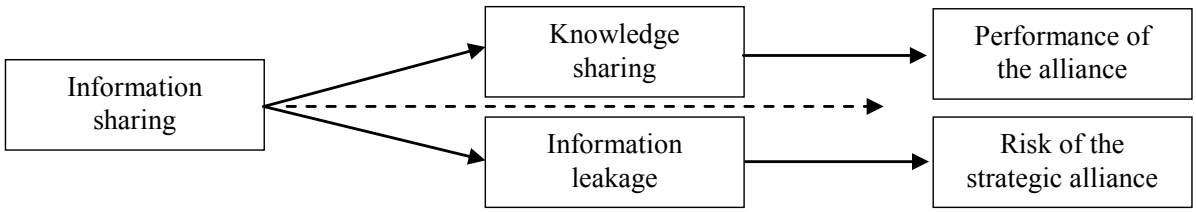

Figure 1. Theoretical model of the research

Source: elaborated by the authors.

According to Figure 1, the core issue of the research is the relationship of information sharing, given the relevance of this type of sharing to benefit the alliance performance. Based on information sharing, relationships were proposed with knowledge sharing and information leakage, which were related to alliance performance and strategic alliance risk. Finally, knowledge sharing and information leakage were related as mediators of information sharing with the performance and risk of the strategic alliance.

3. Research Method

This research was conducted based on a survey, using the Brazilian agricultural cooperatives listed in the OCB (2018) as the population. This sector was selected due to the cooperative principles (voluntary and open membership; democratic control of members; economic participation of members; independence, provision of education, training and information; cooperation between cooperatives; and concern for the community) highlighted by Mojo *et al.* (2015); aligned with characteristics needed to create a collaborative environment and which are presumed to stimulate information sharing and knowledge.

Of the 966 agricultural cooperatives listed in the OCB (2018), 278 cooperatives were identified with employees registered in the professional network LinkedIn. In this network, people with positions in these cooperatives were identified at the management level, searching for the terms: "manager", "coordinator", "supervisor" and "controller". In total, 1,255 people in any of these positions were identified and invited to participate in the survey. The 516 managers who accepted the invitation received the link from the survey instrument and obtained a total of 109 responses.

The questionnaire was sent through the SurveyMonkey platform from June to August 2018. Of the 109 answered questionnaires, 13 were incomplete, resulting in a valid sample of 96 respondents, suitable for analysis of the proposed theoretical model. The appropriate sample size was calculated using G * Power software (Faul, Erdfelder, Buchner & Lang, 2009). The evaluation of the sample size and statistical power of the analysis followed the criteria according to the predictor variable (information sharing) on the dependent variable (alliance performance and strategic alliance risk), with a mean effect size of 0.15, sample power of $1-\beta = 0.8$ and a significance level of $\alpha = 0.05$, which resulted in at least 68 responses.The research instrument consists of five blocks, with 20 assertions in seven-point Likert scale (Table 1), in line with the constructs of the theoretical model for this research. The research instruments were elaborated and validated by the authors indicated in the respective constructs. To ensure proper translation, the instruments were back-translated into English.

Table 1

Research construct and questions

Constructs	Statements
Information sharing (Tan *et al*., 2016)	1. Mark your level of agreement with each of the statements below about your organization on a scale from 1 to 7, with 1=I completely disagree and 7=I completely agree.
	IS1.We share the proprietary and/or confidential information on our business units with the network/alliance partners (central and other cooperatives). IS2.Our network/alliance partners (central and other cooperatives) share their proprietary and/or confidential information with us. IS3. We and our network/alliance partners and/or other external parties exchange information that helps with the business planning.
Knowledge sharing (Wang & Hu, 2017).	2. Mark how frequently your organization has engaged in knowledge sharing activities with its partners, in the past five years, on a scale from 1 to 7, with 1=rare and 7=very frequent.
	KS1.We share our innovative work reports and technical documents with other members of the supply chain, upon their request. KS2.We share our manuals and methods with our suppliers or clients, upon their request. KS3.We frequently share our experience, know-how or new ideas of innovative work with other members of the supply chain.
Information leakage (Tan *et al*., 2016)	3. Mark your level of agreement with each of the statements below about your organization on a scale from 1 to 7, with 1=I completely disagree and 7=I completely agree.
	IL1.We face problems with information leakage/losses to third parties. IL2. We face problems with information leakage due to technology-related incidents (such as company database invasion). IL3. We face problems with information leakage due to employee fraud (such as employees stealing or getting information without permission). IL4. We face problems with information leakage as a result of efforts to cooperate with external parties. IL5. We face problems with information leakage due to employees' moving to other organizations. IL6.It is highly probable that the external parties will benefit from the information that leaked. IL7.Severe interruptions in our daily operations and in the supply chain have happened due to information leakage/losses.
Performance of the alliance (Christ & Nicolaou, 2016)	4. Assess for each of the statements below the performance of your cooperative's strategic alliance with the central and the other cooperatives on a scale from 1 to 7, with 1=I completely disagree and 7=I completely agree.
	PA1.It has been very profitable to our cooperative. PA2.Our strategic competitiveness has improved. PA3.It has fully attended to our cooperative's expectations. PA4.We hope that the strategic alliance with the current partners will continue in the long term.
Risk of the strategic alliance (Christ & Nicolaou, 2016)	5. Mark your level of agreement with each of the statements below about your perceived risk of your cooperative's strategic alliance with the central and the other cooperatives on a scale from 1 to 7, with 1=I completely disagree and 7=I completely agree.
	RA1.The probability of not reaching the results is high. RA2.The probability of failure is high. RA3.It is highly probably that it will somehow result in failure.

Source: elaborated by the authors.

The analysis begins with factor analysis of the research instrument to identify observed relationships and common factors of the construct (Hair Jr, Babin, Money & Samouel, 2014). Still in the factor analysis, in order to verify the common method bias, Harman's Single Factor test was performed, as all variables were answered by the same respondents (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). The results showed the presence of five factors, with the first factor representing 26.52% of the total explained variance, indicating that the common method bias does not present a threat to the data analysis, as postulated by Podsakoff *et al.* (2003).

Subsequently, the partial least squares were applied using Structural Equations Modeling (SEM) in SmartPLS 2.0 M3. Partial Least Squares (PLS) "combines aspects of multiple regression (examines dependency ratios) and factor analysis (represents unmeasured concepts - factors - with multiple variables) to estimate a series of interrelated dependency ratios simultaneously" (Hair Jr *et al.*, 2014, pp. 468-469). In the analysis of mediation, the recommendations of Baron and Kenny (1986) were followed, namely: (i) in the first equation, the independent variable should affect the mediator variable; (ii) in the second equation, the independent variable must affect the dependent variable; (iii) in the third equation, the mediating variable must affect the dependent variable; and (iv) if these conditions are confirmed, then the effect of the independent variable on the dependent variable needs to be smaller in the third equation than in the second equation. According to Baron and Kenny (1986, p. 1177), "perfect mediation is valid if the independent variable has no effect when controlling for the mediator."

4. Description and Analysis of Results

4.1 Measuring model and descriptive statistics

The application of structural equation modeling initially requires the evaluation of the measuring model, testing the reliability (internal and composite) and validity (convergent and discriminant), as recommended by Hair Jr *et al.* (2014). This information is included in Table 2, along with descriptive data statistics (mean, mode, median and standard deviation).

Table 2
Measuring model and descriptive statistics

Description	IS	IL	KS	RA	PA
Information sharing (IS)	**0.898**				
Information leakage (IL)	0.090	**0.760**			
Knowledge sharing (KS)	0.377	0.227	**0.857**		
Risk of the Strategic Alliance (RA)	-0.027	0.549	0.006	**0.899**	
Performance of the Alliance (PA)	0.356	0.023	0.298	-0.251	**0.860**
Mean Extracted Variance >0.50	0.807	0.578	0.735	0.808	0.740
Cronbach's alpha >0.70	0.881	0.877	0.822	0.881	0.880
Compound reliability >0.70	0.926	0.905	0.893	0.927	0.919
Mean	3.76	3.04	3.34	3.40	4.56
Mode	5	2	1	2	5
Median	4	3	3	3	5
Standard deviation	1.72	1.76	1.75	1.61	1.56

Source: elaborated by the authors.

Convergent validity is obtained by the Average Variance Extracted (AVE), which establishes that the values of the latent variables are above 0.50 (Hair Jr *et al.*, 2014). As shown in Table 2, the way that external loadings and latent variables correlate is fit.

Cronbach's alpha and composite reliability were used to determine the model reliability. According to Ringle, Silva and Bido (2014, p. 65), "they are used to assess whether the sample is free of bias, or whether the answers as a whole are reliable." In line with the criteria of Hair Jr *et al.* (2014), the reliability of the model is observed, as Cronbach's alpha and compound reliability obtained values higher than 0.70.

To ascertain whether one construct is distinct from the others (Hair Jr *et al.*, 2014), discriminant validity was used. In this study, discriminant validity is acceptable according to the criterion of Chin (1998), as the values of the diagonal correlation coefficients are higher than the others. The square root value of the AVE is also higher than the absolute values of correlations with other latent variables, meeting the criteria of Fornell and Larcker (1981).

In the correlation, the 54% explanation percentage among the information leakage variables and risk perception of the strategic alliance is highlighted, which may be a sign of loss of confidence in the exchange of information between related parties. In research by Wu *et al.* (2014), it was observed that elements involved in social exchange (trust, commitment, reciprocity and power) precede information sharing and collaboration.

Also noteworthy is the negative correlation burden between perception of strategic alliance risk and perception of alliance performance, which suggests that the risk of strategic alliance is inversely proportional to alliance performance. In the study by Wu *et al.* (2014), collaboration has a mediating role in supply chain performance, while information sharing has a positive impact on supply chain performance.

There is a negative correlation between information sharing and the risk of strategic alliance, which may be justified by problems arising from lack of trust between alliance members, due to the possibility of information leakage or the use of information / knowledge to one's own benefit (Massaro *et al.*, 2019).

In descriptive statistics, the mean between the variables studied ranged from 3.04 to 4.56, on the 7-point scale, with a standard deviation from the mean between 1.56 and 1.76. The median and fashion denote low signaling of the variables "information leakage", "knowledge sharing" and "risk of strategic alliance". This result reveals insecurity in the process of knowledge sharing due to the fear that this information may compromise some strategy.

Competitive strategies can be a differential for the cooperative and its related parties, and a lack of security or trust can lead to an unfavorable climate, which may cause friction between alliance members and hence the disruption of future alliances. Tan *et al.* (2016) recommend the adoption of 4Cs (Contain, Control, Contract, Cultivate) structures to mitigate information / knowledge leakage, suggested to counteract unfavorable situations.

4.2 Structural model

In the structural model, the values of the bootstrapping analysis are measured, which verifies the fit of the measuring model and the significance of the relationships between the latent variables (Hair Jr *et al.*, 2014). In this analysis, the determination coefficient (R2) is observed, which evaluates the variance portion of the endogenous variables, indicating the quality of the adjusted model. For social and behavioral sciences, an R2 of 2% characterizes a small effect, 13% a medium effect and 26% a large effect (Ringle *et al.*, 2014).

Ringle *et al.* (2014) also suggest the analysis of Relevance or Predictive Validity Q2, which requires values greater than zero, to verify if the model presents accuracy and if the constructs are appropriate for the general fit of the model. In this study, the relevance or predictive validity was reached. Table 3 presents the results of the tests performed according to each research hypothesis.

Table 3

Results of the structural model – Direct effects

	Hypotheses	Structural coefficient	Standard error	T-value	P-value	Decision
H_1	Information sharing → Knowledge sharing	0.377	0.083	4.519	**0.000**	Accepted
H_2	Information sharing → Information leakage	0.090	0.087	1.028	**0.306**	Not accepted
H_3	Information leakage → Risk of the strategic alliance	0.556	0.065	8.555	0.000	Accepted
H_4	Knowledge sharing → Performance of the alliance	0.191	0.092	2.073	**0.041**	Accepted

Assessment of the Structural Model: R^2: Knowledge sharing = 0.142; Information leakage = 0.008; Performance of the alliance = 0.158; Risk of the strategic alliance = 0.307.
Predictive Relevance (Q^2): Knowledge sharing = 0.083; Information leakage = -0.001; Performance of the alliance = 0.086; Risk of the strategic alliance = 0.235.

Source: research data.

Table 3 shows that the model presents a determination coefficient (R2) with great effect for the risk of the strategic alliance, medium effect for alliance performance and knowledge sharing, and small effect for information leakage. In the Predictive Relevance (Q2), the results were above zero, which is in line with the recommendations by Ringle *et al.* (2014), except for the information leakage variable.The interaction of information sharing with knowledge sharing presented a positive correlation coefficient of 37.7% and a significance level of 1%, providing evidence for the acceptance of H1. This result indicates that the network/alliance partners and/or other external parties share information and generate knowledge sharing. The results offered no evidence to support H2 though, which predicts that information sharing is directly associated with information leakage.

Information leakage had a direct and positive effect on the strategic alliance risk, supporting the acceptance of H3. This result indicates that when information is leaked, there is a strong possibility that there will be a risk of alliance breakdown between network/alliance partners and/or other external parties. Likewise, there is statistical evidence that permits the acceptance of H4, with a direct and positive effect between knowledge sharing and alliance performance, at a 5% significance level. This result shows that the knowledge sharing generated in the strategic alliance leads to greater performance in operations.The fifth hypothesis of the study was subdivided into: H5a, which predicts the interaction between information sharing and strategic alliance performance, mediated by knowledge sharing; and H5b, which predicts the interaction between information sharing and strategic alliance risk, mediated by information leakage. To verify the mediation (Table 4), the recommendations of Baron and Kenny (1986) were followed.

Table 4

Direct, indirect and total effects of the mediation models

Hypothesis H5a	Effect Non-mediated model	Mediation of knowledge sharing			
		Direct effect	Indirect effect	Total effect	Mediation
Information sharing → Performance of the alliance	0.358***	0.284**	0.072*	0.356***	Partial mediation 20.2%
Hypothesis H5b	**Effect Non-mediated model**	**Mediation of information leakage**			
		Direct effect	Indirect effect	Total effect	Mediation
Information sharing → Risk of the strategic alliance	-0.115*	-0.077	0.050	-0.027	No mediation

Obs.: *p<0.10; **p<0.05; ***p<0.001.

Source: research dat.

Table 4 shows the effects of the structural model without mediation, as well as the direct, indirect and total effects of the mediating variables, which provides evidence to accept the partial mediation of hypothesis H5a, between information sharing and the performance of the alliance mediated by knowledge sharing. The evidence from the study led to the non-acceptance of hypothesis H5b though, due to the non-compliance with the mediation requirements proposed by Baron and Kenny (1986).

4.3 Discussion of the results

The analysis of the hypothesis test shows that information sharing is directly and positively associated with knowledge sharing, accepting H1. This result is consistent with the theoretical assumptions of the literature and the empirical research findings, which consider information sharing as the basis of the cooperative relationship (Fawcett *et al*., 2007), capable of supporting the coordination and control (Christ & Nicolaou, 2016), thus influencing the access to knowledge (Wang & Hu, 2017).

The information sharing process fosters the knowledge flows between the related parties, due to the exchange of experiences and skills between network/alliance partners and/or other external parties in their daily operations. Lin (2007) calls this process culture of social interactions. Knowledge sharing favors technical problem solving, brainstorming, setting new standards, and building new tools (Wang & Hu, 2017).

Tomaél and Marteleto (2006) add that knowledge is nothing more than processed information, which reinforces the relationship between information and knowledge. Studies in the cooperative environment, such as Galappaththi, Kodithuwakku and Galappaththi (2016), prove the evidence that sharing price, product quality, new technologies and competition information can promote stock adjustment, enabling better compliance among the network/alliance participants, which allows for optimal operations while maximizing overall economic returns.

The results did not confirm that information sharing is directly and positively associated with information leakage, which leads to the rejection of H2. Therefore, they do not corroborate the findings of Christ and Nicolaou (2016) and Tan *et al.* (2016). These studies found that information sharing can drive information leakage, causing vulnerability situations, as individuals can use information to excel opportunistically among related parties, also leading to a loss of competitive advantage and to the failure of the strategic alliance.

The rejection of hypothesis H2 provides interesting insights into the nature of relationships and information sharing channels adopted in the cooperatives studied. Tan *et al.* (2016) highlight that information sharing results in leakage when relationships between partners are top-down in nature and/or when communication channels between them have failures. Based on the above and on the findings of the research, it is speculated that cooperatives act homogeneously with their partners, that is, horizontally, and that their communication channels were designed to prevent failures and prevent leakage.

Information leakage, in turn, exhibits a direct and positive association with the risk of the strategic alliance, leading to the acceptance of H3. This result reinforces the findings of Das and Teng (1996; 2001) and Christ and Nicolaou (2016) that, in the event of information leakage, there may be opportunistic behaviors regarding information, as well as conflicts in partnerships. For Hong *et al.* (2013), information leakage results in lost profit and reduced efficiency of collaborative relationships. In this scenario, loss of competitive advantage may occur due to the risks that information leakage causes in the strategic alliance as a whole.

H4, which foresees a direct and positive association of knowledge sharing with the performance of the strategic alliance, was also accepted. This supports the results of the studies by McLaren *et al.* (2002), Riege (2005), Ritala *et al.* (2015), Christ and Nicolaou (2016), Wang and Hu (2017), that knowledge sharing can be a determinant for benefits such as performance improvements and competitive advantage of alliance partners. In addition, they argue that by sharing information, it is possible to avoid or diagnose any failures due to a lack of communication.

Christensen (2007) argues that knowledge sharing is a practice resulting from the exploitation of existing knowledge and/or the combination of different knowledge sources, which results in the strengthening of ties between different partners. In this perspective, knowledge sharing is an essential factor to understand and respond to the challenges of competitive and collaborative environments, which contributes to the identification and understanding of the skills and preferences of other partners and, consequently, intensifies the performance of the company. alliance (Wang & Hu, 2017).

Finally, hypotheses H5a and H5b predict mediations between the studied variables. H5a results revealed partial mediation of knowledge sharing in the relationship between information sharing and alliance performance. This result confirms those presented by Wang and Hu (2017), that information sharing affects the alliance's performance mediated by knowledge sharing. Wang and Hu (2017), finding a mediating effect of knowledge sharing, described this as a mechanism by which partners in a relationship can turn their expertise (e.g., information) into higher levels of performance. The evidence failed to confirm H5b though, which predicted the mediating role of information leakage in the relationship between information sharing and alliance risk, as Baron and Kenny's (1986) mediation requirements were not met.

Possible explanations for the non-significant outcome for some of the hypotheses tested regarding the effects of information sharing may derive from the fact that, in cooperatives, the benefit of information exchange is not documented but assumed to be voluntary (Evans & Weninger). , 2014). The survey results indicate that policies based on the assumption of free information flows in cooperatives may not reduce the unwanted information gathering or solve management problems. It is noteworthy that there is concern about information security in the strategic alliance, as pointed out in the research by Ahmed *et al.* (2014). Thus, the cooperatives studied in this research may be adopting security practices in the information sharing process, in order to avoid information leakage.

5. Final Considerations

This study analyzed the association of information sharing with risk and strategic alliance performance in cooperatives, mediated by knowledge sharing and information leakage. The results of the hypothesis test showed that information sharing directly and positively impacts knowledge sharing, justified by the social interactions between alliances, due to the exchange of skills, experiences, resolution of technical aspects, manufacturing capacity, access to intellectual property, access to financing, among others (Lin, 2007; Christ & Nicolaou, 2016; Wang & Hu, 2017). In the interaction between information sharing and information leakage, the results contradicted the findings of the studies by Christ and Nicolaou (2016) and Tan *et al*. (2016). The non-interaction between these variables may arise from the fear that shared information may compromise some strategy of one or more alliance members, due to the possibility of leakage of confidential information.

The direct interaction between information leakage and strategic alliance risk presented results in line with that of Christ and Nicolaou (2016), that opportunistic behaviors between individuals involved in the alliance, loss of competitive advantage and conflicts between the parties involved can contribute to Information leakage risks the strategic alliance. The direct interaction between knowledge sharing and alliance performance has also been identified, which is consistent with the studies by Riege (2005) and Wang and Hu (2017) that knowledge exchange favors the performance and mitigation of possible communication problems.

By including the mediating variables, H5a and H5b, in the analysis of the interactions, we identified the partial mediation of knowledge sharing in the interaction between information sharing and strategic alliance performance. There was no statistical support for hypothesis H5b though, according to the criteria of Baron and Kenny (1986). This may be related to opportunistic stakeholder behaviors, which triggers negative consequences involving the risk and performance of the strategic alliance. What is important is not the volume of information shared between the members of the strategic alliance, but the quality and relevance of the information that is transmitted. Therefore, observing the influence of mediating variables is relevant for the investigated cooperatives.

The study contributed to the literature by evidencing the association of information sharing with knowledge sharing in the cooperative environment of cooperatives. It also provides guidance on information sharing and information leakage consequences. It also highlights the importance of strengthening strategic alliances to reduce risk and increase performance. The findings are expected to encourage researchers to further explore the interaction of information sharing with the risk and performance of the strategic alliance, particularly focusing on mediating knowledge sharing and information leakage.

As a limitation, it is pointed out that the same respondents reported the dependent and independent variables, so that the common method bias could occur, although Harman's single factor test did not indicate problems for data analysis. To suppress this limitation, other research designs, for example longitudinal studies, are recommended. This analysis is also recommended in cooperatives of other segments, for example, credit, health, labor, consumer, educational cooperatives, among others, as the results prompt further research, or companies with a head office and branches structure.

As the choice of variables for the composition of each construct implied disregarding the assertions used in related studies, it is recommended that future research work on information sharing interactions involving other elements, such as trust, innovativeness, collaborative innovation, practices to stimulate the development of a more collaborative environment and behavioral issues. It is speculated that these elements may influence the sharing posture in relationships in different organizational settings, seeking performance improvements, goal setting, the provision of feedback and conflict reduction.

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A process model of management accounting change based on the contributions of institutional theory

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Abstract

Objective: This study aims to identify and discuss the core elements of the process of manage-ment accounting change in an organisation to serve as a theoretical framework and to explain the process of management accounting change as an outcome of the inter-relationship between exog-enous and endogenous factors.

Method: This paper is based on a conceptual literature review of the institutional theory studies on management accounting change.

Results: Institutional theory has been widely used to study management accounting change. The institutional literature on management accounting change is fragmented and disjointed though, providing an unstructured picture of the dynamics and outcomes of the process of management accounting change. This situation makes the task of explaining the complexity of management accounting change extremely difficult. In this paper, it is argued that the complexity of manage-ment accounting change comprises four key elements: (1) the internal and external pressures for change and the interplay between them; (2) the role of agency; (3) the idiosyncratic internal ele-ments; and (4) the process of institutionalisation.

Contributions: Drawing on institutional theory and these four elements of management account-ing change, an integrated framework is developed to capture and examine the macro and micro level dynamics in management accounting change.

Keywords: Management accounting; Institutional theory; Change; Accounting.

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1. Introduction

The issue of management accounting change has been the subject of several studies over the past two decades (Berry, Coad, Harris, Otley, & Stringer, 2009; Hiebl, 2018; Parker, 2012). Institutional theory has been the dominant theoretical perspective adopted in these studies (Scapens & Bromwich, 2010; Soeiro & Wanderley, 2019). In particular, new institutional sociology (NIS) and old institutional economics (OIE) have been prominent in extending the study of management accounting and its change towards the inclusion of social and institutional dimensions of organisations and their environment (Jarvenpaa, 2009; Modell & Wiesel, 2008). Although the institutional research on management accounting change has provided a comprehensive understanding of the management accounting change process, however, research on management accounting change based on this approach is fragmented and disjointed, providing an unstructured picture of dynamics and outcomes of the process of management accounting change. As a consequence, the interpretative institutional research has not yet fully provided the so-called theoretical generalisation (Scapens, 1990). This can jeopardise the interpretative nature of the explanation of the process of management accounting change based on the pattern model. This model adopts a holistic approach in which the relationships between various parts of the system and the system's relationship with its context serve to explain the system (Scapens, 2004). Therefore, it is paramount to identify and summarise the key elements of the process of management accounting change to support the difficult task of theorising the complexity of this process in an organisation.

This study then aims to identify and discuss the core elements of the process of management accounting change in an organisation to be able to provide a theoretical framework and explain the process of management accounting change as an outcome of the inter-relationship between exogenous and endogenous factors. The following research question was formulated: **What are the core issues of the management accounting change process and how can these elements be integrated into a 'skeletal' theoretical framework?**

Our starting point in this paper is Scapens' (2006) analysis of the core elements of the process of management accounting change. Scapens (2006, p. 27) states that: "It is this complex 'mish-mash' of inter-related influences which shapes management accounting practices and explains the diversity we see in the practices of individual companies". Based on this discussion, it is proposed that this complexity of influences in the process of management accounting change encapsulates four elements: (1) the internal and external pressures for change and the interplay between them; (2) the role of agency; (3) the idiosyncratic internal elements of the process of change; and (4) the process of institutionalisation in itself. Therefore, to fully explain and understand the process of management accounting change in an organisation, it is necessary to study and explain these four elements and their interaction.

The remainder of the paper is organised in three main sections. First, the institutional understanding of management accounting change based on the four key elements of change: the internal and external pressures for change and the interplay between them; the role of agency; the idiosyncratic internal elements; and the process of institutionalisation is explained. After this, the process model to study management accounting change in an organization is developed and presented. Then, the final section provides concluding comments.

2. Understanding management accounting change

Researchers and management accountants have debated on issues regarding the relevance, nature, and roles of management accounting systems within organisations over the past 30 years. This debate has intensified due to the major transformations in the organisational environment that have taken place in the last few decades (Bromwich & Scapens, 2016; ter Bogt & Scapens, 2019). Nowadays, organisations face an uncertain business environment with increasing market competition. As a result, organisational resources and processes have to be organised and monitored to achieve organisational goals. To achieve this, management accounting systems play an essential role because they provide information for the decision-making process (Quattrone, 2017).

In the late 1980s, the discussion about the process of management accounting change within the broad organisational context became a popular topic of debate among management accounting researchers, in particular after 'Relevance Lost: The Rise and Fall of Management Accounting' Johnson and Kaplan's book in 1987. As mentioned previously, Johnson and Kaplan (1987) questioned the relevance of contemporary management accounting practices. The main argument was that management accounting did not follow the fast development of the organisational environment. In other words, there has not been sufficient change in management accounting techniques to match the changes in the organisational environment and to support the growing demand for information. Johnson and Kaplan (1987) stated that in general, companies opted for internal information systems which were mainly designed to meet the requirements of external financial reports. For this reason, they called for the development and implementation of new 'advanced' management accounting techniques.

Since then, new 'advanced' techniques have been developed and introduced in the management field. The principal management accounting techniques introduced in the 1990s were: activity-based costing (ABC); activity-based management (ABM); life cycle costing; target costing; quality costing; functional cost analysis; throughput accounting, strategic management accounting; shareholder value techniques; economic value added (EVA); the balanced scorecard (BSC); and supply chain management (SCM) (Ax & Bjornenak, 2007).

The debate over the changing nature of management accounting has been supported by a wide array of research, whose findings are not uniform and, sometimes, contradictory (Burns, Ezzamel, & Scapens, 1999; Burns, Ezzamel, & Scapens, 2003; Busco, 2006; Modell, 2019). On the one hand, management accounting change can be understood as the introduction of new management accounting techniques, such as ABC or the BSC. North American accounting scholars (Lukka, 2007) largely support this particular view. On the other hand, management accounting change can be understood as the process of change in the manner in which traditional and/or new techniques are being used. Therefore, management accounting change occurs with the creation and introduction of new techniques or with changes in the way managers use management accounting information generated by traditional systems.

Management accounting change has been exhaustively studied from functionalist, behavioural, interpretive and critical perspectives (Berry *et al.*, 2009). Each of these perspectives has offered unique and varied ways of interpreting, understanding and criticizing management accounting change as contextually grounded phenomena, replete with multiple dimensions and characteristics. In particular, the qualitative research on change has been providing evidence that management accounting change is non-linear, unpredictable, uncontrollable and involves much more than simply technical change (Parker, 2012).

Institutional theory has been the most influential and popular theoretical lenses in theorising management accounting change (Parker, 2012; Soeiro & Wanderley, 2019). Smets, *et al.* (2012) have identified three existing approaches to analyse institutional change, which emphasise differences in the origin, mechanism, and unfolding of change. The first approach depicts institutional change as resulting from exogenous shocks, such as shifts in social values, regulatory policies, or technological regimes. The second stream focuses on the triggering role of endogenous organisational field-level contradictions. It is argued that organisations at the interstices of these contradictions become able to consider different responses to institutional pressures and to initiate change. The third approach focuses on the role of the intra-organisational dynamics, that is, the notion that intra-organisational interests and values condition the organisational responses to institutional pressures. These three approaches have collectively provided important insights into why, where, and how a change in institutional logics and their associated organisational arrangements might occur.

The literature on institutional theory and accounting change has also benefitted from these general studies on institutional change. This paper draws on Scapens (2006) to provide a broad picture of the institutional understanding of the management accounting change process and to identify the core elements to explain this process. Scapens (2006) reviews the utilization of the institutional theory, particularly the Burns and Scapens (2000) framework, in the study of management accounting change. In his paper, Scapens (2006) shows the importance of the process of institutionalisation (routinisation) to understand management accounting change. Also, he explains why the interplay of external and internal pressures, the role of agency, and the issue of trust and power are primordial aspects to consider to make sense of the process of management accounting change in an organisation. Scapens (2006, p.27) concludes:

> "At one level there are broad systematic pressures shaping management accounting practices (...) But in addition to these external pressures, there are internal pressures for and constraints on management accounting practices. Management accounting change in organisations has to be seen as an evolutionary, path-dependent process in which existing ways of thinking (institutions), circuits of power and trust in accountants can all have an impact on how the actors within the organisation respond to external institutional and economic pressures."

Based on Scapens (2006), it was identified that the core elements involved in the process of management accounting change are: (1) the interplay of internal and external pressures; (2) agency; (3) the idiosyncratic internal elements of change; and (4) the process of institutionalization. The interplay of internal and external pressures, the role of agency, and the process of institutionalisation are explicitly presented by Scapens (2006) as key elements to understand management accounting change. In this paper, the label 'the idiosyncratic internal elements of change' was created to aggregate all factors that make up the intra-organisational dynamics and might influence the process of change, such as the previous institutions, power, and trust as highlighted by Scapens (2006), and other factors presented in the institutional literature such as, politics (Burns, 2000), organisational culture (Busco & Scapens, 2011), and capacity for action (Greenwood & Hinings, 1996). Then, this paper moves on to explain in detail the four key elements of management accounting change.

2.1 The internal and external pressures for change and the interplay between them

Management accounting change has many reasons or drivers for change (Innes & Mitchell, 1990; Scapens, Ezzamel, Burns, & Baldvinsdottir, 2003; Yazdifar & Tsamenyi, 2005). Change can occur as a response to external sources, such as market pressures, government laws, consumer expectations, technology, social and political change or internal pressures, such as a change in the power dynamics of the organisation, a change in dealing with a process or behaviour problem, or a change in the size and complexity of the organisation (Carruthers, 1995; Greenwood & Hinings, 1996). As a consequence, institutional change is not only seen as arising out of pressures from an organization's external environment, but also from the actions of organisational actors (Greenwood, Díaz, Li, & Lorente, 2010; Tracey, Phillips, & Jarvis, 2011). It is the interaction of the external and internal pressures that shape the process of management accounting change (Busco, Quattrone, & Riccaboni, 2007; Dillard *et al*., 2004; Hopper & Major, 2007; Moll & Hoque, 2011; Scapens, 2006; Tsamenyi, Cullen, & Gonzales, 2006). As a result, this interplay between internal and external pressures must be considered as a key element to understand and explain management accounting change in an organisation.

Although the literature on accounting change has identified that the interplay between the external and internal pressures is paramount to understanding change, the extant literature typically emphasises the dichotomy between exogenous and endogenous factors affecting change (Liguori, 2012). In order to overcome this situation, some authors have extended the Burns and Scapens (2000) framework by incorporating the external environment and explaining the interaction between internal and external factors for change (Busco, Riccaboni, & Scapens, 2006; Busco & Scapens, 2011; Nor-Aziah & Scapens, 2007; Ribeiro & Scapens, 2006; Yazdifar, Zaman, Tsamenyi, & Askarany, 2008). Although, these studies have provided a valuable contribution for the management accounting change field, they focus on only one aspect of the process of change, such as trust (Busco *et al*., 2006; Nor-Aziah & Scapens, 2007), culture (Busco & Scapens, 2011), and power and politics (Ribeiro & Scapens, 2006; Yazdifar *et al*., 2008). Also, these studies do not fully theoretically articulate how the criteria and practices at the inter-organisational and intra-organisational levels are linked.

To theorise the interplay between external and internal organisational factors in the process of change, the Dillard *et al*.'s (2004) model is particularly useful. Dillard *et al*. (2004) advocate that the process of institutionalisation moves in a recursively cascading manner through three levels of socio-historical relationships, namely economic and political level (PE), organisational field level (OF), and Organisational level. Dillard *et al*.'s framework is supported by the concept of 'axes of tension' proposed by Weber (1958, 1961; 1968) and insights from structuration theory, in particular three structural type concepts, namely: 'signification', 'legitimation', and 'domination' (Giddens, 1976, 1979, 1984) to indicate how criteria and practice are linked over the three levels of the social system. This theoretical conceptualisation gives support for theorising and explaining how the external and internal pressures are interlinked and how they shape the process of management accounting change.

2.2 The Role of Agency

Agency is the actions taken by individual members or agents of a social system in time-space (Giddens, 1984). Agency is a central issue in the process of change (Englund & Gerdin, 2011, 2018; Englund, Gerdin, & Burns, 2011; Leonel-Junior & Cunha, 2012). Busco *et al*. (2007) consider this issue as one of the key dimensions of the research in management accounting change. The importance of this issue has been acknowledged by the academic community and, in later contributions, researchers have been more interested in the actors' agency in the institutionalised world (Lounsbury, 2008). The role of agency in the process of change is a particular challenge for the institutional theory, because of the embedded agency problem, i.e. the difficulty of explaining how change occurs in institutionalized organisations (Johansson & Siverbo, 2009).

The difficulty in explaining change is because institutional theory argues that social and economic activity is governed, enabled and constrained by widely shared regulative, normative and cultural-cognitive norms, creating stability and similarity (Van Dijk, Berends, Jelinek, Romme, & Weggeman, 2011). However, research has shifted attention from the stabilising effects of institutions to agency and institutional change, by investigating strategic responses to institutional pressures (Oliver, 1991), institutional entrepreneurship (DiMaggio, 1988) and institutional work (Kaghan & Lounsbury, 2011; Lawrence, Suddaby, & Leca, 2009). Among these approaches institutional entrepreneurship has been increasingly adopted by academic scholars to explain how actors can contribute to changing institutions despite pressures towards stability and inertia (Battilana, Leca, & Boxenbaum, 2009; Royston Greenwood & Suddaby, 2006; Hyvönen, Järvinen, Oulasvirta, & Pellinen, 2012; Lounsbury & Crumley, 2007; Sharma, Lawrence, & Lowe, 2010; Tracey *et al*., 2011).

The concept of institutional entrepreneurship refers to the actions of "actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones" (Maguire, Hardy, & Lawrence, 2004, p. 657). Individuals, organisations and collectives have been pointed out as examples of actors who can act as institutional entrepreneurs. However, not all actors appear to be equally motivated to initiate change. Battilana, *et al*. (2009) highlight that the actors' willingness to exert agency depends on two conditions: (a) field characteristics (i.e. mature field or emerging field), and (b) actors' social position (i.e. dominant or marginal). Although these are important characteristics to analyse agency and institutional entrepreneurship, it is the accumulation of institutional contradictions that enables agency to introduce change as institutional fields are comprised of multiple logics and structures that often overlap and conflict (Greenwood *et al*., 2010; Hyvönen, Järvinen, Pellinen, & Rahko, 2009; Lok, 2010; Michael Lounsbury, 2007; Wagner, Moll, & Newell, 2011). Such heterogeneity is likely to give rise to institutional incompatibilities that become a source of internal contradiction, which can be defined as "a pair of features that together produce an unstable tension in a given system" (Battilana *et al*., 2009, p. 75). The accumulation institutional contradiction is likely to trigger actors' reflective capacity, enabling them to take some critical distance from existing institutional arrangements, to propose new forms of acting and organising, and to mobilise others about their projects and ideas (Greenwood & Suddaby, 2006; Seo & Creed, 2002).

The Seo and Creed (2002) provide a consistent framework to theorise the role of agency in the process of change. Some authors (Abrahamsson & Gerdin, 2006; Burns & Baldvinsdottir, 2005; Burns & Nielsen, 2006; Hopper & Major, 2007; Sharma *et al*., 2010) have used the Seo and Creed's (2002) framework to explain the process of institutional change in the management accounting field. The main pillar of the Seo and Creed (2002) framework is the view that institutional change should be understood as an outcome of the dynamic interactions between institutional contradictions and human praxis. The concept of contradictions is key to Seo and Creed's (2002) framework because it can explain when, how and why institutionally embedded agents might come to challenge, and subsequently attempt to change their and other's taken-for-granted beliefs and ways (Burns & Baldvinsdottir, 2005). Seo and Creed (2002) identified four sources of contradiction: technical inefficiency, non-adaptability, institutional incompatibilities, and misaligned interests.

First, isomorphic conformance to the prevailing institutional arrangements to obtain legitimacy might be at the expense of technical efficiency. Several authors highlight that conformity to institutional arrangements may conflict with technical activities and efficiency demands (Meyer & Rowan, 1977; Powell & DiMaggio, 1991). The possibility of loose coupling can lead to a discrepancy between the functional/technical requirements of the company and institutional requirements. This possible discrepancy can be a source of institutional contradictions.

Second, contradictions can arise from non-adaptability to the external environment. According to Burns and Baldvinsdottir (2005), once institutions are in place, they tend to be self-enforcing and taken-for-granted. As a result, there is little or no response to shifts in external factors due to psychological and economic lock-in towards (internal) institutional arrangements. Seo and Creed (2002, p. 228) summarise this source of contradiction by stating that "although institutionalization is an adaptive process, once in place, institutions are likely to be both psychologically and economically locked in and, in a sense, isolated from unresponsive to changes in their external environments".

The third source of contradiction is related to intra-institutional conformity that creates inter-institutional incompatibilities. In other words, conformity to specific institutional arrangements often leads to conflict with alternative institutions. Seo and Creed (2002) emphasise that individuals and organisations are increasingly exposed to multiple and contradictory, yet interconnected, institutional arrangements. As a consequence, an organisation or individual that conforms to particular embedded institutional arrangements might be incongruent to other institutional settings and different time-space circumstances (Burns & Baldvinsdottir, 2005).

Finally, the fourth source of contradiction is due to political struggles among various participants who have divergent interests and asymmetric power (Seo & Creed, 2002). Seo and Creed (2002) point out that actors whose ideas and interests are not adequately served by the existing social arrangements can act as potential change agents who, in some circumstances, become conscious of the institutional conditions. Therefore, a contradiction can emerge due to misalignment between institutionalised ways and the divergent perceived interests of actors embedded in such ways (Burns & Nielsen, 2006).

Institutional contradictions are the essential driving forces of institutional change, but human praxis is a necessary mediating mechanism between institutional contradictions and institutional change. Praxis defines human agency of a political nature which, though embedded in existing institutions, attempts to influence and secure change in the institutional configuration (Burns and Nielsen, 2006). This definition is similar to that of an institutional entrepreneur. In the same vein as Greenwood and Suddaby (2006), this paper considers human praxis and institutional entrepreneurship are similar concepts. According to Seo and Creed (2002, p. 230) praxis has three components: (1) actors' self-awareness or critical understanding of the existing social conditions, and how these social conditions do not meet actors' needs and interests; (2) actors' mobilisation, rooted in new collective understandings of the institutional arrangements and themselves; and (3) "actors' multilateral or collective action to reconstruct the existing social arrangements and themselves".

2.3 The idiosyncratic internal elements of the process of change

The idiosyncratic internal elements of the process of change are the items that make up the intra-organisational dynamics. The management accounting change literature has provided many examples of factors that make up the intra-organisational dynamics, such as power (Burns, 2000; Coad & Herbert, 2009; Jacobs, 2009; Kholeif, Abdel-Kader, & Sherer, 2007; Tsamenyi *et al.*, 2006), trust (Busco *et al.*, 2006; Johansson & Baldvinsdottir, 2003; Nor-Aziah & Scapens, 2007; Seal, Berry, & Cullen, 2004; Taylor & Scapens, 2016), politics (Burns, 2000; Yazdifar *et al.*, 2008) and organisational culture (Busco & Scapens, 2011; Jansen, 2011; Moll & Hoque, 2011; Yazdifar *et al.*, 2008).

The literature on organisational and accounting change has provided substantial evidence that to understand and explain change it is necessary to examine the organisational interpretation of the social, political and economic contexts and intra-organisational dynamics (Schreyögg & Sydow, 2011; Steen, 2011; Thomas, Sargent, & Hardy, 2011). The management accounting literature shows the intra-organisational dynamics and its implications at various hierarchical levels of an organisation play an important role in the process of management accounting change (Burns, 2000; Tsamenyi *et al.*, 2006; Yazdifar, Askarany, Askary, & Daneshfar, 2005).

Organisations are open to the external environment and influenced by external pressures, but organisations' responses to external forces and expectations are no longer assumed to be invariably passive and conforming across all institutional conditions (Greenwood *et al.*, 2010; Hardy & Maguire, 2008; Oliver, 1991). How organisations respond to external pressures, becomes a function of intra-organisational dynamics (Greenwood & Hinings, 1996; Ma & Tayles, 2009).

To theorise the influence of the idiosyncratic elements on the management accounting change process, Greenwood and Hinings (1996) provide a strong framework. This study provides a systematic view and a typology of the idiosyncratic elements of the process of change. Their ideas have been used extensively by the institutional organisational change literature (e.g. Greenwood & Suddaby, 2006; Pache & Santos, 2010), as well as, by the management accounting change literature (e.g. Liguori & Steccolini, 2012; Ma & Tayles, 2009).

Greenwood and Hinings (1996) identified four main intra-organisational factors that can create institutional contradiction and influence the process of change. These factors are: (a) the interests of those affected by change - groups seek to translate their interests into favourable allocation of scarce and valued organisational resource; (b) value commitments, which are the values that are generally the prevailing conceptions of what a company should be doing, of how it should be doing it and of how it should be judged (Liguori & Steccolini, 2012); (c) the power dependencies which is the power of particular groups to influence the process of change; and (d) the capacity for action, which is determined by a combination of technical and managerial capacities (Greenwood & Hinings, 1996; Liguori & Steccolini, 2012). Greenwood and Hinings (1996) view these four elements as the filters of the external pressures for change acting as change precipitators and/or mobilises. As a consequence, the idiosyncratic internal elements can trigger change and influence the process of institutionalisation.

In addition to the above idiosyncratic elements of change, the 'previous institutions' are part of this category (Scapens, 2006). The 'previous institutions' represent the set of rules, routines, and assumptions that the organisational actors followed before the process of change. The previous institutions should be considered as a factor that influences change, because new practices tend to be constrained by past actions, and existing/previous routines and institutions will shape, to some extent, the selection and implementation of the new set of rules and routines (Burns, 2000; Burns and Scapens, 2000; Scapens, 2006).

2.4 The Process of Institutionalisation

Institutionalisation refers to both the implementation and internalisation of new practices (Dambrin, Lambert, & Sponem, 2007). By analysing the process of institutionalisation, one seeks to explain how new practices became accepted and take root as values and beliefs in an organisation (Kreuzberg, Beck & Lavarda, 2016). Scapens (2006) states that routinisation and institutionalisation are at the heart of the Burns and Scapens (2000) framework. Burns and Scapens' (2000) framework has been widely adopted to explain management accounting change, in particular, the process of institutionalisation of new practices (e.g. Burns & Quinn, 2011; Guerreiro, Pereira, & Frezatti, 2006; Herbert & Seal, 2012; Lukka, 2007; Nor-Aziah & Scapens, 2007; Soin, Seal, & Cullen, 2002; Yazdifar *et al.*, 2008; Callado & Pinho, 2015; Espejo & von Eggert, 2017).

According to the Burns and Scapens (2000) framework, the process of institutionalisation follows four stages. The first step concerns the 'encoding' of the existing institution and taken-for-granted assumptions and meanings into the new rules, routines, and procedures which embody organisational values, such as management accounting practices. The second process refers to the 'enactment', through the day-to-day activities performed by organisational actors, of the routines and rules which encode the institutional principles. The third process represents the 'reproduction' of the rules and routines over time, through their repeated use in practice. The last step refers to 'institutionalisation' of routines and rules which have been reproduced through the behaviour of the individual actors.

In sum, the process of institutionalisation can be described as a process in which rules and routines are first encoded within the underlying assumptions that condition how people behave and then enacted by organisational members and gradually reproduced through their everyday actions, ultimately being institutionalised, that is, taken-for-granted by the majority of the organisational actors (Burns and Scapens, 2000).

3. A process model of management accounting change

The recent literature on accounting change that draw on institutional theory, i.e. after the Scapens (2006) paper, continues to discuss these four issues on change (i.e. (1) the interplay of internal and external pressures; (2) agency; (3) the idiosyncratic internal elements of change; and (4) the process of institutionalization), which reinforces the view that these four elements taken together are key to explain management accounting change. This recent literature aims to refine our understanding regarding these four elements of the process of change. For example, Ezzamel, *et al*. (2012) refine our understanding regarding the interplay between the external and internal pressures to introduce change by exploring tensions that emerged between the new business logic, prevailing professional logic, and governance logic in the education field in the UK. They found that competing logics in a field impact upon budgeting practices and the interpretation of budgetary outcomes.

Hyvönen, *et al*. (2012) draw on the concept of institutional entrepreneurship to study the role of actors and agency in institutional changes at organisational field level by exploring the emergence of accounting shared service centres in the municipal sector in Finland. They conclude that institutional entrepreneurs operate at different levels simultaneously, at the organisational field level institutional entrepreneurs need to interact with other actors who share the same interests and, at the organisation level, they need to find critical audiences that are receptive to their change agenda.

The idiosyncratic internal elements of the process of change are the items that make up the intra-organisational dynamics. Liguori and Steccolini (2012) explore this issue by aiming to explain why in the accounting change process, organisations confronting similar external environmental pressures show different outcomes of change. The authors use the archetype theory (Greenwood & Hinings, 1996) to undertake this study. Liguori and Steccolini (2012, p. 27) conclude with their study that "accounting change can be prompted by external stimuli, but, once the change is prompted, the outcomes of the change are explained by the dynamics of intra-organisational conditions". Another example of research that explains the importance of internal elements in the process of change is the Jansen (2011) study that explores the effects of managers' leadership style on the process of management accounting change.

The process of institutionalisation has also attracted considerable attention in the recent literature. Dambrin, *et al*. (2007) explore the issue of institutionalisation by studying the process by which a change in the institutional logic of an organisational field diffuses through the management control system of a firm. This paper is based on the approach developed by Hasselbladh and Kallinikos (2000). This framework suggests studying management accounting change as an institutional process based on the concepts of ideals, discourses, and techniques of control. Dambrin, *et al*. (2007) concludes that institutionalisation is completed only if ideals, discourses, and techniques are coherent. Although this recent literature refines our understanding regarding these four elements of the process of change, these studies tend to concentrate only on one aspect of the process of change. We understand the contributions and the reasons to adopt this approach due to the interpretive nature of the explanation of the process of management accounting change based on the pattern model, in which the researcher seeks theoretical generalisation (Scapens, 1990, 2004). However, this paper challenges this approach by proposing that to provide holistic analysis and understanding regarding the management accounting change process and its outcomes in an organisation, it is necessary to explain and understand the above four elements and how they interact with each other. In other words, if a study aims to provide a full account and make sense of the process of management accounting change in an organisation, it is argued that the researcher should draw on the above four elements of change to be able to achieve this objective.

The Burns and Scapens' (2000) framework has been widely adopted to explain management accounting change. In a review, however, Scapens (2006) criticised this framework for ignoring issues about the interplay between internal and external institutions, the importance of trust in accountants, the impact of circuits of power, and the role of agency in institutional change. Though a number of prior studies have drawn on these theories individually to study management accounting change, there is now an increasing recognition that change is complex and therefore there is the need to integrate ideas from different theoretical perspectives (Nor-Aziah and Scapens, 2007, Ribeiro and Scapens, 2006, Sharma *et al*., 2010, Busco and Scapens, 2011, Hopper and Major, 2007).

Hopper and Major (2007) is one of the few studies (see also Sharma *et al*., 2010) that explain the four elements of the process of management accounting change in an integrated way (however, they do not acknowledge explicitly these four elements of change as the key to understanding change). Hopper and Major (2007) provide useful lessons by explaining that institutional and technical pressures are interwoven and both impact on the process of management accounting change (Cruz, Major, & Scapens, 2009). Also, they stress the importance of studying power struggles and conflicts at the intra-organisational level. Due to the importance of this study, we initially considered adopting the Hopper and Major (2007) model as the theoretical framing for this study, however upon reflection, we decided against it for two main reasons.

First, Hopper and Major (2007) draw extensively on new institutional sociology (NIS), but not explicitly on old institutional economics (OIE). As a consequence, they neglected important concepts, such as lock-in and path-dependence (Ribeiro & Scapens, 2006; Schreyögg & Sydow, 2011). Second, their framework does not deal completely with the issue of the paradox of embedded agency. Hopper and Major drew on the labour process theory to explain the role of agency in the process of change using the concept of praxis. By adopting this approach they were able to explain how struggles within production over the material issue, autonomy, self-identity, and inter-professional rivalry affected accounting change. However, this view can be considered to be too narrow if you take into consideration that Seo and Creed (2002) suggest that praxis will be enabled by four sources of contradictions: inefficiency, non-adaptability, inter-institutional incompatibles, and misaligned interests.

Other attempts to provide an integrated framework to explain management accounting change have been discussed (e.g. ter Bogt & Scapens, 2019). Among these attempts, the work of Wanderley and colleagues (2011) suggest integrating three different frameworks, namely: Burns and Scapens (2000); Seo and Creed (2002); and Dillard *et al*. (2004). Although Wanderley *et al*. (2011) discuss and present interesting propositions on how to explore management accounting change, the present paper differentiates from the work of Wanderley *et al*. (2011) by proposing a 'skeletal' framework, which has the potential to help researchers to explain and rationalise management accounting change, without the constraints of following a specific theoretical way of seeing the world. This is particularly important, as the institutional theory is in constant evolution. Therefore, limiting researchers' theoretical perception about the accounting change phenomenon seems somehow contradictory to the social construction nature of the institutional theory.

In sum, institutional research in management accounting change has been done within three approaches or levels of analysis. First, the macro-level approach with the focus on changes triggered by exogenous shocks. Second, the meso-analysis seeks to explain change caused by field-level contradictions and pressures. Finally, the third approach focus on the intra-organisational dynamics that influence the process of change. In the same vein as Scapens (2006), we conclude that institutional research on management accounting has provided a comprehensive understanding of the complexity of the processes which shape management accounting practices. We then suggest that this complexity of processes involved in the process of change encapsulate four key elements (see above) that together can fully explain the process of management accounting in an organisation. As a result, It is proposed a process model to explain and study management accounting change in an organisation (see figure 1).

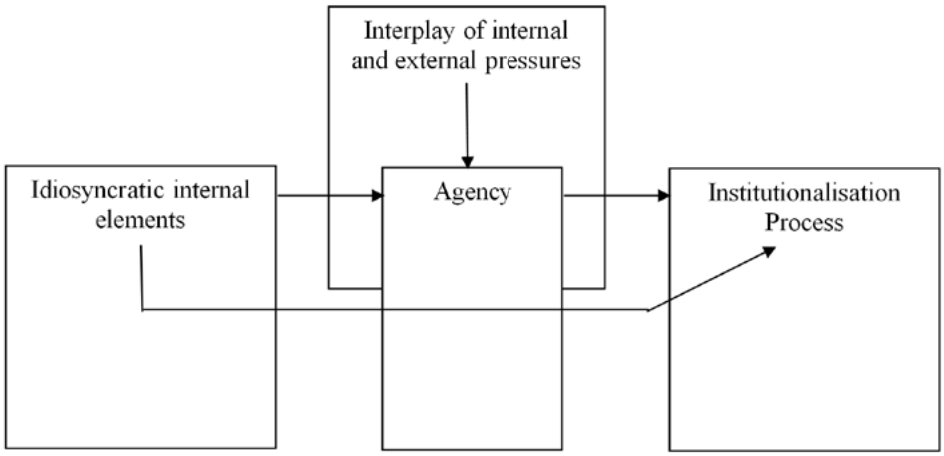

Figure 1. Process Model of Management Accounting Change

This model depicts that the process of management accounting change is triggered by the interplay of internal and external pressures for change. These external environmental pressures and intra-organisational pressures over time will generate institutional contradictions (Seo and Creed, 2002). The accumulation of contradictions may create conflicts among the organisational actors and generate the conditions for institutional change to take place by enabling agency for introducing change. The role of agency in the process of change is also shaped by the so-called idiosyncratic internal elements, as the environmental pressures are filtered by organisations through an internal process (the idiosyncratic internal elements) of interpretation and attribution of meaning. As a consequence, the idiosyncratic internal elements act as change precipitators and/or mobilisers (Royston Greenwood & Hinings, 1996). The idiosyncratic internal elements also shape the diffusion and institutionalisation process of the introduced practice into the organisation (Scapens, 2006).

4. Concluding comments

Institutional theory provided the lens to achieve our objective. Though the extant literature on institutional theory provided detailed explanations of the management accounting change process, it failed to identify and explain the core elements that can provide a holistic and systemic understanding of the process of management accounting change (Wanderley & Cullen, 2012). This observation is similar to that of Ezzamel, *et al.* (2012, p. 282), who states that "recent interest in 'management accounting change' has promised a more dynamic frame of reference, though up till now that model of change has not been clearly defined". As a consequence, with the endeavour of making sense of the process of management accounting change in an organisation in a holistic and systematic way, this paper revisited the institutional theory contributions on the topic of change, in particular, the one based our study on Scapens (2006) in order to identify the core elements capable of explaining and understanding management accounting change in an organisation.

This paper contributes to the literature on management accounting change by consolidating the institutional understanding that in studying management accounting change, researchers and practitioners have to understand the processes through which management accounting practices change and how they are shaped by the broad external influences as well as the systematic and more idiosyncratic internal influences (Scapens, 2006). In doing so, it is argued in this paper that, in order to provide a full explanation of the process of management accounting change, four elements should be taken into consideration: (1) the interplay of internal and external pressures; (2) the idiosyncratic internal elements of change; (3) agency; and (4) the process of institutionalisation. These four elements of change have the potential to fully summarise and explain the complexities of management accounting change in an organisation. As a consequence, the theorisation and explanation of management accounting change in an organisation may comprise the identification and explanation of these four elements of change. However, the theorisation and explanation of management accounting change using these four elements should be undertaken in an integrated manner, as these elements are interconnected and interrelated.

While it has been acknowledged in the literature that these four key elements are important in understanding and explaining management accounting change, previous institutional studies have failed to explicitly consider how they can be integrated into one framework to theorise and explain management accounting change. To address this situation, this paper proposed a process model based on the four elements of change and its interconnections to explain management accounting change in an organisation. This proposed process model is offered as a suggested guide by which future researchers might systematically examine how management accounting practices are shaped by the intra-organisational and inter-organisational factors involved in the process of change by emphasising the four elements of change.

In terms of a practical contribution, the research might take managers away from their day-to-day implementation activities and enables them to see how management accounting changes were operationalised within their organisation from a broader perspective. For practitioners, it is important to recognise that institutions matter at both inter (economic and political level; and organisational field level) and intra organisational level. At the intra-organisational level, institutions, taken for granted assumptions and the existing internal dynamics can all have a direct and important impact on the success or failure of a programme of change. Therefore, it is the intersection and interaction of the two forces (institutional context and organisational actors) that the direction of change can be shaped.

In terms of future research, the newly developed theoretical framework can be used to explore processes of management accounting change in several organisations since the validity of the theoretical framework presented in this paper would be greatly enhanced if supported by empirical studies of organisational and management accounting change. Additionally, the framework could be further extended to include aspects of recursivity since, as outlined by Dillard *et al* (2004), the criteria and practices at the intra-organisational level influence the criteria and practices at the organisational field level, as well as the economic and political level.

Although future research on the process of management accounting change may benefit from adopting a qualitative approach, the proposed process model may have important implications for traditional large-scale management accounting change studies based on quantitative methods. However, investigating the process of management accounting change at the intra-organizational level poses certain methodological challenges to those studies based on quantitative data. It may be possible for quantitative studies to consider effects on the management accounting change process including some indirect measures or proxies that do not adequately represent such effects. Such measures are unlikely to capture all the implications of the change process as a more continuous process and may underrepresent the complexity and dynamic nature of this phenomenon.

The process model based on the four elements of change is proposed as a 'skeletal' framework, that is, a generic model that can provide researchers support to rationalise and explain the process of change. This 'skeletal' framework provides the bones (structure) and future researchers will insert the 'flesh' according to each case to make sense of the process of accounting change. Therefore, the proposed model is open to other theoretical approaches to make sense and rationalise the four elements of change.

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Cognitive and affective development of Accounting students - influence of the case method in the light of Bloom's Taxonomy.

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Abstract

Objective: To evaluate the cognitive and affective development achieved when using the case method teaching technique, based on Bloom's Taxonomy, in Accounting students from a Federal Higher Education Institution (IFES).

Method: Quasi-experiment in a group of students (intact without selection), in the subject Structure of Financial Statements, taught in the 4th course semester, during the first semester of 2018.

Results: The results reveal that the use of an active teaching technique, as a complementary tool, can influence the level of cognitive and affective development the students achieve, also stimulating decision making, communication and problem solving, and also provide a more interactive, dynamic, reflective and motivating learning environment, making students responsible for their own learning, thus allowing the subject to act and interact with their area of study, which are essential and relevant elements for the construction of knowledge.

Contributions: The data collected in this research allow us to infer that the use of the case method, as a complementary teaching technique, contributed to the development of superficial learning, as it expanded the most basic level of development, also helping to partially expand all cognitive levels and motivating the students.

Keywords: Case method. Cognitive and affective development. Bloom's Taxonomy.

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1. Introduction

The constant search for quality education poses daily challenges for teachers. In this context, countless issues motivate the need for adaptation, such as programs imposed by the Government, like in the implementation of the Restructuring and Expansion of Federal Universities (Reuni), which increased the number of places in higher education (Pavione, Avelino & De Souza Francisco, 2016), or, as a result of proposed changes in accounting legislation, such as the changes resulting from the amendments to Law 6.404/1964, defined based on Laws 11.638/2007 and 11.941/2009. These factors demanded adaptations from teachers; firstly regarding the increase in the number of students in the classroom; and secondly regarding the immediate need for updating on the new accounting requirements.

The quality of teaching is associated with the relationship established between the teacher, the student and the institutional structure. Therefore, it is essential to understand how these interact for a better development of the educational process (Souza Gil, Garcia, Lino & Gil, 2012). In this sense, reevaluating the strategies used, seeking to build a motivating environment for higher education, is also considered a challenge for teachers (Souza Gil *et al*. 2012).

Aiming to increase the quality of education and the students' commitment, teachers resort to the use of teaching strategies that actively engage these students in the academic process (Guimarães, Severo, Nobrega, & Leone, 2019). In addition to enhancing the teachers' reflection on the methodologies employed, the use of different teaching strategies can improve the levels of understanding about the contents addressed (Carneiro, Portes & Cavalcante, 2014). In this sense, the methodology used is a determining factor to facilitate learning, as the students are willing and dedicated when motivated by an appropriate teaching technique, that is, one that arouses "students' attention and interest in the subject", stimulating the learning process (Morozini, Cambruzzi & Longo, 2007, p.97).

Another point considered important and highly relevant in the context of learning is the analysis of each individual's learning styles, because this permits verifying the student's ability to process information (Butzke & Alberton, 2017). These capacities, according to the authors, are diverse and, therefore, this perception allows the teacher to appropriately define what method to use. Therefore, it should be acknowledged that, in view of the diverse range of learning styles, it is essential to use different teaching techniques, as the various individual characteristics justify the use of different teaching techniques (Leal, Miranda & Casa Nova, 2017).

Among the teaching techniques available in the literature, the case method stands out. It is a clinical study of a situation, used to stimulate critical thinking, develop problem-solving skills and concentrate learning in an area (Rios, 2011). It is a technique that allows teachers to involve student participation in the teaching process, allowing students to reflect on a problem, developing arguments, evaluating the situation and proposing solutions (Leal, Medeiros & Ferreira, 2017).

According to Rama (1998), techniques that use the solving of actual problems can provide students with a richer learning experience than those used in traditional models. This strategy aims to approach the student to a real professional situation; stimulate diagnostic analysis skills; learn to apply information to existing situations; develop teamwork skills; analyze problems and propose solutions (Leal, Medeiros & Ferreira, 2017). In this sense, besides stimulating the student through complementary techniques, the effect of using this technique on the students' cognitive and affective development also needs monitoring, as these processes occur through the students' interaction and experience with the research subject (Pillete, & Rossato, 2018).

In this scenario, the complementary use of active teaching techniques can represent a promising strategy to maintain the field of accounting in the academic setting, besides helping to prepare teachers' didactics, given the challenges imposed by Reuni, by recent changes in accounting legislation and also by the expectations of a new generation of students. In this sense, this study aimed to answer the following question: **How does the use of the case method, as a complementary tool to the traditional method, influence the level of cognitive and affective development accounting students achieve?**

In an attempt to answer this question, we evaluated the ability of the case method technique to influence the levels of cognitive (learning) and affective (motivation) development Accounting students attained in the light of Bloom's Taxonomy. Thus, the research contributes to the educational practice, indicating that it is beneficial for accounting teaching to use the case method technique as a complement to lectures and exercise solving, as it furthers the students' profound cognitive development, allowing teachers to use this data as an analytic tool, in view of the educational objectives they intend to achieve, and feel stimulated by the possibilities, as the results found demonstrated that the use of this active methodology contributes to the teaching and learning process, enabling teachers to reflect on their practice.

As a theoretical contribution, we highlight the recovery of how knowledge is constructed, highlighting Constructivism as a format that allows the student's cognitive development and, consequently, the construction of knowledge, demonstrating its effect through the evaluations performed. The study also collaborated with the students, who, through the application of the experimental technique, obtained a learning environment with integration, group work, development of the experience of solving problems and making decisions, improving communication, conducting research and mainly providing an environment capable of improving cognitive development, bringing satisfaction. Satisfaction can be an indicator of quality. In this sense, this analysis was fundamental to understand the processes that need to be improved, serving as a basis for the management of IFES to review educational plans and proposals.

2. Theoretical Framework

Based on Cognitive theory, when it comes to the study of learning, concerns focus on how subjects interact with the research subject through their mental structure (Moreira, 2011). Thus, cognitivism is based on the assumptions that current learning depends on previous learning, analyzing how subjects process information and assign meaning to it (Lefrançois, 2016). In this sense, development is seen as a result of the interaction between the subject's thought processes and external actions (Piletti & Rossato, 2011). Thus, knowledge is understood based on human cognition as a process of construction (Moreira, 2011).

Knowledge is developed through mental mechanisms, which the subject uses to translate the world, and therefore cannot be transferred, as it is a consequence of the information the subject incorporates and assimilates during all stages of his life (Piaget, 1970). Within this context, it becomes relevant to discuss the development of knowledge in the subject, addressing issues such as the cognitive and affective development of students; and to present a form of learning assessment deriving from the subjects' experience.

2.1 Development of Knowledge

Knowledge is the result of the confrontation between subject and object; thus, "the function of the subject is to learn about the object and that of the object is to be apprehensive and to be learned by the subject" (Hessen, 2003, p. 20). Thus, by analyzing knowledge departing from the subject, the object belongs to him transcendently, as it is the subject who undergoes changes in his cognitive function, from which he issues a representative image of the object's determinations (Hessen, 2003).

Knowledge results from action and interpretation. Thus, to know an object, the subject needs to transform this object into knowledge and grasp its mechanisms, so that he can assimilate or accommodate it, being built by this subject (Piaget, 1970). This knowledge is not something finished, it is constituted by the subject through his interaction with the physical and social environment. Thus, learning is only meaningful if it happens through the movement of the structures of consciousness (Becker, 1992). Thus, for the author, "education has to be a process of knowledge construction" and not an ideology of transmission (Becker, 1992, p. 10).

In this sense, knowledge, from a constructivist perspective, is not solely due to intelligence (cognitive, affective and psychomotor structures), but also to the subject's experiences throughout his life. Therefore, knowledge is constructed by the spontaneous process (Piaget, 1970). Thus, the theory of Cognitive Development, created by Piaget, is fundamental to understand learning (Moreira, 2011), as it is the result of what happens in the subject's organism, as a consequence of his experience (Lefrançois, 2016). This experience is also considered by andragogy, which defends the principle that the teacher should consider the student's experiences, because they relate knowledge to real situations, giving meaning to the objects of study (Knowles, Holton & Swanson, 2012).

Learning is considered active when it is done through any technique that involves the students, requiring that they perform meaningful activities and reflect on what they are doing (Prince, 2004). Thus, it is considered that learning is an integrated process, composed by intellect, affection and muscular system, which allows the learning subject to acquire new knowledge (Bordane, & Pereira, 2015). Under the aegis of this view, the form of learning assessment needs to enable the teacher to verify how efficient his work is and the student to verify his level of cognitive development (Luckesi, 2014).

2.2 Learning Assessment

Learning assessment makes it possible to diagnose the development of knowledge and the difficulties that have occurred, allowing the teacher to analyze the progress of teaching, proposing adjustments in search of teaching quality (Lopes & Carvalho, 2017). The general principle of evaluation is to verify if the objectives set and proposed were achieved, being related to the evaluation of the teacher's own work. Thus, by assessing the progress and difficulties of students, the teacher diagnoses his pedagogical practice (Haydt, 2011). For the author, this mechanism allows her to reassess and propose improvements and, therefore, evaluation is considered as an instrument that contributes to the improvement of the quality of learning and teaching.

Analyzing assessment from Piaget's perspective of Genetic Psychology, education is considered to develop through students' experiences, who are seen as active and participatory beings in the construction of their knowledge (Haydt, 2011). In this sense, the educational unit is seen as a privileged place that develops the construction of knowledge and values. Following this line, the assessment should be viewed as a constant process that allows the interpretation of knowledge, skills and attitudes developed by students (Barbosa, 2008).

Based on the above, it is appropriate to use competency-based assessment models, which focus on the student. In this perspective, Bloom's Taxonomy is highlighted - a methodological tool that allows the establishment of educational objectives (Oliveira, Pontes & Marques, 2016). This taxonomy evidences "in a learning hierarchy ranging from simpler cognitive skills, such as memorized knowledge, to the most complex, such as the act of analyzing or evaluating" (Oliveira, Pontes & Marques, 2016, p. 13).

2.3 Bloom's Taxonomy

Bloom's Taxonomy is an instrument designed to classify what students are expected to learn as a result of instruction, enabling them to measure the educational goal: learning (Krathwohl, 2002). This instrument acts as a plan to classify educational outcomes by investigating changes in the students as a result of their educational experiences (Bloom Engelhart, Furst, Hill, & Krathwohl, 1977) (Bloom *et al.,* 1977). According to the authors, the limits of the taxonomy are the objectives: knowledge, intellectual skills and intellectual technical capacity, called "cognitive domain". It also considers affection, which is related to individual interest (Bloom, Hastings & Madaus, 1971).

The development of cognitive domain elements joins the educational objectives in six categories: (1) knowledge: ability to remember or recognize facts, methods and processes in the same way as they have been learned, (2) understanding: represents a capture or interpretation, based on previous knowledge, (3) application: refers to the use of abstractions in specific or concrete situations, recalled from memory and applied to a circumstance., (4) analysis: expresses the relationship between ideas, comparing information, (5) synthesis: brings together elements and parts to form a whole, constituting a scheme that was not clear or present, and (6) evaluation: formulates judgment, conceptions for certain proposals, based on determined or suggested criteria (Bloom *et al.* , 1977). The taxonomy underwent a review 45 years after its elaboration, being analyzed based on two dimensions: knowledge and cognitive processes, that is, knowledge becomes related to all ranked elements (Krathwohl & Anderson, 2010).

In this new construction, the degrees presented by Krathwohl (2002) refer to: (1) recalling, characterizing the process of retrieving relevant knowledge contained in long-term memory; (2) understanding by elaborating meaning for instructional messages through interpretation, exemplification, classification, summary, inference, comparison, and explanation; (3) applying by performing or using a procedure in a given situation; (4) analyzing, breaking up the material into constituent parts, to detect it as related parties that either constitute a general structure or represent a purpose; (5) synthesizing, reaching judgments based on criteria and standards, through verification and criticism; (6) creating, assemble the known elements into an original product.

Anderson and Krathwohl (2001) explored the two-dimensional structure of the revised taxonomy, based on the association between the dimensions of the cognitive process: (1) the dimension of knowledge, (2) facts, (3) concepts, (4) processes and(5) meta-cognitive) and the degree of knowledge the student considers to have acquired - remembering, understanding, applying, analyzing, evaluating or creating.

As for the affective domain, educational objectives describe changes related to interest, attitudes, and values, emphasizing feeling and emotion, to a degree of acceptance or rejection, expressed as interests (Bloom *et al*., 1977). Thus, the resulting educational objectives in this domain refer to the development of an attitude of trust - in the power of reason and methods of experimentation and discussion; intelligent self-critical attitude - related to one's own affective expression and written communication (Bloom *et al.* 1977) as well as to the feelings and rights of others; possession of deep sources of feelings and affects - manifested through their contentment and discontent; interest in reading; and, finally, ability to appreciate a song (Bloom *et al*., 1977).

This internalization is the main classification tool, which presents a mind-body dualism, defined as a process by which the information object is transferred from an external state or location to an internal one (Morshead, 1965).

The categories in the affective domain are described as successive levels, which, according to Bloom *et al*. (1977), are represented by: (1) receptivity: the subject's receptivity process, departing from awareness, he feels a stimulus that attracts his attention, (2) response: refers to the regular way of responding to his consent, willingness and satisfaction to respond, (3) valuation: the condition of sustaining, accepting, preferring and committing to a value, (4) organization: organization of the values assigned to a system, and (5) characterization: it is the point where the subject responds in a very coherent way, characterized by a complete set of values, which allows him to review new evidence and modify his attitudes. The affective domain is used to analyze when the individual becomes aware of the stimuli received, giving rise to the affective behavior, which is configured according to the context it occurs in (Bloom *et al*., 1977). This domain served as the basis for verifying, in this research, the student's satisfaction (motivation) with the techniques used. As motivation is responsible for arousing the student's interest and involvement (commitment) in learning, the teachers need to identify appropriate strategies that provide increased motivation (Ames, 1990). Hence, strategies to enhance the students' skills, values and social integration can stimulate the classroom scenario (Parellada & Rufini, 2013).

Satisfaction is considered as an instrument capable of assessing the quality and effectiveness of education, as this information contributes to the fact that universities can, through these measures, improve their services and, consequently, their quality Hussain, Jabbar, Hussain, Rehman and Saghir (2014). The quality of education is defined as a set composed by the attitudes the students develop towards the contents presented and the commitment of the students and the teachers, including student satisfaction and academic performance (Bertolini, 2007). In addition, students' satisfaction does not only corroborate their well-being, but motivation can also bring about changes in the learning environment (Lens, Matos & Vansteenkiste, 2008). Thus, the purpose of this study, regarding satisfaction, was to verify if the case method has potential to motivate students.

2.4 Previous Studies

Santos, Gaspari and Marques (2016) conducted a bibliometric survey on studies of teaching methodologies in accounting. The findings indicate that studies in accounting education are still in an initial stage, but are on the rise. The authors list some methods used in the area, such as the case method and problem-based learning, and indicate some authors and techniques applicable to accounting.

The action research conducted by Rios (2011) proposed the application of the case method technique to Accounting teaching, in the discipline Analysis of Financial Statements, in the Accountancy program at a higher education institution in the state of São Paulo, aiming to verify the contribution of the method to accounting teaching. The method was applied during a lecture, when the teacher presented the case. In the following class, the students discussed the case in the large group and then, the students gave group presentations in the classroom. Subsequently, an assessment class was held, and the results were determined by applying a questionnaire and applying the test, which, according to the author, pointed out that the method contributed to the development of students' skills and confidence through their more active participation in learning (RIOS, 2011).

3. Methodological Procedures

This research aimed to apply an active teaching technique - case method - in addition to lectures and exercise solving, to the same group of students (intact without selection), in the fourth semester of an Accountancy program, taught in the discipline Structure of Financial Statements during the first semester of 2018 at a Federal Higher Education Institution (IFES), due to the easy access to the university. Forty-two students were enrolled in the class and 35 participated in the experiment.

The study is a quasi-experiment, which is performed for treatments involving the same subjects, analyzing them before and after the intervention (Martins & Theóphilo, 2016). In this research, an experimental technique was applied to the same subjects, without controlling the variables, which, according to Campbell and Stanley (1963), is a data collection procedure in which the researcher does not have complete control over the experimental stimuli, and can be used with the same group.

For the observation of the data, the design of the quasi-experiment used the developmental levels presented in Bloom's Taxonomy (cognitive and affective domain), analyzed in the pretest (after the lecture, plus exercise solving) and post-test phases (after use of treatment / experimental technique). The application of the case method was used in the teaching of content on the Income Statement (I.S.), after a lecture on the subject (concepts, objectives and structure), followed by a content evaluation through a questionnaire. Subsequently, the case method was applied by means of an I.S. that contained structural problems with one (real) case.

The case method is a technique that focuses on experience, that is, it concentrates on a specific case, aiming to stimulate student participation, through the analysis and decisions proposed during the action, providing the development of students' analysis, judgment and decision-making skills (Hassler, 1950).

Regarding the assessment, the development of (cognitive) learning took place in two steps: after the lecture and exercise solving, to verify the cognitive development achieved; and at the end of the application of the case method, used to identify if the use of the complementary technique influenced the level of cognitive development achieved, based on Bloom's Taxonomy. The evaluation of the affective domain happened after the application of the experimental technique to verify the student's satisfaction with and evaluation of each applied technique. To evaluate the data, categories were established in the cognitive and affective domain, as presented by Bloom *et al.* (1977), to classify and analyze the content presented in the questionnaires, seeking to understand the effect on performance and satisfaction.

The quasi-experiment was carried out by using a teaching technique to complement the explanation of the content addressed in the lecture plus exercise solving, in a class with 42 enrolled students. For the purpose of this research, only the 35 who participated in all evaluations were considered though, aiming to monitor the students' cognitive and affective development.

Historically, the discipline in which the quasi-experiment was applied has a high failure rate (more than 50% on average), so that students were present who had repeated the subject more than once. Thus, the number of dropouts and absences in class is high. This factor was noticed in the evaluations performed, with variations in the number of participating students. There was no resistance or discomfort concerning the application of the quasi-experiment. On the contrary, when they found out about the proposed application, the students were receptive and motivated.

The dynamics to apply the cognitive development assessments took place in two steps: after the lecture plus the exercise solving, and after the application of the technique, aiming to compare the results obtained through one technique and the other.

To identify the level of cognitive development the students achieved, as indicated by Anderson and Krathwohl (2001), it was considered that the student reached the desirable level in those situations in which the answer to the question was correctly and completely elaborated, regardless of the words used (in accordance with the teacher/legislation). When the student answered the question asked only partially, it was considered that he partially reached a certain level; and when he did not answer or answered wrongly, it was considered that he did not reach the desired level.

To perform cognitive and affective assessments, analysis instruments were developed, applied in the form of a questionnaire based on Bloom's Taxonomy, which served as a basis for the verification of the results obtained - which were arranged in tables, showing the levels of cognitive and affective development attained at each step and in each technique used (lecture + exercise solving and the case method).

The application of the case method involved three steps (Leal, Medeiros & Ferreira, 2017). The first step was based on an individual study by the students, who were expected to read the case initially and carefully to become familiar with the presented contents; in the second, a more careful reading took place, focused on the details, analyzing the most important ones to identify the problem. Subsequently, discussions were held in small groups in order to ascertain the elaboration of the case. From this moment on, complementary bibliographies were suggested, exchanging ideas with the students, based on situations already experienced or studied; and, finally, the groups presented their proposed solutions, which were discussed in class.

The script followed for the application of the case method was indicated by Leal, Medeiros and Ferreira (2017): (1) **Planning** (occurs before class, this moment is intended to choose the case and the reading material, as well as to prepare the class and the teaching plan); (2) **Case presentation** (availability of bibliographic material, separation of groups, case analysis and solution finding); (3) **Presentation and discussion** (of the arguments raised); (4) **Conclusion** (conclusion of discussions, assessment of student participation, application of assessment and self-assessment of the method as well as learning assessment through a questionnaire).

As for the objective of the method, this was to discuss the concepts, objectives and structure of the Income Statement, offering the student: contact with real and possible situations in search of a solution for a problem; develop teamwork skills; and analyze problems and propose solutions (Leal, Medeiros & Ferreira, 2017).

The application of the case method technique was presented to the students through PowerPoint, indicating its concept, benefits, educational objective, application and evaluation, according to the steps shown in Figure 1.

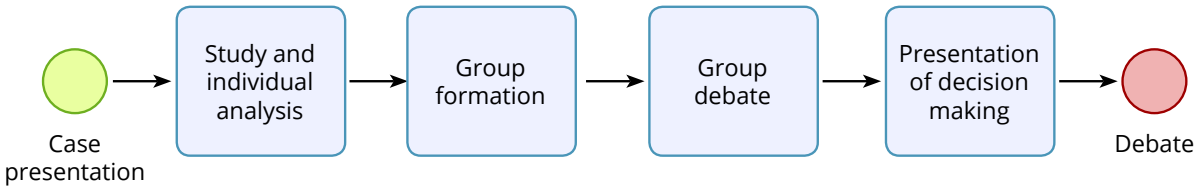

Figure 1. Steps of the Case Method

Source: elaborated by the authors, based on Leal, Medeiros and Ferreira (2017).

The steps illustrated in Figure 1 show the development steps of the case method, detailing its application, as proposed by Leal, Medeiros and Ferreira (2017). Thus, at the end of the presentation on the technique, its application began by giving students a real Income Statement - which was unstructured and contained a missing element (a value) - for the student to calculate the result, characterizing the first stage of development of the case method. Two statements of renowned and popular clothing and accessories companies were used. Each student individually received a random statement containing a letter, for example, Case Method (A) and should restructure it and calculate the unreported value.

In total, there were six different statements, randomly distributed among the students, with the indication of a letter (A, B, C, D, E, F), so that, after the individual resolution, the students would form the groups based on this information. Six groups were formed, which discussed and sought to solve the question, according to one of the propositions used: "Analyze the present situation of the company based on the individually prepared statement, and then compare it with a new situation, in which selling expenses should be equal to zero".

Based on the case presented, each group should carry out a new restructuring of the statement and compare both situations, seeking to identify the consequences of this change in the other accounts of the company's structure and reality. Then, they should discuss the reflection of the proposed changes and present the decision making, indicating whether or not the company should make the new change. Each group defended its ideas, based on the concepts discussed, and an intense debate was held with the whole class. The application took place during four 50-minute classes.

4. Results and Discussion

Questionnaires were applied to analyze the cognitive and affective development of the case method, which served to identify the level the students had reached at each step in the evaluation and to verify if the use of the technique was able to influence the cognitive and affective level the students had reached. For this analysis, an evaluation instrument was elaborated, containing the questions that permitted verifying each level proposed in the Bloom Taxonomy for the Cognitive Domain, according to Table 1.

Table 1
Cognitive Assessment Tool – I.S

Cognitive Dimension	Knowledge dimensions	
	Facts and Terms	Concepts (structure) and processes
Recall	Q1. Define what the net income is?	Q2. Describe where the company should classify the equity account in the structure of the Income Statement?
Understand	Q1.1 Explain what the net income represents for the company?	Q2.2 Interpret: If the company has a negative result, how does this affect the income taxes?
Apply	Q5. Elaborate the Income Statement.	Q5. Elaborate the Income Statement.
Analyze		Q3. Comparing the company results in steps 1 and 2 of the individual and group activity, identify which presents the best situation and growth capacity
Synthesize		Q.4 Propose solutions to improve the result of the company with the worst income.
Create		Q3.1. Justify the answer to question 3.

Source: elaborated by the authors, based on Bloom *et al* (1977) and Krathwohl (2002).

Based on the instrument described in Table 1, the cognitive assessment was applied to the 35 students who participated in the two assessments proposed in the case method.

In question (Q.1), we sought to verify the recall of facts and terms about the income statement, identifying the student's ability to remember the technical terms and their meaning for accounting, as indicated by Bloom *et al.* (1977). Twenty percent of the students reached the "Remember" level completely and 80% partially. Therefore, no student left the question blank or answered the wrong way. Overall, the students were able to remember the subject studied.

Still at the "Remember" level, in question (Q.2), we sought to identify the students' understanding of the specific facts addressed in the I.S., as recommended by Bloom *et al.* (1977), regarding the knowledge of concepts, structures and processes. This question revealed that 17.14% of the students answered this question correctly and completely, 20% partially; and 62.86% did not reach this level, suggesting greater difficulty in understanding the concepts, structures and processes discussed.

As for the "Understand" level, after question (Q.1), questions were asked about facts and terms to verify if the student was able to explain what he understood about the subject inquired on. At this level, 48.57% of the students answered completely, 22.86% partially achieved and 28.57% did not reach the "Understand" level, indicating that most or all of the students could understand the facts and terms worked. Still exploring the understanding level regarding the knowledge of concepts, structures and processes, students were asked to interpret how the negative result affected the taxes, under (Q.2.2). Based on this question, 85.71% students reached the "Understand" level, 11.43% partially and only 2.86%, i.e., one student did not reach. the required level, pointing out that the understanding of concepts, structures and processes occurred more broader than that of facts and terms.

As for the "Apply" level, the students were asked to prepare an Income Statement. As the exercise was solved in the classroom, however, before the students handed it in, its result would not portray the student's development, so it was not part of this analysis.

At the "Analyze" level, based on the students' evaluation, two exercises performed by the teacher (as exercise resolution) were verified, which presented two Income Statements from two consecutive years, related to two different companies. One company made a profit and the other a loss, intended to verify the students' ability to recognize the I.S.'s explicit assumptions, structure, and operation, so there was no single correct answer. Students were asked, based on these statements, to analyze which company was in the best situation and had the best growth potential, under (Q3). Only 2.86% of the students analyzed the question by relating their arguments with the concepts studied, while the remaining 97.14% partially analyzed the question, expressing only the opinion, without recognizing explicit assumptions (through data analysis in comparison with theory, distinguishing shapes and elements between companies, etc.). According to Bloom *et al.* (1977), this level allows us to identify the comprehension of the requested facts, relying on the facts and standards, presenting support for their answer.

At the "Synthesize" level, the two statements used in the exercise developed by the teacher were further elaborated, requesting a proposal to improve the company's results, under (Q.4). In this question, the intention was to verify the student's ability to develop arguments that defend his/her solution based on the contents studied. The intention of the question was to verify if the student could elaborate justifications (associations) based on the available information and using the contents studied. The result pointed out that 97.14% of the students partially reached the "Synthesize" level, as they did not develop arguments based on the contents studied, while 2.86% presented a response beyond the analyzed context (answers without logical/theoretical argument), demonstrating the difficulty related to this level, which requires, according to Bloom *et al.* (1977), the student's examination of the facts, pointing to a practical description, such as the indication of cause and effects for his argument.

To analyze the last level, the ability of the student to "Create" based on the concepts discussed, relating their criticism to the standards, the students were asked to justify the answer given to the question (Q.3) about which company (from the I.S. exercise) was in the best situation with the best growth potential, according to (Q3.1). What this item is concerned, none of the students presented a justification or argument to defend his/her answer. This step, proposed by Bloom *et al.* (1977), requires the student to present a judgment based on specific arguments, previously developed at each level, defending a proposal that contains concepts the students recalls, understands, applies and is able to synthesize. Hence, the cognitive level the students achieve as a whole, based on the lecture and exercise solving on the content of the Income Statement is displayed in Figure 2.

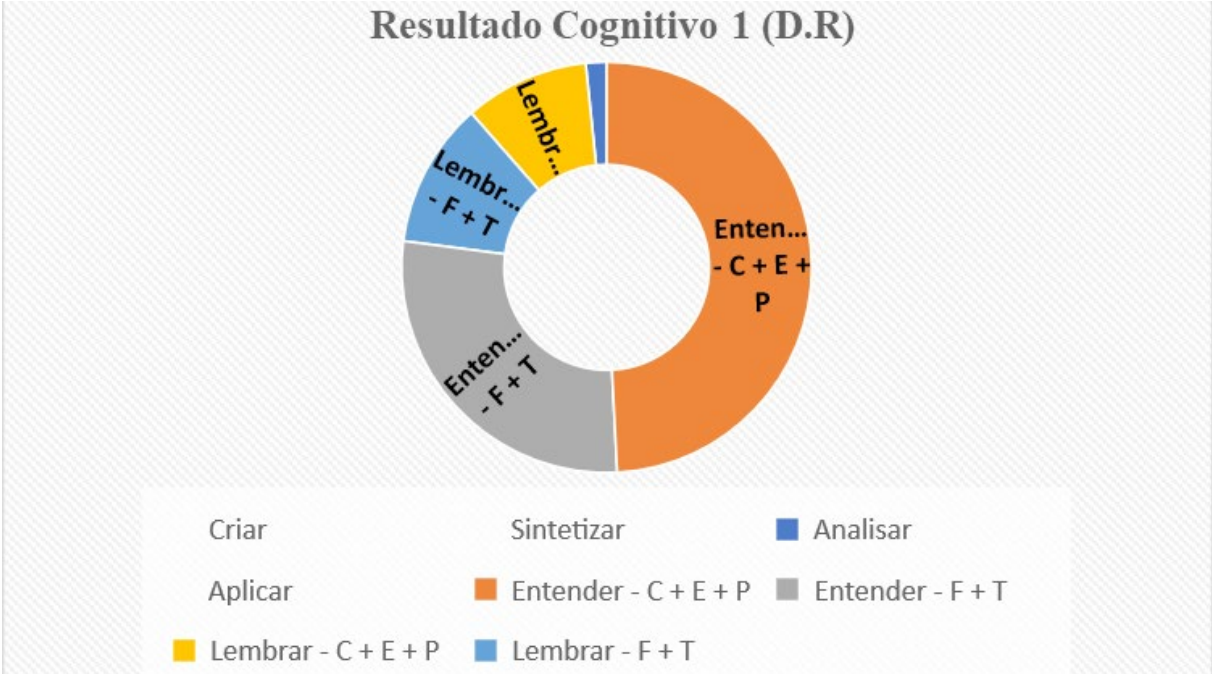

Figure 2. Cognitive Assessment - Lecture + Exercise solving - (I.S)

Source: research data.

(Translation: Cognitive Result 1 (I.S) – Create – Synthesize – Analyze – Apply – Understand – Recall)

In these results, it is noteworthy that most students reached or partially reached the level "Remember", when questioned on facts and terms (F + T); When it came to concepts, structures and processes (C + S + P), 62.86% did not reach this level. At the "Understand" level, on the other hand, this result was different as, in both cases, most or part of them reached the "Analyze" level. It is noticeable that, based on the knowledge developed, none of the students was able to reach the level "Create" - the most complex and difficult to reach, according to Bloom *et al.* (1977).

Regarding the analysis of the student's satisfaction with the lecture, followed by the solution of the exercise resolution on the I.S., an assessment tool was elaborated based on the affective domain of Bloom's Taxonomy, as shown in Table 2.

Table 2

Affective Assessment Instrument – Lectures + Exercise Solution - (I.S)

Levels	Self-assessment
Receiving	Q2. Do you believe that the lecture and solution of exercises helped to improve the understanding of the content? (_) Yes (_) No
Responding	Q1. Score the application of the lecture + exercise solving: (_) 5 – Highly satisfied (_) 4- Satisfied (_) 3 – Partially satisfied (_) 2- Dissatisfied (_) 0 -Totally dissatisfied
Valuing	This item was used after the application of the case method technique to verify the student's preference of either the lecture + exercise solving or the case method.
Organizing	This item refers to the organization of preferences. This element was not used in the experiment.
Characterizing	Q3. Do you like to participate in group activities? (_) Yes (_) No

Source: elaborated by the authors, based on Bloom *et al.* (1977).

These questions were used to understand how the student received and responded to the stimulus deriving from the teaching strategy, as well as to understand how the student organizes his preferences. Through the item "Characterize", the change in his/her behavior can be identified.

The self-assessment results (Q.2) revealed that 100% of the students believe that lecture plus exercise solving helped to better understand the content on the I.S. This level highlights the student awareness of a situation where, according to Bloom *et al.* (1977), (s)he should evaluate the characteristic of the stimulus, perceiving it as a completed activity.

Regarding satisfaction, verified in the "Answer" level (Q.1), 94.24% of the students were satisfied with the explanation of the content and 5.71% partially satisfied, indicating, according to Bloom *et al.* (1977), the students' willingness to participate in that activity. According to Bertolini (2007), satisfaction may indicate the students' commitment to their learning and influence their performance.

The element "Characterize" (Q.3), according to Bloom *et al.* (1977), is associated with the student's conviction regarding a situation, being used in this case to identify the student's behavior towards his participation in group activities. This level revealed that 77.14% of the students enjoy participating in group activities, compared to 22.86% who said they did not like this. Figure 3 illustrates the general results of the affective assessment.

Figure 3. Affective Assessment – Lecture + Exercise solving (I.S)

Source: research data.

(Translation: Affective Result 1 – I.S – Characterizing – Receiving – Responding – Characterizing – Organizing – Valuing – Responding – Receiving)

The results shown in Figure 3 summarize the attitudes the students attained and perceived regarding the stimulus deriving from the lecture and the exercise solving in the study of the income statement, showing that the students believe in the ability of the strategy to help understanding the content. Most were satisfied with the experience, indicating their commitment to the activity, and 77.14% say they enjoy participating in group activities.

Regarding the second assessment performed after the application of the case method, the questions used to assess cognitive development were the same or similar to those asked in the first assessment (Table 1). In this sense, the results show that, of the 35 students who participated in the case method, regarding the "Remember" level of facts and terms, 25.71% answered the question (Q1) completely, thus reaching the level, while 71.43% partially reached and 2.86% did not reach the level. This result is close to that achieved by the lecture plus exercise solving, which indicated that 20% fully and 80% partially recalled facts and terms.

Regarding the concepts, structures and processes, still at the "Remember" level, it is clear that the results achieved through the technique were more significant than the previous evaluation, as 22.86% reached the level completely and 74.29% partially. In the previous case, these results amounted to 17.14% and 20%, respectively, indicating that the use of the technique in this subject and level influenced the cognitive development. The results verified for the levels "analyze", "synthesize" and "create" were similar to the result evaluated after the lecture plus the resolution of exercises.

At time one, 97.14% of the students had partially achieved the analyze and synthesize levels, while none had reached the create level. Variance was found though between a student who reached the "analyze" level previously and one who achieved "synthesize" with the case method. Thus, the general result of the cognitive development achieved is shown (Figure 4).

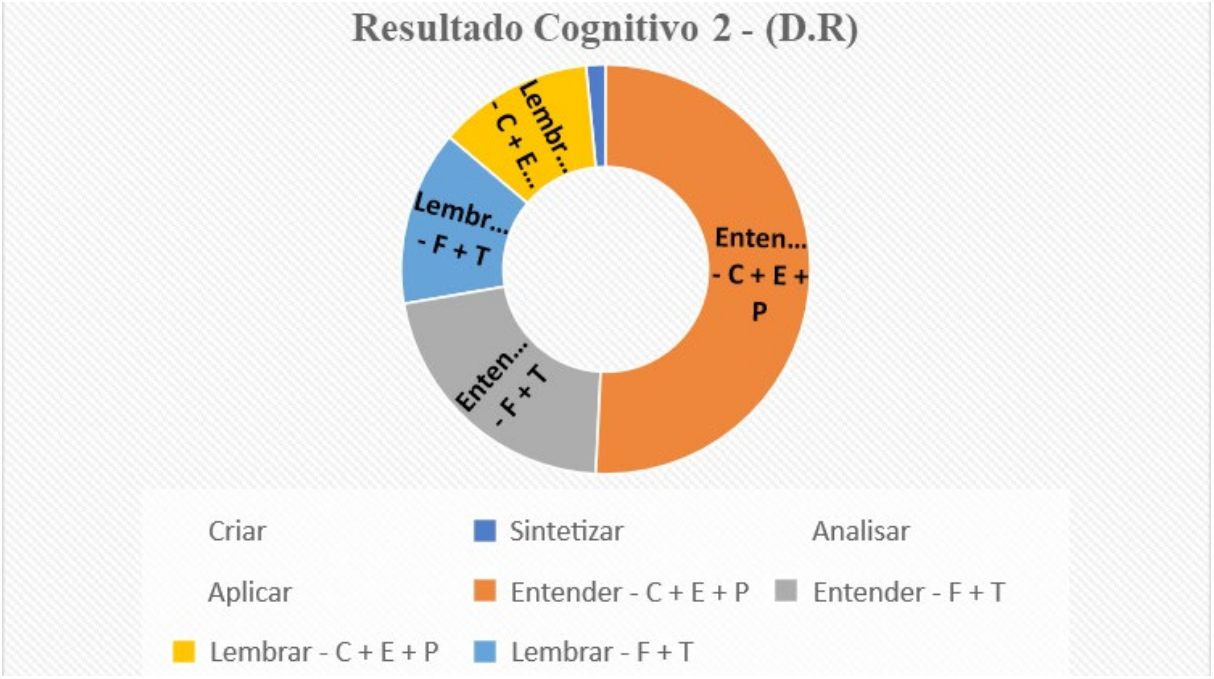

Figure 4. Cognitive Assessment – Case Method

Source: research data.

(Translation: Cognitive Result 2 – Create – Apply – Recall – Synthesize – Understand – Recall – Analyze - Understand

Analyzing the case method, a technique that focuses on experience and seeks to stimulate decision making, as indicated by Hassler (1950), it is clear that the educational objective has been achieved. The students experienced decision making, as they proposed to maintain or not the new situation indicated in the proposed exercise. Regarding the cognitive development, although they did not reach the "Create" level, at the levels "Remember and Understand", the technique was able to positively influence the students' cognitive development, because it increased the percentage of students who, at these levels, understood the content better.

Based on this context, it can be inferred that there was a transformation in the students' mental structure, as indicated by Piaget (1970), verified by comparing the results of evaluation 1 with 2, before and after the application of the case method, considering the evolution of the students who used their memory (acquired in the lecture or before) to build a concept (reach the level understand).

Thus, according to Piaget (1970), in these cases, students are assimilating knowledge, because they use previous knowledge to build new structures. Thus, it can be appointed, due to the initial assessment regarding the "Understand" level, that in this element, the students had to accommodate new knowledge, which did not exist previously, so they transformed their cognitive structure.

The analysis regarding student satisfaction with the application of the case method was verified through the self-assessment questions, seeking to identify the attitudes developed, based on Bloom's Taxonomy, according to Table 3.

Table 3
Affective Assessment Instrument – Case Method

Levels	Questions
Receiving	Q2. Do you believe that the case method helped to improve the understanding of the content? (_) Yes (_) No
Responding	Q1. Score the application of the case method (_) 5 – Highly satisfied (_) 4 – Satisfied (_) 3 – Partially satisfied (_) 2 - Dissatisfied (_) 0- Totally dissatisfied
Valuing	Q4. Which of the applied techniques do you prefer? (_) Lecture + Exercise solving (_) Case method (_) No preference
Organizing	Not used in this research.
Characterizing	Q.3. Did you like participating in the group activity, considering the exchange of ideas and cooperation from colleagues? (_) Yes (_) No

Source: elaborated based on Bloom *et al* (1977).

These questions were intended to analyze how the student received the stimulus through the Case Method (Q.1), answered it (Q.2), valued his/her preferences (Q.4) and modified his/her attitude or not (Q.3) towards participation in a group activity. To this end, the instrument allowed us to analyze whether the student who said he did not like to participate in this type of activity reviewed the evidence, such as the benefits of the technique, and also changed his/her attitudes, starting to like it.

The results of the affective domain revealed, regarding the "Receive" level (Q.2), that 100% of the students believed that the case method helped to better understand the content about the income statement, similar to what was evaluated for the lecture and exercise solving. The same can be said of satisfaction. The results obtained are identical to those achieved by the lecture and exercise solving on the I.S., as 94.29% were satisfied with the technique and 5.71% partially satisfied (Q.1).

On the other hand, in the evaluation regarding the characterization (Q.3), there is a slight change in the students' attitude, as 88.57% said they liked participating in the activity against 11.43% who did not. Earlier, in the self-assessment performed after the lecture and exercise solving, these results amounted to 77.14% and 22.86%, respectively, showing that, after participating in a group activity, some students changed their attitudes, starting to like the strategy.

When asked about the preference (Q.4) between the lecture and exercise solving or the case method, the students who reached the "Value" level were those who preferred the case method, corresponding to 42.86% of the students, while 8.57% partially reached the level, because they indicated that they liked the two techniques equally, and 48.57% indicated preferring the traditional method.

Given the analysis of the affective domain, it can be concluded that the students were satisfied with the technique, indicating that the case method can be a motivating strategy for students, as it granted satisfaction. This result is compatible with the study by Rios (2011), who used the case method in the subject Financial Statements Analysis, revealing that the technique contributes to the students' development and motivation, making them more active and responsible for learning.

In addition to these factors, Hassler's (1950) notes indicate the need for students to work with incomplete data, such as those presented in the case method, as they face situations in which they need to carefully analyze information that may be incomplete. For these reasons, according to the author, students end up accepting this type of technique.

5. Final Considerations

Piaget (1954) argues that knowledge development results from intelligence, from the subject's awareness, constructed based on his interaction with the object of study, through the use of schemes. These schemes, according to the author, use existing structures, providing content assimilation, or create new structures to interpret and accommodate new information. In this sense, knowledge is the result of a transformation undergone in the subject' awareness, in view of the experience (s)he lived. Thus, according to Becker (1992), the educational process must be directed through a spontaneous process that enables this construction. Hence, considering that learning is seen as a condition that permits the construction of meanings, it is up to the teacher to adopt strategies that influence and provide this construction (Moreira, 2011). Consequently, these strategies represent the path that the teacher will use to support the students' intellectual development. Therefore, variation is necessary to benefit the different learning styles.

Thus, analyzing the students' cognitive development process, considering that knowledge is built, contributes to the teaching and learning process, as it allows the educator to position himself as a mentor, who seeks to find tools that facilitate the process, stimulating and motivating the students. This constructivist perception provides an understanding of the factors that influence learning and, through cognitive and affective assessments, permits the identification of difficulties encountered in the process and enables teachers to review their teaching strategies and improve them.

This research analyzed the cognitive performance the students achieved by applying the case method teaching technique. The findings indicate that this technique, as a complementary strategy, was able to influence their levels of cognitive and affective development, failing to fully reach the most complex levels (analyze, synthesize and create), but significantly influencing the learning of the most basic levels (remember, understand). In order to classify the students' partial answers, it was considered that they partially reached the levels investigated when they partially answered the questions, and this result strongly influenced the cognitive development at all levels analyzed in this study (increase in the percentage reached).

Analyzing the developed attitudes, as verified by the affective dimension in Bloom's Taxonomy, we tried to understand the students' motivation by applying the case method. The results indicate that, in general, the students were satisfied with all the applied techniques (lecture + exercise solving and the case method), which reveals that, in general, they consider the application of the case method as motivating. Other attitudes they developed were commitment to the proposed tasks, collaboration, respect, flexibility in the distribution of tasks, interest in the activities and exchange of experiences. This result is similar to Leal and Oliveira (2018), who concluded that the case method contributes to learning, teamwork, reflection and critical analysis.

Thus, based on the data collected in this research, the use of the case method, as a complementary teaching technique, contributed to the development of superficial learning, as it expanded the most basic level of development, besides partially assisting in the expansion of all cognitive levels and motivating the students.

This study was developed considering that the knowledge is built through the subjects' experiences and the experimentation of a specific teaching technique; the goal was to evaluate the ability of this technique to influence the students' cognitive performance level. The results indicate that the experiences provided helped to construct the knowledge developed, according to data found in the evaluations based on the Bloom Taxonomy.

The findings suggest that the use of the case method as a complement to lectures and exercise solving benefits the learning process as it enhances the students' cognitive development, allowing teachers to use these data as an analytic tool, in view of the educational objectives they intend to achieve, and to feel stimulated by the possibilities. Thus, the use of the case method contributes to the teaching and learning process. The study also collaborated with the students who, through the application of an active technique, obtained a learning environment with integration, group work, developing the experience of solving problems and making decisions, improving communication and research skills, and especially provided an environment capable of improving cognitive development, bringing satisfaction. Satisfaction can be an indicator of quality. In this sense, its analysis was fundamental to understand the processes that need improvements, serving as a basis for the management of IFES to review educational plans and proposals.

The limitations of this research are related to the fact that it was performed in only one class, without being able to compare its results with other classes that were not influenced by applied techniques, which would permit verifying the development achieved in both cases. Another limiting factor was the sample size which, because it is only one class, does not allow for generalizations. As a suggestion for future research, an experiment using a complementary technique could be applied in one class group and not another, and in a public and a private institution, so that the effect on cognitive and affective development can be compared between classes and institutions. Another suggestion is to identify the students' learning styles, allowing them to select teaching techniques that are tailored to the students' learning forms.

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Influence of Academic Performance on Perceived Academic Justice in the Learning Environment

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Abstract

Objective: To look for evidence to identify the relationship between the academic performance of undergraduate students in accounting and their perception of academic justice, segregated in the distributive, procedural and interactional dimensions.

Method: qualitative and quantitative approach in a sample of 534 undergraduate Accounting students from nine federal universities in Minas Gerais. For the quantitative approach, questionnaires were applied to capture the perception of justice in its three dimensions (distributive, procedural and interactional justice as dependent variables), academic performance (explanatory variable) and eight control variables. For the qualitative approach, interviews were conducted.

Results: The quantitative analyses indicate that, of the nine variables tested, only three were statistically significant: the gender variable for procedural justice, the class group variable for procedural and interactional justice, and the failure variable for all three dimensions of justice. In qualitative terms, the findings show that, in the learning environment in general, students associate justice especially with the figure of the teacher.

Contributions: The study contributes to the literature by identifying how the academic environment occurs from the students' perspective, regarding their perception of justice, concluding that the relationship with the teacher influences their perception of justice.

Keywords: Justice in the Learning Environment. Accountancy. Federal Universities

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1. Introduction

The perception of justice is related to the individual's behavior in the group (s)he belongs to. Its social importance gained strength when it started to be studied as an autonomous field of Social Psychology (Assmar, Ferreira & Souto, 2005). Within organizations, Greenberg and Tyler first proposed the term Organizational Justice in 1987, suggesting that research on organizational justice could explain many variables regarding employee behavior within organizations.

Although the concept of justice has been most often dealt with in business organizations, the construct can also be employed to verify the student's perception of justice in relation to the teacher and the institution they are affiliated with (Rego, 2001; Chory-Assad, 2002 & Simil , 2016). Kovačević, Zunić and Mihailović (2013) related organizational justice with perceived justice in a non-organizational environment (school and university). The perception of justice, both in an organizational environment and in a non-organizational environment, is related to work developed by an individual. In addition, several studies have emerged in the field of education, investigating students' perception of justice in elementary, middle and higher education (Chory-Assad, 2002; Pereira, 2004; Peter, Kloeckner, Dalbert and Radant, 2012; Kovačević *et al*., 2013 & Simil, 2016).

Chory-Assad and Paulsel (2004) interpret justice in the learning environment as the evaluation of processes and performance outcomes that occur in the instructional context. According to Kovačević *et al*. (2013), organizational justice in a learning environment is presumed in the relationship between the perception of justice and performance in educational institutions. Thus, recent studies have been devoted to analyzing the relationship between perceived justice and academic performance. Kovačević *et al*. (2013) found a positive association between the feeling of justice and the academic performance of Psychology students from the Faculty of Organizational Sciences at the University of Belgrade, Serbia. This fact led the authors to point out that this relationship is directly proportional, demonstrating that students tend to report satisfactory performances as more just and unsatisfactory performances as less or not just.

The importance of studying the perceived justice of accounting students is the significant increase in the courses offered in recent years. According to information provided by the Brazilian Ministry of Education [MEC] (2017), there are 1,700 active undergraduate Accounting courses in Brazil in activity, in the "face-to-face" and "distance" modalities. The large number of courses available is mainly due to the market demand for qualified professionals. In this sense, proposals are needed that reinforce the potential and perceived quality of the course, including the possibilities of improvement in the intra and interpersonal training of accounting professionals as a result of the social experience at the university.

Apostolou, Dorminey, Hassell and Rebele (2017) stressed that the accounting profession has a tradition of discussing changes in educational processes, aiming to enable accountants to act as professionals. Thus, it is up to the educational institutions to ensure improvements in the quality of teaching, considering aspects that go beyond the institutions' curricular structure and facilities.

This research is particularly concerned with investigating the perception of undergraduate students. Therefore, the study answers the following research question: **What is the relationship between the academic performance of accounting undergraduate students and their perception of justice in the learning environment?** Consequently, the objective of the research is to seek evidence to identify the relationship between the academic performance of accounting undergraduate students and their perception of justice.

The undergraduate course represents a unique experience of students in the vocational training environment, in which different types of people share the same space and interpersonal treatment gains very particular meanings. Knowledge of the relationship between academic performance and justice helps schools understand the interactions between students, teachers and the course. The perception of justice affects, among other factors, individual performance. Thus, in the learning environment, academic performance may be linked to the student's perceptions of justice regarding their teachers and the institution they are affiliated with (Peter *et al*., 2012; Kovačević *et al*., 2013). Therefore, understanding the way academic performance is affected becomes extremely relevant to improve the teaching-learning process.

Understanding what can be considered just or not in universities from the student's point of view represents one of the important theoretical contributions of this study. Understanding how this relationship is processed in the learning environment helps in the management of Accounting courses, particularly due to the possibility of directing actions that stimulate the dimensions of the effectiveness the good relationship between students and teachers can grant to learning, such as, for example: the discussion of evaluation forms and clarity of the criteria adopted in the evaluation of academic activities.

2. Academic Justice and Development of Hypotheses

Homans (1961) assumed that individuals expect social exchanges to be just and that an individual's rewards be proportional to the partner's costs and rewards, reflecting the inverse relationship in which profits can be proportional to the investments made. Subsequently, Adams (1965) proposed the theory of equity. To ground his theory, the author relied on Homans's (1961) concept of Distributive Justice. Adams (1965) assumes that the fundamental criterion of justice is related to the standard of equity or proportionality. According to the author, a situation is fair or just when individuals receive rewards proportionately to their contributions. Equity between employee and employer is not generally perceived as a mere exchange of monetary values.

The concept of Distributive Justice, proposed by Homans (1961), is based on the idea that social exchanges are fair and the profits received are proportional to the investments made. Several studies were based on this concept (Walster, Berscheid & Walster, 1973; Leventhal, 1980; Greenberg, 1990), leading to a set of studies that created the idea that equity was seen as the only form of distributive justice.

Adams' (1965) study of the theory of Iniquity, based on Homans' (1961) concept of Distributive Justice, among other premises, was the cornerstone of the original theory of justice. This understanding provoked several criticisms from scholars who questioned equity as the sole principle of justice (Deutsch, 1985 & Leventhal, 1980). Given this, Deutsch (1985) argues that there are other forms of relationship, in which social welfare is considered, emphasizing equality and necessity over the initial model of Distributive Justice, in which the goal of economic productivity prevails.

In this sense, the concept of procedural justice introduced by Thibaut and Walker (1975) emerges. According to Assmar *et al*. (2005), procedural justice focuses on the means of conflict resolution or of decision-making processes. Greenberg (1990) presented procedural justice in an organizational context as a way to understand phenomena not achieved by distributive justice, such as the means to achieve the desired ends. Lind, Tyler and Huo (1997), however, found evidence that when individuals are committed to conflict resolution in the group they belong to, the perception of fairness in the procedures adopted is shaped by recognition of the hierarchical level they are subordinated to and by neutrality.

Interactional Justice concerns the social aspects involved in the relationship between two individuals, the first being the one who makes the decision, and the other who will be affected by this decision (Assmar *et al.*, 2005). Proposed in the 1980s, initially by Bies and other authors (Bies & Moag, 1986; Bies & Shapiro, 1987), and later ratified by Bies (2001), Interactional Justice was presented as a third distinct type of perception of justice. Cropanzano and Greenberg (1997) claim that a clear distinction between Interactional and Procedural Justice is difficult because they believe that the relationship between two individuals is directly linked to the decision-making process. In this regard, Tyler and Blader (2000) state that interaction is a social aspect of procedural justice.

Rego (2000) exemplifies the relationship between the three variables through a disciplinary sanction: the sanction itself (Distributive Justice), the process by which the sanction was determined (Procedural Justice), and the way the superior justifies, transmits and explains the sanction to the collaborator (Interactional Justice).

Due to the variety of concepts in the theoretical approach, it is noted that organizational justice is a field of integrated knowledge and, as a result, has undergone several changes. The evolution of applicability and concepts of organizational justice has led research to expand to other forms of 'unconventional' organizations (Rego, 2001)

.In this sense, studies that applied the three-dimensional model of justice as a way to explain the behavior of individuals in organizational environments, began to be adapted to the learning environment, such as: Chory-Assad (2002); Chory (2007); Peter *et al.* (2012); Kovačević *et al.* (2013) and Simil (2016). Initially applied to organizations, in order to explain the reaction of employees to their compensation, organizational justice has also extended to non-organizational environments.

In the academic setting, Distributive Justice is related to the way the student receives his grades and how he makes comparisons with other peers' grades (Uludag & Yaratan, 2013; Chory-Assad, 2002). Regarding procedural justice, this can be understood as the way teachers distribute grades and define criteria for assessing students' participation in class and delivery of activities. Interactional Justice in the academic environment is related to the way the interpersonal relationship between the teacher and the student occurs. This dimension stands out in the academic environment because the way the teacher considers the student's opinion, listens to and interacts with him or her influences the student's behavior and motivation (Wubbels & Brekelmans, 2005). Given these concepts, Table 1 presents the applicability of the three-dimensional model of justice in the organizational and academic environments.

Table 1
Applicability of the three-dimensional justice model

Dimensions	Organizational Environment	Academic Environment
Distributive	Is based on the approach that social exchanges are just, and that the profit received is proportional to the investment made.	Considers the way the student receives the grades in the subjects
Procedural	Refers to the means to solve conflicts or the decision-taking processes	Refers to the procedures adopted concerning the grading of the discipline.
Interactional	Refers to the social aspects involved in the relationship between two individuals, both of whom are affected by the decision taking.	Refers to the interpersonal relationship between teacher and student

Source: elaborated by the authors

In recent studies (Chory-Assad, 2002; Kovačević *et al*., 2013; Simil, 2016) in which the concept of justice is applied in learning environments, organizational justice has been gaining different approaches, such as: teacher-student, student-institution and academic performance.

Studies on academic performance move across all areas of knowledge. Weiner and Kukla (1970) inferred that good performance can be attributed to personal effort, and poor performance may indicate a lack of motivation or ability. Cornachione Jr, Cunha, De Luca and Ott (2010, p. 3) related academic performance from the perspective of Attribution theory, in which, according to the authors, "it is a relevant component of the transformation driven by education and professional experiences, which influences the performance of individuals".

Fagundes, Luce and Espinar (2014) underline the motivation to study the causes that can affect academic performance, justifying the influence of academic performance in three areas. The first of these refers to the national level, where poor performance leads to failures, which reflects an increase in public spending on higher education. The second, in relation to the university level, in which academic performance is related to the overall performance of the institution. Finally, at an individual level, poor academic performance can lead to delays and dropping out of the course, likely leading to personal dissatisfaction.

Given this scenario, hypotheses were developed relating the dimensions of justice and the academic performance of undergraduates.

- **H_1**: Academic performance influences the perception of Distributive Justice.
- **H_2**: Academic performance influences the perception of procedural justice.
- **H_3**: Academic performance influences the perception of Interactional Justice.

The research hypotheses are supported by the work of Peter *et al*. (2012) and Kovačević *et al*. (2013). Peter *et al*. (2012) found empirical evidence that the more students perceived that the teachers treat them fairly, the better their academic performance was. Kovačević *et al*. (2013) tested the hypothesis of a positive correlation between the perception of justice and academic performance. Both authors argue in favour of a statistically significant relationship between academic achievement and all dimensions of fairness.

3. Method

This descriptive and explanatory research presents a quantitative and qualitative approach to the problem. We studied the federal universities of the State of Minas Gerais that offer the undergraduate program in Accounting. The choice of Minas Gerais was due to the fact that this is the state with the largest number of federal educational institutions in the country. The institutions included in the sample are: Federal University of Minas Gerais (UFMG), Federal University of Uberlândia (UFU - Uberlândia and Ituiutaba), Federal University of Viçosa (UFV - Viçosa and Rio Paranaíba), Federal University of São João Del Rei (UFSJ)), Federal University of Vales do Jequitinhonha e Mucuri (UFVJM), Federal University of Juiz de Fora (UFJF - Juiz de Fora and Governor Valadares).

For this research, two data collection instruments were used: structured questionnaire and semi-structured interview. The quantitative stage used descriptive and inferential statistics in the applied questionnaires, and the qualitative stage was performed through the analysis of the interviews, in order to deepen the specific explanation of the data collected.

The questionnaire consisted of 44 items, divided into two parts, the first with 10 questions to characterize the respondent; and the second part, composed of 34 questions that seek to measure the perception of justice, using a 5-point Likert scale. The second part of the questionnaire, called Revised Classroom Justice Scale (RCJS), addresses the perception of justice in three dimensions: distributive, procedural and interactional. Initially, this instrument was built by Chory-Assad (2002) and used by Chory-Assad and Paulsel (2004), Paulsel and Chory-Assad (2005), Chory (2007) and Simil (2016). The version used was the same as Simil (2016), translated into Portuguese and validated in a study conducted with stricto sensu graduate students in Accounting from Brazilian universities.

The instrument was applied in person and electronically at the participating universities. The questions were designed so that the participants could choose answers ranging from "extremely unfair" to "extremely fair". The first part contains nine sociodemographic questions, which seek to characterize the respondent in relation to: institution where he/she studies, course group, current period, gender, marital status, if he/she has already failed subjects and, if yes, how many, if he/she engages in a remunerated activity and if he/she holds another undergraduate degree. Besides these variables, the instrument contains a closed question to identify the student's perception of his/her own academic performance.

Regarding the academic performance, the respondent was instructed to consider whether he/she had a "poor performance" when his/her grades for approval were below average; "Good performance" when the grades achieved for approval were equivalent to the average; and "excellent performance" when the grades achieved for approval were above average. This way of measuring performance was adapted from Cornacchione Jr. *et al.* (2010), who used the measure to evaluate academic performance from the perception of Accounting undergraduates at four Brazilian universities.

The dependent variables were the perception of justice in three dimensions (Distributive, Procedural and Interactional). To capture the perception of justice, 34 variables were used in the Revised Classroom Justice Scale instrument.

The 34 questions were structured to meet each justice dimension, identifying three latent variables. Latent variable is a theoretical construct that cannot be measured directly, but can be represented by one or more observable variables (Hair, Black, Babin, Anderson & Thatam, 2009). For the analysis of the questionnaire, the multiple linear regression analysis technique was used. The proposed models are expressed in the following equations:

$$DJ_i = \beta_0 + \beta_1 GoodPerf_i + \beta_2 ExcPerf_i + \beta_3 Gen_i + \beta_4 Per_i + \beta_5 Fai_i + \beta_6 NFai_i + \beta_7 Marst_i + \beta_8 Emp_i + \beta_9 Und_i + \beta_{10} Cla_i + \varepsilon_i \quad (1)$$

$$PJ_i = \beta_0 + \beta_1 GoodPerf_i + \beta_2 ExcPerf_i + \beta_3 Gen_i + \beta_4 Per_i + \beta_5 Fai_i + \beta_6 NFai_i + \beta_7 Marst_i + \beta_8 Emp_i + \beta_9 Und_i + \beta_{10} Cla_i + \varepsilon_i \quad (2)$$

$$IJ_i = \beta_0 + \beta_1 GoodPerf_i + \beta_2 ExcPerf_i + \beta_3 Gen_i + \beta_4 Per_i + \beta_5 Fai_i + \beta_6 NFai_i + \beta_7 Marst_i + \beta_8 Emp_i + \beta_9 Und_i + \beta_{10} Cla_i + \varepsilon_i \quad (3)$$

Where,

- DJ (Distributive Justice) = Dependent variable;
- JP (Procedural Justice) = Dependent variable;
- JI (Interactional Justice) = Dependent variable;
- GoodPerf (Good performance) = Dummy variable
- ExcPerf (Excellent performance) = Dummy variable; (do not separate the coding from the variable)
- Gen (Gender) = Dummy variable;
- Per (Course period) = Quantitative variable, course period the respondent is taking, ranging from 1st to 10th;
- NFai (Number of failures) = Quantitative variable. (do not separate the coding from the variable)
- Marst (Marital status) = Dummy variable;
- Emp (Employee or grantee) = Dummy variable; Und (Other undergraduate degree) = Dummy variable;
- Cla (Class period in which the course is offered) = Dummy variable.

The questionnaire contained a field asking about the willingness of the student to grant an interview to the researcher. Subsequently, the questionnaires were numbered and positively marked with the intention of granting the interview, followed by a draw was made to choose the respondents. Flick (2008) defines that, for theoretical sampling, the size is not previously defined. Students were invited to participate in an interview by email. Six students agreed to grant an interview. For data analysis, the in-depth analysis criterion was adopted. The adoption of this criterion, according to Flick (2008, p.47), aims to pursue the analysis as far as possible, and that data collection is done "to develop the properties of its category until no new properties arise".

The authors elaborated the interview script based on the work of Rego (2001). This script was separated in two parts: the first contained information to characterize the respondent; and the second 11 open-ended questions to encourage students to discuss experiences of injustice, suffering, and retaliation in an organization and teacher assessment measures.

4. Results Analysis and Discussion

4.1 Quantitative Analysis

Data were collected between January and March 2017. The questionnaires were applied face-to-face to students who were present in the classroom on the day of application at seven universities (UFMG, UFV, UFV-Rio Paranaíba, UFVJM, UFJF, UFJF-Governador Valadares, UFSJ), and using an electronic form at two universities (UFU, UFU-Ituiutaba). In total, 700 questionnaires were applied at the nine universities and 166 were discarded because they were not fully completed.

Table 2
Total number of questionnaires per Federal University (FU)

FU	Questionnaires applied	Invalid questionnaires	Valid questionnaires
UFJF – Governador Valadares	44	10	34
UFJF – Juiz de Fora	107	25	82
UFMG	188	36	152
UFSJ	100	54	46
UFU – Uberlândia	13	1	12
UFU – Ituiutaba	30	0	30
UFV – Rio Paranaíba	97	18	79
UFV – Viçosa	45	7	38
UFVJM	76	15	61
Total	700	166	534

After the data had been processed, the descriptive analysis of the sample began. Regarding marital status, 89% of the students participating in the survey are single, 10% married and only 1% are separated. None of the research participants marked the widower option. At the researched universities, the Accountancy course is offered in only two periods: day and/or night. About 84% of the respondents study at night and only 16% during the day. Among the respondents, 12% say they have completed another degree and 88% are taking their first degree.

With regard to gender, 58% of the students surveyed are female and 42% male, which reveals a female predominance in the Accountancy course at the analyzed HEIs. Regarding paid activity, 45% of students say they have some type of paid activity.

Regarding the analysis of the main independent variable (academic performance), the results indicate that 57% of the students consider that they have a good academic performance, 37% consider to have an excellent academic performance and only 6% said that they had a poor academic performance. More specifically, the distribution of academic performance according to gender was analyzed. Results are presented in Table 4.

Table 3
Distribution of Performance per Gender

Performance / Gender	Male		Female	
	Absolute Value	Relative %	Absolute Value	Relative %
Excellent Performance	68	30.09%	130	42.21%
Good Performance	142	62.83%	163	52.92%
Bad Performance	16	7.08%	15	4.87%
Total	226	100.00%	308	100.00%

Regarding the distribution of academic performance, 42.21% of all female respondents considered their academic performance to be excellent. Similar results were found in the study by Cornachione Jr. *et al*. (2010), in which female students evaluated themselves as having superior academic performance compared to their male colleagues.

4.2 Inferential Analysis

For the sake of inferential analysis, three regressions were generated, one for Distributive Justice, another for Procedural Justice and the last for Interactional Justice. Table 5 presents the values obtained in the regression, extracted from the STATA® software for the Distributive Justice Dimension.

Table 4
Regression of the Distributive Justice Model

Variable	Coefficient	Std. Error	T-statistic	P>|t|
Good Performance	.0456077	.1437556	0.32	0.751
Excellent Performance	.1799518	.1587704	1.13	0.258
Gender	-.0209831	.0634303	-0.33	0.741
Period	.0176683	.0143071	1.23	0.217
Failure	-.1483889	.083889	-1.77	0.077***
No. of Failures	-.0233071	.0174973	-1.33	0.183
Marital Status	-.1508488	.1078988	-1.40	0.163
Paid Activity	.0004831	.0655353	0.01	0.994
Other Undergraduate Degree	-.0308407	.0982181	-0.31	0.754
Class	-.0151906	.085793	-0.18	0.860
Constant	3735584	.1732347	21.56	0.000
R2	5,12%			
No. of Observations	534			
Significant at	1% *			
	5%**			
	10%***			

Obs.: The variables: Good performance corresponds to the self-assessment of the student's performance, which can be good or bad; Excellent performance corresponds to the self-assessment of the student's performance, which can be good or excellent; Gender corresponds to the student's gender, either male or female; Period correspond to the course term the student is taking; Failure corresponds to the dummy variable, equal to 1 for students who failed at least one subject throughout the course and 0 for students who did not; Number of failures corresponds to the total number of subjects failed until the time of the research; Marital status corresponds to the student's marital status, whether single, married, widowed or divorced; Paid activity is related to whether the student has a paid job or not; Other undergraduate degree is related to whether the student has an earlier undergraduate degree or not; Class corresponds to the time of the classes, whether at night or during the day.

As observed, the only independent variable that was statistically significant was failure. That is, students who failed some subject during the course feel more wronged (hence the negative coefficient) than those who have never failed any subject. Braga, Pinto and Cardeal (1997) found a relationship between failure and dropout rates of undergraduate students. Dropout is one of the consequences of students' perception of injustice (Durso, 2015). Although there is no empirical evidence from previous studies linking failure with perceived justice, the findings in this study identified a direct relationship between both. The fitness coefficient of the model was 5.12%, which indicates that 5.12% of the variance of the Distributive Justice variable was explained by the variance of the independent variable. Table 6 presents the results for procedural justice.

Table 5
Regression of the Procedural Justice Model

Variable	Coefficient	Std. Error	T-statistic	P>|t|
Good Performance	.112832	.1494302	0.76	0.451
Excellent Performance	.1108159	.1650376	0.67	0.502
Gender	.1105087	.0659341	1.68	0.094***
Period	-.0173693	.0148719	-1.17	0.243
Failure	-.2988839	.0872004	-3.43	0.001*
No. of Failures	-.0050027	.018188	-0.28	0.783
Marital Status	.0064453	.112158	0.06	0.954
Paid Activity	-.0522027	.0681222	-0.77	0.444
Other Undergraduate Degree	-.1108292	.1020952	-1.09	0.278
Class	-.2763096	.0891796	-3.10	0.002*
Constant	3911065	.1800729	21.72	0.000
R2	7,20%			
No. of Observations	534			
Significant at	1% *			
	5%**			
	10%***			

The variables related to academic performance were not statistically significant. The model presented three control variables with statistical significance though. The variable "gender", indicating that male students have a higher perception of procedural justice than female students. Similar results were found in the work of Simil (2016), who identified that male students have a greater perception of procedural justice. The variable "failure", as in the distributive justice model, indicated that the fact that the student failed at least one subject during the course makes him/her feel more wronged concerning the perception of procedural justice. And the variable "class group" indicated that students who study at night feel more wronged in relation to procedural justice than students who study during the day. Students in the evening course are also more likely to drop out of the course compared to students studying during the day (Dias, Theóphilo & Lopes, 2010).

Possible reasons for this result may be identified. Procedural justice refers to the procedures the superior adopts towards his subordinates. In the learning environment, these procedures can be defined as: the amount of work required to achieve good grades and the amount of time required to dedicate to the course. Students studying at night usually engage in some kind of paid activity and, because they have little time for extracurricular activities, may perceive procedural justice items as unfair.

The goodness of fit of the model indicates that 7.20% of the variance of the procedural justice variable is explained by the variance of the independent variables. Although the Procedural Justice model presented more control variables with statistical significance, the fit coefficient was 2.08% higher than for Distributive Justice. Finally, the regression analysis for the Interactional Justice dimension was performed. Table 7 presents the results of this regression.

Table 6

Regression of the Interactional Justice Model

Variable	Coefficient	Std. Error	T-statistic	P>|t|
Good Performance	-.0722534	.1671043	-0.43	0.666
Excellent Performance	-.1110193	.1845577	-0.60	0.548
Gender	-.1043816	.0737326	-1.42	0.157
Period	-.0001203	.0166308	-0.01	0.994
Failure	-.250208	.0975142	-2.57	0.011**
No. of Failures	-.0107825	.0203392	-0.53	0.596
Marital Status	-.0412663	.1254236	-0.33	0.742
Paid Activity	-.0569993	.0761795	-0.75	0.455
Other Undergraduate Degree	-.0283955	.1141706	-0.25	0.804
Class	-.1764129	.0997275	-1.77	0.077***
Constant	4197241	.2013713	20.84	0.000
R2	4,25%			
No. of Observations	534			
Significant at	1% *			
	5%**			
	10%***			

In the analyzed model, two control variables (class group and failure) were statistically significant for the Interactional Justice dimension, at a 10% confidence level. Regarding the variable "class group", it can be inferred that it behaves analogously to the procedural justice dimension. The amount of work needed to perform extracurricular tasks can trigger feelings of injustice in relation to the procedures adopted and, consequently, interfere in the relationship between students and teachers.

Regarding the variable "class group", Pereira (2004) points out that the interactional aspects may be more relevant in the perception of justice the closer the relationship between two individuals. Fonsêca (2008) points out that educational failure (failure) triggers social adaptation problems, besides causing dropout and psychological problems, such as demotivation to study. This analysis allowed us to infer that students with successive failures have relationship difficulties, especially with their teachers. This relationship difficulty, associated with constant failure, can trigger feelings of injustice in the interactional aspect. The fit coefficient of the model was lower than for the other two models analyzed, indicating that 4.25% of the interactional justice variance is explained by the variance of the proposed control variables.

After the regression analysis, homoscedasticity, absence of multicollinearity and correct model specification tests were performed to validate the assumptions of the classical linear regression model proposed in this study. The first test performed was to verify the absence of multicollinearity of the model. Table 8 shows the result of the VIF tests of the three regressions previously presented.

Table 7
Analysis Test of the Variance Inflation Factors

Variables	Distributive Justice		Procedural Justice		Interactional Justice	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Good Performance	5.36	0.186618	6.23	0.160461	6.23	0.160461
Excellent Performance	6.23	0.160461	5.36	0.186618	5.36	0.186618
Gender	1.04	0.962836	1.93	0.517519	1.93	0.517519
Period	1.33	0.751123	1.71	0.586251	1.71	0.586251
Failure	1.71	0.586251	1.33	0.751123	1.33	0.751123
No. of Failures	1.93	0.517519	1.12	0.889808	1.12	0.889808
Marital Status	1.06	0.940275	1.08	0.929275	1.08	0.929275
Paid Activity	1.12	0.889808	1.06	0.940275	1.06	0.940275
Other Undergraduate Degree	1.08	0.929275	1.06	0.942051	1.06	0.942051
Class	1.06	0.942051	1.04	0.962836	1.04	0.962836
Mean VIF	2.19		2.19		2.19	

The VIF values found corresponded to 2.19 points for all regressions, revealing, according to Gujarati and Porter (2011), absence of multicollinearity problems. To verify the absence of heteroscedasticity, the Breusch-Pagan test was used. If the Lagrange Multiplier (LM) test statistic is significant at the adopted significance level (p-value <α), the null hypothesis of homoscedasticity is rejected. Table 9 presents the test values for the three models.

Table 8
Breusch-Pagan Test

	Chi2 test(4)	Prob> chi2
Distributive Justice	1.53	0.2163
Procedural Justice	2.43	0.1187
Interactional Justice	2.92	0.0877

The p-value of the Interactional Justice test was 0.0877, which is significant at 10%, indicating the presence of heteroscedasticity. One of the alternative ways to correct heteroscedasticity is to re-estimate the regression with robust standard errors. The results of this regression are presented in Table 10.

Table 9

Regression of the Interactional Justice Model – Robust Standard Errors

Variable	Coefficient	Std. Error	t-statistics	P>|t|
Good Performance	-.0722534	.1924273	-0.38	0.707
Excellent Performance	-.1110193	.218393	-0.51	0.611
Gender	-.1043816	.075656	-1.38	0.168
Period	-.0001203	.0165175	-0.01	0.994
Failure	-.250208	.1020654	-2.45	0.015**
No. of Failures	-.0107825	.0216156	-0.50	0.618
Marital Status	-.0412663	.1306603	-0.32	0.752
Paid Activity	-.0569993	.0784778	-0.73	0.468
Other Undergraduate Degree	-.0283955	.137441	-0.21	0.836
Class	-.1764129	.0886509	-1.99	0.047**
Constant	4197241	.2228654	18.83	0.000
R2	3,66%			
No. of Observations	534			
Significant at	1% *			
	5%**			
	10%***			

When analyzing the re-estimated Interaction Justice regression, it was observed that there was no change in relation to the significant variables in the model. Finally, the correct specification of the estimated model was verified. For this, the RESET (Regression Specification Error Test) test was performed. Table 11 presents the test result for the three dimensions of Organizational Justice.

Table 10

Specification Error Tests

	Chi2 test(4)	Prob> chi2
Distributive Justice	F(6, 517)	0.58
	Prob> F	0.7490
Procedural Justice	F(6, 517)	1.16
	Prob> F	0.3266
Interactional Justice	F(6, 517)	1.46
	Prob> F	0.1900

The result of the F statistic was higher than the adopted significance level ($\alpha = 0.10$). Thus, it was inferred that the functional form of the proposed model is well fit. The low R^2 values (measure of the degree of fit) observed in all regressions show low explanatory power of independent variables over the variation in the dependent variable though. Being explained mainly by the residual, the main causes of the variations in the perceptions of justice (dependent variables) are variables that were not covered in the established models. Therefore, although statistical validation is associated with theoretical constructs, there are components omitted in the regression residues that cause greater variation in the dependent variable.

Finally, the results indicate that there was no statistical significance with any of the hypotheses outlined in this study. The findings of this research go against the empirical evidence of Peter *et al.* (2012) and Kovačević *et al.* (2013), who found a positive relationship between academic performance and all dimensions of justice, but with a stronger relationship between performance and distributive justice.

4.3 Qualitative Analysis

All interviews were held with female students, aged 19 to 30 years. Interviewees 2 and 3 were students from the states of São Paulo and Tocantins, respectively, who came to Minas Gerais to study. Only interviewee 4 declared her marital status as separate; the others are single. Regarding the year of entry in the course, all students started between 2012 and 2016; Interviewee 1 does not and has never performed any kind of remunerated activity.

4.3.1 The Concept of Justice

Interviewee 1 understands justice as something that is true, fair and just, emphasizing that "the student must be treated well, but also has to respect the teacher very much, because, thus, there is a student who ends up mistreating the teacher and then ends up complaining about the way the teacher treats him [...] So I think it has to do with the way he treats people ". For respondents 2 and 4, in the learning environment, justice related to the treatment between teachers and students.

For respondents 5 and 6, justice is related to the distinction between student and teacher roles. Interviewee 5 points out that justice "is to be aware of your position when you are learning something; be aware of what is right, what is wrong, what should be done, what should not be done; I think it's fair for the student to be willing to learn and the teacher to teach."

Interviewee 3 associates justice with meritocracy. According to her, justice "is that you really have the grade that you obtained... That the grade you receive must be commensurate with your effort, or discipline, or your non-effort."

In this first question, it could be identified that the interviewed students relate justice in the learning environment in two ways. The first, with the behavior of teachers and students, and the second, with the effort the students employ compared to the grades obtained. These perceptions, although different, express the feelings of justice described by Barzotto (2003), who points out that the concept of justice in the social sphere manifests itself in three ways. The first occurs through the dependence of the other on the social relationship, which points to the fact that justice is always established between different subjects. The second refers to duty, which assigns something to a person through a rational need. The last concerns adequacy, which refers to the manner of determining what is due.

4.3.2 The Perception of Distributive Justice

In this regard, questions were asked about the distribution of grades in the subjects; form of assessment of the subject; and form of evaluation of the grades compared to the other students.

Regarding the distribution of grades in the subjects, all interviewees considered the way grades are distributed as fair. Interviewee 1 considers the distribution of grades fair "because it has always been agreed upon with the students, the question of distribution of grades, how the assessment of the subject will be divided. They are very flexible about that. And they might even come up and say, 'Such exam, such an assessment will be worth that much.' But it's always discussed, whenever I need it they change. There's nothing that fixed, no".

Interviewee 6 pointed out that "I don't think it's fair when the work grades are more than the exam grades, so I think it's unfair". He pointed out that as most students work, there is not much time left to study and that "work takes much more time and there are many activities". Another relevant point was that "in general, the activities, the method we adopt is very flawed. For example, we usually divide it, each one takes a part and each one talks about that part. So for me, this method attends to the teacher's needs, but not to the students".

Interviewees 3 and 4, although they considered the teachers' form of distributing grades fair, reported that they had a specific problem in relation to substitute teachers. In both cases, teachers changed the distribution of grades throughout the semester. Interviewee 3 pointed out that the class thought about making a complaint to the board, but "he was a very good teacher, he was a nice teacher, but we were afraid to make it public, so we accepted it. Especially because he passed everyone, so we did not have much to complain about." This issue differs from the perception of substitute teachers discussed by De Jesus and Rowe (2014), in which the authors identified that substitute teachers perceive the dimensions of Distributive and Interactional Justice more positively when compared to effective teachers. This discrepancy in the perception of fairness between substitute teachers and students may indicate two things: the substitute teacher values the relationship with students more highly and the substitute teacher's little experience makes him more accessible and flexible towards the students.

In a joint analysis, the interviewees perceive the Distributive Dimension fairly, and few punctual situations were highlighted as unfair, however, the aspects highlighted by the interviewees do not interfere in the perception of Distributive Justice. According to Homans (1961), feelings of anger or sadness are triggered when individuals realize that the rewards obtained are not proportional to the efforts made. Thus, the perception of Distributive Injustice could generate feelings of anger or guilt (Assmar *et al*., 2005). The reports presented showed that no such feelings are triggered though.

4.3.3 Analysis of the Perception of Procedural Justice

For this dimension, the focus was on understanding how the opinions and complaints of the institution are heard, as well as the teachers' expectations from the students.

Regarding the educational institution, the interviewees feel supported when any complaint or opinion is expressed. One of the interviewees mentioned turning to the Central Student Directory whenever necessary: "whenever we need to, we go to them and they bring our information, criticism, finally, about the course. So we are always heard". Another student pointed out that, being part of a university in the interior of the state, the relationship with teachers and staff is very close. She considers that the university has a different culture and treats students as if they were a family.

Considering the procedures used to handle student complaints and opinions, most stated that they consider the use of the procedures in HEIs as fair. They all acknowledge the hierarchy of procedures required to file complaints or opinions at the institutions they are affiliated with. Interviewee 2 pointed out that she already had "a problem in a grade that the teacher had registered wrongly, so she went there and solved it, there was no problem". Another student mentioned a problem with buses that take students to the campus four kilometres from the city. She stated that "there is a bus here that is free and there were a lot of complaints about it, because they were not committed to driving at the right times, to passing at the predetermined points. So we took it to DCE and DCE talked to the Campus director and, thus, there was an assembly and it was all sorted out. To the extent that now everything is normal".

Regarding the way teachers express what they expect from students in the classroom, the responses were quite diverse. Most answers indicated that not all teachers express what is expected of students. They pointed out that the teachers "inform us of their expectations regarding the good performance of the whole class"; that teachers "relate the professional's daily life to what they charge too [...]. So they make this correlation in a very fair way, often demanding in the test [...] what we will experience beyond the university".

Chory-Assad (2002) found that there are strong associations between the perception of procedural justice and the variables motivation and affective learning in the relationship between teacher and student. Chory-Assad and Paulsel (2004) highlighted that policies adopted in the classroom, evaluation criteria and task schedule are directly related to procedural justice. They stated that perceptions of procedural justice, such as the way the grades were distributed in an assessment, seem to be more relevant than perceptions of distributive justice, which deals with the appropriate determination of grades. Overall, the interviewees considered that the institution and its teachers use the procedures fairly.

4.3.4 Analysis of Perception of Interactional Justice

In the Interactional Justice dimension, we analyzed questions about how teachers treat students and whether students have ever witnessed actions of injustice in the classroom. Regarding the treatment of teachers towards students, the interviewees highlighted aspects about attention and respect: "the teachers are very receptive, all teachers I had always welcomed me very well and respectfully".

Although most interviewees reported that they had never experienced situations of injustice in the classroom, two interviewees reported feelings of injustice regarding the behavior of some teachers. One of them believes that it is necessary to improve the interpersonal relationship with some teachers, "the actual contact among the teachers would be more pleasant and not boring as it is lately". Another student highlighted relationship problems with substitute teachers. According to her, "I have some problems with substitute teachers. That was the case in the first semester and this semester too".

Considering the situations of injustice experienced in the classroom related to colleagues, two interviewees highlighted having experienced unfair situations. One highlighted situations of injustice in the school environment, but not in the classroom environment. Another pointed out that, when trying to contact the teacher outside the classroom, "some in particular refuse to collaborate, teach, even outside the classroom environment. We go there to solve some questions, something and they aren't, I won't use the word competent, to answer because they are very competent indeed. But they don't do it with pleasure, you know. We realize this when we are told to look for another type of information. Do a Google, as they often say here".

Regarding the other dimensions of justice, interactional justice was the dimension that aroused the largest number of perceptions of injustice, especially because it recalls situations experienced in the classroom. Similar results were found in the work of Chory (2007), who showed that teacher credibility was more strongly related to Interactional Justice and that the teacher's character was the most consistent predictor of classroom justice.

According to Wubbels and Brekelmans (2005), Interactional Justice is particularly important in learning environments, as the way teachers and students interact with one another influences students' motivation and stimulation and positive behavior. It should be emphasized that both the institution and the teachers and colleagues are components of the learning environment and influence the individual perception of justice. Although analyzed individually, it can be inferred that one dimension is influenced by another to complement the general concept of justice in the learning environment.

5. Final Considerations

The aim of this study was to look for evidence to identify the relationship between the academic performance of Accounting undergraduate students and their perception of justice. To this end, the perceptions of undergraduate students in Accounting from all federal universities in Minas Gerais were evaluated. For the research, the theoretical constructs used were based on the studies of Homans (1961), Adams (1965), Chory-Assad (2002), Peter *et al.* (2012), Kovačević *et al.* (2013) and Simil (2016). The findings of this research allow us to infer that academic performance does not influence the perception of justice in any of its three dimensions, rejecting the three hypotheses: (1) academic performance tends to influence the perception of Distributive Justice; (2) academic performance tends to influence the perception of Procedural Justice; (3) academic performance tends to influence the perception of Interactional Justice.

Based on this result, some questions may be raised though. Although not used as a performance measure, failure proved to be statistically significant for the three models tested, implying that students who fail some subject feel wronged, however, this does not influence their perception of academic performance. The sign of the coefficient (negative) obtained in the three regressions shows that students who have failed at least one subject during the course perceive more Distributive, Procedural and Interactional Injustice than students who have never failed. The variable 'number of failures' was not statistically significant in any of the three dimensions of justice though. This demonstrates that only the fact that the student has failed at least once influences his or her perception of justice, no matter how many times he or she has failed a subject during the course.

Among the study variables, gender was statistically significant only in relation to procedural justice. Male students have a higher perception of procedural justice. Regarding Distributive and Interactional Justice, no statistical evidence was found that this relationship exists. Similar results were evidenced in the work of Simil (2016).

The variable 'course period in progress' was not statistically significant with respect to any of the three dimensions of justice. There is no evidence that students who are more advanced in the course have a greater perception of justice than students in the early periods. The same relationship was observed among students who had already graduated when they entered the Accounting course. These results show that, in the research sample, the university experience during the course or experiences of previous courses did not influence the students' perception of justice in any of the three dimensions.

The low R^2 values (measure of degree of fit) observed in all regressions showed low explanatory power of the independent variables on the variance in the dependent variable. Being explained mainly by the residual, the variances in the perceptions of justice (dependent variables) are mainly caused by variables that were not considered in the established models. Therefore, although statistical validation is associated with the theoretical constructs, there are components omitted in the regression residues that cause greater variation in the dependent variable.

Regarding the qualitative analysis, some association between justice in the learning environment and the figure of the teacher was identified. Regarding Distributive Justice, the way the teacher distributes the grades and the way he evaluates the students were the most appointed aspects. It is noteworthy that students feel wronged when the teacher gives a lot of work to be done at home, whether individually or in groups. The justification for this fact is the impossibility of reconciling professional activities with extra-class activities.

Regarding procedural justice, feelings of welcoming and justice regarding complaints and opinions were observed. Difficulties have been reported in understanding what teachers expect from students though.

Concerning Interactional Justice, it has been shown that this is the dimension in which the interviewed students feel most wronged. This association of justice in the learning environment with the teacher reveals that, when there is a breach of trust or respect for the teacher, the feeling of injustice emerges in the student. Interactional Justice showed the highest sensitivity on the part of the students, precisely because it refers to the social relations between teachers and students.

It is concluded that, for the Accountancy students of the Federal Universities in the State of Minas Gerais that were included in the sample, the relationship between teacher and student, as well as the way he organizes the class schedule are more relevant in the interviewees' perception of justice. Understanding what the student considers fair or unfair in the university broadens the discussion about what should be considered in the management practices adopted, especially in the organization of subjects and interpersonal relationship policies between teachers and students.

The main limitation in this research is the fact that only students from federal universities were included. The differences between public and private universities are well-known. In addition, only women were shown in the analysis of the interviews, as women's ease to express their feelings could explain a greater perception of injustice. As the theme is incipient in the academic environment, it is important to highlight that the results of this study cannot be generalized as a profile of accounting students in Minas Gerais. Thus, further research can be developed based on the results presented here.

As a suggestion, this study could be replicated in private higher education institutions. Students from private institutions may have different perceptions of justice than those pointed out here, as they are engaged in a context that often diverges from students at public universities. Thus, it is expected that the research will contribute to the improvement of the pedagogical practices of teachers and course coordinators.

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An approach to assess the quality of the research process in Accounting

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Abstract

Objective: To associate research quality attributes with those perceived in the accounting research process.
Method: The Modified Delphi Technique was used. There were two rounds with online questionnaires and personalized access. The panel was composed of 41 professors affiliated to 19 Brazilian graduate programs in Accounting. A guidance matrix with 53 attributes/relationships linked to general quality criteria and nine key-characteristics was developed and assessed by the respondents according to their adherence to research practices.
Results: Approximately ¾ of the items obtained a strong level of agreement. The attributes that obtained low or moderate levels of agreement, however, include items that may compromise the quality and integrity of research such as those related to ethical principles, errors and biases and also related to the impact the research team may have on a study's results.
Contributions: This study is expected to support researchers to self-assess their studies, identifying deficiencies and limitations, which in turn promotes greater acceptance of papers and shortens the process of submission to periodicals. As a consequence, financing opportunities and international partnerships may be created, as well as improve the relevance of scientific studies in the field.
Keywords: accounting – research, scientific production, graduate school, research quality, quality criteria.

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1. Introduction

Research is an important activity undertaken in educational institutions and is capable to promote the development and improvement of work techniques and strategies and courses of action in various fields of knowledge. In addition, it is essential to advance knowledge and develop solutions for social problems. Scientific research is an activity intended to test hypotheses, draw conclusions and contribute to generalizable knowledge, expressed in theories, principles, and stated relationships (National Institutes of Health, 1979).

The institutional research environment in Brazil establishes basic productivity standards for graduate programs (Master's and doctoral programs). These standards are consistent with the requirements of government research funding agencies and institutional research infrastructure, being established by the Coordination for the Improvement of High Education Personnel (CAPES). If, however, on the one hand, these standards promote scientific production in various fields, on the other hand, on the eagerness to publish research results, researchers may overlook the relevance of studies and disregard scientific rigor. Therefore, the institutional environment justifies the need for studies addressing the quality of scientific research, that is, verifying how the scientific process has been implemented.

International studies evaluating research in the accounting field address various aspects such as productivity and quality, involving university business departments (Chan, Chang, Tong, & Zhang, 2012; Jones, Brinn, & Pendlebury, 1996; Lowe & Locke, 2005). Other studies address research quality criteria such as the impact of studies (Brown & Gardner, 1985; Carmona, 2006); their relevance (Reiter & Williams, 2002); rigor (Evans, Feng, Hoffman, Moser, & Van der Stede, 2015; Williams, 2014); and validity (Libby, Bloomfield, & Nelson, 2002). Finally, other studies analyze citations (Brown & Gardner, 1985; Dunbar & Weber, 2014) and quality perceptions of accounting periodicals (Ballas & Theoharakis, 2003; Brinn, Jones, & Pendlebury, 2001; Brown & Huefner, 1994; Lowe & Locke, 2005; Lowensohn & Samelson, 2006; Taylor, 2011). Even though these studies do not focus on the quality attributes of good research, they explore productivity and assess the quality of what has been published in scientific periodicals in the field.

Studies addressing accounting research conducted in the Brazilian context have adopted various approaches. Some present a bibliometric perspective and analyze aspects such as methods used in theses/dissertations and publications in periodicals and congresses (Mendonça Riccio, & Sakata, 2009; Miranda, Azevedo, & Martins, 2011), research ethical issues (Antunes, Mendonça, Oyadomari & Okimura, 2011), and analysis of citations in periodicals (Aragão, Oliveira & Lima, 2014). One study, however, analyzes academic productivity (Martins & Lucena, 2014) and specifically, the productivity of professors affiliated to Brazilian graduate programs by investigating the profiles and the main practices of these Programs' scientific production, reporting multiple studies giving account of partial results of a single study, that is, the so-called salami publication, and papers that are rejected by higher impact journals and eventually published when submitted to less prestigious journals.

Bibliometric characterization, however, based on reports and publications, is inadequate to reveal failures in the Accounting research process, which should take into account from the choice of the subject up to the submission of its report for scientific dissemination. Reflecting upon the elements that contribute to the scientific nature of research and its improved quality is key. In this sense, good research practices are defined as rules researchers are supposed to follow to ensure the quality, objectivity, and integrity of results, with reasonable and explicit choices (Denscombe, 2010; Shamoo & Resnik, 2003).

These elements suggest that good research requires appropriate scientific practices to obtain the answer that is the most appropriate to the problem proposed. Given this context, this study's objective was to associate research quality attributes with those perceived in the development of scientific production in Accounting. The scientific research process encompasses key-characteristics or different stages (Mays & Pope, 2006; Spencer, Ritchie, Lewis, & Dillon, 2003) such as planning, implementation, and assessment of results (Brinberg & McGrath, 1985). This study's hypothesis is that certain practices currently adopted in the process of scientific research in accounting in Brazil do not meet the research quality attributes described in the literature.

The findings presented here show that approximately ¾ of the items concerning 53 attributes/quality relationships analyzed obtained a strong level of agreement on the part of researchers in the accounting field. Six attributes, however, obtained moderate agreement and 3 obtained a low level of agreement, including items that may compromise the quality and integrity of research, such as those related to ethical principles, errors and biases, and the impact of the researcher team on studies' results. Additionally, 5 attributes associated with reliability, integrity and internal validity criteria did not obtain a consensus, suggesting that failures may be found in certain stages of the research process that concern these criteria

Assessment of scientific production focused on results is limited to evidencing potential failures in the research process of graduate programs and researchers. Studies assessing research practices may have an impact on the field, as it can support researchers to self assess their studies, identifying deficiencies, limitations, and aspects that need to be taken into account to improve methodological choices. Greater acceptance of papers may result as well as the period to submit papers to periodicals may be shortened, as fewer reviews will be required. Better quality studies that present clear contribution and impact are considered in the allocation of resources and recruiting of professors, among other factors (Chan *et al.*, 2012). An addition result expected is that improved quality scientific research conducted by graduate programs in accounting improves the chance of publishing studies in relevant periodicals in addition to promoting new opportunities of financing, collaboration in international partnerships, and greater relevance of scientific production in the field.

2. Literature Review

The literature review is divided into three subtopics: the first presents an overview of quality and good research practices. The second highlights the stages of the research process based on the Validity Network Schema (Brinberg & McGrath, 1985), as well as on the Research Evidence Assessment Framework (Mays & Pope, 2006; Spencer *et al.,* 2003). Finally, it presents evidence concerning quality criteria and indicators used in evaluations of the research process.

2.1 Quality Research and Good Research Practices

To understand this study's objective, we need to make clear the meaning of its central elements: quality, attribute, and research process. In a generic sense, quality is described as an attribute, natural condition, or property by which something or someone is individualized and distinguished from others. It is also a way of being, essence or nature, or degree of perfection, precision, and conformity with a given standard (Michaelis, 2012). Valentine (2009) notes that, in scientific research, the answer to the question "what are the characteristics of a high-quality study?" in part depends on why such question is being asked, considering that different individuals assign different meanings to it. The aforementioned author defends that quality refers to an appropriate link between the study's objectives, design and purpose involved in its implementation. In terms of research in the accounting field, Clarkson (2012) argues that quality is associated with three fundamental factors: (i) contribution - the importance of the study's focus and its level of innovation; (ii) the rigor with which a study was performed (scientific credibility); and the (iii) ability of a document in reporting the study in a transparent and accessible way (communication).

The concept of attribute also has a variety of meanings, including (1) what is inherent and peculiar to someone or something; (2) a condition, property or quality of something. Grammatically, an attribute modifies a noun expressing its quality or strength (Michaelis, 2012). The research process, in turn, is defined as the identification, combination, and use of elements and relationships of conceptual, methodological and substantive domains, divided into three stages and with different validity perspectives (Brinberg & McGrath, 1985). Additionally, the research process may be described according to the following steps (or stages): findings, design, sample, data collection, analysis, and report (Mays & Pope, 2006; Spencer *et al.*, 2003). Given these definitions, the quality attributes of the research process described in this study include a set of characteristics that show the connection between the focus of interest, evidence, theory and researchers' methodological choices. Quality is present in the various stages of study planning and implementation, permeated by the tradition of the underlying research.

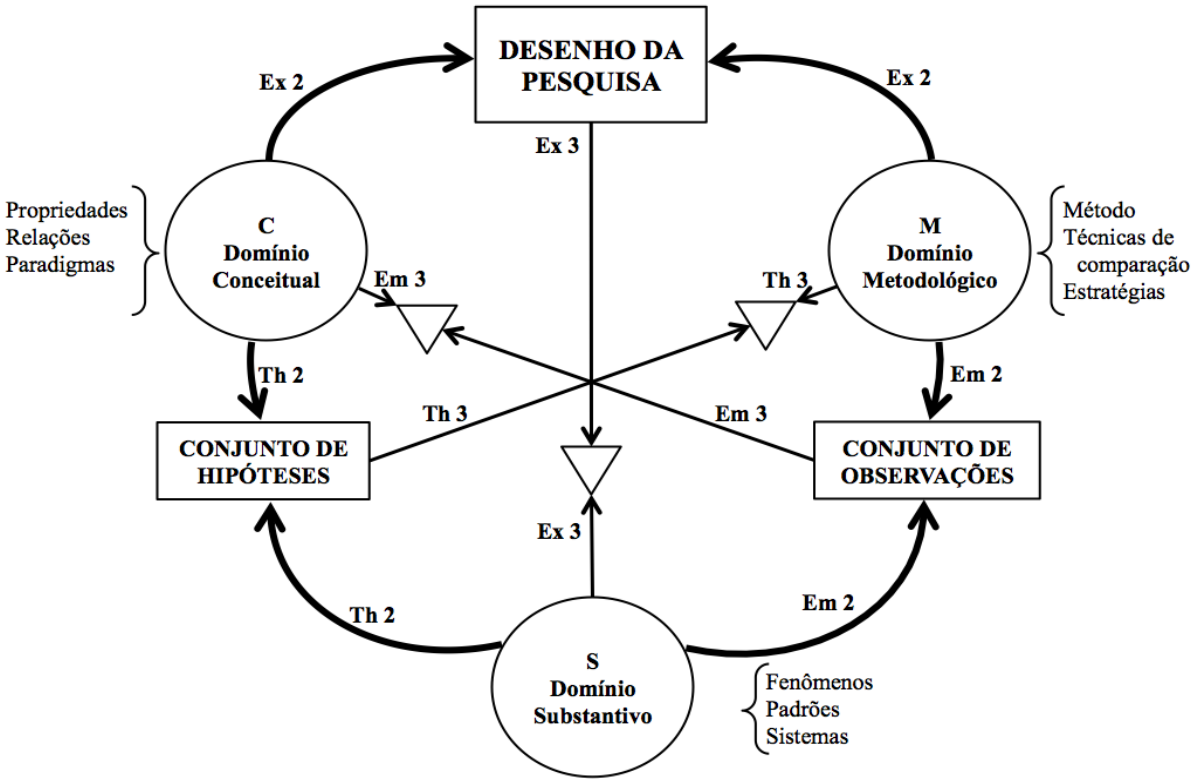
Given its subjective and evaluative nature, it is not an easy, or consensual task, to establish what good research is. Those in leading positions may play a key role in the development of a culture in which ethical behavior and good research practices prevail. If the most prominent researchers, managers, companies, and governmental agencies display and tolerate anti-ethical behavior and poor research practices, such behavior and practices will prevail (Shamoo & Resnik, 2003). Good research practices are rules researchers can follow in order to promote and ensure the quality, objectivity, and integrity of data.

These aspects can guide the assessment of a study quality because they represent the general attributes of good research. Similar elements are reported by one study (Webster & Watson, 2002) that ask questions associated to each of the following: (a) contribution ("what is new?"); (b) impact ("so what?"); (c) logic ("why?"); and (d) rigor ("was it well done?"). The two first aspects refer to the "substance" of a study, that is, its research problem, foundations, gap identified, justification, and potential implications for the field. The logic of a study is not only associated with the development of a theoretical framework. It is also associated with study design while the latter refers to the rigor with which a given study is conducted, as well as to its ethical aspects.

In short, the notion of good research is associated with rules, which if followed, can help researchers to ensure the quality, objectivity, and integrity of data. For that, one needs to make reasonable and explicit choices in regard to every component of a study and in this context, rigor, and quality are strongly related, as one cannot conduct good quality research if the process is poorly implemented. That is why each of the tasks included in the phases (stages) of a research process needs to be carefully considered.

2.2 Research Process Stages: the Validity Network Schema and Research Evidence Assessment Framework

Research is basically a study of relationships, that is, it always takes into account the relationship between units (Brinberg & McGrath, 1985). These authors studied the validity of the research process and argue this is not a commodity that be can be acquired by merely applying techniques, but an ideal state, a concept to be pursued and which is applied in the different stages of a research process. As a result, the authors present the Validity Network Schema (VNS) in which they assume that research involves three inter-related, though analytically distinct, domains: conceptual, methodological, and substantive. While the phenomenon is a central object in the perspective of the substantive domain, the conceptual domain is concerned with the identification of the concepts and attributes that can help to explain the phenomenon under study, that is, a theory (or theoretical lens) that sustains the analysis of information collected. The methodological domain, in turn, is concerned with presenting and describing the means used to conduct a study (Figure 1).



Translation:
STUDY DESIGN - C Conceptual Domain - Properties Relations Paradigms - M Methodological Domain - Method Techniques to compare strategies - S Substantive Domain - Phenomena - Patterns - Systems - SET OF OBSERVATIONS - SET OF HYPOTHESES

Experimental Path (Ex)	→	Building a project and implementing it using a set of substantive events
Theoretical Path (Th)	→	Building a set of hypotheses, testing and assessing them with an appropriate set of methods
Empirical Path (Em)	→	Building a set of observations, explaining and interpreting them based on a set of meaningful concepts

Figure 1. The VNS: domains, levels, and paths.
Adapted from Brinberg and McGrath (1985, p. 22).

Brinberg and McGrath (1985) consider that the entire research process involves three large stages (steps): Stage 1 – Validity as Value, called Pre-Study or Preparatory Stage, concerns research planning, when criteria to assess the relationships of the domains are established, that is, the merit of a research proposal is judged; Stage 2 – Validity as Correspondence, also called Central Stage, refers to the study's implementation phase, in which the use of elements and relationships of the three domains to produce a set of empirical findings using different paths are established; and Stage 3 – Validity as Robustness, called Stage 2 Findings Monitoring, a stage in which the results are assessed and one verifies the extension and outlining of findings in order to identify the study's boundaries and contributions. There are three alternative paths to perform the central stage within a research process: Experimental (Ex), Theoretical (Th) and Empirical (Em), which reflect different styles of doing research and finding different validity questions. In essence, you have a link between object of interest (represented by the substantive domain) and the conceptual relationships denoted by its properties (theory) support the establishment of a set of hypotheses that may explain a given phenomenon. On the other hand, the connection between the focus and the methodological domain is related to strategies used to systematically collect a set of observations that support evidence and findings.

Another perspective to assess research processes is the Research Evidence Assessment framework (Mays & Pope, 2006; Spencer *et al.*, 2003), intended to assess evidence of nine main characteristics and processes:

- (1) Findings – characteristics associated with the assessment of elements such as credibility of findings, how findings broaden existing knowledge, the scope of inference, and whether the original objectives and purpose were met
- (2) Design – justification of why a given design was chosen (methodological choices)
- (3) Sample – assessment of criteria used to conceptualize and selecting a sample, as well as inclusion and exclusion criteria.
- (4) Data Collection – assessment of how data were collected.
- (5) Analysis – depth and complexity of data, the approach that was chosen, and analysis of formulation, data source context, and diversity of perspectives.
- (6) Report – assessment of the connection between data, interpretations, and conclusions, as well as the coherence of the global report.
- (7) Reflectivity and neutrality – clarity regarding the assumptions, theoretical perspectives, and values that guide the study as well as consideration of errors and biases.
- (8) Ethics – assessment of how well researchers and the research team dealt with ethical issues.
- (9) Auditability – verification of formal procedures and documentation of the study process for future inspections.

2.3 Quality criteria and indicators in research process evaluation

According to the definition of the Joint Committee on Standards Committee for Educational Assessment (Yarbrough, Shulha, Hopson, & Caruthers, 2011), a criterion is a standard through which something is judged. Another definition involves the notion of merit, that is, whether something is valuable or not, or whether something is good or not (Davidson, 2005). A third concept describes criteria as a set of standards that establish acceptability (Brinberg & McGrath, 1985). The judgment of each evaluator, however, tends to be different. Evaluators use different indicators in assessment processes, and even though the word "assessment" implies judgment from a broadened perspective, it essentially focuses on merit. In essence, an indicator is described as a gauge (a scale) or measure of a variable (Weiss, 1997). The framework used to assess the quality of evidence produced by qualitative research (Mays & Pope, 2006; Spencer *et al.*, 2003) stresses that it is possible to use "(...) a series of quality indicators that indicate the type of information necessary to asses whether a given quality attribute was met or not".

There is no consensus in the literature on which criteria are best to assess the quality of research. For instance, some authors argue that it is impossible to have only one set of criteria to assess qualitative and quantitative studies due to the differences involved in these two types of research (Whittemore, Chase & Mandle, 2001). Other authors, however, defend the possibility of using common criteria to assess both qualitative and quantitative research (LeCompte & Goetz, 1982).

The assessment of research stages is a task involving various stakeholders. On the one hand, there are funding agencies, interested in the results of the planning phase (study project), relying on criteria such as relevance, impact, and feasibility to decide which projects will be funded. On the other hand, researchers are concerned with quality attributes that allow for a systematic and rigorous study, that is, the implementation of a study that produces the best quality of evidence. Finally, other stakeholders consider the quality of the "research product", that is, scientific publication. The academic community has basically used two ways to identify the quality of periodicals: surveys are conducted with members of the scientific community (referees, editors, researchers, etc.) to identify their perceptions of quality (Ballas & Theoharakis, 2003; Brinn *et al.*, 2001; Lowe & Locke, 2005; Lowensohn & Samelson, 2006; Northcott & Linacre, 2010; Van der Stede, Young, & Chen, 2005) and measures based on studies' citations (citation impact) (Aragão *et al.*, 2014; Doyle & Arthurs, 1995).

Considering the focus of this study is related to the study of practice, a combination of different sources was used to identify a set of general criteria that are possible to apply, as summarized in Table 1. Thus, a set of more general criteria was chosen based on the literature and the frameworks previously mentioned (Brinberg & McGrath, 1985; Mays & Pope, 2006; Spencer *et al.*, 2003), to guide an analysis of the research process in the Accounting field.

3. Method

This study comprises 4 stages. The first stage refers to a bibliographic survey, intended to identify the attributes of good research described in the literature. After establishing a list of general criteria, and considering the VNS domains as well as key-characteristics presented by the Research Evidence Assessment Framework, a matrix was developed to guide the development of the instruments to collect data.

The second stage refers to the application of the Delphi Technique, based on the type of consensus formation. The modified Delphi technique was used, in which the propositions of the first stage are based on the literature rather than proposed by the participants (Kelbaugh, 2003). There were two rounds with professors affiliated to academic graduate programs in accounting that are recognized by CAPES. Overall, 318 professors were invited, 41 participated in the first round and 37 in the second. Nineteen out of 23 graduate programs recognized by CAPES and still active during the period of data collection were represented.

Using a 10-point numeric scale, an instrument was developed to collect data based on a clinical study (Elwyn *et al.*, 2006). It is composed of 53 items listing attributes/relationships concerning the quality of the research process and level of adherence on the part of respondents to such attributes. In order to improve internal validity, a pre-test was performed with 5 evaluators: 3 doctoral students, 1 Ph.D. in Accounting and 1 Ph.D. in Education. Data were collected between October 2015 and February 2016 using the SurveyMonkey online platform, each using custom ID and password that were sent through an email inviting the panelists. The result of the first round presented a Cronbach's alpha equal to 92.2% while consensus was not obtained for 28 items, which were reassessed in the second round. Because only 5 items (less than 10% of the total) did not obtain consensus after the second round and also because standard deviation varied little between rounds, we opted for dispensing the third round. Data analysis considered location and dispersion measures in addition to criteria used to obtain consensus.

Having identified the attributes (Stage 1) and obtained the Delphi's results concerning the consensus (Stage 2), the third stage consisted of comparing evidence with classification according to levels of agreement and identifying potential patterns and/or variations. Criteria to established consensus were: (a) 75% or more assigned 1-3 or 8-10 scores (strong agreement); (b) 25% or less assigned 1-3 scores (disagreement); and (c) standard deviation variation ≤25% between rounds. The classification of items according to the level of agreement is detailed in Table 2.

Table 1

Summary of the general scientific criteria and their characteristics

Criterion	Meaning/Characteristics	Source
Contribution/quality of the theoretical perspective	The extent to which the target-audience can directly use the findings; the extension to which the study advances knowledge or brings broader understanding about a study object. It is characterized by the identification of knowledge gaps and may provide solutions to audience problems.	(Mays & Pope, 2006; Meyrick, 2006; Spencer *et al*., 2003; Webster & Watson, 2002)
External validity or generalization/ opportunity	Application of results in other contexts, generalization to other populations. In a qualitative approach, it is an opportunity to verify how well hypotheses would fit in a context different from the one addressed. Factor: applicability.	(Brinberg & McGrath, 1985; Spencer *et al*., 2003; Valentine, 2009; Yarbrough *et al*., 2011)
Feasibility	It is "the extent to which resources and other factors allow for satisfactory assessment to be performed" (Yarbrough *et al*., 2011). To verify whether a study is feasible, one should consider access to data, resources available, the research team's skills, and time restriction, among others, as well as cost-benefit.	(Davidson, 2005; Rossi, Lipsey, & Freeman, 2004; Weiss, 1997; Yarbrough *et al*., 2011)
Impact	Impact, when assessing a program, can be defined as "a change in the target population or social conditions that have been brought about by the program, that is, a change that would not have occurred in the program had not happened." (Rossi *et al*., 2004). Similarly, impact in the case of scientific research refers to changes that take place due to the results of a study or which were induced by such results.	(Carmona, 2006; Rossi *et al*., 2004; Webster & Watson, 2002; Weiss, 1997)

Criterion	Meaning/Characteristics	Source
Integrity	It refers to the rigor of research questions, design, conduct, and theorization, revealing principles and rules of conduct or codes of practice people and organizations involved in scientific research are supposed to follow: (a) honest communication; (b) reliable research; (c) Objectivity; (d) impartiality and independence; (e) openness and accessibility; (f) duty of diligence; (g) fairness in providing reference and making citations; and (h) being accountable with future scientists and researchers (European Science Foundation, 2011). Failure in meeting the criterion of integrity may be evidence of research misconduct.	(Antunes *et al*., 2011; European Science Foundation, 2011; FAPESP, 2012; OADS, 2012)
Internal validity/ credibility or defensibility	Measures the significance of the independent variable with regard to the dependent variable, or how well and faithfully the phenomenon is represented. In qualitative studies, it is credibility or "how vivid and faithful the description is to the experience lived." (Beck, 1993). In general, validity is defined as "the extent to which it measures what it is intended to measure" (Rossi *et al*., 2004). Factor: Truth value.	(Beck, 1993; Brinberg & McGrath, 1985; Libby *et al*., 2002; Mays & Pope, 2006; Spencer *et al*., 2003)
Relevance	The ability of research to help a group of researchers to solve problems. The relevance of a study depends on its potential use for scientific, educational or applied purposes. Schwartzman (1988) argues that the assessment of the scientific relevance of a study depends on the scientist themselves, notably by peer-review; other forms of relevance required the participation of other stakeholders.	(Mays & Pope, 2006; Reiter & Williams, 2002; Schwartzman, 1988; Weiss, 1997; Yarbrough *et al*., 2011)
Reliability/ auditability	An instrument's measure of consistency in obtaining similar results or the ability of another researcher to follow the audit trail. In other words, the "extent to which a measure produces the same results when repeatedly used to measure the same thing" (Rossi *et al*., 2004). Factor: consistency.	(Beck, 1993; LeCompte & Goetz, 1982; Mays & Pope, 2006; Rossi *et al*., 2004; Yarbrough *et al*., 2011)
Rigor/thoroughness	Complete and reliable recording. Rich, detailed and complex data. Rigor includes good practices to collect and analyze data along with transparence. The perception of rigor, however, is complex and may depend on the research method adopted.	(Denscombe, 2010; Evans *et al*., 2015; Webster & Watson, 2002; Williams, 2014)
Adequacy	The choice of a strategy that is likely to be successful in the achievement of a study's objectives, which is clearly and explicitly justified. According to Denscombe (2010), it is not a matter of whether a definition is good or bad – or correct or wrong -, but rather whether it is useful and appropriate to solve a given research problem.	(Denscombe, 2010)

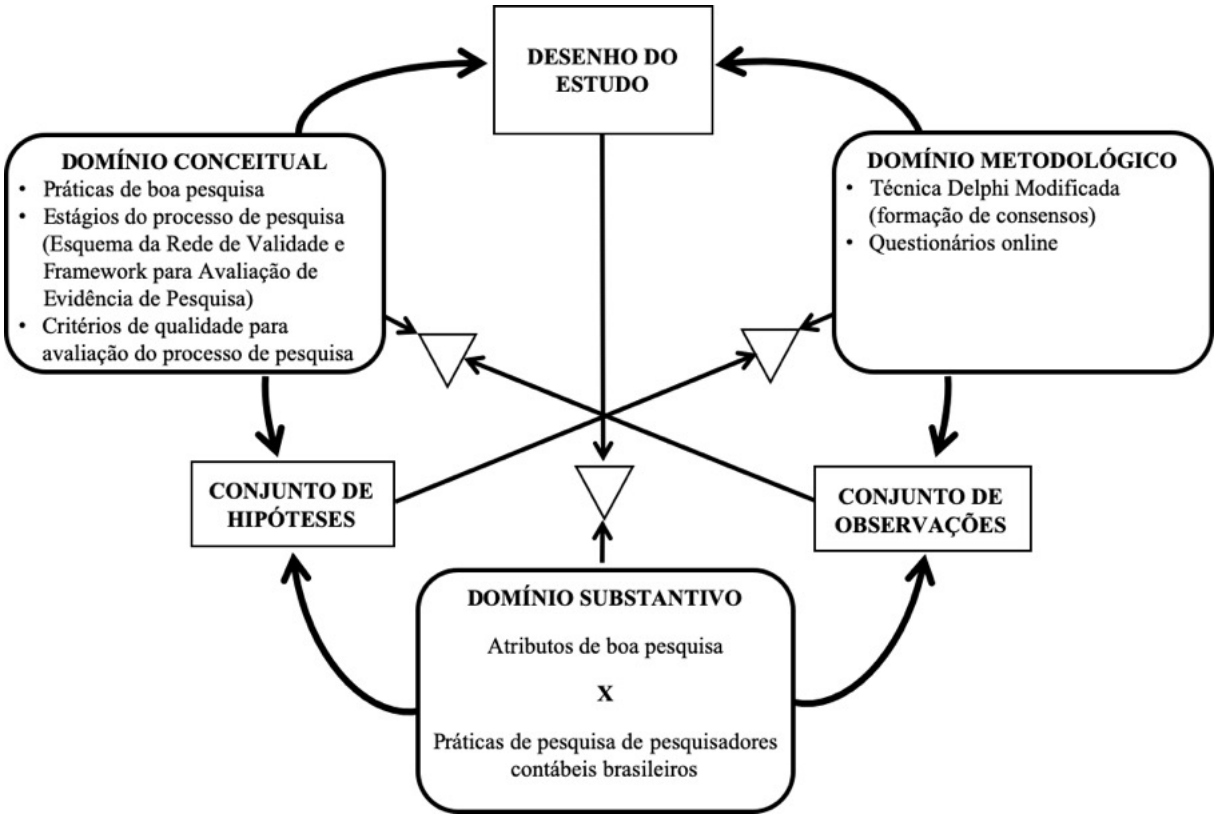
Table 2

Criteria to classify the items according to levels of agreement

Rodríguez-Mañas *et al*. (2013)	Adjusted model	Level of agreement
>80% of the answers ≥8 or ≤3	>75% of the answers ≥8 or ≤3	Strong
70% – 80%	65% – 75%	Moderate
50% – 70%	50% – 65%	Low
<50%	<50%	No consensus was obtained

Based on the propositions and the use of a logic model, the fourth stage refers to the development of an approach to assess the research process. A logic model is a technique used to assess programs and projects, both focusing on the process as well as on the outcomes (Kellog Foundation, 2014; Ladd & Jernigan, 2006). The logic model in this study was structured by adapting examples studied during the Introduction to Evaluation Theory course administered by Professor Thomas A. Schwandt from the University of Illinois at Urbana-Champaign (UIUC), USA in September 2014. The attributes/relationships identified in the literature and assessed by experts in the Delphi's panel were considered. Additionally, the potential implications of not meeting criteria in the VNS's substantive, conceptual and methodological domains were presented.

The study design is summarized according to the scientific research domains presented in the Validity Network Schema (Figure 2).



Translation:
STUDY DESIGN - Conceptual Domain - Good research practice - Stages of the research process (Validity network scheme and Assessment framework for research evidence) - Quality criterion for the assessment of the research process - Methodological Domain - Modified Delphi Technique (reaching consensuses) - Online questionnaires - Substantive Domain - Attributes of good research - Research practices of Brazilian accounting researchers - SET OF OBSERVATIONS - SET OF HYPOTHESES

Figure 2. Summary of the VNS-based research design (Brinberg & McGrath, 1985)

This study was submitted to and approved by the Institutional Review Board (IRB) and is registered in the Brasil Platform.

4. Results and Discussion

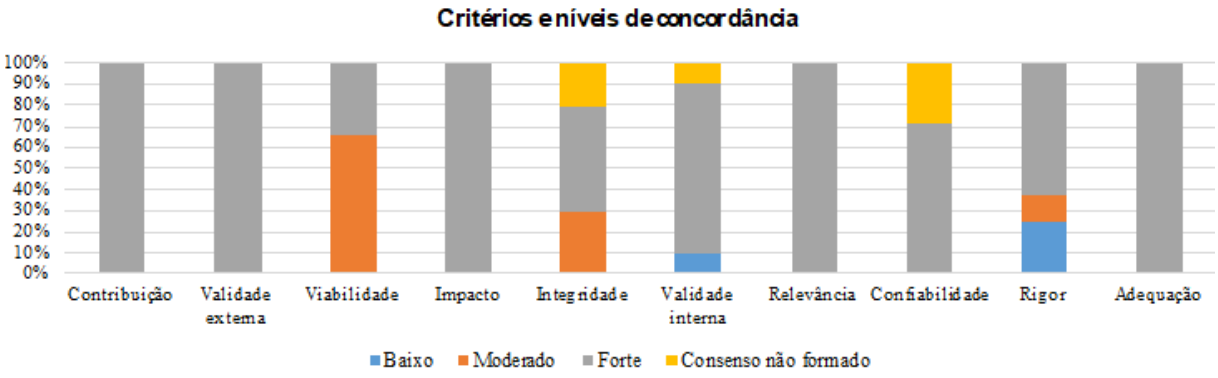
The Delphi's expert panel was composed of 41 individuals in the first found and 37 in the second round. In order to characterize the panel, the respondents were asked about their professional background and experience. Most had a doctoral degree in Accounting obtained in a Brazilian institution different from the one to which they were affiliated and less than 15% had attended a sandwich doctoral program or post-doctorate in an international institution, suggesting poor experience with international activities, which may reflect a low level of insertion in international research networks. Only 9.76% had obtained their doctoral degree in the same graduate program to which they were affiliated, which is evidence of decreased endogeneity, an element CAPES consider to indicate improved quality. Additionally, the graduate programs with diversified educational experiences tend to have researchers with very different skills and worldviews, which may contribute to more comprehensive and innovative studies.

Regarding the respondents' experience with research, an important factor to characterize their participation as a panel expert, 34.14% reported up to two years of experience in a graduate program while the remaining 26.83% had between 5 and 7 years of experience. Additionally, 56.10% had received/receive research financial support, approximately ¼ reported a research productivity scholarship and only 2.44% did not have papers published in periodicals classified A1, A2 or B1 in CAPES' last assessment. Most are affiliated to Master and Doctoral programs rated with a grade 4. These data reveal the group presents research experience that qualifies it for such judgment.

4.1 Implementation of the Modified Delphi Technique

The final result of the modified Delphi is detailed in Appendix A. The number of valid answers varied due to the number of negative answers related to the use of research involving human subjects. Additionally, only five propositions did not reach consensus, not justifying the effort needed to perform another round, given the low variability in standard deviation between the two rounds.

The findings reveal that 73.58% (39) of the 53 items obtained a strong level of agreement; 11.32% (6) obtained a moderate level of agreement; 5.66% (3) a low level; and 9.43% (5) did not reach a consensus. The attribute "subjects' voluntary participation", which is linked to integrity, obtained the highest relative score and 10 items obtained a percentage above 90%. The item that obtained the highest absolute score was "objective/problem was presented with accuracy", which is related to adequacy criterion and obtained 395 points out of the 410 possible.



Translation:
Criteria and levels of agreement
Contribution - External validity - Feasibility - Impact - Integrity - Internal validity - Relevance - Reliability - Rigor - Adequacy
Low - Moderate - Strong - Consensus was not obtained

Figure 3. Criteria and levels of agreement

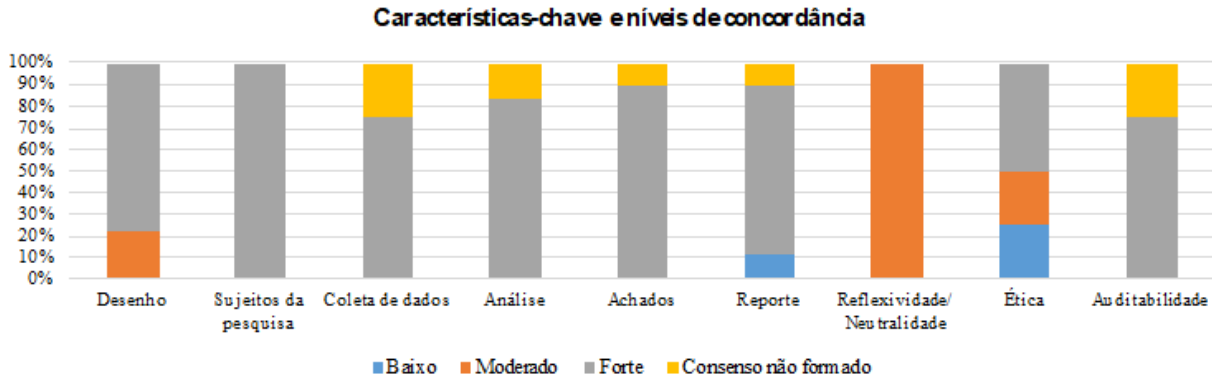
Figure 3 shows that the items concerning contribution/quality of theoretical perspective, external validity or generalization/opportunity, impact, relevance, and adequacy show strong agreement in the respondents' opinion. Approximately 65% of the items related to the feasibility criterion obtained moderate agreement. Even though these do not necessarily indicate severe failures, these should be considered when planning studies, as they are associated with elements such as the size of the study project in terms of time restriction and target population that influence the selection of research strategy. According to VNS (Brinberg & McGrath, 1985), the premise of planning is validity as value, which is called the preparatory stage and should precede the subsequent stages. As a consequence, failure in this stage may compromise a study's feasibility (Rossi *et al*., 2004; Weiss, 1997; Yarbrough *et al*., 2011) and lead to inconsistent data and findings, not meeting internal and external validity as well as a study's impact.

A total of 35% of the integrity items obtained moderate agreement. Integrity requires attention to issues on how researchers deal with errors and biases and how the research team impacts the results. Data integrity is a central element in terms of good research practices and violation of such an element may compromise the scientific credibility of findings (Clarkson, 2012; European Science Foundation, 2011; FAPESP, 2012; OADS, 2012; Shamoo & Resnik, 2003).

Items with a low level of agreement were associated with internal validity/credibility or defensibility and rigor. Approximately ¼ of these obtained a low level of agreement and should be considered by researchers because failure in meeting these criteria may suggest weaknesses during the conduction of studies in the field. Poor agreement in these items may indicate loss of research quality because it may compromise the credibility of findings, as well as reveal aspects that could be improved in the training of researchers in the field, given the importance given to these criteria in the literature (Evans *et al*., 2015; Mays & Pope, 2006; OADS, 2012; Spencer *et al*., 2003; Williams, 2014).

The items that did not obtain consensus are associated with integrity, internal validity/credibility or defensibility, and reliability/auditability. The scores obtained in these items reveal discrepancies or lower average acceptance among respondents in addition to greater dispersion that impeded a consensus to be reached, even when relatively high scores were obtained. These criteria are important for the quality of studies (LeCompte & Goetz, 1982; Libby *et al*., 2002; Mays & Pope, 2006; Spencer *et al*., 2003; Yarbrough *et al*., 2011) and dissonant assessments of these may reveal a lack of clarity regarding the extension of findings in regard to reliability, such as a need to record the reasons changes were implemented in the planning of studies, as well as the reasons for study limitations. Consequently, it may reveal that some research practice requires changes in order to ensure these criteria are met.

Regarding the relationship between key-characteristics and levels of agreement, Figure 4 shows that "research subjects" was the only characteristic with a strong level of agreement. On the other hand, reflectivity/neutrality obtained a moderate level of agreement. Additionally, "ethics" and "report" concentrated the low agreement items. Approximately 25% of the items related to ethics presented a low level of acceptance, suggesting researchers need to be concerned with ethical aspects, possibly indicating weaknesses in terms of methodological rigor and that some essential aspects of research integrity were not met (European Science Foundation, 2011; Mays & Pope, 2006; Spencer *et al*., 2003). Lower levels of agreement suggest potential misalignment between methodological, substantive and theoretical domains proposed by VNS (Brinberg & McGrath, 1985).



Translation:
Key-characteristics and levels of agreement - Design - Study subjects - Data collection - Analysis - Findings - Report - Reflectivity/neutrality - Ethics - Auditability
Low Moderate Strong Consensus was not obtained

Figure 4. Key characteristics and levels of agreement

Among the items with a low level of acceptance, there is the one concerning peer-review, associated with "reporting" and two other items that concern the ethical aspects of formal and mandatory submission of research projects to an institutional review board. Draft review plays an important role in the identification of potential problems and may suggest points that need improvement, also contributing to a manuscript's consistency and logic coherence (Mays & Pope, 2006; Spencer *et al.*, 2003). As a result, peer-review may improve the chances of a manuscript to be approved in periodicals submissions as it decreases potential failures that could lead a manuscript to be rejected (Carmona, 2006; Martins & Lucena, 2014; Shamoo & Resnik, 2003; Valentine, 2009; Webster & Watson, 2002).

Ethical issues are the only characteristics with items that obtained three levels of agreement. Similar to what happens internationally, Brazilian law requires that studies involving human subjects be submitted to the previous assessment and approval of an institutional review board in order to ensure ethical principles, such as respect to participants' dignity and autonomy, are complied with. Informed consent forms should describe the purpose, goals, and procedures of studies, providing clarification regarding potential discomfort and risks, and also specify how participants are monitored and assisted, a condition all participants are entitled to, even after a study is concluded (Brasil, 2012, 2013). Brazilian law also provides that ethical infractions or complaints entailing risks to the participants should be examined and may involve sanctions, including investigation on the part of the Public Prosecution Service. These practices are consistent with international principles such as respect for people, beneficence, and justice (National Institutes of Health, 1979), accountability, respect and integrity (European Science Foundation, 2011; OADS, 2012).

Observance to ethical standards in research involving human subjects has at least three practical effects: (a) ensures that research meets international standards of integrity; (b) mitigates risks to researchers and affiliated institutions concerning potential legal actions on the part of individuals who may feel harmed by their participation in studies; and (c) improves external validity and relevance of a study, which may result in a greater chance of obtaining funding and having greater acceptance on the part of the scientific community.

4.2 Approach to evaluate the quality of the research process in Accounting

Considering the importance of the connection between research quality criteria and the respondents' perceptions regarding their own adherence to the items when doing research, this study suggests a set of elements to assess research processes in Accounting based on the research process stages (key-characteristics), attributes/relationship, general research quality criteria, and research domains.

The Logic model's structure (Kellog Foundation, 2014; Ladd & Jernigan, 2006) was used to outline an approach to assess the quality of the research process in Accounting. This model is widely used to assess programs and projects, both processes and outcomes (or variation). A logic model used to assess processes is structured in inputs, processes/activities, and process indicators/outputs. This approach, based on the Logic model, considers inputs to be stages of the research process (Figure 5). Initially, this approach considered the three stages proposed by Brinberg and McGrath (1985), which in this study are called first (planning), second (implementation), and third (monitoring results or only results). Additionally, the nine key-characteristics (Mays & Pope, 2006; Spencer *et al.*, 2003) were grouped into three stages as the following: (1) design and research subjects; (2) data collection, analysis, results and report; and (3) reflectivity/neutrality, ethics and auditability.

The attributes and relationships adopted in the instrument in the Delphi's data collection were based on the literature and used to characterize the processes and activities proposed in the logic model. In this study, these attributes and relationships properly represent the processes considering that the development of the instrument itself was based on the respondents' research practices, that is, on the activities performed at the different stages of the participants' studies. The items were grouped according to the key-characteristics and quality criteria to which they are associated. In regard to the indicators of processes/outputs, we allocated criteria that were used to group the items, that is, they are associated with attributes/relationships that are defined as processes/activities. Finally, the VNS domains were used to add some potential implications when these criteria are violated or ignored.

Finally, note that this approach (Figure 5) is intended to contribute to the discussion of quality criteria used to develop and conduct research (process), thus is less focused on final results (product's assessment). This approach is only an attempt to help researchers in the accounting field to self-assess the quality of their studies and is not intended to replace other frameworks designed to evaluate research.

Inputs		Processes/Activities	Process Indicators/Outputs	
Stage		Processes/Activities	Criteria	Some potential implications
1st. Planning	Design	• Strategy that is useful to the purpose • Clear overview • Overview x strategy • Establishment of objective/problem • Overview x theory • Reasons for choosing technique	Appropriateness	**Substantive Domain** • Gap not very evidence to justify the research • Poor contribution to advance of knowledge • Inappropriate research strategy • Waste of resources due to inappropriate use of time • Fail to report the study's impact
		• Access to data • Time restriction • Strategy x target audience	Feasibility	
	Research subjects	• Criteria for design/selection of subjects • Representativeness of subjects	Internal validity	
2nd. Implementation	Data Collection	• Record each research stage • Record divergent events	Rigor	
		• Subjects' voluntary participation • Subjects' formal consent	Integrity	
	Analysis	• Describe the nature and shape of data	Integrity	**Conceptual Domain** • Lack of clarity of the main concepts related to the study • Lack of a theory to support data analysis • Difficulty to justify hypotheses based on the literature
		• Describe tools and procedures • Implicit/explicit link – findings and objectives	Rigor	
		• Context x impact for data analysis • Other views to know the context	Reliability	
		• Significance of data to achieve objectives	Relevance	
	Findings	• Path to reach conclusions • Link findings x evidence • Check links findings x purpose • Impact of the nature of divergences	Internal validity	
		• Compare results with those reported by other studies	External validity	
		• New fields based on findings • Insights for the field of knowledge	Contribution	
		• Previous findings x hypotheses	Relevance	
		• Context to enable replications	Reliability	
	Report	• Discussion of the impact for knowledge	Impact	**Methodological Domain** • Failure in ethical procedures • Difficulties that impede replication • Limitations to make comparisons • Study context poorly described • Insufficient record of the research steps • Conclusions are not supported by findings • Risk of impeding the publications of results
		• Report limitations • Study borders	Contribution	
		• Reasons for limitations	Integrity	
		• Literature review x main concepts • Theory underlying propositions • Conclusions x objective • Draft peer-review	Internal validity	
		• Explicit possibility of generalization	External validity	
3rd. Results	Reflectivity/ Neutrality	How to deal with errors and biases Influence of the research team	Integrity	
	Ethics	Institutional Review Board (IRB) to register studies Rules to register studies to IRB Formal submission to an IRB Mandatory submission to an IRB	Rigor	
		Adopt an ethics code Formal respect to human subjects Strategies to minimize harm Confidentiality of participants' data	Integrity	
	Auditability	Record changes in design Record reasons for changes Keep database for checks Keep documents to decrease risks	Reliability	

Figure 5. Logic model for research process evaluation

5. Conclusions

One of this study's conclusions is that certain practices currently used in the development of scientific studies in Accounting in Brazil do not properly meet the attributes of good quality research that are described in the literature. This is evident in the large amplitude of answers obtained in the various attributes, as well as low acceptance of elements concerning ethics, for which Brazilian law does not allow for flexibility. Another conclusion is that ethical criteria lack clarity and need to be complied with in accounting research. We also concluded that the Brazilian institutional environment contributes to a decreased quality of scientific studies in the Accounting field due to institutional failures that may impact the integrity of research, supporting low levels of acceptance of elements concerning rigor and ethics, moderate levels of acceptance for items related to integrity or feasibility in addition to failure in complying with the need to submit projects that involve human subjects to an institutional review board.

One of the conclusions of this study is that certain practices currently used in the construction process of scientific production in accounting in Brazil do not adequately meet the quality attributes of good research described in the literature. This is evident in the wide ranges of answers obtained with regard to the various attributes, as well as in the low acceptance of elements related to ethics, for which Brazilian law does not permit flexibility. Another conclusion is that there is a lack of clarity on ethical criteria and the need to meet them in accounting research. Furthermore, it was concluded that the Brazilian institutional environment contributes to a lower quality of scientific production in Accounting as a result of institutional failures that may impact research integrity, supported by low levels of acceptance of elements related to rigor and ethics, medium levels of acceptance of integrity and feasibility issues, and failure to comply with the obligation to submit research projects involving human beings to an Institutional Review Board.

This study presents limitations, either due to the Delphi technique chosen, which does not allow experts to interact, and potential biases due to the number of panel experts. Another limitation refers to the choice of general criteria, as there may be discrepancies concerning stakeholders' assessment.

This study's contributions include the fact that scientific research assessments, both within the field and among graduate programs, have focused on the results, that is, on the final product. Such an analysis, however, has limitations and fails to reveal to graduate programs and researchers potential failures in the research process. This study is expected to entail implications for the field as it supports researchers to self-assess their studies, identifying deficiencies and limitations, leading to greater acceptance of papers and shortened submission to periodicals. The Logic model is expected to assess the research process and contribute to encourage the target audience to reconsider research strategies and reorient practices that are not consistent with good quality research. Programs can also use the results to improve the process of training new researchers in order to mitigate potential failures in the future.

Given the evidence presented and the model proposed, we suggest that graduate programs intensify training that concerns ethical issues to decrease failures in the conduction of studies. Failure in complying with these requirements may compromise the integrity and quality of studies, possibly impeding the publication of studies. Another suggestion is that programs impose the condition that theses and dissertations' projects involving human subjects be submitted to an institutional review board in order to be accepted for qualification and defense. Future studies are suggested to address the perceptions of graduate students regarding the attributes/relationships addressed here, in order to identify potential errors and failures in the training of new researchers in the field. Additionally, another relevant investigation would be discussing the role played by editors and referees as those responsible for validating the quality of research in terms of their perception of what configures good quality research.

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Attachment A

Final classification of the Modified Delphi Technique according to key-characteristics (research process stages), attributes/relationships, size, number of valid answers, round in which consensus was obtained, score, score relative percentage, ranking, levels of agreement and associated criteria

Characteristic	Attribute/relationship	N	R	Score	%	Rank	Level	Criterion
Data Collection	Subjects' voluntary participation	23	2	222	96.52	1º	Strong	Integrity
Design	Objective/problem explicitly reported	41	1	395	96.34	2º	Strong	Adequacy
Ethics	Confidentiality of participants' data	26	2	248	95.38	3º	Strong	Integrity
Report	Conclusions x objective	41	1	377	91.95	4º	Strong	Internal validity
Findings	Compare results with other studies	41	1	373	90.98	5º	Strong	Internal validity
Findings	Check links Findings x purpose	41	1	373	90.98	6º	Strong	Internal validity
Report	Literature review x main concepts	41	1	373	90.98	7º	Strong	Internal validity
Report	Theory to support propositions	41	1	371	90.49	8º	Strong	Internal validity
Design	Strategy is useful to the purpose	41	1	369	90.00	9º	Strong	Adequacy
Findings	Previous findings x hypotheses	41	1	369	90.00	10	Strong	Relevance
Auditability	Safeguard database for checks	41	1	367	89.51	11	Strong	Reliability
Design	Reasons to the choice of technique	41	1	366	89.27	12	Strong	Adequacy
Findings	Link Findings x evidence	41	1	363	88.54	13	Strong	Internal validity
Data Collection	Records of each research step	41	1	361	88.05	14	Strong	Rigor
Findings	News fields based on findings	41	1	361	88.05	15	Strong	Contribution
Findings	Path to reach conclusions	41	1	359	87.56	16	Strong	Internal validity
Design	Clear overview guiding the study	41	1	358	87.32	17	Strong	Adequacy
Analysis	Description of tools and procedures	41	1	358	87.32	18	Strong	Rigor
Subjects	Criteria for design/selection of subjects	41	1	352	85.85	19	Strong	Internal validity
Design	Access to data	41	1	351	85.61	20	Strong	Feasibility
Analysis	Description of the nature & shape of data	41	1	351	85.61	21	Strong	Integrity
Analysis	Significance of data to achieve objectives	41	1	351	85.61	22	Strong	Relevance
Findings	Context to allow replication	41	1	351	85.61	23	Strong	Reliability
Design	Overview x strategy	37	2	316	85.41	24	Strong	Adequacy
Report	Report limitations	37	2	315	85.14	25	Strong	Contribution
Design	Overview x theory	41	1	349	85.12	26	Strong	Adequacy
Analysis	Implicit/explicit links-findings x objective	41	1	349	85.12	27	Strong	Rigor
Data Collection	Records regarding diverge events	28	2	237	84.64	28	Strong	Rigor
Report	Explicit possibility of generalization	41	1	345	84.15	29	Strong	External validity
Auditability	Records of changes in design	29	2	242	83.45	30	Strong	Reliability
Analysis	Context x Impact for data analysis	41	1	341	83.17	31	Strong	Reliability
Findings	Insights for the field of knowledge	37	2	302	81.62	32	Strong	Contribution
Ethics	Strategy to minimize potential harm	26	2	212	81.54	33	Strong	Integrity
Report	Discussion of the impact for knowledge	37	2	301	81.35	34	Strong	Impact
Ethics	IRB to register studies	26	2	207	79.62	35	Strong	Rigor
Report	Study boundaries	37	2	294	79.46	36	Strong	Contribution
Ethics	Formal respect human subjects	25	2	195	78.00	37	Strong	Integrity
Auditability	Keeping documents to decrease risks	25	2	194	77.60	38	Strong	Reliability

Characteristic	Attribute/relationship	N	R	Score	%	Rank	Level	Criterion
Subjects	Subjects representativeness	37	2	287	77.57	39	Strong	Internal validity
Ethics	Adopting a code of ethics	26	2	187	71.92	1st	Moderate	Integrity
Refl./Neutr.	How to deal with errors and biases	37	2	266	71.89	2nd	Moderate	Integrity
Design	Research strategy x target population	37	2	264	71.35	3rd	Moderate	Feasibility
Design	Time restriction	37	2	261	70.54	4th	Moderate	Feasibility
Ethics	Rules to register studies (IRB)	25	2	176	70.40	5th	Moderate	Rigor
Refl./Neutr.	Influence of the research team	37	2	249	67.30	6th	Moderate	Integrity
Report	Draft peer-review	37	2	229	61.89	1st	Low	Internal validity
Ethics	Formal submission to IRB	25	2	144	57.60	2nd	Low	Rigor
Ethics	Mandatory submission to IRB	25	2	142	56.80	3rd	Low	Rigor
Auditability	Record reasons for changes	29	2	237	81.72	1st	Not obtained	Reliability
Data Collection	Subjects' formal consent	26	2	212	81.54	2nd	Not obtained	Integrity
Report	Reasons for limitations	37	2	293	79.19	3rd	Not obtained	Integrity
Findings	Impact da the nature of divergences	37	2	289	78.11	4th	Not obtained	Internal validity
Analysis	Other perspective to know the context	37	2	278	75.14	5º	Not obtained	Reliability

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A critical analysis on the additional adjustments considered in the disclosure of the non-GAAP "adjusted EBITDA" measure in the reports of Brazilian listed companies

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Abstract

Objective: This research aims to identify the main types of additional adjustments made through the disclosure of the non-GAAP "adjusted EBITDA" measure of the largest Brazilian listed companies and to analysis the fitness of those adjustments based on a critical perspective on their nature.

Method: The press releases of companies in the IBrX 100 index were investigated for the main additional adjustments made by the companies in the sample, followed by a critical analysis on the possible utility or opportunism of these adjustments from the perspective of the Regulation theory and premises of information asymmetry. The quarters of 2014 and 2015 were covered in the research.

Results: The main types of adjustments are Impairment (83.34%), Error correction (3.52%), Equity (1.38%), Dividends received (1.35%) and Provisions (1.29%). Almost 76% of the adjustments made derive from accounting principles and rules.

Contributions: The evidence from this study supports the Iasb's position on the importance of non-GAAP measures, which the board is currently discussing in actions to improve financial reporting, including the use of non-GAAP information in accounting records. The results encourage the debate on the theme in Brazil.

Key words: Non-GAAP measure, Adjusted EBITDA; Additional adjustments.

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1. Introduction

The appetite for non-GAAP performance measures is current and promising. Professional entities and regulators around the world have endeavored to address concerns regarding this type of disclosure through, among other means by conducting research (Financial Reporting Council, 2013; Deloitte, 2015), developing instructions to assist issuers in the preparation and disclosure of non-accounting metrics (European Securities and Markets Authority, 2015; International Organization of Securities Commissions, 2016) and even in the modification of standards to include non-GAAP subtotals in accounting items, such as the project to update IAS 1 (International Accounting Standards Board, nda).

These measurements are referred to as "non-GAAP" because they are metrics that derive from manual interferences with accounting figures to compose and disclose new figures to the market, such interference not being permitted by the accounting framework as it is currently conceived. This means that these are alternative performance measurement measures that do not meet the Generally Accepted Accounting Principles (Nichols, Gray, & Street, 2005), principles inherent in the statements prepared in accordance with the International Financial Reporting Standards.

Figures from the application of these measures are generally associated with results or adjusted earnings. Given the variety of concepts and different indicators developed in order to gauge company performance, the academy (Black, & Christensen, 2009; Cormier, Lapointe Antunes, & Magnan, 2011; Isidro & Marques, 2013), accounting entities (International Federation of Accountants, 2014) and global consulting and audit firms (PricewaterhouseCoopers, 2014; Deloitte, 2016a) have questioned the role of non-GAAP measures in corporate communication.

According to the International Financial Reporting Standards (2011), the development of other methodologies may be linked to the fact that there is a perception in the market that a company's actual operating performance and growth potential cannot be adequately reflected through a single measure. Following the logic of such reasoning, there are claims in the market regarding the use and disclosure of non-accounting metrics in order to provide users with measures that allow the assessment of the effective cash generation of companies considering only their operating activities.

The authors believe that, given that the market has sought to meet its own and its stakeholders' informational needs, standards under the GAAP may not meet the specific purposes of certain users. Therefore, it is fundamental to use and disclose measures that go beyond the "walls" of accounting. The chairman of the International Accounting Standards Board himself has spoken more than once in favor of non-GAAP measures in corporate reporting, as when he pointed out that "non-GAAP measures can be helpful in explaining different aspects of a company's performance and we do not intend to eradicate them." (International Financial Reporting Standards, 2019).

In Brazil, one of the most widely used non-GAAP financial metrics in the corporate scenario is Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), according to the Brazilian Institute of Corporate Governance (2017). It assesses a company's cash-generating potential while disregarding the financial, tax and depreciation and amortization effects. Adjusted EBITDA, in turn, goes a little further: in its calculation, it considers additional adjustments to include or exclude effects that companies consider to be unrepresentative of their gross cash generation (Brazilian Securities Commission, 2012). Companies have used terms such as "extraordinary", "non-recurring", "non-operating" and "unusual" to justify disclosures of non-GAAP measures.

It is important to note that, until 2019, there is no standard regulating the types of additional adjustments considered for the calculation of the Adjusted EBITDA. ICVM no. 527 governs the voluntary disclosure of EBITDA and Earnings Before Interest and Taxes and points out that, in the event that a company chooses to include other adjustments to EBITDA, the term "adjusted" in the disclosure should be identified (Brazilian Securities and Exchange Commission, 2012).

Regulators have focused on the types of adjustments companies make. Young (2014) points out that regulators often use adjusted figures to monitor companies and Black and Christensen (2018) state that the Securities and Exchange Commission has always been concerned with adjustments that exclude items that are actually recurring in the income statement, such as "operating expenses" for example. The global regulator of the securities commissions warns that issuers of non-GAAP measures need to consider the nature of the facts they intend to adjust, providing the appropriate basis for each adjustment made. The use of Impairment, for example, is considered improper in the view of the agency because it contains in its nature a susceptibility to repetition in the foreseeable future and should not be described as a "non-recurring" or "unusual" item without sufficient explanations (International Organization of Securities Commissions, 2016).

Most scientific research on non-GAAP measures has been conducted on the international stage (Black, 2016a) and, to some extent, it is concentrated in the United States due to the strict Sarbanes Oxley law on the companies registered in the Securities and Exchange Commission regarding the disclosure of non-GAAP metrics, avoiding potential dangers to investors deriving from possible misuse. This argument of corporate misuse of non-GAAP measures is practically common sense in this line of research, as several previous evidences suggest this behavior. Graham, Harvey and Rajgopal (2005) interviewed more than 400 managers to understand the factors that determine earnings disclosure decisions and identified that there is a tendency for managers to emphasize non-GAAP measures when GAAP is not expected. The results of the research conducted by Miller (2009), along the same lines, suggest that managers engage in opportunistic disclosure behavior of non-GAAP earnings measures, benefiting management itself to the detriment of investors.

Regarding the types of adjustments made, Bradshaw and Sloan (2002) document that excluding special items, known as one-time, transitional and/or non-recurring items, would be the main difference between GAAP and non-GAAP figures. More recent evidence indicates that the adjustment of non-recurring items is the most common form of adjustment via non-GAAP measures, and such items are related to restructuring, tax and acquisition facts (Black, Christensen, Ciesielski, & Whipple, 2018b).

In Brazil, however, there is little research on the subject (Oliveira, 2018), despite the growing use of non-GAAP measures in publicly-held companies (Securities Commission, 2012). Some surveys have identified the reasons for using EBITDA and how this measure is used in the Brazilian professional market (Momose, 2009; Carvalho, 2014; Maragno, Borba, & Fey, 2014), while others criticize its use as a measure capable of ensuring debt coverage and as a proxy for operating cash generation (Diaz, 2002; Frezatti & Aguiar, 2007) or value the use of EBITDA from a value relevance perspective (Macedo, Machado, Murcia, & Machado, 2012). No published research has been identified though that critically evidences the types of additional adjustments considered in non-GAAP measures to contribute to the international discussion of whether or not these indicators are appropriate.

The relevance of this study is justified by the signals that the academy as well as the market, regulators and standardizers have sent regarding the subject. Black (2016b) considers the study of non-GAAP measures a hot topic today for conducting scientific research. Marques (2017) points out that descriptive evidence indicates that the disclosure of these measures is a growing practice in many countries and that deliberations and discussions by regulators and standardizers make this area important for research. These statements are in line with the perceived prevalence and recurrence of such metrics in corporate financial reporting around the world, particularly in the jurisdictions of the United States and the United Kingdom, from which the major market regulatory movements come, but also in other countries such as New Zealand, Australia and France (Marques, 2017).

To get an idea of the impact of the use of non-GAAP measures on the US market, in 2016, the topic "non-GAAP measures" ranked third on the list of topics most frequently commented by the Division of Corporation Finance, leading the Securities and Exchange Commission to update, that same year, the interpretation on the use and disclosure of such measures to include new guidelines for companies that chose to disclose them. In the United Kingdom, for example, of the top 100 companies listed on the FTSE index in 2015, 81% reported non-GAAP measures at the beginning of their annual reports (Deloitte, 2016b). According to Black, Christensen, Ciesielski, and Whipple (2018a), the proliferation of non-GAAP measures around the world has revived interest from entities such as the International Accounting Standards Board and the Financial Accounting Standards Board on the topic, which have included projects focused on the discussion and possible regulation of non-GAAP measures on their agendas since 2014 and 2015, respectively.

The purpose of this paper is to fill a gap in the accounting research by identifying the most significant types of additional adjustments made via disclosures of the non-GAAP "Adjusted EBITDA" measure of the largest Brazilian listed companies and analyzing the adequacy of these adjustments from a critical perspective of their characteristics. The methodology consists of descriptive analysis of the collected data and critical analysis of the obtained results.

The results presented indicate that the main types of adjustments with greater magnitude are Impairment, Error Correction, Equity, Dividends Received and Provisions, as well as that almost 76% of the adjustments made by the companies are the result of accounting principles and rules, suggesting that companies have adjusted through non-GAAP measures, items that (i) do not generate cash outflow when constituted; (ii) non-recurring events or events that do not reflect reported results of the year; and (iii) non-operating items. These results generate new evidence in the Brazilian corporate scenario and corroborate the need for the use and disclosure of non-GAAP measures, contributing to discussions in accounting practice as well as in the academy.

2. Theoretical platform

2.1 Use of non-GAAP measures and regulation theory

The main issue related to voluntary disclosures is whether they actually guarantee the quality of the users' decision making. The premise commonly adopted when addressing "non-GAAP measures" is that they entail a discretionary bias. There is reasonable consensus between those publications and the provision of misleading information: "In view of their prevalence and potential for misleading, the use of alternative measurement measures is increasingly in the regulatory focus" (Deloitte, 2016b).

A considerable fraction of previous evidence suggests inconsistencies and opportunism when reporting non-GAAP measures (Miller, 2009; Marques, 2010; Doyle, Jennings, & Soliman, 2013). Black and Christensen (2009), for example, point out that managers manipulate adjustments made to non-GAAP earnings to beat benchmarks set by companies. Marques (2010) suggests that managers emphasize non-GAAP metrics when accounting profit does not reach the expected benchmark and, in the same vein, Lougee and Marquardt (2004) suggest that companies with accounting losses would be more likely to emphasize non-GAAP metrics to present an improved result to the market. With respect to exclusions considered in non-GAAP measures, the study by Doyle, Jennings, and Soliman (2013) states that companies reporting exclusions are more likely to beat or exceed forecasts by market analysts.

There is also academic research that points to the usefulness of non-GAAP measures. This line of research argues that non-GAAP numbers are more informative and efficient, and that the market perceives "pro forma" gains as more representative of operating earnings than GAAP operating earnings (Bhattacharya, Black, Christensen, & Larson, 2003). Bradshaw and Sloan (2002) suggest, for example, that "pro forma" gains are more determining than GAAP gains in explaining changes in stock prices and that corporate management has taken a proactive role in emphasizing non-GAAP measures in corporate reporting.

Despite this evidence, there is still strong concern about whether such measures are reliable, especially as regards the impact of this reliability on the stock market. The International Accounting Standards Board (n.d.a) states that inconsistencies in corporate financial performance can lead to misguided or unsatisfactory investment decisions, resulting in market failures and affecting national and global economies. Malone, Tarca and Wee (2016) state that non-GAAP gains can be "noisy" and difficult to interpret information, causing investors to react inappropriately to share pricing.

Marques (2017) points out that, while there was evidence in favor of the use and disclosure of non-GAAP measures, previous studies seem to indicate that, while they may be helpful to the capital market, they have the potential to mislead investors and, in particular, the "unsophisticated" ones. The experiment by the researchers Johnson, Percy, Stevenson Clarke and Cameron (2014) considered the provision of a non-GAAP gain greater than a GAAP gain in the annual report and concluded that unsophisticated investors, when asked to identify the profitability measures of the report, choose non-GAAP information over GAAPs. The research by Bhattacharya, Black, Christensen, and Mergenthaler (2007) similarly found that unsophisticated investors rely on "pro forma" information. This evidence is important in the discussion about the regulation of non-GAAP measures, as the main regulations in the US capital market are designed to protect this class of "less informed" market participants.

Due to the fact that company managers and management have informational advantage over other market participants (Iudícibus & Lopes, 2004), the use of non-accounting measures in corporate reports may be used to distract these participants' attention from the companies' actual situation. In addition to this premise, there is the aggravation that non-GAAP measures are not audited, thus allowing "freedom" in the construction and presentation of these figures.

This study considers the regulation of certain non-GAAP measures (the most widely used globally) may be an outlet to inhibit or mitigate the possibility of misuse of such voluntary disclosure. Given that there is a tendency for non-GAAP measures to yield more optimistic figures on company performance, the IFRS standard itself needs to provide details and the structure for these disclosures (International Financial Reporting Standards, 2019).

The research by Maragno, Borba and Fey (2014) is an example of the benefit of the EBITDA regulation in the Brazilian market. It is concluded that, before ICVM No. 527 started to regulate aspects of EBITDA calculation and disclosure, less than half of the IBrX 100 companies were in compliance with the established calculation methodology. After the regulation, 60% became compliant with that methodology, indicating increased adherence to the established criteria. Heflin and Hsu (2008) found that, after the regulation of non-GAAP measures by the Securities and Exchange Commission, as from 2003, in the United States, companies have decreased the frequency and magnitude of adjustments ("special items" and others) made through non-accounting metrics. These authors also identified that, after the regulation, there was a decline in the likelihood of reported non-GAAP gains beating or exceeding market analysts' forecasts. These results suggest that regulatory interference in the market has positive impacts in protecting it against misleading information.

Understanding the positive impacts of non-GAAP regulation, the accounting regulator has focused part of its efforts on the "Primary Financial Statements" project, which proposes amendments to the Income Statement through the use of subtotals, one of which is set for all the companies - Earnings Before Interest and Taxes - and another for a different performance measure chosen by management (International Accounting Standards Board, 2018).

This project was added to IASB's agenda in 2014 and, as early as 2015, the respondents identified it as a priority, who indicated that the focus of the project should be the income statement. At the end of 2016, Iasb decided to draw up a project for improvements to this statement, with several discussions on the topic and possibilities for improvement between 2017 and 2019. The result is that, by the end of 2019, Iasb intends to publish an exposure draft, an official document that precedes an accounting standard (International Accounting Standards Board, 2018).

The following is a table summarizing the project timeline and key discussions on the specific EBITDA regulation (International Accounting Standards Board, n.d.b).

Table 1
Project "Primary Financial Statements" and EBITDA

Dates	Main Discussions and Results
July/2017	If the Iasb should require the inclusion of the "EBIT" as a subtotal in the Income Statement.
October/2017	A document "Iasb Investor Update" was issued, which presented and discussed, among other aspects and standards, the reporting of the "EBIT" as a subtotal in the Income Statement from the perspective of the investors and the Iasb itself.
June/2018	If the Iasb should develop a guidance and/or define the "EBITDA" measure, considering that: (i) it is widely used by financial statement users; (ii) there are concerns as to whether it is a valid performance measure; and (iii) diverse definitions and calculations exist for the EBITDA.
September/2018	On this date, the Iasb had not discussed the issue raised in June/2018 yet.
November/2018	The Iasb decided that the EBITDA should not be included in the Income Statement as a subtotal, nor should it be required in the Notes to the Financial Statements, due to, among other reasons: (i) not being applicable to all entities (comparability)); (ii) avoiding highlights on this aspects, given concerns as to whether it is a valid performance measure; (iii) due to the fact that the users can calculate this measure if they think that it is useful, given the requirement to disclose depreciation and amortization individually in the financial statements; and (iv) to avoid the need to describe what "EBITDA" is.
December/2018	On this date, the Iasb decided attending to the Board's suggestions on the discussions held in November/2018 concerning the description of EBITDA, to avoid the diverse forms of calculation. As a result of the incorporation of the term "EBITDA" into the Ifrs terminology, the Iasb would avoid the calculation of measures disclosed with this label as "Adjusted EBITDA", and would enhance the comparability of this measure among entities. Hence, it was decided that EBITDA should be described as: "operating profit before depreciation and amortization" and that it would be added to the list of measures that are not considered as management performance measures. Through this approach, the Iasb would avoid describing "EBITDA" and treating the measure as an operating profit calculation before depreciation and amortization, avoiding additional disclosures if it were considered a management performance measure.
June/2019	Decision to publish an exposure draft by the end of 2019.

Source: elaborated by the authors.

The question of including alternative measures of performance in the "GAAP world" can be explained by the regulation theory, more specifically the theory of public interest. This theory suggests that, when economic regulation is established, there is evidence that action has been taken to correct possible market failures, which are justified by the inefficiency of markets and the existence of information asymmetry. In this case, the regulator's incentives are presumed to be in line with the public's interests and, as a result, the former intervenes in favor of the latter (Beaver, 1998).

2.2 Additional Adjustments

Deciding which items management intends to adjust based on accounting results requires the application of professional judgment and a critical eye. As appointed by the Brazilian Institute of Corporate Governance (2017), the board of directors plays a key role in the assessment of items considered "extraordinary". Although current accounting standards do not allow companies to disclose an item containing "extraordinary items" (Accounting Pronouncements Committee, 2011) in the income statement, management may consider disclosing in its reports that there are facts that are considered to be "unusual" or "infrequent" and make use of a non-GAAP measure to do so.

The Securities and Exchange Commission (2003), as a direct consequence of the Sarbanes Oxley Act, now prohibits US listed companies from adjusting items identified as "non-recurring", "infrequent" and/or "unusual" in non-GAAP measures to smoothen their results. Other important requirements exist aimed at ensuring the validity of such disclosures, such as: (i) giving prominence to the directly comparable non-GAAP measure; (ii) providing details of the differences between the disclosed non-GAAP measure and the directly comparable GAAP measure, with reconciliation information available to the market without undue effort; and (iii) providing a statement highlighting why management believes that the disclosure of non-GAAP measures is useful to investors.

The European Securities and Markets Authority (2015) guide to alternative performance measures points out that it is not a problem in itself that they derive from elements or information in the financial statements, but disapprove of the indiscriminate, inconsistent and unjustified use of adjustments in non-GAAP measures.

Competent institutions for this purpose have fought commonly adjusted items. Both the International Organization of Securities Commissions (2016) and the chairman of the accounting standard setter have already formally rejected adjusting the effect of accounting impairment, given the very nature of this item in reflecting an operating expense of companies (Deloitte, 2017). The research by Doyle, Lundholm and Soliman (2003) suggests that adjustments commonly declared by companies as "non-recurring" and/or "non-cash" are actually important items for the market to understand the firm's future value, such as adjustments for losses on discontinued operations and amortization of goodwill. Bowen, Davis and Matsumoto (2005), while not focusing their study on the adjustments themselves, indicate that, based on the pro forma earnings sample analyzed, the most commonly made adjustments were, in descending order: goodwill amortization, share-based compensation expenses, restructuring expenses and income from disposal of assets.

As there is no standardized theoretical framework to establish what would be considered non-recurring, unusual or infrequent items, there is some openness for corporate management to use these concepts in its favor, and also other terms such as "non-operational" and "non-cash" as a justification for non-GAAP adjustments.

A key issue in understanding whether companies have been reporting opportunistic non-GAAP measures is whether they have consistently presented adjustments. That is, the company needs to adjust both the constitution and reversal of provisions, both the gain and loss on the disposal of assets, and so on. What has actually been observed is that companies have only adjusted "negative items", making their non-GAAP figures always better than the corresponding GAAP figures: "It is not surprising that negative results dominate adjustments to IFRS profits. We should be comforted when we observe that, in any given year, there are companies reporting non-GAAP profit lower than IFRS profit" (Deloitte, 2017, p. 6). Webber, Nichols, and Street (2013) investigated the disclosure of non-GAAP profit measures in 303 US company press releases between 2005 and 2010 and concluded that, as net income declines, firms are more likely to appoint higher non-GAAP gains.

Malone *et al.* (2016) concluded that, overall, both companies and analysts tend to adjust losses and expenses with the effect of increasing non-GAAP earnings, which reflects a higher incidence of negative versus positive adjustments. Black *et al.* (2018b) also identified this pattern, finding that non-GAAP figures exceed both GAAP figures and operating gains, suggesting that the adjustments made are predominantly negative and significant. A recent survey states that CEOs of S&P 500 companies made major adjustments to achieve non-GAAP earnings between 2010 and 2015 and thus received 23% more than the expected annual compensation if the figures used were GAAP (Guest, Kothari, & Pozen, 2019).

This and other evidence suggest that companies typically adjust only negative items through non-GAAP measures, besides indicating a certain degree of inadequacy of these adjustments from a critical perspective. As an example of adjustments that may be considered inappropriate or misleading, including non-compliance with existing requirements for their presentation to the market, the disclosure of Ambev S.A.'s "Adjusted EBITDA" in its annual report of 12/31/2015 may be mentioned, according to Table 2:

Table 2
Disclosure of Adjusted EBITDA of Ambev S.A. in the annual report dated 12.31.2015

Conciliation net income EBITDA R$ million	2014	2015
Net income Ambev	12,065.5	12,423.8
Participation of non-controlling shareholders	296.5	455.4
Expense on income tax and social contribution	2,006.6	3,634.2
Income before taxes	14,368.6	16,513.4
Participation in the results of affiliated and subsidiary companies	(17.4)	(3.1)
Net financial result	1,475.4	2,268.2
Non-recurring items	89.0	357.2
Adjusted EBIT	15,915.6	19,135.7
Total depreciation and amortization	2,360.2	3,074.1
Adjusted EBITDA	18,275.8	22,209.7

Source: elaborated by the authors.

This disclosure was deemed non-compliant with the calculation requirements of ICVM No. 527 because: (i) it contains a line with "non-recurring" items in the disclosure, which is expressly prohibited in article 3; and (ii) it does not disclose traditional EBITDA before Adjusted EBITDA, as required by paragraph 1 of article 4. Additionally, the disclosure did not detail the purpose of considering the additional adjustments "Non-controlling interest" and "Equity in affiliates and subsidiaries" to compose the Adjusted EBITDA.

Lack of compliance, detail and clarity in the disclosure of non-GAAP measures may support the premise that these measurements are discretionary. As the market itself has justifications to legitimize such disclosure, companies that choose to voluntarily disclose non-accounting measures need to do so aiming to present reliable information and with the appropriate technical basis to their investors and potential investors, always respecting the existing regulations.

3. Method

The sample consists of companies listed on the index "IBrX 100" of B3 on 2/24/2017, the starting date of the data collection. The years 2014 and 2015 were selected and all quarterly press releases were considered for the analysis of the Adjusted EBITDA, when disclosed, totaling 8 periods for each sample company. The analyses resulted from 760 reports and 360 observations (reports disclosing the Adjusted EBITDA). This measure was chosen because it is one of the most used in the Brazilian corporate market, regulated by ICVM no. 527 and deriving from the additional adjustments made to EBITDA.

The research was thus delimited given the manual data collection and aiming to consider macroeconomic factors that negatively affected Brazil's financial and economic situation in the years 2010-2015. According to Malone *et al.* (2016), in this scenario, the market and asset price volatility may lead to greater sensitivity about GAAP measurements and can potentially increase the usefulness of non-GAAP disclosures.

As there were repeated companies on February 24, 2017 because they had more than one type of share (ON and PN) classified as the 100 most traded (such as Banco Bradesco SA shares BBDC3 and BBDC4), the actual number of companies needed to be identified. The procedure was performed in Excel through the "Remove Duplicates" command, which was used after aligning the names of the companies present in the index in only one column. Thus, Excel automatically recognizes and excludes companies that may have the same name on different lines. At the end of this procedure, the existence of 95 companies was indicated.

Of the 95 companies, 52 companies reported Adjusted EBITDA in at least one period, representing 55% of all companies in the sample. The researchers compiled the data extracted from the quarterly reports into an Excel spreadsheet. In view of the objective presented in the introduction, the following information was collected for the non-GAAP Adjusted EBITDA: 1) types of additional adjustments to EBITDA; and 2) amounts of additional adjustments to EBITDA, both presented in reconciliations to accounting profit (or loss), as required by ICVM no. 527. After collecting this data, the researchers classified each adjustment into categories that respected the proper name given to the adjustments, as disclosed by the companies.

The methodology of this study is based on a descriptive analysis of the additional adjustments made via Adjusted EBITDA and, considering the main results presented, critical analyses were performed from the perspective of a conceptual discussion of the nature of the adjustments and also considering the existing guidelines and standards concerned. Thus, this research has a normative and exploratory design because, according to Matos and Murcia (2019), it resembles normative theoretical essays for discussing themes based on the current literature, thus stimulating debates and research in the area.

The perspective of the magnitude of the items was also considered and not just their frequency because, according to Young (2014), the economic significance of non-GAAP figures is partially based on their frequency and the magnitude and nature of the components excluded through them. This is due to the fact that the impact (distance between the non-GAAP measures and the corresponding GAAP figures) will be greater when the magnitude of the adjustments is greater. Bhattacharya *et al.* (2003) analyze, for example, the relative magnitude between GAAP and non-GAAP figures, relating this to their locations in press releases. In principle, this distancing can influence the market analyses, given the relevance of the adjustments made.

4. Results

4.1 Types of additional adjustments

In total, 37 adjustment categories were mapped. The researchers identified that each could fit as a reflection of some accounting or other standard. Table 3 presents this framework, with the categories arranged based on the representativeness of the adjusted amounts in relation to the adjusted total (in millions of *reais* and in absolute values) and indicating the frequency of adjustments (number of times reported):

Table 3
Categories and amounts of the adjustments made

Item	Category	Related CPCs	Amount	%	Frequency
1	Impairment	CPC 01	146,601	83.34%	25
2	Correction of errors	CPC 23	6,194	3.52%	1
3	Equity	CPC 18	2,436	1.38%	179
4	Dividends received	Law 6.404/86	2,366	1.35%	8
5	Provisions	CPC 25	2,277	1.29%	55
6	Participation of non-controlling shareholders	CPC 36	2,232	1.27%	80
7	Regulatory assets and liabilities	Others	1,606	0.91%	11
8	Others (revenues and expenses)	CPC 00	1,580	0.90%	70
9	Proportional EBITDA	Others	1,575	0.90%	27
10	Measuring at fair value	CPC 46	1,416	0.81%	38
11	Non-recurring/extraordinary items	Others	1,395	0.79%	88
12	Restructuring, reorganization, donations and indemnities	Others	1,241	0.71%	9
13	Property for investment	CPC 28	934	0.53%	5
14	Tax credit / Retroactive PIS and Cofins	Others	822	0.47%	8
15	Operations involving joint-control entities	CPC 18	637	0.36%	1
16	Operating income	CPC 00	625	0.36%	3
17	Result of asset measuring or disposal	CPC 00	319	0.18%	26
18	Interest capitalization	CPC 20	251	0.14%	8
19	Consolidation	CPC 36	218	0.12%	6
20	Stock-based purchase and payment	CPC 10	203	0.12%	55
21	Prepaid expenses	CPC 00	164	0.09%	8
22	Discontinued operations	CPC 31	133	0.08%	11
23	Interests and fines on delays	Others	124	0.07%	16
24	Company investments (participations)	CPC 18	99	0.06%	10
25	Result of disposal of participations in joint ventures / associated companies	CPC 18	90	0.05%	8
26	Non-tax expenses	CPC 00	72	0.04%	9
27	Leasing (rent expenses)	CPC 06	65	0.04%	8
28	Hedge accounting	CPC 48	58	0.03%	12
29	Share-based incentives without cash disbursement	CPC 10	36	0.02%	8
30	Commercial agreement with suppliers	Others	32	0.02%	1
31	Reversal of interest on own capital	IN SRF 093/97	28	0.02%	4

Item	Category	Related CPCs	Amount	%	Frequency
32	Revenue from construction	CPC 17	21	0.01%	6
33	Debentures	CPC 08	19	0.01%	8
34	Benefits to employees	CPC 33	10	0.01%	8
35	Realization of attributed cost	ICPC 10 / CPCs 27, 28, 37 and 43	10	0.01%	2
36	Expenses on staff dismissal	CPC 00	9	0.01%	1
37	Expenses on M&A	CPC 00	9	0.01%	3
	Total adjusted		**175.906**	**100%**	**826**

Source: elaborated by the authors.

Based on Table 3, it can be observed that the largest additional adjustments reported in the eight (8) periods analyzed were mainly Impairment and Error Correction, corresponding to 83.34% and 3.52% of the total amount of adjustments, respectively.

Next, Equity is observed, which ranks third in magnitude and first in frequency, representing 21.67% of the total adjustments made in the number of reports. Dividends received and Provisions rank 4th and 5th with, respectively, 1.35% and 1.29% of the total amount of adjustments.

4.2 Critical analysis of Additional Adjustments

Previous studies have shown that Impairment is one of the most commonly performed adjustments using non-GAAP measures (Malone *et al*., 2016) and is the most significant, according to Black *et al*. (2018b). Thus, the findings of this study confirm previous evidence of the frequency and relevance of this adjustment.

Impairment is but the recognition of the economic effect of an impairment loss on the financial statements under the scope of CPC 01 (R1) Asset Impairment. At least annually, entities need to assess whether their assets are recorded in accounting for amounts that exceed the amounts to be recovered from use or sale. This test aims to ensure that the amounts presented in the financial statements are true to the economic reality of the assets.

This economic effect is accounted for through profit or loss (except for assets that have been revalued in the past) against an asset-reducing account the loss relates to. It is easy to note that there is no cash impact on this accounting. Practice has claimed that one of the main reasons for the use and disclosure of "Adjusted EBITDA" would be precisely because some items accounted for under GAAP do not generate cash outflows in the reporting period and, as the company wishes to report its "gross cash generation potential" to the market, items such as Impairment should necessarily be excluded from the account. Malone *et al*. (2016) indicate that companies adjust Impairment expenses because the measuring of this item is uncertain, suggesting a possible utility of this adjustment, as it contributes to the assessment of the current and future performance of firms.

It should be kept in mind, however, that a devalued asset, and imagining that this loss will not be reversed at some future time, will lead the company to record a lower effective cash inflow due to this devaluation. For example, if an asset that had a devaluation of R$ 10,000 at time T0 remains depreciated until the date of its realization for sale at the subsequent moment T1, that R$ 10,000 would have financially impacted the company's cash, which in a previous period disbursed X + R$ 10,000 to acquire it (cost of good, disregarding depreciation in the interval between T0 and T1). Looking at the performance of the reporting period T0 in isolation, it could be helpful for investors to understand this result without the reflection of non-cash items; it is noteworthy, however, that this effect is temporal, that is, it may be realized in the cash.

Moreover, considering the existing guidances about this kind of adjustment and as already discussed in the theoretical survey, it would not be appropriate to exclude the Impairment effect because it represents an operating expense for companies, even though many of them state otherwise. Deloitte (2019) points out that registrants with the US Securities and Exchange Commission are prohibited by paragraph 10 (e) from adjusting items as unusual, nonrecurring or infrequent when the nature of these items is likely to occur again within two years or if there has been a similar charge or gain in the previous two years. By assessing the non-recurrence of an accounting effect as an attribute to justify its non-operational nature, it could be argued that Impairment is non-operational. As pointed out by Webber *et al.* (2013), however, several companies adjust the same item in consecutive years (including Impairment in this analysis), suggesting that, in reality, such adjustments over time would be incorrect from the point of view of their recurrence and/or non-operational nature.

CPC 23 Accounting Policies, Changes in Estimates and Rectification of Errors defines the criteria for "the selection and change of accounting policies, together with the accounting treatment and disclosure of changes in accounting policies, the change in accounting estimates and the rectification of errors "(Comitê de Pronunciamentos Contábeis, 2009). The errors to which this statement refers, for correction or rectification purposes, are material errors, i.e. errors that may, individually or collectively, influence the economic decisions of the financial statement users. When a material error is not identified until the publication of the financial statements to which it belongs, such error shall be corrected in the comparative information of subsequent period's financial statements.

A company is not expected to make corrections to previous errors over and over again, i.e. it is a one-off event and even an event the companies do not want for a variety of reasons (reliability in financial statement balances is one of them). Based on this, it can be understood that error correction is an extraordinary or non-recurring event, or even an event that does not concern the reporting period in question. This is confirmed by the observation of the nature of the adjustment, corresponding to R$ 6,194 million, as indicated in Table 3 regarding "error correction". It refers to a single adjustment made by Petrobras S.A. in the third quarter of 2014 to remove the effect of the write-off of "additional expenses improperly capitalized from property, plant and equipment arising from the undue payment scheme discovered by the Lava Jato investigations".

Adjustments like this cannot represent the operating activities of a company because they stem from fraud and pollute the company's performance. Although necessary for accounting purposes, including tax matters, it is reasonable to use a non-GAAP metric to measure business performance without the effect of error rectification.

In addition to the Impairment and Error Correction adjustments, which together account for almost 87% of the adjusted total, we also have similarly interesting results following adjustments from Equity Income, Dividends Received and Provisions, corresponding to 1.38%, 1.35%. and 1.29%, respectively, of the total.

Equity accounting is the method to recognize an investor's interest in the net assets of an investee. Pursuant to CPC 18 Investment in Affiliates, Subsidiaries and Joint Venture (Accounting Pronouncements Committee, 2012), after an investment is initially recognized at cost, it is adjusted to reflect its share of the investee's profit or loss in later periods. Accounting in the investor's financial statements will depend on whether there has been an income or expense with equity accounting, i.e. whether the investee has made a profit or loss. Regardless of this result, it is interesting to note that the market justifies this adjustment because it is not operational, i.e. it depends on the results of operations of other entities and how they are being managed. Therefore, this result is often excluded in non-GAAP measures as, by doing so, issuers "isolate" the effect of their own unique operations.

An important fact that corroborates this is that, of the 28 companies that made adjustments deriving from equity results, none of them is from the Participations segment, a sector that naturally has as its business model or "end activity" the participation in other entities. This data is essential to understand whether or not adjustments made for the sake of equity accounting could be considered as non-operating items, which in the authors' view would be justifiable. It should be remembered, however, that although companies may classify these items as non-operating, they remain recurring items, as each position closes with changes in the investment position.

Finally, the recognition of this accounting fact also does not impact the investor company's cash. As explained in the example of the sale of undervalued property, plant and equipment, if the investing company decides to dispose of its investments, the effects that were recognized in assets would have impacted cash. Therefore, it is not at all reasonable to consider this item to be a "non-cash" item as it is non-cash only if the base date on which the effect was recognized is considered.

Following the same investment logic, Dividends Received are amounts that a company receives from equity interests and are registered against cash, as they are recognized as a result of their financial receipt. That is, it is non-operating revenue of the company and, from the above, it would make sense that companies do not evaluate its performance considering effects from other entities. This also discusses the regularity or frequency of these receipts, but it is possible that these adjustments come with justifications that prove the need for their exclusions

Provisions are liabilities of uncertain term or amounts. Under CPC 25 Provisions, Contingent Liabilities and Contingent Assets (Comitê de Pronunciamentos Contábeis, 2009), provisions are recognized as liabilities because they are present obligations and it is probable that an outflow of resources will be required to settle the obligation. The provision is recorded through profit or loss against a current or non-current liability account, depending on how long it will take for the obligation to be settled. Because these are accounting estimates, provisions should be revalued at each balance sheet date to reflect the best possible estimate.

It is clear that, in this case, there is also no outflow of funds from the entity on the base date on which the provision is generated; what happens is the recognition of an economic fact to reliably present in the financial statements other obligations that the company has, even if the amounts or terms of these obligations cannot be 100% confirmed on the reporting date. As this is an accounting estimate that involves judgment and subjective assumptions, it is possible that some provisions or part of them may be fully reversed in the near future due to changes in the expected scenario, for example.

Following the same rationale of presenting an entity's gross cash generation potential, Provisions recognized in the reporting period could also be subject to adjustments to "Adjusted EBITDA". It is noteworthy that, considering all classes of provisions in this indicator, future cash disbursements, if the expected scenario is confirmed, are also disregarded, making a broader analysis of whether an entity expects or does not expect these provisions to impact the cash in the future.

Looking at Table 3, it is interesting to note that, of the 37 adjustment categories, only 9 (9) do not directly refer to an accounting standard. The result of this finding is enriching and relevant, as it points out that almost 76% of the types of adjustments made by companies are the result of required accounting principles and rules, but were considered by companies as items that should be excluded or included in the calculation of the Adjusted EBITDA.

Overall, the results presented and discussed are in line with the results obtained by Malone *et al.* (2016), in that companies adjust items not yet realized in the reporting period and items considered non-recurring. Nevertheless, companies need to reflect their non-GAAP disclosures, as Webber *et al.* (2013) conclude that the justifications for the adjustments are in fact generic, not containing informative content because they do not present perceptions about the nature of the adjustments made.

More specifically or the adjustment types of Error Correction, Equity, Dividends received and Provisions, no previous descriptive results could be found that could be confirmed or not, which can be explained by: (i) the lack of research focusing on non-GAAP descriptive analysis; (ii) differences in the categorization of adjustments in each study; (iii) the differences in practices in the different markets surveyed; (iv) by different samples and investigated periods; and (v) because Adjusted EBITDA has not been studied as compared to EBITDA, for example.

5. Conclusions

It could be concluded that the largest additional adjustments the companies reported in the analyzed periods were Impairment and Error Correction, with 83.34% and 3.52% of the total amount of adjustments disclosed. Subsequently, the adjustments resulting from Equity Income, Dividends Received and Provisions represent an additional 4% of the adjusted total.

Although the other types of adjustments made are not relevant to the total adjusted amount, it was observed that almost 76% result from the effect of an accounting standard on the financial statements, such as: Fair Value Measurement, Capitalization of Interest, among others.

Practice has pointed out that one of the reasons for disclosing Adjusted EBITDA would be because some items accounted for by GAAP do not generate cash outflow for companies: both Impairment and provisions are items that affect the accounting result, but do not generate cash impact when they are constituted, In principle, it makes sense that these items are disregarded in the performance from the perspective of the preparers.

Error correction, as discussed, can be characterized as an event of a one-off nature and, therefore, it can be understood as a non-recurring event that does not concern the reporting period in question. Equity income and dividends received may not represent an operating result for the investor as they do no depend on actions taken by the investor and lie beyond his management control.

Based on the critical analysis of the adjustments, the authors understand that the survey results suggest that the market has legitimate claims about the need to use measures complementary to GAAP figures, but that caution should be exercised in disclosing non-GAAP measures, seeking conceptual justification to avoid discretionary use. For this, and as the Regulation theory, market interventions are necessary when there are possible failures arising from informational asymmetry and inefficiency in the markets. As discussed throughout the text, previous research has identified the potential misuse of non-GAAP measures in financial reporting and how this behavior could negatively impact markets. Heflin and Hsu (2008) indicated that disclosures of non-GAAP measures have increased in quality after regulation, which is a mechanism to avoid problems in non-GAAP disclosures.

This study differs from previous publications in that it is the first to critically analyze the adjustments made through non-GAAP measures in Brazil, based on the existing literature on the subject and its normative concepts. For investors, who have the potential to be misled by the misuse of non-GAAP measures (Marques, 2017; Black *et al.*, 2018a), scientific research on the subject may suggest the most appropriate types of disclosure if markets and companies in the US which they invest are in compliance with available regulations and guidances or if evidence points to opportunistic behaviors in the use of non-GAAP measures, drawing attention to such issues to enable them to distinguish good from bad disclosures in their assessments.

For Brazilian regulators, standardizers and supervisors, this research may contribute to the understanding of how listed companies have been disclosing one of the most widely disseminated non-GAAP measures in the domestic scenario, and may complement the existing standard to include additional investor protection requirements.

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Guidelines for Authors

1. Paper Submission Guidelines

To submit articles to the *Journal of Education and Research in Accounting* – REPeC authors should follow the standards and criteria set by REPeC. From January 2013, the guidelines of the American Psychological Association (APA) with regard to citations and references should be followed. Submissions not complying with the standards will be rejected.

Articles submitted to the journal must be original, i.e., cannot have been published or submitted to another journal.

Articles may be written in Portuguese, English, with at least 5,000 and maximum 9,000 words, including tables, figures, notes and references. A maximum of 5 (five) authors are allowed per article. All papers accepted will be translated and published in two languages: Portuguese and English.

Articles containing tables or figures, they [the tables and figures] should be in a format that allows them to be edited. In case some of these Figures or Tables have been imported from other programs such as Excel, Power Point etc.., the source file must also be sent as Supplementary File.

Do not use expressions like id., ibid., op. cit., loc. cit. and the like, or reference notes and footnotes. Notes at the end of the text are acceptable, but should be avoided.

The submission of articles should be done electronically, through the www.repec.org.br website. At the end of the submission an electronic message will be sent by e-mail, confirming receipt of the article.

2. Content and Formatting of Papers

At the moment of submission, the articles should contain:

- The **title** in the language of origin of the article (Portuguese or English) without identifying the author(s);
- An **abstract** written in the language of origin of the article (Portuguese or English) with at least 150 and at most 200 words, single space between lines, in four paragraphs containing the following elements, highlighted: **Objective, Method, Results and Contributions**. At the end of the abstract should be placed **three to five** keywords;

Objective: this study was aimed at investigating the relevance of accounting education and research for the growth of the Brazilian economy during the first decade of the 21st century.

Method: to collect the data, a structured questionnaire was used, elaborated based on the relevant literature. The questionnaire was tested and applied to a sample of Brazilian accountants and businessmen during 2017. In the analysis of these data, content analysis was applied and statistical tests were used to establish relations between the answers obtained.

Results: the main findings of this study indicate that the expansion of accounting education and research in Brazil was essential for the growth of the economy, according to the respondents' perception, despite the impression that accountants and businessmen need to make better use of the accounting information.

Contributions: from the academic viewpoint, the evidences from this research contribute to fill of an important existing gap in the Brazilian literature. What the market is concerned, they contribute by providing evidence that, despite its perceived relevance, its users need to make better use of the accounting information.

Key words: Education: Research; Accounting.

- The article itself, written in Portuguese or English, with at least 5,000 and at most 9,000 words, including tables, figures, notes and references.
- The pages of the articles should be properly numbered in the upper right corner, typed with Word for Windows, under the following conditions:
  - A4 paper (210 x 297 mm);
  - Times New Roman, size 12;
  - Spacing: single;
  - Paragraph input: 1.25;
  - Margins: 3cm top, 2cm bottom, 3cm left, 2cm right;
  - Tables and figures in Times New Roman, size 10;
  - Citations and references must comply with current standards of the APA (American Psychological Association).

3. Tables and Figures[1]

Tables and figures should be used in articles whenever their information make text comprehension more efficient, without repeating information already described in the text.

3.1 Tables

The table should usually show numeric or textual information organized in an orderly exposition of columns and rows. Any other statement should be characterized as textual figure.

The table should be displayed with its information visible and sufficient for their understanding and should be formatted as follows:

1 Most of these guidelines were adapted from the Manual for Submissions of the *Revista de Administração Contemporânea* – RAC, available at www.anpad.org.br.

Table editor	Word for Windows 97 or superior. In case authors have drawn their tables in Microsoft Excel or in a similar program, please remake the tables using the feature in Word.
Font	Times New Roman, size 10.
Line spacing	Simple.
Spacing before and after paragraphs	3 pt.
Table colors	Use only black and white (grayscale).
Title	The table title must be brief, clear and explanatory. It should be placed above the table, in the top left corner, and on the next line, just below the word Table (with a capital initial), followed by the number that designates it. The tables are presented with Arabic numerals in sequence and within the text as a whole. Eg: Table 1, Table 2, Table 3, and so on.
Citation of tables	When citing tables in the text, type only the number referring to the table, for example Table 1, Table 2, Table 3 and so on. (the word 'Table' should be presented with the first letter capitalized). Never write 'table below', 'table above' or 'table on page XX' because the page numbers of the article may change while formatting.
Table notes	The font used in the notes of the table should be Times New Roman, size 10, single spaced. The notes should be described in the footnote of the table, and they serve to indicate the Source of the information of the table, and other information important to understanding the table.

3.2 Figures

The figure should show a flow chart, a chart, a photograph, a drawing or any other illustration or textual representation.

The figure should be displayed with its information visible and adequate for its understanding, and should be formatted as follows:

Font	Times New Roman, size 10.
Figure colors	Use only black and white (grayscale).
Format	Figures should be submitted in an editable format.
Title	It explains the figure concisely, but discursively. The title should be placed under the figure and numbered with Arabic numerals in sequence, preceded by the word Figure (with initial capital). Eg: Figure 1, Figure 2, Figure 3, etc. After the title, any other information necessary for clarification of the figure or source must be added as a note.
Captions	The caption is the explanation of the symbols used in the figure and must be placed within the limits of the figure.
Size and proportion	Figures must fit the dimensions of the journal. Therefore, a figure should be drawn or inserted into the article so that it can be reproduced in the width of a column or page of the journal to which it will be submitted.
Citations in the main text	When citing a figure in the text type only the number referring to the figure, e.g. Figure 1, Figure 2, Figure 3 and so on. (the word 'Figure' should be presented with the first letter capitalized). Never write 'figure below' figure above ', or even 'figure on page XX' because the page numbers of the article can be changed during formatting.

4. Citations and References

For the full version of the standards of citations and references according to APA (American Psychological Association), access http://www.repec.org.br/index.php/repec/article/view/1607/1237.