ISSN 1981-8610

(cc) BY

English version

repec

Revista de Educação e Pesquisa em Contabilidade

Journal of Education and Research in Accounting

REPeC, Brasília, v. 12, n. 2, Apr./Jun. 2018
Available online at www.repec.org.br
DOI: http://dx.doi.org/10.17524/repec.v12i2

ABRACICON
ACADEMIA BRASILEIRA
DE CIÊNCIAS CONTÁBEIS

repec

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

ISSN 1981-8610 Quarterly journal, digital and free published by Brazilian Academy of Science in Accounting (Abracicon)

ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

Publication date: June 29th, 2018

EDITORIAL TEAM

STEERING BODY
Maria Clara Cavalcante Bugarim, President of Brazilian Academy of Science in Accounting (Abracicon), Brasil

COMMITTEE OF EDITORIAL POLICY
Antonio Carlos Dias Coelho, Doutor, Universidade Federal do Ceará (UFC), CE, Brasil
Carlos Renato Theóphilo, Doutor, Universidade Montes Claros (Unimontes), MG, Brasil
Edgard B. Cornachione Jr., Ph.D., Universidade de São Paulo (USP), SP, Brasil
Ernani Ott, Doutor, Universidade do Vale do Rio dos Sinos (Unisinos), RS, Brasil
Ilse Maria Beuren, Doutora, Universidade Federal de Santa Catarina (UFSC), SC, Brasil
Jacqueline Veneroso Alves da Cunha, Doutora, Universidade Federal de Minas Gerais (UFMG), MG, Brasil
Patricia Gonzalez Gonzalez, Doutora, Universidade del Valle (UV), Cali, Colômbia
Valcemiro Nossa, Doutor, Fucape Business School (FBS), ES, Brasil

EDITOR
Orleans Silva Martins, Doutor, Universidade Federal da Paraíba (UFPB), PB, Brasil

ASSISTANT EDITORS
Felipe Ramos Ferreira, Doutor, Fucape Business School (FBS), ES, Brasil
Gerlando Augusto Sampaio Franco de Lima, Doutor, Universidade de São Paulo (USP), SP, Brasil
Márcia Maria dos Santos Bortolocci Espejo, Doutora, Universidade Federal do Mato Grosso do Sul (UFMS), MS, Brasil
Vinícius Gomes Martins, Doutor, Universidade Federal de Pernambuco, PE, Brasil

SCIENTIFIC EDITORIAL BODY
Adriano Rodrigues, Doutor, Universidade Federal do Rio de Janeiro (UFRJ), RJ, Brasil
Alfredo Sarlo Neto, Doutor, Universidade Federal do Espírito Santo (UFES), ES, Brasil
Aneide Oliveira Araujo, Doutora, Universidade Federal do Rio Grande do Norte (UFRN), RN, Brasil
Antonio Benedito Silva Oliveira, Doutor, Universidade Católica de São Paulo (PUCSP), SP, Brasil
Cláudio Parisi, Doutor, Fundação Escola de Comércio Álvares Penteado (FECAP), SP, Brasil
Edílson Paulo, Doutor, Universidade Federal da Paraíba (UFPB), PB, Brasil
Eduardo Schiehll, Ph.D., HEC Montreal, Canadá
Fátima Souza Freire, Doutora, Universidade de Brasília (UNB), DF, Brasil
Fernando Caio Galdi, Doutor, Fucape Business School (FBS), ES, Brasil
Ilirio José Rech, Doutor, Universidade Federal de Uberlândia (UFU), MG, Brasil
Jeronymo José Libonati, Doutor, Universidade Federal de Pernambuco (UFPE), PE, Brasil
José Alonso Borba, Doutor, Universidade Federal de Santa Catarina (UFSC), SC, Brasil
Laura Edith Taboada Pinheiro, Doutora, Universidade Federal de Minas Gerais (UFMG), MG, Brasil
Lauro Brito de Almeida, Doutor, Universidade Federal do Paraná (UFPR), PR, Brasil
Leandro Cañibano, Doutor, Universidad Autonoma de Madrid, Espanha
Luis Eduardo Afonso, Doutor, Universidade de São paulo (USP), SP, Brasil
Luís Lima Santos, Doutor, Instituto Politécnico de Leiria (IPL), Portugal
Maisa de Souza Ribeiro, Doutora, Universidade de São Paulo de Ribeirão Preto (USP-RP), SP, Brasil
Márcia Martins Mendes De Luca, Doutora, Universidade Federal do Ceará (UFC), CE, Brasil
Marcos Antonio Souza, Doutor, Universidade do Vale do Rio dos Sinos (Unisinos), RS, Brasil
Milanez Silva de Souza, Doutor, Universidade Federal do Amazonas (UFAM), AM, Brasil
Roberto Carlos Klann, Doutor, Universidade Regional de Blumenau (FURB), SC, Brasil
Sonia Maria da Silva Gomes, Doutora, Universidade Federal da Bahia (UFBA), BA, Brasil
Waldir Jorge Ladeira dos Santos, Doutor, Universidade Estadual do Rio de Janeiro (UERJ), RJ, Brasil

AD HOC CONSULTANTS
List published annually in the last issue of the Journal

PORTUGUESE LANGUAGE REVIEW
Maria do Carmo Nóbrega, Conselho Federal de Contabilidade (CFC), Brasil

ENGLISH LANGUAGE REVIEW
Aksent Assessoria Acadêmica

REVIEW OF STANDARDS
Rosangela Bekman dos Santos, Conselho Federal de Contabilidade (CFC), Brasil

METADATA REVIEW
Orleans Silva Martins, Doutor, Universidade Federal da Paraíba (UFPB), PB, Brasil

GRAPHIC PROJECT
Wellington Cardoso de Araujo, Conselho Federal de Contabilidade (CFC), Brasil
Raul Vinicius F. Gonçalves, Conselho Federal de Contabilidade (CFC), Brasil

PAGE LAYOUT
Pedro de Moraes, Conselho Federal de Contabilidade (CFC), Brasil

LIBRARIAN
Lúcia Helena Alves de Figueiredo, Conselho Federal de Contabilidade (CFC), Brasil

EDITORIAL ASSISTANT
Rosangela Bekman dos Santos, Conselho Federal de Contabilidade (CFC), Brasil

This journal offers immediate, free access to its content from the internet through SEER system, therefore, scientific knowledge is freely available to the public, aimed at a democracy of knowledge.

REPeC uses the Journal Electronic Editing System (SEER) for management of the periodical.

The Electronic Editing System (SEER) was translated and adapted from the Open Journal Systems (OJS) by the Brazilian Institute of Information in Science and Technology (IBICT). This free software, developed by the British Columbia University from Canada, aims at assisting scientific journals editing in each stage of the process, from submission and consultants evaluation to online publication and its indexation.

Available online at: *http://www.repec.org.br*

© Abracicon – Academia Brasileira de Ciências Contábeis – 2018

ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

Academia Brasileira de Ciências Contábeis (Abracicon)
SAS, Qd. 5, Bl. J, 4º andar, Ed. CFC,
CEP: 70070-920, Brasília-DF
E-mail: *repec@cfc.org.br*

REPeC: Journal of Education and Research in Accounting [eletrônic issue] / Brazilian Academy of Science in Accounting – v.1, n.1 (dec. 2006 /mar. 2007)-. -- Brasília: CFC, 2007-.
Quarterly
ISSN: 1981-8610
Access Mode: http://www.repec.org.br

1. Accounting Sciences 2. Accounting I. Federal Council of Accounting II. Title.

CDU-657

Catalographic Label prepared by Librarian Lúcia Helena Alves de Figueiredo CRB 1/1.401

Copyright © 2017 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

CC BY

repec

REPeC, Brasília, v. 12, n. 2, Editorial, p. 144-146, Apr./Jun. 2018
Available online at *www.repec.org.br*

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

ISSN 1981-8610

Editorial

Dear reader,

The Journal of Accounting Education and Research (REPeC) is a scientific journal issued by the Brazilian Academy of Accountancy (Abracicon), electronically published every three months.

In this issue, we inform the academic community about the decision to leave of our Assistant Editor Prof. Felipe Ramos Ferreira, Ph.D., the oldest member of the current Editorial Team of REPeC. His expertise during this whole time he served on this Team was certainly very relevant for REPeC and for the academy. He was essential for REPeC's consolidation as an important journal in our area. Although we regret his departure, we understand his decision and wish him success in the new challenges! So, on behalf of REPeC's entire Editorial Team, I extend our sincerest thanks! And we hope to continue to count on his collaboration and publication of his research!

In this Volume 12, Issue 2, REPeC publishes 7 (seven) original articles, resulting from relevant research in Accounting and related areas. The themes range from teaching cases on Corporate Governance to papers dealing with topics related to education and research in Accounting, such as inbreeding in graduate programs, academic achievement of students, entrepreneurial skills of course coordinators, learning and teaching methods.

Thus, I present to you a brief account of the seven (7) studies we are publishing:

The first paper is a Teaching Case, titled **The Board of Administrators or the Flesh is Weak? The dilemma of BRF S.A.**, by Raul Beal Partyka, Jeferson Lana and Anete Alberton, which aims to portray the Corporate Governance problem of BRF S.A., triggered by Federal Police Operation Weak Flesh. Its purpose is to stimulate discussions about the effectiveness of boards of directors as governance mechanisms in the decision-making process about stock investment. The case proposes the exercise of decision taking, based on two points of view: on the company side, the board of directors is analyzed as an internal governance mechanism. And in the point of view of the shareholder, an investor who entrusted his capital reserves to that company. The case allows the analysis of the effectiveness of the board of directors as an internal governance mechanism, asymmetry of information, conflicts of interest and ownership structure.

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

(cc) BY

The second article was written by Edmery Tavares Barbosa, Micheli Aparecida Lunardi, Luana Sara Bizatto and Vania Tanira Biavatti, whose title is **Relation between Inbreeding and CAPES Evaluation of Graduate Accounting Programs in Brazil**. It aims to analyze the relationship between inbreeding in the coordinators' education and the concepts attributed by the CAPES evaluation of the Graduate Programs in Accounting Sciences in Brazil. Analyzing a sample of 23 coordinators, the authors verified that there is evidence of a relationship between inbreeding and CAPES concepts. Therefore, although the literature review indicates that inbreeding is one of the negative aspects for research performance, it was concluded that the practice can provide the institution with a prominent position in research. Thus, the authors argue that the displacement of the coordinators to more prestigious universities has contributed to improve accounting research and the concept of the doctoral programs of their universities of origin.

Academic Performance Analysis of Accountancy Students at FEARP-USP Served by INCLUSP / PASUSP is the third article, authored by Cláudio de Souza Miranda, João Paulo Resende de Lima and Matheus Canuto Marinello, who analyzed whether there is a difference between the academic output of the Accounting students at FEARP-USP who benefited from the USP entrance exam bonus system and the students not benefiting, analyzing incoming students between 2010 and 2014. The authors verified that there were no significant differences in average performance between the benefitted and non-benefitted students, either in the average performance with fail grades or the average without fail grades. In the comprehensive analysis of the disciplines, a significant difference was observed in the mean without fail grades, in which the benefitted students have a higher performance. Also, the students with the best classification on the college entrance examination, regardless of being benefitted or not, had a significantly higher academic performance.

In the fourth paper, under the title **"Entrepreneurial Competencies and Performance of Undergraduate Programs: A Study of its Relations Based on Center Directors' Perspective"**, by Suzete Antonieta Lizote, Miguel Angel Verdinelli, Luciana Merlin Bervian and Sabrina Nascimento, the authors evaluated how the center directors of the universities perceive the entrepreneurial skills of the course coordinators in the academic unit they lead. And how they relate to the performance of these courses, according to the measures by the Ministry of Education. Measuring the entrepreneurial skills, based on the findings, the authors confirm that the coordinators' competences, according to their superiors, relate to the performance in a positive and significant way when considering the set of competences. But when analyzed according to Cooley's proposal, the competences in the achievement set show no association with performance. For the planning and power sets, there was a positive and significant link with performance.

Teacher, Can I Use My Mobile Phone? A Study on the Use of the Student Response System (SRS) in the Educational Process of Accounting Students. This is the title of the fifth article, by Vitor Hideo Nasu and Luís Eduardo Afonso. This paper seeks to investigate students' perceptions on the use of the Student Response System in the educational process. The research was developed in a public HEI, involving two classes of the subject Accounting for Diverse Entities, during the first and second bimesters of the academic calendar of 2016. At the end of the second bimester, questionnaires were applied to obtain the data. The authors identified that the Student Response System is easy to use and makes classes more interactive. There was a strong relationship between the perceptions that SRS helps students as a didactic tool and that it was beneficial for learning. Also, it was verified that there was no significant difference between the students' perceptions between the classes concerning SRS use. Nevertheless, significant differences of perception were found when analyzed by gender and age range.

The sixth article, by Juliana Ribeiro Souza, Lua Syrma Zaniah Santos, Jacqueline Veneroso Alves da Cunha and Bruna Camargos Avelino, is titled **Academic Delay of Gratification and its Relation with Learning Self-Regulation Strategies** and investigated the academic delay of gratification, verifying its relationship with learning self-regulation strategies. The authors analyzed a sample of 133 students from the Accounting course at the Federal University of Minas Gerais (UFMG). After performing Kruskal-Wallis and correlation tests, they verified that female students made greater use of learning strategies, while students who did not perform paid activities simultaneously were more likely to delay their academic gratification. They observed that the academic delay of gratification is generally positively correlated with learning strategies, specifically metacognitive strategies, cognitive strategies (rehearsal, elaboration and organization) and the management of time and the study environment.

And the seventh article is **"Broadening the benefits of PBL: a 'good' problem",** written by Fábio Frezatti, Daiana Bragueto Martins and Daniel Magalhães Mucci. This study aimed to address the characteristics of a "good" problem for a management accounting course that applies the Problem Based Learning (PBL) method, in which undergraduate students have to define their own problems. PBL was applied as an integrative discipline from the middle to the end of the course. The focus was on the intrinsic and useful characteristics of good problems in 17 groups that participated in the course in 2014 and 2015. The main implications are: (i) highlight an opportunity to expand the potential benefits of PBL, better characterizing a "good" problem for the PBL approach; (ii) discussing critical issues for PBL, which differ from the traditional approach; (iii) using the 11 characteristics for a "good" problem in PBL in a segmented manner; and (vi) providing evidence that the teacher's role requires adaptation due to the level of uncertainty this approach encourages.

Finally, the entire editorial team of REPeC hopes you will enjoy your reading!

Prof. Orleans Silva Martins, Ph.D.
Editor-in-Chief

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 1, p. 147-162, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1664

The Board of Administrators or the Flesh is Weak? The dilemma of BRF S.A.

Abstract:

Objective and method: This teaching case pictures the Corporate Governance (CG) problems of BRF S.A. triggered by the Brazilian Federal Police's Operation Weak Flesh. The goal is to encourage discussions on the effectiveness of boards of administrators as CG mechanisms and in the stock investment decision process. The case can be applied in graduate courses, especially in subjects whose contents are related to the Capital Market, Finance, Corporate Strategy and CG, besides undergraduate courses in related subjects. The data on the origin and historical evolution of the company, as well as about the characteristics involved in the case, were obtained from websites, magazine articles and the company website. The information that was collected and transcribed was not adapted. The script and events actually happened. The investor's situation is fictitious.

Results and contributions: The case proposes the exercise of decision making, based on two viewpoints: from the company's perspective, the Board of Administrators is analyzed as an internal CG mechanism. And from the shareholder's viewpoint, an investor who trusted that company with his capital reserves. The case permits analyzing the effectiveness of the board of administrators as an internal governance mechanism, the information asymmetry, conflicts of interest and the property structure.

Key words: Board of Administrators; Shareholders; Corporate Governance.

Raul Beal Partyka
Master's student in Business Administration at the University of Vale do Itajaí (UNIVALI). **Contact:** Rua João Coan, 400, Sala 408, Universitários, Biguaçu (SC), CEP: 88161-064.
E-mail: raul@edu.univali.br

Jeferson Lana
Ph.D. in Business Administration at FGV-EAESP and Professor at Universidade do Vale do Itajaí (UNIVALI). **Contact:** Rua João Coan, 400, Sala 408, Universitários, Biguaçu (SC), CEP: 88161-064.
E-mail: jlana@univali.br

Anete Alberton
Ph.D. in Production Engineering from the Federal University of Santa Catarina (UFSC) and Professor at the University of Vale do Itajaí (UNIVALI). **Contact:** Rua João Coan, 400, Sala 408, Universitários, Biguaçu (SC), CEP: 88161-064.
E-mail: anete@univali.br

Published in Portuguese and English. Original Version in Portuguese.

Received in 8/30/2017. Ask to Revise on 4/5/2018. Resubmitted on 4/9/2018. Accepted on 5/4/2018 by Drª. Márcia Maria dos Santos Bortolocci Espejo (Assistant Editor) and by Dr. Orleans Silva Martins (Editor). Published on 6/22/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

1. Introduction

Within the capital market, there are always at least two points of view: that of the company and that of the investor. From the company's perspective, there is BRF, a multinational company in the food sector, one of the world's largest producers of fresh and frozen protein. The organization resulted from the merger of two Brazilian companies, Perdigão and Sadia, which was announced in 2009 and completed in 2012. Both companies that composed it were family businesses. Perdigão was born in 1934, in the city of Videira (SC), and Sadia in 1944, in Concordia (SC). Both had underlying values: the family business, respect for work, care for the earth and valuation of technique. They grew and expanded, turning into major players in the food market in Brazil and later abroad. Their products include chicken and turkey, specialty meats, processed frozen foods, frozen ready meals, portions, sliced products, margarine, specialty desserts, sandwiches, mayonnaise and animal feed. The products reach more than 150 countries on five continents, through some of its established brands, such as Sadia, Perdigão, Qualy, Dánica and Paty. The company first went public in 1980 and it is currently listed on the B3 Novo Mercado (BRFS3), Brazil Stock Exchange, and also has its securities traded on the NYSE (BRFS), New York Stock Exchange, United States. Its revenues in 2016 increased by 4.9% compared to 2015, from 37.23 to 39.06 billion reais, when more than four million tons of food were marketed.

The company has more than 100,000 employees, distributed across more than 50 factories in eight countries. The largest representative is Abilio Diniz, chairman of the Board of Directors (BD). Abílio Diniz has a management background and is accustomed to dealing with complex situations in a wide range of executive arenas. He has led other companies and also passed through the Federal Government, serving on the National Monetary Council, the highest body of the National Financial System, for over ten years. Abilio learned a lot from his father, who had the same trade. As a young man, he accompanied his father in charge of a company that was founded in the 1970s and which became nationally known as Pão de Açúcar.

The fund manager Tarpon became BRF's largest private partner. Two members of Tarpon, Pedro Faria and Zeca Magalhães were advisors to the company, but they needed a new name to convince the majority of the board and shareholders to change the management. Entrepreneur Abilio Diniz embarked on the project when he bought about 3% of BRF shares and, with the support of Previ, a pension fund of Banco do Brasil employees, took over the presidency of the board, replacing Nildemar Secches in 2013 (Filgueiras, 2017, p. 81).

BRF's Board of Directors consists of nine members, six of them independent. The chairman of the board has no executive functions. It is defined in the bylaws that the chairman needs to have an unblemished reputation, not hold positions in competitors nor represent conflicting interests.

Chief Executive Officer Pedro de Andrade Faria is a financial expert and partner in BRF's largest private shareholder, Tarpon:

> At the age of 40, Pedro Faria took over BRF on January 2, 2015. Excited at the success of the first year of the new management, Faria began the second phase in the restructuring of BRF - a process that is now known internally as "tarponization - ambevization" of the company (Filgueiras, 2017, p.82).

From the shareholder's point of view, there is Marcelo, one of the thousands of BRF investors in Brazil and around the world. A Brazilian student and very curious about the capital market, Marcelo found in BRF S.A. the hope of multiplying his money. Between 2006 and 2015, BRF shares rose from R$ 10 to R$ 70. Marcelo analyzed the company's economic and financial information and found that, if he had invested all his money in BRF shares in that period, he would be a millionaire today. With this conclusion, he invested all his capital reserves in this company in February 2017. He thought he might even retire, why not? After much analysis, he started to trust the company and its entire structure.

But not everything is perfect. That Friday, March 17, 2017, a striking fact would undermine BRF's governance foundations and, consequently, the profitability of Marcelo's investments. The news was everywhere: the Federal Police had discovered a scheme through which BRF officials paid bribes to inspectors from the Ministry of Agriculture, Livestock and Food Supply (MAPA). The reason for this corruption was to avoid effective oversight in one of the company's factories and thus keep it running.

On the one hand, the Chairman of the Board of Directors of BRF, who should manage and monitor the company in constant and meticulous operations, seeking to maximize the shareholders' wealth, had yet another obstacle to solve, as he did not know about the illegal practice and the involvement of high-level employees and directors. In addition, the board of administrators had to investigate the facts. Decisions needed to be taken to achieve the best solution internally as well as to reduce the external repercussions.

On the other hand, there was Marcelo, one of the shareholders, who put his equity in one of the companies with the best governance structure in Brazil thus far. What was next? While both seek solutions, or at least understand the problem, the company shares are melting away on the stock exchange. Would the board of administrators be effective at representing the shareholders' interests, in its oversight and management of company strategies and operations, and would it stem this catastrophe? And Marcelo, should he maintain his shares in BRF or withdraw them, in order to mitigate the risk due to the information asymmetry?

2. Operation "Weak Flesh": Corruption involving BRF

The Federal Police (FP) had scheduled a special March 17. On that date, which marked the third anniversary of the Carwash investigations, the FP started its largest operation, called "Weak Flesh" (Filgueiras, 2017, p.88).

The FP exposed the corruption that took place between the company and the federal agency, as a result of two years of investigation, involving more than 1.1 thousand police officers. When the institution "[...] convened a press conference [...] to show the 353-page survey that resulted in Operation Weak Flesh, a situation came out that may have surprised most Brazilians. But not the federal agricultural tax auditors"(Caetano, 2017, p.32).

The FP's action resulted in a corruption scheme rooted in at least three state superintendencies of the Ministry of Agriculture, in Paraná, Minas Gerais and Goiás. In exchange for bribes, inspectors, veterinarians and heads of the ministry in these states issued false quality assurances for meatpackers who, with these certificates, were not concerned with meeting the minimum sanitary requirements established by law (Campbell, 2017, p.50).

At that point, the BRF chairman had to gather all the executives to confirm that not only he was not aware of this practice under his supervision. And also to contain the negative effects on the company's image as quickly as possible.

3. The complaint of corruption

The investigation pointed out that the meatpackers had a direct influence on the Ministry of Agriculture to choose the agents who would carry out the inspections in the company, through the payment of undue advantages (Folha, 2017).

According to FP, BRF officials had free access to the Ministry of Agriculture to access the inspection system the auditors used, with the acceptance of the former superintendent of the Ministry of Agriculture in Paraná, Daniel Gonçalves Filho, appointed as the head of the scheme (Campbell, 2017, p.50). The FP arrested a manager and a director of the company and the home of the vice president of corporate integrity was searched (Filgueiras, 2017, 79).

Amidst the economic and political crisis, losing money is like accelerating the car towards the abyss. But what worsened the whole story was the combination of the police operation with the expectation of the current board of directors, created when it took command four years earlier.

A conversation wiretapped by the FP revealed that the agent of the Ministry of Agriculture responsible for the on-site inspection stated that he would "kill in the chest" the notification to suspend the plant and that he would not warn Brasilia (Uol Economia, 2017).

For FP, a conversation between BRF's two directors showed that veterinarian Dinis Lourenço da Silva, head of the Inspection Service for Animal Products in Goiás, was asking for a 300,000 reais bribe to cover up some irregularities in the BRF unit in Mineiros, in the interior of the state. In exchange for the payment, the veterinarian would return to the Mineiros unit to redo the inspection and - surprise! - he would find that everything was in order that time (Bonin, 2017, 55).

4. Meeting of the Board of Directors

Less than two hours after the Federal Police launched Operation Weak Flesh, in the morning of Friday March 17, 2017, the top eight BRF executives had locked themselves in the main meeting room in the company's headquarters in São Paulo. Among them were the CEO, Pedro Faria, and the chairman of the board of directors, Abílio Diniz. The aim was to define a plan of action to stop the public bleeding of the company's reputation, accused of committing corruption to have its health oversight process loosened by the Ministry of Agriculture agents (Cilo & Drska, 2017, p.42).

Everyone was talking fast. Cell phones kept ringing. Every minute there, thousands of negative comments and jokes about the company were published and flooded the social networks (Cilo & Drska, p.42). In the face of that much news and comments spreading, the company had to react urgently. Thus:

> The sense of urgency, in the case of operation Weak Flesh, entailed almost immediate results. In little more than 20 minutes, the largest action plan in the history of BRF was ready. Even before they left the room, the executives decided to create a crisis management committee. They summoned the main creative thinkers from the publicity agency DM9, the directors of the public relations agency Loures Comunicação, the three law firms that provide legal support to the company and called upon the most experienced directors and top employees of BRF at full speed (Cilo & Drska, 2017, pp. 42-44).

Agriculture Minister Blairo Maggi, also worried about all the repercussions, contacted the company to inquire about its treatment of the problem. According to the article in the magazine Globo Rural, issue March 17, 2017, the minister talked with Pedro Faria and Abilio Diniz, and expressed his concern with the repercussion of the subject. The executives assured that there were internal procedures to deal with this and that, four years ago, they had no news of this type of misconduct and would work together to clarify the facts.

"*No one there was aware of the intensity and scope of that crisis. All we knew was that we had to act quickly and transparently*", an executive related to BRF told Cilo & Drska (2017, p. 42), who closely followed the reaction behind the scenes.

Soon after the creation of the committee, BRF published a web page - brf.com.br/portasabertas -, which contained a letter of clarification on the scandal. There was also a team to respond to consumers' comments on social networks, and a structure was set up to respond to the Brazilian and international press. Without wasting time and uninterruptedly, employees selected by the BRF top management contacted suppliers, customers and investors in order to play down the facts, to try to appease the situation (Cilo & Drska, 2017, p. 44).

5. A small investor

Marcelo is 26 years old and is taking an MBA in Capital Markets. The young man had been accompanying the companies listed on the Brazilian Stock Exchange (B3) for some time. He took great interest in Brazilian companies, to the extent that he decided to go for more profitable investments, as he had some knowledge on the subject and his colleagues already bought and sold shares. Marcelo was concluding his specialization, so it would be a good time for him to start. So he spent a few days analyzing the market, looking for a company to invest his capital in.

The young man got to the BRF shares with great interest in the investment, because his father had worked at Perdigão for more than 30 years (one of the merged companies that resulted in the creation of BRF) until he retired. He evaluated its main investors, its board members, their background and remuneration, as well as the company's contribution to the country, in economic and social value, so that he felt like a real partner.

At the end of 2012, BRF changed management. Majority shareholders criticized the slowness of the former administration. A group of shareholders, led by the manager Tarpon, joined Abilio Diniz to deal the cards at BRF. They changed everything, starting with the top of the company. Nildemar Secches left as chairman of the board, making room for Diniz. The changes in the board came next. Tarpon and its group criticized what they saw as slowness of BRF's management, considering the company as a giant that could be transformed into a global leader. Investors bought the idea that the shares, worth around 40 reais at that time, would be worth at least 100 reais in four years. Today, BRF shares are worth about 35 reais, therefore almost 20% less than they were worth four years earlier (Filgueiras, 2017, pp. 78-79).

Table 1 describes the profile of the BRF directors, representing the minority shareholders, analyzed by Marcelo.

Member	Function	Educational background
Abílio dos Santos Diniz	Chairman of the Board (independent)	Business Administration
Renato Proença Lopes	Deputy Chairman of the Board	Graduate degree in Business Administration and MBA in Wholesaling Business Management
Henri Philippe Reichstuk	Sitting member (independent)	Graduate degree in Economics
Luiz Fernando Furlan	Sitting member (independent)	Specialization in Financial Management
Manoel Cordeiro Silva Filho	Sitting member (independent)	Graduate degree in Economic Engineering and MBA in Finance
Walter Fontana Filho	Sitting member (independent)	Graduate degree in Economics
José Carlos Reis de Magalhães Neto	Sitting counselor	Business Administration
Aldemir Bendine	Sitting counselor	MBA in Top Executives and Finance
Vicente Falconi Campos	Sitting counselor	Ph.D. in Engineering

Picture 1. Composition of BRF Board of Administrators on April 22nd 2017

Source: the authors, based on Econoinfo and Website Relação com Investidores BRF, 2017.

Pedro Faria, the CEO, took charge of the company on January 2, 2015. Until then, he had been the Director of Investor Relations at Tarpon. He holds a degree in Business Administration at FGV-SP and an MBA from the University of Chicago (USA). In 2016, BRF paid all members of the Board of Administrators more than 7.5 million *reais*.

In Table 1, the corporate division of BRF, illustrating one of the research sources for Marcelo to define his investment, related to the ownership dispersion or concentration.

Table 1

Stock Composition of BRF on 05/31/2017

Stockholder	Number of ordinary shares	Ordinary shares(%)
Petros – Fundação Petrobras de Seguridade Social	92,716,266	11.41
Previ – Caixa Previdência Funcionários Banco do Brasil	86,691,252	10.67
Tarpon Gestora de Recursos S.A.	69,131,442	8.51
GIC Private Limited	51,913,800	6.39
BlackRock Inc.	40,867,404	5.03
Stock in Treasury	13,468,001	1.66
Others	457,684,835	56.33
Total	**812,473,000**	**100.00**

Source: the authors, based on Econoinfo, 2017.

Marcelo thoroughly investigated BRF, all of its history until the change of its management, the investor relationship website (*www.brf-br.com/ri*), financial statements, annual and sustainability reports, the economic-financial indices, the composition of the board of directors and shareholder composition. In addition, he researched on the bylaws, policies and regulations for BRF investors, such as dividend policies. He already felt a future investor: "The company is one of the best in governance that I analyzed. It has several independent members on the board, as well as the president. They are able to make good investment, financing and management decisions, always expecting to represent shareholders' rights". That is what Marcelo thought after his first days of appreciation.

The company was the first food and beverage company to comply with B3's New Market rules on April 12, 2006, which is the highly differentiated governance segment of the Exchange. That is further information that enhanced the company's credit towards the shareholders, indicating that it follows a pattern of transparency and governance.

The company is also highly regulated, even doubly regulated, its shares being traded on the São Paulo Stock Exchange and the New York Stock Exchange. The Company complies with the International Financial Reporting Standards (IFRS) and the regulations of the Financial Reporting Internal Control System (SCIRF) regulations, based on the Sarbanes-Oxley Act (SOX).

After hours of fundamental analysis, Marcelo came to the conclusion that he should invest in BRF. He defined the company as a great investment, took into account mainly the profile of its executives, made available by the company itself. In theory, it was a great team, well paid, highly advised. Marcelo then invested all of his capital reserves in February 2017, buying BRF shares. According to his testimony: "I confirmed a lot of information that made me bet on BRF as the best company to invest my money in. There is a small percentage, between 10 and 12% of shares concentrated in only one shareholder. The large majority of the board members has some background in Business Administration, Finance or Economics. In the last 10 years the value of the company's stock has jumped from about 10 *reais* to 70 *reais*. I believe that, with the new management, this level lies within reach again".

At one point, however, a problem arose that exists in several countries as something endemic: corruption. In this case, in the Brazilian society in which, due to weak historical social ethics, the more bureaucracy, the more rules there are. The strongest is the inspector who creates difficulties to sell facilities to an employee who thinks this normal way of operating in Brazil is wrong, but perhaps this operation has some educational effect.

According to Adeodato Volpi Netto, chief equity strategist at Eleven Financial Research, however, according to Gradilone (2017), what scares investors is not only the immediate effect of Operation Weak Flesh on the company's results, but its consequences. Prior to the transaction, Eleven considered BRF's shares to be one of the most promising in the sector.

Thus, the turbulent operation launched by the FP on March 17, 2017 harmed thousands of investors. Shareholders took losses of up to 10% in a few days. The shock was so great that it affected not only BRF, but also other companies in the sector, which saw their shares drop by up to 9% (Gradilone, 2017, p.48).

After hearing the news of the bribery case, however, what most concerned Marcelo was not only with the loss resulting from that investment, but also the fact that he saw the proportion the corruption case between company and inspection gained. He still had no idea what its effects on the company's immediate results would be. Marcelo, however, was starting to realize that the board of directors might have failed to perform its functions, as this internal corporate governance mechanism should seek efficiency in monitoring the company through constant scanning operations, always seeking to maximize shareholder wealth and help investors to define the best firms to invest in.

On March 16, 2017, one day before the disclosure of Operation Weak Flesh, the closing price of a BRFS3 share was 40.01 *reais*. On July 17, the stock started the trading session at the price of 38.00 *reais* and, at the end of the day, accumulated a loss of 7.30% in 24 hours, closing at 37.09 *reais*. This figure was recorded for the first time in the company's history. It reached its low on the 22nd, at the value of 35.58 *reais*. Not even the most pessimistic investor would be expecting such an event, even when considering the current national scenario. On April 18, 2017, one month and a day after the operation was triggered, the closing price of a BRFS3 share was 40.62 *reais* (Figure 1), even higher than the price on the day before the announcement of Operation Weak Flesh and its intensive media disclosure.

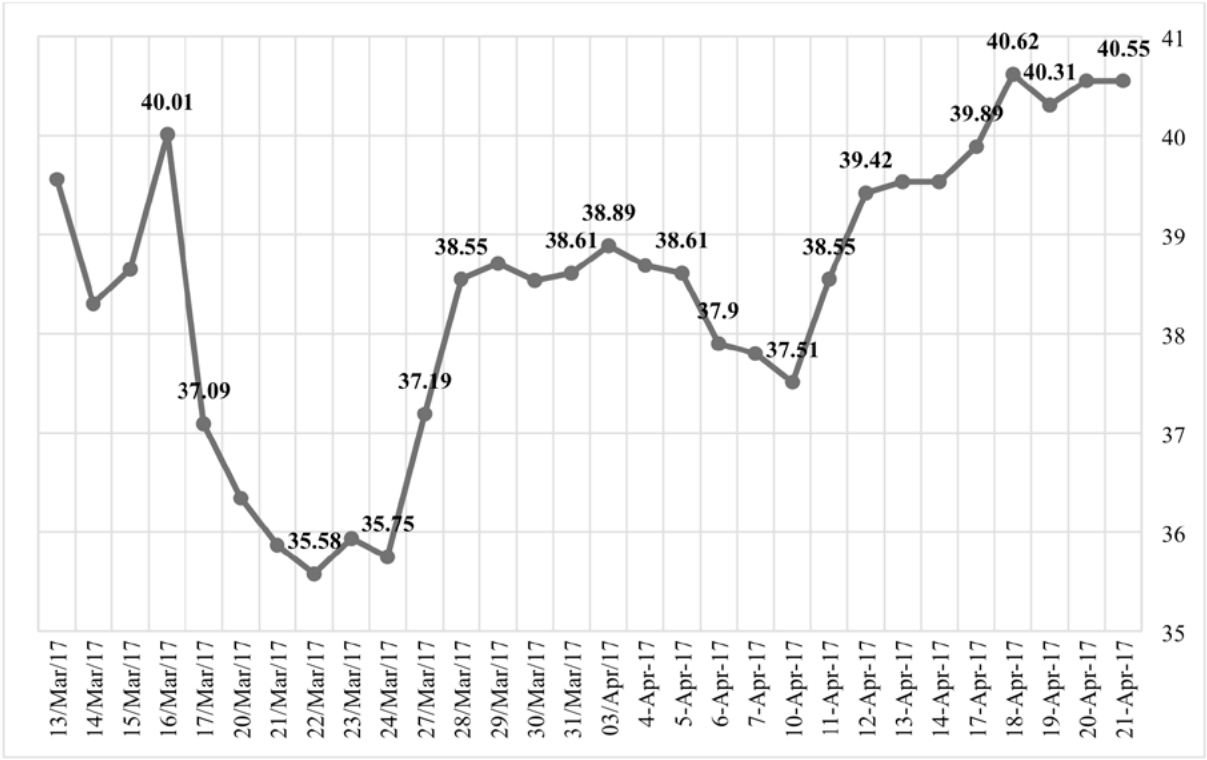


Figure 1. Closing prices of stock BRFS3 between March 13th and April 21st 2017

Source: Created by the authors based on ADVFN Brasil, 2017.

6. Bad things do not only happen to others

In Brazil, it is nothing new, and one should not think far to recall other cases of bribery, corruption, among other deviations of conduct, in which there is no praiseworthy act whatsoever. In this case, the board had more than one obstacle to be solved, starting with its ignorance of the practice and the involvement of senior officials and directors. All of this plus the need for investigation by the board of directors. There were decisions to be made to solve these facts in the best possible way, internally, as well as to mitigate the repercussion of external factors. On the other hand, a small shareholder, who entrusted his capital reserves to a company, hitherto without risk of significant losses, saw his equity be drastically reduced in a matter of a few hours. Hence, what mechanisms could mitigate the agents' conflict? Would the board of directors have been effective in representing the shareholders' interests in their role of oversight and management of strategies and operations? Should Marcelo keep his shares in BRF or withdraw them to mitigate his risk due to asymmetric information?

7. Teaching Notes

The Teaching Notes are of exclusive access to the teachers, aiming to direct the objectives, methodological strategies and evaluation of the case for teaching.

7.1 Data sources

The data source on the origin and historical evolution of the company, as well as on the characters involved in the case were obtained through websites, magazine articles and the company's website. The shareholder's point of view is fictitious, created through the character Marcelo. The data presented on the Operation Weak Flesh and its unfolding are real and were obtained from secondary sources, through reports in magazines, websites, policies, bylaws and regiments of the company (ADVFN Brasil, website B3, magazines Carta Capital, Época Negócios, Folha de São Paulo, EXAME, Isto é Dinheiro, VEJA, Dinheiro Rural, Globo Rural, and the websites BRF and EconoInfo). The period of data collection was from March 14, 2017 until August 29, 2017. First, all the magazines and newspaper articles that quoted the Weak Flesh operation were digitally cataloged. After this process, the excerpts that made up the teaching case were captured from this sample. The information collected and transcribed did not suffer adaptations or inclusions. The script and events actually happened.

7.2 Educational objectives

The dilemma of BRF S.A., reflecting a problem with international repercussion, was designed to grant knowledge about corporate governance and agency theory amidst a governance problem at BRF. The case permits analyzing the effectiveness of the board of directors as an internal governance mechanism, information asymmetry, conflicts of interest and ownership structure.

Decision making should be based on two points of view: that of the company and that of the shareholder. On the company side, the Board of Directors is observed as an internal corporate governance mechanism. Its efficiency in monitoring and its composition should help an investor to define the best companies to invest in, albeit in a scenario where they find great schemes of money laundering, bribes and the accumulation of bad management news.

And from the point of view of the shareholder, we observe an investor who entrusted his capital reserves to that company, in defining the expected return and appropriately choosing the types of investments that should compose his portfolio. The didactic emphasis is on finance, where risk is sovereign. A possible choice is investing in shares, although these continue to be seen as a black box. How to choose the right company? Which indicators should be analyzed? What characteristics of the company should be considered? The answers are many, and yet they are not definitive.

The central theme of the application of the case concerns corporate governance. We divide this theme into three main areas of program content: agency theory, board of directors and property structure. Students are invited to put themselves in the place, on the one hand, of the Chairman of the Board of Directors of a global company and, on the other hand, of a shareholder of that company.

Prior to the discussion of the case, it is recommended that the data sources and the referenced works be read in full. Through discussion of the case, especially debating on the proposed issues, participants are expected to be able to: identify conflict passages of the agents and suggest mechanisms that can mitigate this problem; judge BRF's board of directors, through its characteristics, such as the independence of the board, with a view to the actual effectiveness of the governing body; and relate the shareholder composition with the management problem and its consequences for investors, particularly for Marcelo, a minority investor.

The case further seeks the students' historical understanding of other cases of effectiveness problems in the board of directors, which may also have affected minority investors, contextualizing the discussion of the theme in another age and scenario.

The questions presented next can be used with the educational objective of discussing the thematic axes, fully or separately, according to the need of the application.

1. **Questions about Agency Theory:**
   a. One of the principles of agency theory is the idea that the agents may possess asymmetrical information, which enhances conflicts between the parties. Identify excerpts or situations in the case in which this may have happened.
   b. Another principle of agency theory is the idea that the agents' interests may differ from those of the principals, that is, the owners. Identify excerpts or situations in which this may have been the case at BRF.
   c. Mention possible mechanisms that could reduce the above problems, existing in the case or others you suggest.

2. **Questions about Board of Directors**
   a. Which are the general characteristics of the board at BRF?
   b. Which are the advantages or disadvantages of an independent chairman serving on the board of directors?
   c. And independent members? Do they help or not in good governance practices? If yes, how?
   d. How do the characteristics of the board, the presence of an independent chairman and members help or not to revalue BRF?

3. **Questions about Property Structure**
   a. Which are the main characteristics of the ownership composition of BRF?
   b. How can the ownership dispersion be related with the management problem in this case?
   c. What is the foreign partners' main reaction to the drop in share value provoked by a corruption problem?
   d. How could the minority investor Marcelo mitigate the risk in the short term?

7.3 Application of the case

The teaching case presented can be used for discussion in graduate courses, especially in subjects whose contents are related to the Capital Market, Financial Market, Corporate Strategy and Corporate Governance, more specifically in the discussion of internal Corporate Governance mechanisms and Agency Theory. In undergraduate classes, the case should be applied to students who are moving towards the end of their courses in Business Administration, Accounting, Management and who are familiar with Governance, Financial Market and Strategy themes.

To support the teacher to choose the audience, the arrangement in the class, the parts in the presentation of the case, among other actions, we suggest reading and analyzing the scale of difficulty levels. The case presents difficulty levels 3, 3 and 1 on the scale proposed by Leenders, Mauffette-Leenders and Erskine (2001), respectively, for the analytic, conceptual and presentation dimensions, in which 1 means easy, 2 regular and 3 difficult, divided per dimension, level, case layout, explanation of the difficulty level and goal, as displayed in Picture 2:

Dimension	Level	Case layout	Explanation of difficulty level	Goal
Analytic	3	In the case, the criteria are presented to decide on the form of the fact that occurred, the form of treatment thus far, on both sides, and the unknown factor regarding what action to take to attend to both parties	There is no outcome in the case. The dilemma for the students is to put themselves in the chairman of the board's and in a shareholder's place. Several decisions are possible, and one action by the company can influence the investor's decision.	In this dimension, the case readers' task is related to the key decision of the case. The analytic task depends on how the decision is presented in the case: as the alternative chosen, suggested alternatives or the reader should put himself in the context to decide on the best action.
Conceptual	3	Three thematic axes are outlined for the individual conception. The theoretical perspective is necessary to drive the action after the dilemma	More than one concept is present and these require in-class discussion and explanation, combining them with examples, problems or exercises, mainly concerning corporate governance	At this level, the concern is what theories, concepts or techniques can be useful to understand and/or solve the situation in the case. The difficulty of the theory itself and the number of concepts to be used simultaneously are taken into account
Presentation	1	The information is presented in popular language and the story is compelling	The case includes various media excerpts, which contributes to easy, organized and rapidly assimilated reading. Theoretical and technical information is restricted to the teaching notes	Offers an opportunity to develop skills during reading and structure information. Engages the reader from start to finish. Short, organized case containing all relevant information in a sample manner without odd data

Picture 2. Difficulty levels of the case

Source: Created by the authors, based on the criteria proposed by Leenders *et al.* (2001, p. 17).

To support the teacher with the application of the case in the classroom, the following script is suggested. It is important to guarantee that the students read the case carefully before the class. If that is not possible, 20 minutes can be reserved at the start of the class for the students to read the case in the classroom.

Estimated Time	Activity	Concepts Applied
0-15 min	General presentation of the case, detailing its objectives	Objectives
30-40min	Discussion on the consequences, contextualize the event for the company.	Context of the event with the country's political-economic situation, as well as its international repercussion.
60-90min	1. Suggestions: Organization of small groups. Distribution of thematic axes (presented further on) and surveying solutions or alternatives to face the problems. 2. Suggestion: Discussion between two groups with representatives, one playing the role of the company and another of the investor. 3. Suggestion: Creation of various pairs, in which half is responsible for answering the questions with positive assertions and the other part gives opposite answers.	• Corporate governance • Agency theory • Board of administrators • Property structure
20-30min	Closing off the class with proper decisions made thus far.	Company decisions on the case in the short, medium and long terms

Picture 3. Suggested lesson plan

Source: the authors.

7.4 Proposals to address the questions

1.

a) The case presents a problem caused by asymmetric information, in which the board of directors was unaware of the corrupt practice of paying bribes to inspectors of the Ministry of Agriculture to achieve the issuance of quality certificates. For Jensen (1993), serious information problems limit the effectiveness of board members in large corporations. For example, the CEO almost always determines the agenda and information given to the board. This limitation of information severely impairs even the ability of talented board members to effectively contribute to the monitoring and evaluation of the CEO and company strategy.

b) There was a conflict of interest in the case, as the board (agents) did not truly represent the interests of the shareholders (principal), because of their lack of effectiveness in formulating, directing and controlling policies, guidelines and strategies. The information presented shows that the council did not even know about the illegal practice, thus failing to resolve the problem of paying the bribe internally. Wiseman and Barton (2015) argue that a good first step would be for everyone to fully understand what a "fiduciary duty" means for a board member. Most legal codes emphasize two key aspects: loyalty (placing business interests above any other) and prudence (dedicating appropriate attention, skills, and diligence to business decisions). The role of a loyal and prudent board member is not to force the executive to maximize shareholder value in the short term, to the detriment of any other interest. Rather, it is that the member should help the company succeed for years on end.

c) The media acted as an external governance mechanism, activating the board of directors, internal mechanism, for the irregularity that existed in the company, and bringing to light the lack of effectiveness of this entity. For Aguilera, Desender, Bednar and Lee (2015), the media is considered an external mechanism because it can widely disseminate information. It exists to exert a controlling role, in which the threat, acting as negative media, can prevent managers from acting out of self-interest because they are afraid to damage their reputation, in addition to acting on agency theory of governance to enhance the effectiveness by increasing transparency and reducing information asymmetry. Based on the case, the media, as an external governance mechanism, activated the Board of Directors for the occurrence of a bribery practice, thus demonstrating the failure of

the internal mechanism. The Federal Police also acted as an external mechanism, through the legal system, by triggering Operation Weak Flesh. According to Aguilera *et al*. (2015), the legal system is the set of structures and processes used to interpret and apply the existing law. It establishes how property rights are defined and protected and includes regulatory institutions, which oversee standards and rules that firms have to comply with.

2.
(a) The Council consists of nine members, six of whom shall be independent. The Chairman of the Board is one of the independent members. As a rule of BRF, the Chairman of the Board of Directors has no executive functions. There is no duality in command, with Pedro Faria serving as the CEO and Abilio Diniz as the Chairman of the Board. It is also defined, in the Bylaws, that the chairman should have an unblemished reputation, not hold positions in competitors nor represent conflicting interests. The large majority of the board members hold a degree in Business Administration, Finance or Economics.

(b) An independent chairman should strongly watch over his reputation and activity in the company, as he may be observed by other companies to sit on their Boards of Directors in the future. Thus, he is much more concerned with his reputation, so he uses all his expertise to maintain his reputation towards all companies. The Brazilian Securities Commission recommends that, among the good corporate governance practices, due to the fact that the Board of Directors has the function of supervising the directors' management, in order to avoid conflicts of interest, the Chairman of the Board of Directors should not also sere as the president of the Board of Executive Officers or its chief executive officer. According to Fama and Jensen (1983), it is expected that, to protect the flow of information to the board, senior executives, especially those who sit on the board, can only be actually dismissed with the consent of the board, being thus protected against retaliations of other senior executives. Corporate boards usually include external members, i.e. members who are not internal managers, and who often hold a majority of the seats.

c) According to the IBGC, the boards of directors of New Market companies have to be composed of at least five (5) members, elected by the general meeting, at least twenty percent (20%) of whom should be Independent Board Members. External board members act as arbitrators in disagreements between in-house managers and perform tasks involving severe agency problems between internal managers and residual claimants, for example, setting executive compensation or seeking substitutions for top managers. Effective separation between management and control of high-level decisions means that external directors have incentives to perform their tasks rather than colliding with managers to expropriate residual claimants. Most of the external directors of open corporations are either managers of other corporations or important decision makers in other complex organizations. The value of their human capital depends primarily on their performance as an internal decision manager in other organizations. One of the recommendations in the Brazilian Securities Commission's corporate governance booklet is also that the board should have as many members independent of the company's management as possible.

d) As shown in Figure 1, the value of the BRF shares one month and one day after the start of the operation was 40.62 *reais*, even surpassing the price prior to the announcement date of Operation Weak Flesh and its mass dissemination in the media. This recovery is mainly due to the plan of action developed at the meeting between the board and the CEO on March 17, 2017. The board members set up a crisis management committee. They summoned the top creative officials of the commercial agency DM9, the directors of the public relations agency *Loures Comunicação*, of the three law firms that provide legal support to the company, and also called upon the most experi-

enced directors and senior officials of BRF. The case portrayed that the Board of Directors has little influence in the discovery of illegal practices, also considering the view that it is logically impossible to know everything. Good advice can shield the market value in the long term though, as seen with BRF's shares, which returned to even higher values little more than a month after the FP investigation was triggered.

3.
a) As shown in Table 1, the ownership composition of BRF is dispersed, the largest shareholder being Tarpon, an investment management company, which owns 11.94% of the shares. Then comes Petros, *Fundação Petrobras de Seguridade Social*, with 11.42%. The third largest shareholder is Previ, Banco do Brasil Employees' Pension Fund, with 10.65%. With 5.03%, BlackRock Inc. is the fourth largest shareholder, a global American investment company. GIC Private Limited owns 5.01% of BRF shares and is an investment company in Singapore. And 1.66% of BRF's shares were acquired by the company itself and thus named Treasury Shares. Minority shareholders hold the remaining 45.71% of the shares. It is noted that there is a high dispersion of ownership, which should lead to greater governance control and minimize internal interference.

b) The stock dispersion leads to the existing premise that diffuse control of the company results in greater demand for efficient business management. This minimizes internal interference, increasing independence, and generates more governance. In this case, the management problem occurred even though there was high dispersion of ownership. This feature requires greater administrative efficiency. The regulation of the New Market segment of the Brazilian Stock Exchange makes mention of the shareholding dispersion so that, in any and all public offering of shares, the company needs to make its best effort to achieve shareholding dispersion, with the adoption of special procedures, which will be included in the respective prospectus, such as: a) guarantee of access to all interested investors; or b) distribution to individual or non-institutional investors of at least 10% (ten percent) of the total to be distributed (BM & FBOVESPA, 2011). In the case of BRF, there is a concentration of large funds managing the BRF, although they are not majority shareholders (with more than 50% of the shares) and actively manage the decisions at BRF, including board members appointed by the funds themselves. Dispersion is good, but with limits. From this limit, there will be many shareholders who will want to be active in the company. Jensen and Meckling (2008) argue that most of the major conflicts are likely to stem from the fact that, as the managers' ownership rights decrease, their incentive to devote significant effort to creative activities, such as finding new profitable enterprises, also drops. They can actually avoid these ventures simply because they would involve a lot of concern or effort for the managers to administer them or learn new technologies. In conclusion, thus, ownership concentration benefits the corporations, as it can generate lower costs and enhances the monitoring of the management.

c) Foreign shareholders hired a North American law firm, which is preparing collective lawsuits for the shareholders to retrieve their losses. According to the article published in Época Negócios (2017), Rosen Law Firm is investigating potential accusations on behalf of shareholders, resulting from allegations that JBS may have issued materially misleading information to the investing public. This reaction partially remits to the Enron case in the United States, when executives manipulated the financial statements with the help of companies and banks, and thus hid 25 billion dollars in debt for two years on end, thus artificially inflating company profits.

d) First, in finance, an important concept for risk mitigation is the use of asset diversification. When buying shares (for example) of companies whose market oscillations are uncorrelated, Marcelo could prevent large market falls from reaching them. If his decision was nevertheless to invest in only one company, Marcelo did a good part of his homework by investing in a company with good corporate governance practices, having independent and qualified members in the Board of Directors, dispersed ownership , among other characteristics. A final strategy for Marcelo could have been smaller and gradual batches of investments, such as the partial purchase or sale of his shares according to the market's movements.

8. Closing

An alternative to close off the plenary discussion could be the proposition of a challenging situation: to raise another possible treatment the company could have given to the event and its repercussion. Also, on the part of the shareholder, to find the best attitudes, asking the students to put themselves in his place in view of his investment in BRF shares.

A case for teaching is not an exercise, there are no right answers, there are the best answers, which can lead to a better decision. We suggest closing off the case with an open question: what other cases of corporate corruption can be cited, as happened with BRF? With this question, it is intended to instigate students to think more about the subject, taking the discussion of the case beyond the classroom. The purpose is to leave an important lesson of understanding how failures in companies' corporate governance can lead to substantial value losses. Beyond what was illustrated by BRF, as well as other international companies, such as Enron, and the Brazilian companies Sadia, Aracruz and OGX

References used and recommended

Aguilera, R. V., Desender, K., Bednar, M. K. & Lee, J. H. (2015). Connecting the Dots: Bringing External Corporate Governance into the Corporate Governance Puzzle, *The Academy of Management Annals*, *9*(1), pp. 483-573, doi: http://dx.doi.org/10.1080/19416520.2015.1024503

Bonin, R. (2017, março, 29). O custo Brasil sujo. *Revista Veja*, 2523(13), Ano 50, pp. 54-55.

Bonin, R., & Alvarenga, B. (2017, março, 29). A carne nem é fraca, mas o estrago é forte. *Revista Veja*, 2523(13), Ano 50, pp. 46-49.

BRF. (2017) *Estatuto Social BRF*. Recuperado em 22 de abril, 2017 de http://ri.brf-global.com.

Caetano, M. (2017, abril). Os limites da inspeção. Revista Dinheiro Rural, 146, pp. 32-34.

Campbell, U. (2017, março, 29). Errou na mosca. *Revista Veja*, 2523(13), Ano 50 pp. 50-51.

Cilo, H. & Drska, M. (2017, março, 29). O contra-ataque de BRF e JBS. *Revista Isto É Dinheiro*, 1011, pp. 42-46.

Comissão de Valores Mobiliários (2002). *Cartilha de boas práticas de governança corporativa*. Recuperado em 22 de abril, 2017 de http://www.cvm.gov.br.

Fama, E. F. & Jensen, M. C. (1983). Separation of Ownership and Control, *The Journal of Law and Economics*, *26*(2), pp. 301-325, doi: http://dx.doi.org/10.1086/467037

Filgueiras, M. L. (2017, março, 29). Mudar tudo. De novo. *Revista Exame*, 1134(6), Ano 51, pp. 76-88.

Gradilone, C. (2017, março, 29). Repercussões da operação Carne Fraca no exterior podem dificultar avenida de ações da BRF e da JBS no mercado internacional. *Revista Isto É Dinheiro*, 1011, pp. 48-49.

Instituto Brasileiro de Governança Corporativa (IBGC) (2015). *Código das melhores práticas de governança corporativa.* (5ª ed.), 108 São Paulo.

Instituto Brasileiro de Governança Corporativa (IBGC). (2007). *Guia de orientação para o gerenciamento de riscos corporativos*, 48. São Paulo,

Jensen, M. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance, 48*(3), pp. 831-880, doi: http://dx.doi.org/10.2139/ssrn.93988

Jensen, M. C. & Meckling, W. H. (2008). Teoria da firma: comportamento dos administradores, custos de agência e estruturas de propriedade. *RAE-Clássicos, 48*(2), pp. 87-124.

Leenders, M. R., Mauffette-Leenders, L. A. & Erskine, J. A. (2001). *Writing cases*. (Fourth Edition). Ontario: Richard Ivey School of Business.

Wiseman, M. & Barton, D. Onde os conselhos falham. *Harvard Business Review Brasil.* Jan, 2015. Recuperado em 22 de abril, 2017 de http://hbrbr.uol.com.br/onde-os-conselhos-falham/.

Referências recomendadas

Daily, C. M., Dalton, D. R. & Cannella, A. A. (2003). Corporate governance: Decades of dialogue and data. *Academy of Management Review*, *28*(3), pp. 371-382, doi: http://dx.doi.org/10.2307/30040727.

Denis, D. K. & Mcconell, J. J. (2003). International corporate governance. *Journal of Financial and Quantitative Analysis,* 38(1), pp. 1-36, doi: http://dx.doi.org/10.2307/4126762

Freitas R. M. de N. & Mol, A. L. R. (2017, April). Determinantes dos papéis dos Conselhos de Administração de Empresas Brasileiras. *RAC, Rio de Janeiro (sai), 21*(spe), pp. 63-83, doi: http://dx.doi.org/10.1590/1982-7849rac2017160053

Silveira, A. D. M. da (2005). *Governança corporativa: desempenho e o valor da empresa no Brasil.* São Paulo: Saint Paul Editora.

Silveira, A. D. M. da (2010). *Governança corporativa no Brasil e no mundo: teoria e prática.* Rio de Janeiro: Elsevier.

Sites consultados

ADVFN Brasil. Recuperado em 20 de abril, 2017 de http://br.advfn.com.

Infomoney (2017). *A carne é fraca e a fé também: o mercado desistiu da BRF após mais uma má notícia?* Recuperado 20 em abril, 2017 de http://www.infomoney.com.br.

Regulamento de listagem do novo mercado (2011). BM&FBOVESPA. Recuperado em 01 de maio, 2017 de http://www.bmfbovespa.com.br.

Carta Capital (2017). *Carne Fraca: O que pesa contra a BRF e a JBS.* Recuperado em 20 de abril, 2017 de https://www.cartacapital.com.br.

Época Negócios (2017). *Escritório dos EUA prepara ações contra BRF e JBS após operação Carne Fraca.* Recuperado em 30 de abril, 2017 de http://epocanegocios.globo.com.

Folha de São Paulo (2017). *Operação contra frigoríficos prende 37 e descobre até carne podre à venda.* Recuperado em 30 de abril, 2017 de http://www1.folha.uol.com.br/mercado/2017/03/1867309-pf-faz-operacao-contra-frigorificos-e-cumpre-quase-40-prisoes.shtml.

Globo Rural (2017). *União Europeia pede reunião de emergência com o Brasil sobre fraude da carne.* Recuperado em 20 de abril, 2017 de http://revistagloborural.globo.com.

UOL Economia (2017). *Em escuta, diretor da BRF fala de bactéria, propina e exportação vetada*. Recuperado em 22 de abril, 2017 de https://economia.uol.com.br/noticias/redacao/2017/03/25/em-escuta-diretor-da-brf-fala-de-bacteria-propina-e-exportacao-vetada.htm.

Website de Relação com Investidores BRF (2017) *Governança Corporativa*. Recuperado em 25 de março, 2017 de http://ri.brf-global.com.

Website B3 (2017). Recuperado em 22 de abril, 2017 de http://www.bmfbovespa.com.br.

Website EconoInfo (2017). Recuperado em 29 de março, 2017 de http://www.econoinfo.com.br.

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 2, p. 163-178, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1673

Relation between Inbreeding and CAPES Evaluation of Graduate Accounting Programs in Brazil

Abstract:

Objective: This study aims to analyze the relation between the inbreeding of the coordinators and the grades conceded in the CAPES assessment of Brazilian Graduate Accounting Programs.
Method: Regarding the data analysis, the research is classified as descriptive and the approach is quantitative. The sample consisted of 23 coordinators of Graduate courses in Brazilian regions. For the data analysis, Correspondence Analysis (ANACOR) was used.
Results: The results evidenced proximity between the Mobile and Pure Endogenous coordinators and "Grade 3", between Non-Endogenous coordinators and "Grade 4" and "Grade 5" in the Master's programs, evidencing that inbreeding is related with the CAPES grades.
Contributions: Although the literature review appoints that inbreeding is one of the negative aspects for research performance, it is concluded that the practice can favor an outstanding position in research for the institution. In addition, we believe that the coordinators' shift to non-Brazilian universities may have influenced the fact that their universities of origin offer doctoral programs or not. Thus, it is possible that the shift to reputable universities contributes to improve accounting research and the grade of the doctoral programs at their universities of origin.
Key words: Academic Inbreeding; Coordinators; PPGCC.

Edmery Tavares Barbosa
M.Sc. in Accounting from Regional University of Blumenau (FURB) and Professor at Federal University of Paraíba (UFPB). **Contact:** Cidade Universitária, Departamento de Finanças e Contabilidade, Universidade Federal da Paraíba, Castelo Branco, João Pessoa (PB), CEP: 58051-900.
E-mail: edmerytb.ufpb@gmail.com

Micheli Aparecida Lunardi
M.Sc. in Accounting from Regional University of Blumenau (FURB)
CAPES grantee at Regional University of Blumenau (FURB). **Contact:** Rua Antônio da Veiga, 140, Itoupava-Seca, Blumenau (SC), CEP: 89030-903.
E-mail: michelilunardi01@gmail.com

Luana Sara Bizatto
M.Sc. in Accounting from Regional University of Blumenau (FURB) and Professor at Education Center for Young People and Adults. **Contact:** Rua Engenheiro Paul Werner, 608, Itoupava-Seca, Blumenau (SC), CEP: 89030-100.
E-mail: luanasarabizatto@hotmail.com

Vania Tanira Biavatti
Ph.D. in Social-Political Sciences from Pontifícia Universidade Católica de São Paulo (PUC-SP) and Professor at Regional University of Blumenau (FURB). **Contact:** Rua Antônio da Veiga, 140, Itoupava-Seca, Blumenau (SC), CEP: 89030-903.
E-mail: vania@hprada.com.br

Published in Portuguese and English. Original Version in Portuguese.

Received in 8/30/2017. Ask to Revise on 4/8/2018. Resubmitted on 4/12/2018. Accepted on 5/2/2018 by Dr.ª Márcia Maria dos Santos Bortolocci Espejo (Assistant Editor) and by Dr. Orleans Silva Martins (Editor). Published on 6/22/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

1. Introduction

Accounting research is recent Brazil and starts to develop after the creation of the first Graduate Program in Accounting (PPGCC) at the School of Economics and Business Administration of the University of São Paulo (FEA/USP). As a result, the country still has few professors holding a doctoral degree, making it difficult to define the identity of Brazilian accounting research (Frezatti, Aguiar, Araujo & Malagueño, 2015; Lima, Oliveira, Araújo & Miranda, 2015).

To foster greater reflection, interdisciplinarity, innovation, creation and maturation of accounting research, there is a need for stronger partnerships between Brazilian and international research centers. These partnerships may arise when teachers leave their institutions of origin to train in graduate programs in another location, contributing to the reduction of inbreeding among the faculty of a graduate program as announced by the Coordination for the Improvement of Higher Education Personnel (CAPES) (Frezatti, Aguiar, Araujo & Malagueño, 2015; Lima, Oliveira, Araújo & Miranda, 2015).

With the creation of undergraduate and graduate courses, the search for excellence and new knowledge that fosters creativity and interdisciplinarity increases, avoiding inbreeding in teacher training (CAPES, 2010). Inbreeding is the practice of hiring junior professors from the Master's and/or doctorate programs of the same institution (Braga & Venturini, 2013), which may influence the limitations found in the development of university research (Tavares, Cardoso, Carvalho, Sousa & Santiago, 2015).

Considering that university research develops critical functionalities, quality and advancement for an entire nation, it is also significant that university research is not restricted to a specific study center, as this restriction may limit the achievement of scientific and economic results. Therefore, it is relevant to study the impact of inbreeding, as it interferes directly in the generation of knowledge and in external environments (Horta, Veloso & Grediaga, 2010). In addition, there are few studies about the relationship between academic inbreeding and the performance of graduate programs, which theoretically make efforts to develop scientific research (Smyth & Mishra, 2014).

Empirically, we can mention Braga and Venturim (2013), who aimed to identify academic inbreeding in a graduate program in law at a public university in the State of São Paulo - Brazil and, for that purpose, used the taxonomy of academic career categories proposed by Horta (2013). According to the recent history of accounting research and the importance of Graduate Accounting Programs in teacher training and the need to discuss the inbreeding in those courses, the purpose of this study is to answer the following question: What is the relationship between inbreeding and the CAPES evaluation of Graduate Programs in Accounting?

Through the Horta (2013) taxonomy, the objective is to analyze the relationship between the type of inbreeding in the coordinators' education and the grades attributed in the CAPES evaluation of Graduate Accounting Programs in Brazil. The specific objectives are: a) to identify the types of inbreeding in the education of the program coordinators; b) to present the network of universities responsible for training the coordinators of the Master's and Doctoral programs, respectively; and finally c) to present the grouping of inbreeding types according to the CAPES grade for the Master's and Doctoral programs, respectively.

This study is justified by the lack of debate on the subject in the area of accounting. To date, the only research carried out on the subject is focused on the area of Law and was developed by Braga and Venturim (2013). In addition, according to Leite Filho (2008), it is necessary to analyze the profile of researchers or a certain area in order to identify their trajectory and thus, make projections on the possibilities of cooperation among institutions to strengthen accounting research. In addition, for the sake of justification and according to Nelson and Rosenberg (1993), universities are core elements of the knowledge economy, with fundamental importance for regional innovation. Thus, the importance of research and knowledge leads to the need to carefully examine the productivity of accounting researchers in Brazil.

2. Theoretical Framework

In this part, we present a critical reflection on the advantages and disadvantages of inbreeding, based on Horta's (2013) taxonomy. Inbreeding can be analyzed at different levels of education, including that of teachers graduated from different institutions, as well as graduate education, resulting in degrees obtained from more than one university (Stewart, 1992).

In the academic context, this phenomenon can be seen as a kind of "consanguinity" related to a certain "kinship degree" of the teacher with his university of origin or, according to Berelson (1960), academic inbreeding consists in the recruitment of academics by the same institution where they obtained their doctoral degree. According to the author, inbreeding is closely related to the concept of immobility, in which only those academics who work in the same university where they obtained their doctoral degree can be considered inbred, without having worked in any other university after the conclusion of their Ph.D.

It is necessary to re-examine and define the correct concept of academic inbreeding though as, in recent years, changes in science and higher education have taken place (Stewart, 1992; Horta, 2013). In view of comprehension difficulties, Horta (2013) proposed a taxonomy to distinguish the types of academic inbreeding. For a better understanding of the types of inbreeding, in Table 1, the categories and their respective explanations can be identified, which show the degree of inbreeding present for each category.

Categories	Explanation
Pure Endogenous	Academic career (undergraduate, Master's and doctoral) and teaching activities at the same university.
Mobile Endogenous	Teaching activity and undergraduate degree at the same university, but at least doctoral degree at another university.
Non-endogenous	At least the teaching activity at the university differs from the undergraduate university and the doctoral degree differs from both.
Adherent (non-endogenous)	Teaching activity and doctoral degree at the same university, but at least undergraduate degree at another university.
Silver ribbon	Teaching activity at the same university where the doctoral degree was granted. Start of the academic career at a different university from the institution where the doctoral degree was obtained.

Picture 1. Taxonomy of academic career categories.

Source: Adapted from Horta (2013).

The inbreeding is not only characterized in the teacher's individual context, but in the group of the universities, which also influence and stimulate this consanguinity. According to Altbach, Yudkevich and Rumbley (2015), older institutions have higher levels of inbreeding. The elite universities, generally large institutions, tend to have higher inbreeding rates than the others, as there is a trend to hire Ph.D.'s from these same universities (Stewart, 1992).

According to Horta, Sato and Yonezawa (2011), elite universities can hire their own doctors because, through this practice, they can achieve better research products and enhance their teaching skills. If these universities, with the presence of inbreeding, become part of the elite, they can maintain a position considered almost monopolistic, aggregating in their institution a renowned capacity to produce Ph.D.'s (Belreson, 1960). Therefore, there may be a connection between academic inbreeding and the prestige of universities.

The positive aspects of academic inbreeding include the stability and consolidation of collaborative agendas when the university is still in an early stage (Pan, 1993; Morichika & Shibayama, 2014, Gorelova & Lovakov, 2016). In addition, Higher Education Institutions (HEIs) often maintain bonds with their academics because they aim to guarantee their values, practices, myths, beliefs and symbols and, consequently, to preserve their own identities, as well as present more bureaucratic management. In addition, Horta *et al.* (2011) emphasize that the reality of the inbreeding for universities to become true ivory towers, made up of considerable knowledge and prestige, and because of their positions, therefore distances them further from the needs of society.

In addition, hiring academics can reduce hiring processes, containment costs, hiring uncertainties per se, and possibly allow for more efficient use of human resources and knowledge. Studies such as Pan (1993) and Altbach, Yudkevich and Rumbley (2015) found that, in dozens of countries, inbreeding is common practice, but it is also a way to maintain their best intellectual talents. In addition, according to Gorelova and Lovakov (2016), low academic salaries prevent young academics from moving to other regions where there are more universities, strengthening the interest in the best students and Ph.D.'s of the university.

In studies such as Eisenberg and Wells (2000), Sivak and Yudkevich (2008) and Horta *et al.* (2010) (Mexico), however, it was identified that inbreeding has a negative effect on research productivity. In particular, Eisenberg and Wells (2000) found that pure endogenous faculty members were cited between 7 and 13% less than other faculty members who did not fall into this category.

Inanc and Tuncer (2011) found through a binomial model that academic consanguinity has a negative influence on scientific efficacy. The authors also identified that there is a negative and statistically significant correlation between an individual's productivity and the percentage of pure (pure endogenous) teachers.

In the research by Horta *et al.* (2010), the authors discovered that the college with a greater presence of pure endogens produced 15% less peer-reviewed articles than other teachers who did not belong to this inbreeding classification. Similarly, Sivak and Yudkevich (2008) found that academics hired from other universities were more likely to publish in higher-ranking national magazines, whereas those hired from the home university tended to publish in less successful local journals.

In Asia and Europe, academic inbreeding has been severely criticized (Smyth & Mishra, 2014). Inbreeding may be a reflection of academic corporatism, as a way of favoring candidates who maintain a closer relationship with their structure and faculty. Therefore, the university can recruit its own academics, even when outside candidates achieve superior results. Thus, with the presence of a strong link between universities and academics, institutions can control external groups' access to professions and approve more formal controls and, with this practice, make it difficult to diversify knowledge, improve techniques, creativity and make it impossible to break paradigms (Stewart, 1992; Pan, 1993; Sivak & Yudkevich, 2008; Altbach *et al.*, 2015).

The presence of academic inbreeding may lead to insufficient dedication of teachers to research, having dedicated themselves more to the exercise of their functions, to teaching and extension. Likewise, in addition to academic inbreeding, the institutional inbreeding, which refers to the universities maintaining a more central posture, not being very open to other scientific contexts, can also limit productivity in the whole (Horta *et al.*, 2010; Morichika & Shibayama, 2014; Altbach *et al.*, 2015).

Academics considered to be less mobile are characterized by a greater degree of inbreeding. They exchange more information oriented towards the inside of their own university, presenting less scientific productivity. On the other hand, the more mobile academics have a lower degree of inbreeding, validated by the exchange and passage through other national or international institutions, and which consequently strengthens scientific production (Braga & Venturini, 2013). In this sense, Frezatti *et al.* (2015) reinforce the need for international partnerships, especially for teachers to develop fluency in English or another foreign language, as this aspect may help to promote research on Brazilian companies in the international environment.

Tavares *et al.* (2015) argue that new institutionalists say that institutions should reject individual rationality and methodological individualism because the social world is made up of social actors who are "providing" cultures. There are institutions who limit themselves to a culture of their own though, without fully adding culture and, to break this culture of inbreeding, there needs to be an opening to the world external to the institution.

In the research by Altbach *et al.* (2015), however, it was concluded that there is no general consensus about the effects of academic inbreeding when analyzing eight countries (China, South Africa, Spain, Japan, Russia, Slovenia, Ukraine and Argentina). The authors argue that, while some teachers considered as pure endogenous can be equally productive in a similar way to their peers, they are generally more susceptible to the standards and values of their location, and therefore tend not to innovate.

Specifically countries such as Japan and Slovenia believe that the preference for internal candidates is only considered when the internal candidate truly shows to be considerably more qualified than external candidates (Altbach *et al*., 2015). Horta and Yudkevich (2016) and Gorelova and Lovakov (2016) emphasize that the practice of inbreeding is considered appropriate especially when higher education systems are in the process of building knowledge capacity, or when academic job markets are not open and developed yet.

In the study by Smyth and Mishra (2014), no significant difference between research performance and academic inbreeding was found, even though there are conceptual arguments in favor of a positive or negative relationship with the research performance. Gorelova and Lovakov (2016) found that academic inbreeding does not influence the research productivity of Russian teachers, but also found that especially faculty members who work at the university where they obtained their doctoral degree are more productive in publishing than pure endogenous and non-endogenous academics.

Gorelova and Lovakov (2016) emphasize that the relationship between academic inbreeding and research productivity is broader, as it is important to consider the organizational effects on inbreeding (Smyth & Mishra, 2014), where it may possibly to explain this lack of relationship, or even the changes in academic systems over time (Gorelova & Lovakov, 2016). In addition, Horta and Yudkevich (2016) argue that academic inbreeding can possibly be considered a social phenomenon, as this type of inbreeding is not always to be considered as detrimental to the development of higher education systems.

Among the positive consequences, academic inbreeding is related to the consolidation of scientific and academic teams and to organizational stability (Horta & Yudkevich, 2016). When institutions no longer have that much difficulty in attracting their best candidates, the universities' flexibility is important because changes contribute to strong institutional identities, organizational stability and values (Horta & Yudkevich, 2016).

3. Methodological Procedures

Considering the typology of Raupp and Beuren (2006), this research is classified as descriptive and quantitative. Table 1 shows the number of graduate accounting courses in Brazil by region.

Table 1
Number of Graduate Accounting courses by region

Region	States	Number of Master's courses	Number of Doctoral courses
Northeast	PB	1	1
	PE	2	1
	RN	1	0
	BA	1	0
	CE	2	0
South	PR	3	1
	SC	3	2
	RS	1	1
Southeast	RJ	3	1
	MG	2	0
	SP	5	2
	ES	3	1
Central-West	DF	1	1

Source: Research data.

According to the Brazilian National Association of Graduate Accounting Programs (ANPCONT), there are currently 28 Graduate Programs in Accounting and Controllership in Brazil. Of this total, four correspond to Professional Master's; 11 offer Master's and doctoral programs and 17 only Master's.

According to the purpose of the study, it was decided to exclude the four Professional Master's from the sample as, according to Moreira (2004), the Professional Master's Degree aims at "professional action", differently from the Academic Master's degree, which consists of the preparation of a professional researcher, which is more related to productivity in scientific research, contributing to the investigation proposed in this study. Thus, the research sample considers the 24 institutions that offer an academic master's degree and/or doctoral degree.

In relation to the evaluation of the master's and doctoral degrees, the classification of the grade of graduate courses in the period 1976-1997 was alphabetical from A to E, in which the courses that received grade A were considered courses of international standards. From the year 1997 onwards, the alphabetical scale was replaced by the numerical scale from 1 to 7, in which grade 3 is considered a satisfactory standard to implement the course. Courses that already receive grade 6 or 7 are seen as courses of international standards, and particularly grade 5 is considered the maximum national level. Courses with grade 6 or 7 need to be evaluated in a time period longer than three years. Thus, the courses that have grades 3, 4 and 5 are evaluated in three years and grades 6 and 7 in five years (CAPES, 2010).

In Table 2 below, the criteria can be identified, ranging from faculty to studies published internationally.

Steps	Grade Scale	Criteria Assessed
Brazilian insertion	Grades 1 to 5	Teaching staff, Research activities, Educational activities, Dissertations and Theses and Intellectual production.
International insertion	Grades 6 and 7	Agreements, Invitations for courses/lectures abroad, Participation in journal boards and/or scientific congress committees, Reception of foreign students, Studies published for international circulation.

Picture 2. Classification of course grades through CAPES evaluation process

Source: Adapted from Horta and Moraes (2005).

The publications should seek originality, technological innovation, qualified by a Commission that is a reference in the area. To achieve grades 6 and 7, it is necessary to observe publications, international insertion of the program in a collective manner and individual international insertion of teachers in the teaching staff (Horta & Moraes, 2005).

In the use of the CAPES criteria and grade scale, of the PPGCC presented in Table 1, only USP presents grade 6, while the remained presents grade 4, both for the Master's and doctoral programs. In relation to the Brazilian regions, it is evident that the Southeast region concentrates the largest number of institutions offering Graduate programs. Both the Southeast and South have four Master's and doctoral programs at the same time though.

In order to verify the existing relationships between the coordinators of the Graduate courses and the places where they obtained their respective Master's and doctoral degrees, a network analysis was carried out with the support of UCINET software, in order to achieve the second specific objective. Network analysis is the means to carry out a structural analysis whose purpose is to show the extent to which the network shape explains the phenomena analyzed. Thus, it is intended to show that the function of a relation depends on the structural position of the links, in which a network consists not only of the sum of relations, but exerts influence on each relation (Degenne & Forse, 1994).

In order to reach the study objective, which is to analyze the relationship between the type of inbreeding in the coordinators' education and the grade attributed after CAPES' evaluation of the Brazilian PPGCC, first, a descriptive analysis will be carried out to verify whether or not there is inbreeding and which is the predominant type. Subsequently, the data analysis was performed using SPSS. Simple Correspondence Analysis (ANACOR) was used to identify the relationship between the taxonomy of academic inbreeding of the Graduate program coordinators and the concepts CAPES assigned to each graduate program, in order to fulfill the third specific objective of the study.

Correspondence analysis is a technique that uses a perceptual map, making associations between non-metric categorical variables so as to visually reveal the data structure (Hair, Black, Babin, Anderson & Tatham, 2009). ANACOR allows the graphical representation of the nature of the existing relationships, distributing the data and providing their coordinates, in which the associated levels tend to approach one another.

For the descriptive analysis and correspondence analysis of the academic inbreeding taxonomy, the categories proposed by Horta (2013) were adapted, considering some modifications of this classification in this study, according to the information that was obtained on the academic background and the current coordinator's teaching activities. In search of evidence from the institutions where the coordinators obtained their Master's and doctoral degrees, this information was collected in their Lattes curricula. After processing the data and elaborating the relationships matrices, they were inserted in UCINET® 6.610, in order to organize the data related to the networks, showing the concentration of the universities that absorb the coordinating teachers in the accomplishment of their respective Master's and doctoral programs.

Academic inbreeding was analyzed in relation to the education and career of the Graduate program coordinators in each region of Brazil, according to the data collected in the Lattes curriculum. As some of the Brazilian universities do not offer Master's and doctoral programs, they were classified according to levels of inbreeding. After the information was collected, the appropriate classifications of the endogenous type were performed, thus reaching the first specific objective of the study, as presented in Table 2.

Table 2
Classification of inbreeding by Graduate coordinators

Academic career categories	Number of coordinators
Mobile endogenous	8
Non-endogenous	8
Pure endogenous	2
Adherent	5

Source: Research data.

From the data presented in Table 2, it can be observed that most of the coordinators of the Brazilian Graduate courses are characterized as Mobile Endogenous and Non Endogenous, both categories with eight coordinators. Thus, one can verify that the teachers who are coordinating the graduate programs serve as professors at the same university but obtained their doctoral degree from another university or their teaching activities in the university differ from the university where they obtained their undergraduate degree and the university where their obtained their doctoral degree differs from both. There were five coordinators in the Adherent category, in that the teachers included in this group work in the same university where they obtained their doctoral degree, while their undergraduate came from another university. Table 3 shows the universities with their respective Master's and doctoral degrees.

Table 3

Ranking of universities according to CAPES grade in 2016

Region	Universities	Capes grade	
		Academic Master's	Doctoral
Northeast	UFPB	–	–
	UFRPE	3	–
	UFPE	4	4
	UFRN	3	–
	UFBA	3	–
	UFC	–	–
South	UFPR	4	4
	Unioste	3	–
	Unoesc	–	–
	UEM	3	–
	UFSC	4	4
	Unhochapecó	3	–
	FURB	4	4
	Unisinos	–	–
Southeast	USP	6	6
	Umesp	–	–
	Facesp	–	–
	Unifecap	4	–
	UFRJ	5	5
	UFF	–	–
	IBMEC	–	–
	FGV	–	–
	Uerj	–	–
	UFU	3	4
	UFMG	4	4
	UPM	–	–
	USP/RP	4	4
	PUC/SP	3	–
	Fucape	4	4
	Ufes	3	–
Central-West	UnB	–	–

Source: CAPES (2016).

According to Table 3, we can notice that the university with the highest CAPES grade is USP, the sole institution to obtain grade 6 for the Master's and doctoral programs. In addition, UFRJ presents the second highest CAPES grade, receiving grade 5 for the Master's and doctoral programs. Some of the universities offer no academic Master's and doctoral programs acknowledged by CAPES, such as UFC, UNOESC, UERJ, UPM, FGV, UMESP, IBMEC and UFF. Also, the universities that offer a Master's program with minimum grade 3 normally do not present doctoral programs, such as UFRPE, UFRN, UFBA, UNIOESTE, UEM, UNOCHAPECÓ, PUC/SP and UFES, which possess CAPES recognition, except for UFU, which offers a Master's program grade 3 and a doctoral program grade 4.

The remaining universities offer both Master's and doctoral programs that received grade 4, such as UFPE, UFPR, UFSC, FURB, UFMG and FUCAPE. It should be highlighted, however, that the cluster of UNB-UFPB-UFRN-UFPE presents a Multi-institutional Program, with grade 5 for the Master's and doctoral programs, similar to the evaluation of UFRJ.

4. Analysis of Results

For the data analysis, two procedures were adopted. First, the network analyses were presented to observe the behavior of the teachers' educational trajectory, in this case separated between the coordinator and deputy coordinator of the PPGCC. Then, the perceptual map was elaborated to analyze the relation between the type of inbreeding and the CAPES grade for the Master's and doctoral programs separately. This criterion was adopted due to the fact that the Master's and doctoral evaluations present different aspects, in accordance with CAPES' institutional criteria.

4.1 Network Analysis

Figure 1 highlights the network between the coordinators and the places where they obtained their Master's degree.

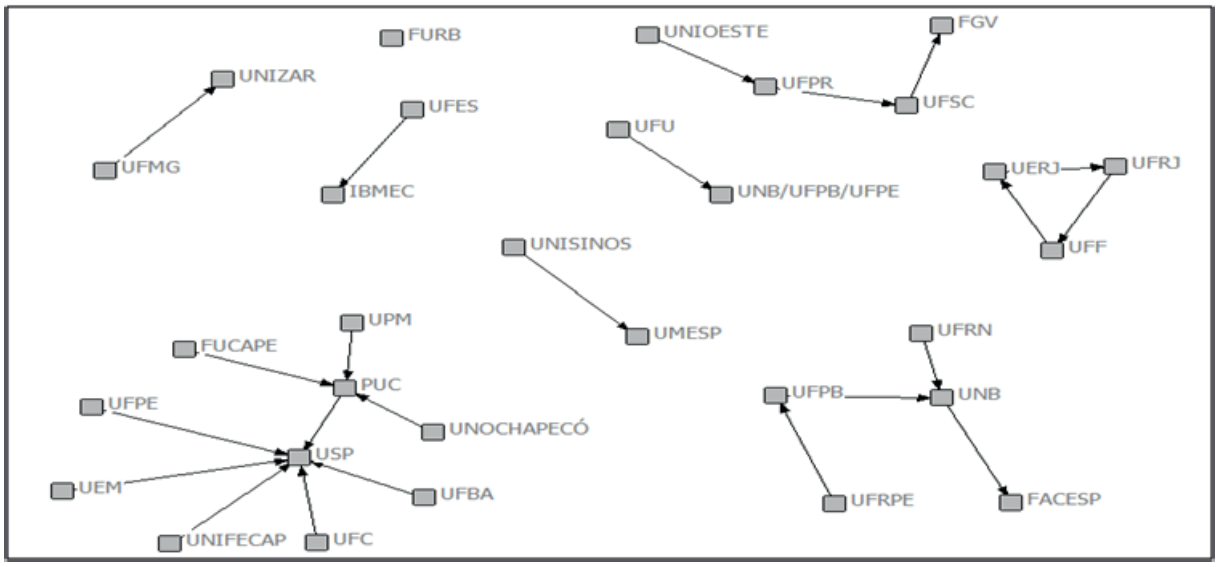


Figure 1. Networks in Master's Programs in Accounting in Brazil

Source: Research data.

In Figure 1, it can be verified that there is a concentration of coordinators who obtained their Master's degrees at USP, which is the only university in Brazil to present CAPES "Grade 6". This is due to the fact that this university is the pioneer in the development of accounting research in Brazil and a reference in the quality of teacher training. In addition, not only coordinators who graduated from USP are moving to other universities, that is, USP is characterized according to the adaptation of Horta's taxonomy (2013) as pure endogenous.

This result in relation to USP is in accordance with Altbach *et al.* (2015), who argue that the eldest institutions generally tend to be more endogenous; and with Stewart (1992), who argues that in larger or so-called elite universities, they usually hire their own doctoral graduates as, through this practice, they tend to maintain their positions in research, as well as the recognition that they have one of the greatest capacities to produce doctoral graduates. The universities related to USP include UFPE, UEM, UNIFECAP, UFC, UFBA and PUC. Three of the universities related to USP coordinate institutions located in the Northeast: UFPE, UFBA and UFC.

It is observed that, in the universities FURB and USP, the coordinators obtained their Master's from the same university they work at. Note that UNB and PUC both graduated three coordinators of Graduate programs, i.e. UFPB, UFRN and FUCAPE, UNOCHAPECO, UPM. In relation to the coordinators of the universities in the State of Rio de Janeiro, such as UFF, UERJ and UFRJ, these tend to remain in their regions to take their master's degrees.

In addition, two professors who currently serve as coordinators of the PPGCC in the states of Rio Grande do Norte (RN) and Paraíba (PB) have been awarded a master's degree at the University of Brasília (UNB), probably as a result of the creation of the Multi-Institutional Program UNB-UFPB-UFRN-UFPE, which joined to contribute to teacher training in the Northeast. Therefore, USP and UNB are the institutions responsible for the academic training at Master's level of the teachers who today coordinate the PPGCC in the Northeastern states, which certainly contributed to the strengthening of undergraduate courses in accounting and therefore provided for the creation of the PPGCC. This evidence is confirmed by the last class that graduated from the Multi-Institutional Program at the end of 2015, with UFPB and UFRN being the last institutions to leave the agreement and create their own Master's programs.

Figure 2 shows if the inbreeding in the coordinators' doctoral degree presents diversity in the search for the PPGCC to take the doctoral program.

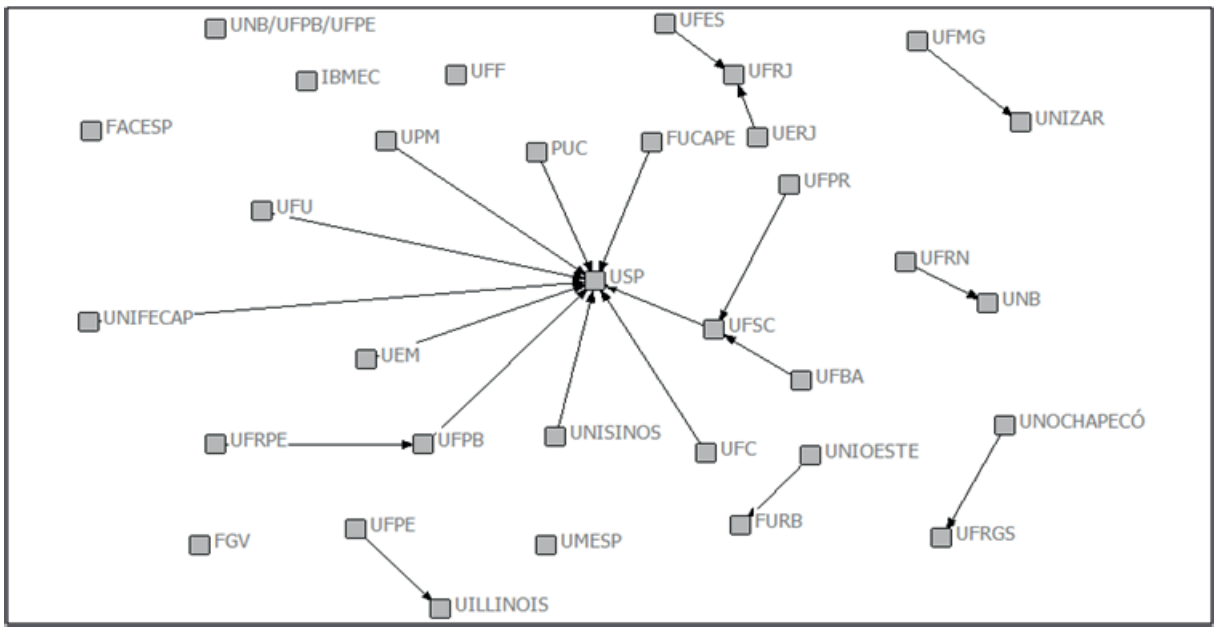


Figure 2. Networks in Doctoral Programs in Accounting in Brazil

Source: Research data.

In Figure 2, we can see that the highest concentration of doctoral degrees among the coordinators of the Graduate courses is found in USP, with ten coordinators who graduated from that institution. UFSC and UFRJ both graduated two coordinators in their doctoral programs.

FURB, a university in the South, presents only pure inbreeding, with partial similarities with USP, from which the university seeks to hire its own academics to serve on its teaching staff (Smyth & Mishra, 2014), as both coordinators took their undergraduate, Master's and doctoral degrees and work at their university of origin. This is possibly due to being one of the few universities in Brazil that presents CAPES grade 4 in the doctoral program. In addition, UFRJ, a university in the Southeast with grade 5, can also be characterized as pure endogenous.

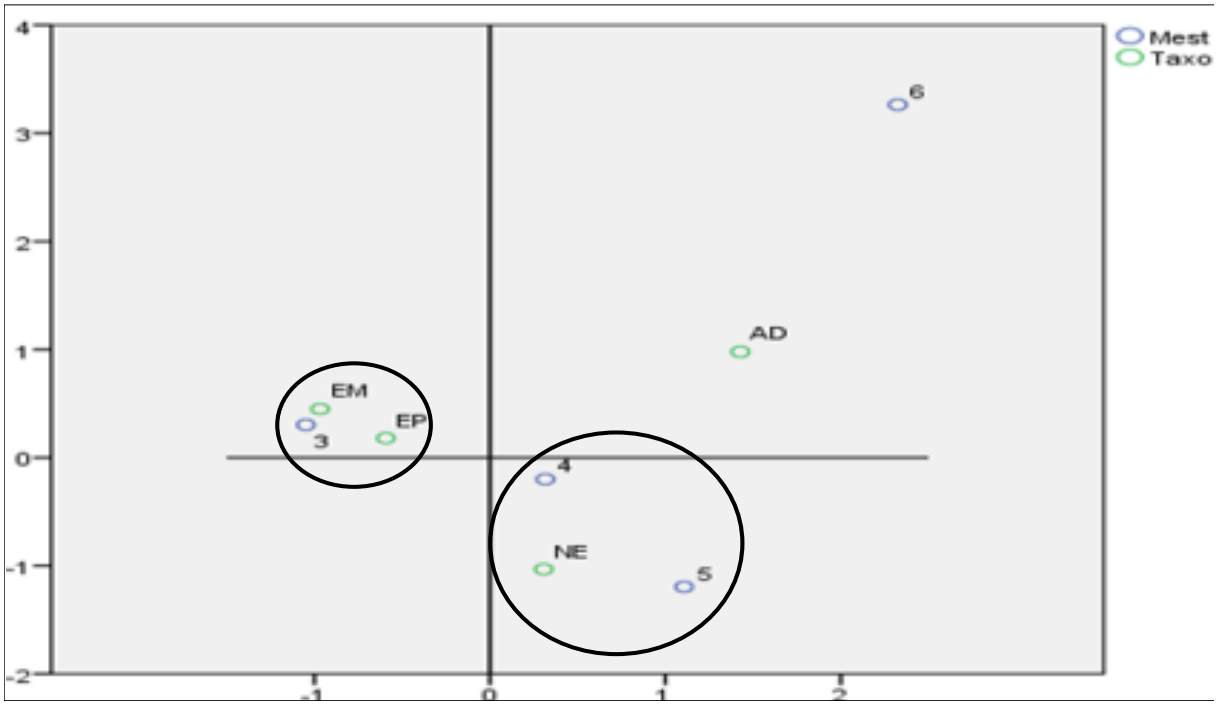
We can highlight some more evidence regarding the universities that present grade 4 in the doctoral program. It is noteworthy that UFPE, with grade 4, is related to a foreign university, in this case the University of Illinois in Chicago, just like UFMG (grade 4 in the doctoral program) is related to Unizar, the University of Zaragoza, located in Spain. In relation to FUCAPE, UFSC and UFU, which also received grade 4, these are related to USP, and particularly UFPR is linked with UFSC.

As evidenced by the results of the study, the displacement to the best universities tends to increase the universities' CAPES grade, as even though UFRN, UNOCHAPECÓ, UFRPE, UNIOESTE, UFES and UERJ are not pure endogenous, they do not offer doctoral programs, possibly due to the fact that they travel to UNB, UFRGS, UFRJ and UFRJ, respectively, which present lower CAPES grades than USP.

4.2 Perceptual map

In order to verify the relationship between the taxonomy of academic inbreeding of the Master's program coordinators and the CAPES grade, Correspondence Analysis (ANACOR) was used.

The ANACOR application generated a perceptual map, presented in Figure 3.



Legend: Mast: Master's. Taxo: Taxonomy. EM: Mobile Endogenous. NE: Non-Endogenous. EP: Pure Endogenous. AD: Adherent

Figure 3. Perceptual map of Master's Program in Accounting in Brazil

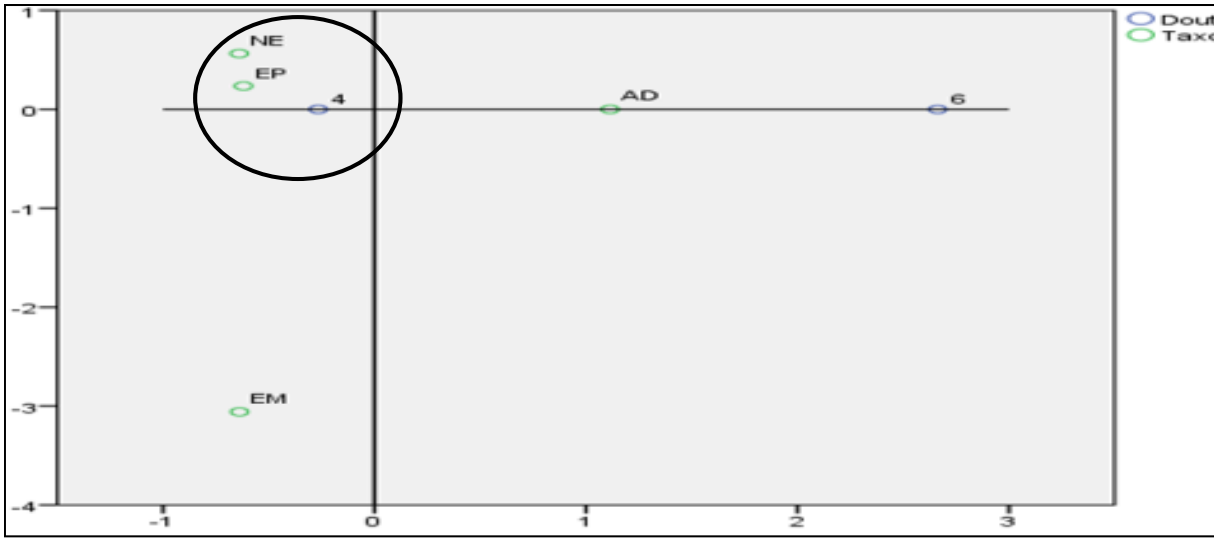
Source: Research data.

As observed in Figure 3, there is proximity between the categories Mobile Endogenous and Pure Endogenous with "Grade 3", thus constituting a cluster and revealing the relationship between these variables. Note that in this cluster in the perceptual map that the lowest grade obtained from CAPES is linked to the inbreeding category presented by Horta (2013). Thus, it can be inferred that the academic trajectory, which basically involved undergraduate, Master's and doctoral programs; and teaching at the same university, together with teaching and undergraduate degree at the same university, and only a doctoral degree at another university, are related to lower grades.

These results in Brazilian universities can justify the arguments and findings of research such as Sivak and Yudkevich (2008), Smyth and Mishra (2014), Morichika and Shibayama (2014), which identified that inbreeding has a negative effect on research productivity, and consequently has an impact on the scientific community. Inanc and Tuncer (2011) also verified the negative effect of inbreeding in identifying that there is a negative and statistically significant correlation between the productivity of an individual and the percentage of pure endogenous academics. Thus, the presence of academic inbreeding can characterize teachers' lack of dedication to research, also indicating that these teachers are more dedicated to the exercise of their functions, as well as to teaching and extension, according to Horta *et al.* (2010) and Altbach *et al.* (2015). Moreover, according to Smyth and Mishra (2014), academic inbreeding has been widely criticized in Asia and Europe.

On the other hand, one perceives closeness between "Grade 4" and "Grade 5" and the Non Endogenous. That is, the coordinators who completed their Graduate program in other universities are in charge of programs with higher CAPES grades. Therefore, this evidence is associated with arguments by Braga and Venturini (2013), who argue that more mobile teachers tend to strengthen scientific production. Regarding the degree of inbreeding attributed to adherents, this was not related to any CAPES grade.

These evidences obtained through the perceptual map allow us to infer that the coordinators' inbreeding influences the CAPES grades. In addition, as verified, the Master's program with grade 6 distances itself from the other grades and categories of inbreeding. In Brazil, the only course with concept 6 is the PPGCC at USP. Next, the same comparison will be made with the coordinators of the doctoral programs, as displayed in Figure 4.Figure 4: Perceptual map of Doctoral Programs in Accountancy in Brazil, the only course with the coordinators of the doctoral programs, as displayed in Figure 4.



Legend: Doct: Doctoral. Taxo: Taxonomy. EM: Mobile Endogenous. NE: Non-Endogenous. EP: Pure Endogenous. AD: Adherent

Figure 4. Perceptual map of Doctoral Programs in Accountancy in Brazil

Source: Research data.

The data presented in Figure 4 show that CAPES "grade 4" in the doctoral programs is closer to the categories of non-endogenous and pure endogenous, showing that the programs with "grade 4" are coordinated by teachers who got a doctoral degree from a different university as the institution where they took their undergraduate program.

Overall, it is noteworthy that the possible negative effect of inbreeding on CAPES grades is more evident only in the Master's programs as, specifically in doctoral programs, no relations could be established between adherent and mobile endogenous academics and the CAPES grades. Besides, the highest degree of inbreeding, attributed to the pure endogenous, and the lowest, attributed to the non-endogenous, are associated with the same concept.

Therefore, in doctoral programs, inbreeding may be a practice intended to maintain the best intellectual talents of the university, as explained by Pan (1993) and Altbach *et al*. (2015), as can also be observed in the network analysis in the doctoral programs at USP and FURB, which are characterized as pure endogenous. In addition, the non-association between academic inbreeding and research productivity may also be due to other, more influential variables, as Smyth and Mishra (2014) and Gorelova and Lovakov (2016) argue, which cite variables such as organizational effects and changes that happen in the academic systems.

5. Final Considerations

This research aimed to analyze the relationship between the type of inbreeding in the training of the coordinators, as determined by the Horta (2013) taxonomy, and the CAPES grades of the Graduate Accounting Programs in Brazil. According to a general objective, the specific objectives were outlined, which consisted of: a) the identification of the types of inbreeding in the education of those programs' coordinators; b) presentation of the network of universities responsible for training the coordinators and, finally; c) presentation of the distribution of inbreeding types according to the CAPES grade of the respective PPGCC.

Through this study, the importance of traditional universities such as USP and UNB in the academic training at the Master's and doctoral level of the current PPGCC coordinators could be observed. According to a perceptual map of the Master's level, with the application of the CAPES grades, USP has particularities not found in other Brazilian universities, and its inbreeding is considered pure (according to the identification of endogenous types in the first specific objective), despite being the only university with grade 6. This distance of USP due to its particularity is also verified in the perceptual map at the doctoral level, so that the institution cannot be grouped with other grades. The perceptual maps permitted achieving the third specific objective.

Especially USP is a reference for accounting research in Brazil. The network analysis revealed that this university is classified as pure endogenous. Thus, although studies contained in the literature review point out that inbreeding is often a negative aspect of research performance, especially in reference universities, this practice allows the institution to maintain its prominent position in research development. Therefore, the inbreeding found in USP has revealed positive characteristics, being the oldest university in Brazil by the year of creation of the PPGCC, and showing the best grades in the country. For this reason, hiring its best talent maintains its position in the Brazilian scientific productivity ranking.

Through the network analysis, we could verify if the coordinators (if there was a coordinator and a deputy) remained in their universities of origin to take a Master's program, as well as to take a doctoral program, in a separate analysis. The coordinators of USP and FURB also completed their academic careers (undergraduate, Master's and doctoral degrees), respectively, at USP and FURB, serving as teachers, that is, they can be characterized as pure endogenous. Thus, the second specific objective was accomplished.

Most of the PPGCC coordinators of the Brazilian universities observed in the network analysis are mobile endogenous or non-endogenous, having taken their Master's and doctoral program at other universities than their institutions of origin. It is also observed through the perceptual maps that the presence of inbreeding may negatively influence the research productivity in the Brazilian Master's programs in Accounting. In the doctoral programs, however, this inbreeding aspect may not be as relevant, as grade 4 admitted both the presence and absence of academic inbreeding. It was verified, however, that the choice in favor of the displacement of the coordinators may have influenced grade 4 in the doctoral programs, as those who migrated to non-Brazilian universities or to USP, or were pure endogenous, presented doctoral programs, unlike the other institutions which only presented Master's programs or neither of both.

Nevertheless, in the perceptual map of the Master's programs, other universities that present a certain degree of inbreeding (pure and mobile endogenous) had grades 3, while grades 4 and 5 were more related to non-endogenous universities (non-endogenous teachers). Therefore, as the other universities are more recent than USP, the inbreeding can influence their performance in scientific development negatively; in contrast, universities with greater openness to the external world, that is, less endogenous, are better able to raise their levels of scientific production.

In the perceptual map of the doctoral programs, results are slightly different in relation to the Master's degree. In addition to grade 6, one can perceive grade 4, which is composed of pure non-endogenous and endogenous universities, that is, the presence or not of inbreeding was not determinant specifically for this grade at the doctoral level. Thus, in relation to the doctoral programs, other factors such as organizational effects and changes in academic systems may be more associated with research productivity than academic inbreeding. For grades 3 and 5, no significant results were obtained.

As a limitation of the study, the research was focused only on the coordinators and deputy coordinators' profiles in the PPGCC, without considering the other faculty who serve on the teaching staff in these programs, nor did we go deeper into details about their research areas and publications. One of the contributions of the study is the use of the CAPES evaluation variable instead of analyzing the teachers' level of scientific production though (number of publications), similar to other studies (Inanc & Tuncer, 2011; Horta, 2013; Morichika & Shibayama, 2014; Smyth & Mishra, 2014).

The research also contributes to the understanding of the consequences of inbreeding in Brazil. The results help to adjust the universities' incentive and hiring policies, and consequently to increase the college teachers' productivity. As suggestions for future research, the use of other performance variables in research should be considered to analyze the influence of academic inbreeding on scientific productivity, as well as the consideration of possible moderating variables of this relationship, such as changes in academic systems and other relevant variables.

6. References

Altbach, P. G., Yudkevich, M. & Rumbley, L. E. (2015). Academic inbreeding: local challenge, global problem. *Asia Pacific Education Review*, *16*(3), pp. 317-330. doi: http://dx.doi.org/10.1007/s12564-015-9391-8

Berelson, B. (1960). *Graduate education in the United States.* New York: McGraw-Hill.

Braga, M. M. S. & Venturini, A. E. J. F. (2013). Endogenia acadêmica em um programa de pós-graduaçao em direito. *MEZZAROBA, Orides; TAVARES NETO, José Querino; VASCONCELOS, Silvia Andréia (Coord.). Direito, educação, ensino e metodologia jurídicos. Florianópolis: FUNJAB*, 91-108. Recuperado em 23 de agosto, 2016 de http://www.publicadireito.com.br/artigos/?cod=30f0641c041f03d9

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. (2010). Plano Nacional de Pós-Graduação (PNPG) 2011-2020. Brasília, DF. Recuperado em 22 de agosto, 2016 de http://www.capes.gov.br/plano-nacional-de-pos-graduacao.

Degenne, A. & Forsé, M. (1994). Les réseaux sociaux. Une approche structurale en sociologie. *Paris: Armand Colin*.

Eisenberg, T. & Wells, M. T. (2000). Inbreeding in law school hiring: Assessing the performance of faculty hired from within. *The Journal of Legal Studies*, *29*(S1), pp. 369-388. doi: https://www.journals.uchicago.edu/doi/abs/10.1086/468077

Frezatti, F., Aguiar, A. B., Araujo, C. W. & Malagueño, R. (2015). A Pesquisa em Contabilidade Gerencial no Brasil: Desenvolvimento, Dificuldades e Oportunidades. *Revista Universo Contábil*, *11*(1), pp. 47-68. doi: http://dx.doi.org/10.4270/ruc.2015103

Gorelova, O. & Lovakov, A. (2016). Academic Inbreeding and Research Productivity Of Russian Faculty Members. *National Research University Higher School of Economics, pp.* . 1-37. doi: http://dx.doi.org/10.2139/ssrn.2778004

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. (2009). *Análise multivariada de dados*. Bookman Editora.

Horta, J. S. B. & Moraes, M. C. M. D. (2005). O sistema CAPES de avaliação da pós-graduação: da área de educação à grande área de ciências humanas. *Revista Brasileira de Educação*, *30*(4), pp. 95-116. doi: http://dx.doi.org/10.1590/S1413-24782005000300008

Horta, H., Sato, M. & Yonezawa, A. (2011). Academic inbreeding: Exploring its characteristics and rationale in Japanese universities using a qualitative perspective. *Asia Pacific Education Review*, *12*(1), pp. 35-44. doi: http://dx.doi.org/10.1007/s12564-010-9126-9

Horta, H., Veloso, F. M. & Grediaga, R. (2010). Navel gazing: Academic inbreeding and scientific productivity. *Management Science*, *56*(3), pp. 414-429. doi: https://doi.org/10.1287/mnsc.1090.1109

Horta, H. (2013). Deepening our understanding of academic inbreeding effects on research information exchange and scientific output: new insights for academic based research. *Higher Education*, *65*(4), pp. 487-510. doi: http://dx.doi.org/10.1007/s10734-012-9559-7

Horta, H. & Yudkevich, M. (2016). The role of academic inbreeding in developing higher education systems: Challenges and possible solutions. *Technological Forecasting and Social Change*, *113*, pp. 363-372. doi: http://dx.doi.org/10.1016/j.techfore.2015.06.039

Inanc, O., & Tuncer, O. (2011). The effect of academic inbreeding on scientific effectiveness. *Scientometrics*, *88*(3), pp. 885-898. doi: http://dx.doi.org/10.1007/s11192-011-0415-9

Leite Filho, G. A. (2008). Padrões de produtividade de autores em periódicos e congressos na área de contabilidade no Brasil: um estudo bibliométrico. *RAC-Revista de Administração Contemporânea*, *12*(2), pp. 533-554. doi: http://dx.doi.org/10.1590/S1415-65552008000200011

Lima, F. D. C., Oliveira, A. C. L., Araújo, T. S. & Miranda, G. J. (2015). O choque com a realidade: dormi contador e acordei professor. *REICE. Revista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, *13*(1), pp. 49-67.

Moreira, M. A. (2004). O mestrado (profissional) em ensino. *Revista Brasileira de Pós-Graduação*, *1*(1), pp. 131-142. doi: http://dx.doi.org/10.21713/2358-2332.2004.v1.26

Morichika, N. & Shibayama, S. (2014). Impact of inbreeding on scientific productivity: A case study of a Japanese university department. *Research Evaluation*, *24*(2), pp.146-157. doi: https://doi.org/10.1093/reseval/rvv002

Nelson, R. & Rosenberg, N., 1993. Technical innovation and national systems. In: Nelson, R. (Ed.), National Innovation Systems. Oxford University Press, Oxford.

Pan, S. (1993). *A study of faculty inbreeding at eleven land-grant universities*. Doctoral dissertation, Iowa State University, Ames, Iowa.

Sivak, Y. & Yudkevich, M. (2008). Academic inbreeding: pro and contra. *Educational Studies*, (1), pp. 170-187. doi: http://dx.doi.org/10.17323/1814-9545-2009-1-170-187

Smyth, R. & Mishra, V. (2014). Academic inbreeding and research productivity and impact in Australian law schools. *Scientometrics*, *98*(1), pp. 583-618. doi: http://dx.doi.org/10.1007/s11192-013-1052-2

Stewart, G. B. (1992). Institutional inbreeding among mathematics faculty in American colleges and universities. (Doctoral dissertation, University of North Texas, 1992). Dissertation Abstracts International, *53*, p. 2710.

Raupp, F. M. & Beuren, I. M. (2006). Metodologia da pesquisa aplicável às ciências sociais. *Como elaborar trabalhos monográficos em contabilidade: teoria e prática*. São Paulo: Atlas. *3*, pp. 76-97.

Tavares, O., Cardoso, S., Carvalho, T., Sousa, S. B. & Santiago, R. (2015). Academic inbreeding in the Portuguese academia. *Higher Education*, *69*(6), pp. 991-1006. doi: http://dx.doi.org/10.1007%2Fs10734-014-9818-x

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 3, p. 179-196, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1629

Academic Performance Analysis of Accountancy Students at FEARP-USP Served by INCLUSP/PASUSP

Abstract

Objective: This study aims to analyze whether there is a difference between the academic performance of accounting students at FEARP-USP who benefit from the bonus system on the USP entrance exam and that of non-benefitted students.
Method: A quantitative study was undertaken by applying analysis of difference of means to new students between 2010 and 2014.
Results: No significant differences of means were observed between the students who received the bonus or not, neither in the average grade with nor without fail marks. When considering the analysis of all subjects, however, a significant difference is observed in the average without fail marks, where the students with bonus demonstrate a higher performance. In addition, it is highlighted that the students who ranked better on the entrance exam, without considering the bonus, display a significantly higher academic performance.
Contributions: This study contributes to the field of study on affirmative actions by empirically analyzing the concerns studied in confrontation with the literature and the area on academic performance, discussing the impact of the variables "Affirmative Actions" and "Entrance Exam Ranking" on student performance.
Key words: Higher Education, Accounting Education, Affirmative Actions.

Claudio de Souza Miranda
Ph.D. in Controllership and Accounting from University of São Paulo (USP) and Professor at University of São Paulo at Ribeirão Preto (USP-RP). **Contact:** Avenida Bandeirantes, 3900, Monte Alegre, Ribeirão Preto/SP. CEP: 14040-905.
E-mail: csmiranda@usp.br

João Paulo Resende de Lima
Ph.D. candidate in Controllership and Accounting from University of São Paulo (USP). **Contact:** Avenida Professor Luciano, 908, Butantã, São Paulo/SP. CEP: 05508-010.
E-mail: jp.resendelima@hotmail.com

Matheus Canuto Marinello
B.Sc. in Accounting from University of São Paulo at Ribeirão Preto (USP-RP) and Auditor at EY Auditores Independentes.
Contact: Avenida Chedid Jafet, 75, 10º, Vila Olímpia, São Paulo/SP. CEP: 03178-200.
E-mail: matheus.marinello@gmail.com

Published in Portuguese and English. Original Version in Portuguese.

Received in 10/17/2017. Ask to Revise on 2/19/2018. Resubmitted on 4/8/2018. Accepted on 4/27/2018 by Dr.ª Márcia Maria dos Santos Bortolocci Espejo (Assistant Editor) and by Dr. Orleans Silva Martins (Editor). Published on 6/22/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

1. Introduction

According to article 205, Chapter III, Section I, of the Constitution of the Federative Republic of Brazil (1988), education is the right of everyone and the duty of the State and of the family, with the purpose of full development, preparation for the exercise of citizenship and qualification for work. The Federal Constitution of 1988 guarantees universal access only to basic education though - from kindergarten to high school, so access to higher education is achieved through the intellectual capacity and economic, social and financial conditions of each individual.

In Brazil, higher education has undergone profound changes, especially in terms of its expansion, which affected not only the availability of places, but also the profile of the population served (Franco, 2008). Despite the increase in the number of places available, access remains restricted for the low-income population, mainly because more than 70% of the available places are offered by the private sector (INEP, 2013) and lower-income students still see access to university as something almost impossible (Piotto & Nogueira, 2013). Given this scenario, it was necessary to create affirmative actions that encourage and facilitate the entry and permanence of the economically less privileged population in the country to Higher Education Institutions (HEIs).

The discussions about affirmative actions aimed at higher education in the Brazilian scenario began after 2002, when the state universities of Rio de Janeiro adopted the first quota system (Piotto & Nogueira, 2013). According to Pinheiro (2014), the main concern with the adoption of affirmative action to enroll students from the public education system is the drop in the quality of teaching, as the quota students tend to have a basic education level of lower quality and, supposedly, would not follow the development of the other students.

In order to verify if there is really a drop in the quality of teaching after the adoption of these affirmative actions, studies that involve the academic performance of the students benefited have been developed mainly in federal and state universities (Cardoso, 2008; Matos, Ferreira, Pinheiro & Dalmas 2010; Nabeshima, Machado, Martins, Coto & Dias, 2011; Dallabona, 2011; Bezerra & Gurgel, 2012; Waltenberg & Carvalho, 2012; Matos, Pimenta, Almeida & Oliveira, 2012; Peixoto, Ribeiro, Bastos & Ramalho, 2013; Piotto & Nogueira, 2013; Golgher, Amaral & Neves, 2014; Mendes Jr, 2014; Carvalho & Cerqueira, 2015).

The analysis of the literature review carried out by the authors indicates that performance data of accounting students have been investigated in a single study (Golgher, Amaral & Neves, 2014). In addition, a small number of specific evaluations exists on the academic performance of students who benefit from the bonus system on the entrance exam to the University of São Paulo (USP). In this line, only the work by Nabeshima *et al.* (2011), which evaluates students from the School of Dentistry between 2007 and 2010; and the work by Matos *et al.* (2012), which analyzed the data of students who entered 118 courses in 2007 were found.

Thus, the aim in this paper is to answer the following question: Are there differences in academic performance between students from the Accounting course at FEARP-USP, served or not by the USP bonus system?

Thus, the objective in this paper is to verify if there is a difference in performance between the Accounting students who benefitted from the social inclusion program or not at the School of Economics, Business Administration and Accounting at Ribeirão Preto. To achieve this goal, the averages of 11 subjects from the first year of FEARP's Accounting course were analyzed and statistical tests were performed to analyze possible differences among the students surveyed.

The study of affirmative actions is justified on the basis of the various concerns presented in the literature. The main concerns regarding affirmative actions include the possible drop in the entry of non-quota students and the possible drop in the quality of teaching, as the quota students tend to have a lower-quality educational background and supposedly would not follow the development of the other students (Pinheiro, 2014). There is also the fear that there is an overload in universities to meet those students with deficient basic education and that, as these students often come from low-income families, they usually work for their maintenance at the university, a factor that can increase the dropout rate (Dallabona & Schiefler Filho, 2011).

This paper is organized in five sections, starting with this introduction. The second part presents the discussion about Brazilian higher education and the affirmative actions present, while the third section presents the methodological design adopted to develop this study. Finally, the fourth and fifth parts present the results and discussion and the conclusions, respectively.

2. Theoretical Framework

In this part, texts are presented and discussed that supported the development of this study. First, Brazilian higher education is discussed in its current context, followed by the discussion about affirmative actions at the Brazilian universities. Finally, the University of São Paulo's Social Inclusion Program is presented.

2.1 Brazilian Higher Education: current context

The right to education was first established in 1948, in the United Nations Organization's (UN) Universal Declaration of Human Rights (ONU). In Brazil, the declaration of the Right to Education is established in article 6th of the Federal Constitution (1988) and, according to article 205th, education is a right of all and a duty of the State.

Although education is a right of all, universal access is only guaranteed for basic education – from kindergarten to secondary education -. Hence, equalitarian access to higher education is not guaranteed, and is achieved through individual intellectual capacity and social, financial and economic conditions. The economic and financial factors have gained a determinant role in the access to higher education due to the quality difference between public and private basic education (Castro & Leite, 2006) and the intense expansion movement of Brazilian higher education, in which the availability of places in the private sector surpassed that in the public sector. This affected not only the number of places, but also the profile of the attended population (Franco, 2008). Concerning the total number of places, data from the Department of Education (MEC) appoint that, since the 1980's, the private sector has been responsible for most, as shown in Table 1.

Table 1

Places available

Year	Public Sector		Private Sector		Total
	Places	%	Places	%	
1933	18,986	56.3	14,737	43.7	33,723
1945	21,307	51.6	19,969	48.4	41,275
1965	182,696	56.2	142,386	43.8	325,082
1985	556,680	40.7	810,929	59.3	1,367,609
2004	1,178,328	28.3	2,985,405	71.1	4,163,733
2009	1,523,864	25.6	4,430,157	74.4	5,954,021
2013	1,932,527	26.5	5,373,450	73.5	7,305,977

Source: INEP (2013)

Despite the expansion in the number of places, the lower income population continues with restricted access to higher education. According to Franco (2008), 50% of young people between 18 and 24 years of age whose family income exceeds five minimum wages are enrolled in higher education institutions, whereas only 12% of young people of the same age group whose family income is less than three minimum wages are enrolled in a higher education course.

As a result of the great expansion in the supply of private higher education, income has become a determining factor for access to these institutions, increasing the elitism of this level of education even further. The scenario in public institutions follows the same trend, as 70% of the students entering public institution belong to the 20% economically most privileged population in the country (Castro & Leite, 2006).

In that context, affirmative actions were necessary that encourage the entry and permanence of the economically less privileged population in Brazil, as higher education is a door towards the qualification of labor and, consequently, a synonym for a better life. This social ascent through education is based on the theory of human capital, which assumes that individuals with higher levels of education are more productive and receive higher wages (Alves, 2005).

Conceptually, affirmative actions "are intended to eliminate or reduce imbalances among social groups through actions in favor of these groups" (Dallabona & Schiefler Filho, 2011, p.2) and philosophically rest on distributive and compensatory justice (Bezerra & Gurgel, 2012). These actions can take various forms, such as voluntary or compulsory actions, public or private initiatives, and target audiences that vary according to the action (Dallabona & Schiefler Filho, 2011).

In recent times, in Brazil, most public universities are adopting some affirmative action and, according to Bezerra and Gurgel (2012, p. 5), this adoption of affirmative actions "aims, above all, to make it [the public university] a public place, which all Brazilians can have access to. They also seek to transform an equality de jure into an equality de facto". The authors also point out that the creation of quotas is an emergency measure and not a definitive measure for the issue of exclusion.

The creation of affirmative actions that encourage the entry and continuation of economically underprivileged students has generated great discussion in society and the academy. The main concerns are the possible decrease in the number of non-quota holders and the possible drop in the quality of teaching, as the quota students tend to have a lower quality education and, supposedly, would not accompany the other students' development (Pinheiro, 2014).

In this sense, both government and universities have been engaged in the creation of affirmative action programs. These actions include Federal Law 12.711/2012 - known as the Quotas Law - the Social Inclusion Program of the University of São Paulo, the University for All Program (PROUNI), the Student Financing Fund (FIES), among other actions taken at different universities.

2.2 Affirmative actions: The case of Brazilian universities

Based on Pinheiro's (2014) concern about the possible drop in teaching quality, several studies on the academic performance of the students entering through affirmative actions have been carried out. To begin the discussion, a definition is needed of what is meant by academic performance and whether socioeconomic variables - which give entitlement to affirmative action - and the way of entering higher education influence academic performance.

The academic achievement of a student can be defined as the result of an evaluation and can be expressed through a grade or concept (Munhoz, 2004). The simplest measures that can be used are scores on tests or subjects, besides more complete measures such as the average of a given period - such as a semester or a school year (Miranda, Silva, Lemos, Oliveira & Ferreira, 2015).

On the factors that can influence the academic performance of the students in business courses within the Brazilian territory, in the work by Miranda *et al.* (2015), it was identified that the students' characteristics are the main factor, among which the authors highlight the socioeconomic status. In the work by Ferreira (2015), the academic performance of Accounting students was analyzed through the grades obtained on the ENADE and, among the factors that influenced this performance at the "Student level", the variables income and form of admission can be highlighted. In this sense, in the work by Martins (2017), the academic performance of Accounting students was analyzed, showing that this is influenced, among other factors, by the student's form of entrance into higher education (affirmative or non-affirmative actions).

This shows that the students' entry form and socioeconomic status influences their academic performance, indicating that students who enter through affirmative actions would perform differently from students who enter without affirmative action. Research on the adoption of affirmative action in Brazilian universities began after 2002, when the state universities of Rio de Janeiro adopted the first quota policies (Piotto & Nogueira, 2013). The studies on the topic usually discuss and analyze not only the academic performance of the students benefited by the affirmative actions, but also their dropout and their trajectory before entering the university.

Bezerra and Gurgel (2012) analyzed the academic performance and dropout rates of students from the State University of Rio de Janeiro (UERJ) in 2005 and 2006 in five distinct courses - Administration, Law, Chemical Engineering, Medicine and Pedagogy. The results show that the quota holders' performance on the entrance exam is lower than that of non-quota students, however, without differences in the academic performance of both. With regard to dropout, the rate for non-quota students is 21.81%, against 10.80% - less than half - for quota holders. By expanding the sample to all courses at UERJ, Mendes Junior (2014) finds results that differ from Bezerra and Gurgel (2012).

Mendes Junior (2014) analyzed the graduates in 43 UERJ courses in the period from 2009 to 2011. The results of the study infer that the non-quota students present a higher performance than the quota holders and that this difference increases with the relative difficulty of the course - reaching 16.35% of difference between the groups. Regarding dropout, the study corroborates the work by Bezerra and Gurgel (2012), showing a lower dropout rate among the quota holders. Mendes Junior (2014) also emphasizes that the quota students, despite an inferior performance, have a higher graduation rate than non-quota students.

Peixoto et. al. (2013) compared the academic performance of the students benefiting from the quotas with that of the students who got into the Federal University of Bahia the traditional way. The results show that, when the averages are compared directly, the students who did not benefit from the quotas present higher academic performance. When segregated by knowledge area, however, the performance of the quota students in humanities is higher. The difference in the students' performance is explained by the deficient basic education of quota students, especially in the area of mathematics.

Cardoso (2008) evaluated the academic performance of new students in the second semester of 2006 at the University of Brasília (UnB). The evaluation compared students who entered through the universal system and the quota system. The author also divided the analysis by course area (Humanities, Sciences and Health) and subgroups of courses of greater and lesser prestige.

The data analysis by Cardoso (2008) indicated that, in the most prestigious courses, the students who entered through the universal competitive system scored higher averages in the areas of humanities, sciences and health, but with a significant difference in the area of sciences only. In the less prestigious courses, the students obtained higher averages in the areas of humanities and sciences, but without a significant difference of means. In the general analysis of UnB, the average of the students who enter through the universal system is 3% superior to that of the quota students, but without a significant difference.

Matos et. al. (2010) analyzed the averages of first-year students at the University of Londrina (UEL) in 2005 and 2006, in a universe of 5,713 students. The UEL has three entrance systems, one universal quota (U), one quota for students from public schools (EP) and another for the quota of black and mulatto students from public schools (N). During the period analyzed, EP and N students represented 55.9% of enrolled students. The average of all students in 2005 was 7.31 and there was no significant difference of means among students of all categories. In 2006, the overall average was 7.34 and a difference was observed between the groups. The lowest score was found in the N group with an average of 6.67. The authors point out, however, that there is no significant difference in the analysis per course.

Dallabona and Schiefler Filho (2011) evaluated the averages of new students in the courses of the Universidade Tecnológica Federal do Paraná (UTFPR), Curitiba campus, between the first semester of 2008 and the second semester of 2010. The university in question adopts a quota system in which 50% of the places are destined for students from public schools. The authors' analysis comprised a universe of 3,035 regular students and grouped the courses of the university in four types (Engineering, other baccalaureate courses, Teaching Diplomas and Technologies). The analyses indicate that the weighted average of non-quota students was higher in the Teaching Diploma category only, although no significant differences of means were observed in all groups.

In the study by Dallabona and Schiefler Filho (2011), it is also appointed that, among the 20 courses analyzed, non-quota students scored higher averages in only six, without a significant difference. In four of the 14 courses where the quota holders performed better, significant differences of means were found. The authors further highlight that the weighted averages of female non-quota students were higher than those of all other students.

Piotto and Nogueira (2013) discuss the college experience of new USP students through the USP Social Inclusion Program (INCLUSP/PASUSP). According to the authors, one of the main challenges for the effectiveness of affirmative actions is to encourage the students to take part in the entrance exam, as they often consider getting into university as something unachievable. After getting into college, the students reported relationship difficulties with peers due to social differences.

Golgher, Amaral and Neves (2014) estimated a statistical model to analyze the Global Semester Performance (GSP) of students who did nor did not receive bonuses in the UFMG entrance exam in 2009 and 2010. The authors used social, demographic and economic variables as controls. The results show that the difference between the groups - with and without bonus - is small or, as in most cases, null. As previously explained, this is the only study that provides information from Accounting students. In this case, the data indicate that there is no significant difference in academic performance between quota and non-quota students in the Accounting course.

Waltenberg and Carvalho (2012) developed another analysis of quota and non-quota students' performance. The authors used the scores from the specific exams of the National Examination of Higher Education (ENADE), comparing the grades of students admitted through some affirmative action with those who did not enter through affirmative action. The analysis considered 13 courses and, on average, 18.5% of the participants came from affirmative actions, mainly in the teaching diploma courses. As previously explained, this is the only study to point out information from Accounting students. In this case, the data indicate that there is no difference between Accounting students.

The analysis by Waltenberg and Carvalho (2012) shows that the average grade of students coming from public educational institutions and who entered without affirmative action is four points higher than that of students who entered through affirmative actions, and this difference is statistically significant. Among students from private educational institutions, no statistical difference was observed.

Also analyzing data from the ENADE, Carvalho and Cerqueira (2015) evaluated whether there was a grade difference between quota holders and free-competition students. The analysis was based on the specific tests for the courses of law (ENADE 2012) and medicine (ENADE 2013). The data show that, among the law students, there was no significant difference in scores between quota and non-quota students. Among the medical students' tests, however, a significant difference was observed, with non-quota students obtaining a higher average score than the quota students.

Campos, Machado, Miranda and Souza Costa (2017) analyzed the dropout level among business students who entered a federal university through affirmative action and students who entered the same university through places for open competition. The authors' results show that there are no significant differences between the two groups' dropout, showing that affirmative actions did not significantly affect the dropout rates. In the work of Campos *et al.* (2017), the need to analyze not only the entrance forms, but also the permanence of these students in higher education is emphasized.

2.3 Social inclusion program of USP

The discussion about the creation of quotas at USP began in 1995 with the perspective of creating and implementing a policy that would increase the access of black students, however, the university only adopted a bonus system in 2006. Instead of a bonus system based on the candidate's ethnic origin, the system takes into account the socioeconomic conditions (Piotto & Nogueira, 2013).

Created in 2006, INCLUSP aims to progressively increase the percentage of high school students entering public schools without compromising academic meritocracy or reducing the quality of incoming university students. The program works by means of a bonus in the grade of the two selection process phases for the candidates who prove to have fully completed high school in public schools. In 2007 and 2008 the bonus was 3%, with the difference that, in 2008 the candidate could choose whether or not to receive the bonus (Matos *et al.*, 2012).

After an analysis of the results obtained in 2007 and 2008, it was concluded that there was a need to deepen the measures of the program. In 2009, after implementing the changes, the candidate could have a bonus grade of up to 12%, divided among 3% of initial bonus for public school students, a bonus of up to 6% referring to the student's performance on the National Exam (ENEM) and a bonus of up to 3% referring to the USP's Serial Assessment Program (PASUSP), which was created in 2008 for students in the third year of regular high school education at schools affiliated with the São Paulo State Department of Education (Matos *et al.* 2012). The fact of using the bonus already in the first phase of the entrance exam shows the University's effort to enhance social inclusion.

Currently, the program works by granting a 15% bonus to candidates who prove that they have completed primary and secondary education in public schools, plus an optional bonus for candidates who self-declare PPI - black, mulatto or indigenous - or a 12% bonus to candidates who prove that they have taken only secondary education in the public network.

According to Pinheiro (2014), one of the main concerns with the bonus programs is the benefitted students' academic performance. In this sense, Nabeshima *et al.* (2011) investigated the performance of students who received the program bonus and students without the bonus. Therefore, the authors analyzed the grades on subjects taught in the first semester of the dentistry course, distinguishing between specific and basic subjects, and distinguishing the course period - evening and fulltime - between 2007 and 2010. The study appoints that the two student groups behave similarly, but that the performance of the INCLUSP students in the specific subjects of the fulltime course surpassed that in the basic subjects.

Matos *et al.* (2012) analyzed the impact of the INCLUSP program on the access of public school students to university. The authors point out that, although they are encouraged to take the entrance exam, the participation of students who have completed high school in public schools has decreased in the period from 2001 to 2010, having peaked in the year 2006, when 45.12% of the entrance exam candidates had studies in the public school network, while 2010 represented the lowest percentage of the period, totaling 26.60%.

Regarding the academic performance, the authors indicate that the average of the INCLUSP participants was equal to or higher than the university average in 64 of the 118 courses offered, demonstrating that the increased access of this student profile does not compromise the quality of the teaching offered by the institution. It should be emphasized that the study does not indicate the period analyzed, nor does it present the statistical background of the analysis.

2.4. The accounting course at FEARP-USP

The School of Economics, Business Administration and Accounting at Ribeirão Preto of the University of São Paulo was created in 1992 as an extension of FEA-USP in São Paulo. The unit currently offers four undergraduate courses, including the Accounting course, which is the focus of this research. The course offers 45 places per year and, in October 2015, there were 207 students enrolled in the course.

2.4.1 Profile of new accounting students at FEARP-USP

To help and analyze the school performance, the focus of this research was to obtain information about the profile of the student in the Accounting course at FEARP-USP. It should be emphasized that there is no data crossing between the analysis of the student profile and the students' academic performance.

The candidate for entrance examination at USP, developed by the University Foundation for Vestibular (FUVEST), has to complete a socioeconomic assessment sheet at the time of enrollment. On the sheet, various data are requested, and this information is subsequently consolidated and made available on the FUVEST website. In the case of FEARP, the new students' profile was analyzed after the final call - the last moment for admission during the first semester of the course. This analysis was developed based on the profile of all students in the four courses offered at FEARP, with one separate analysis for Accounting students only. The numbers presented below are a condensation of the data between 2010 and 2014, which is the focus of analysis in this research.

Within the focus of this research, the first point of analysis is the student's indication in favor of the bonus system INCLUSP and PASUSP. On average, 19% of new FEARP students choose the bonus system, but this average increases to 33% when analyzing the Accounting students only. This greater presence of Accounting students with bonus in the entrance exam permits more reliable statistical analyses than in other courses at the school.

Some factors of the socioeconomic questionnaire may explain this difference. For example, in terms of the origin in primary and secondary education, it can be observed in Table 2 that accounting students, compared to the whole unit, more frequently come from public education.

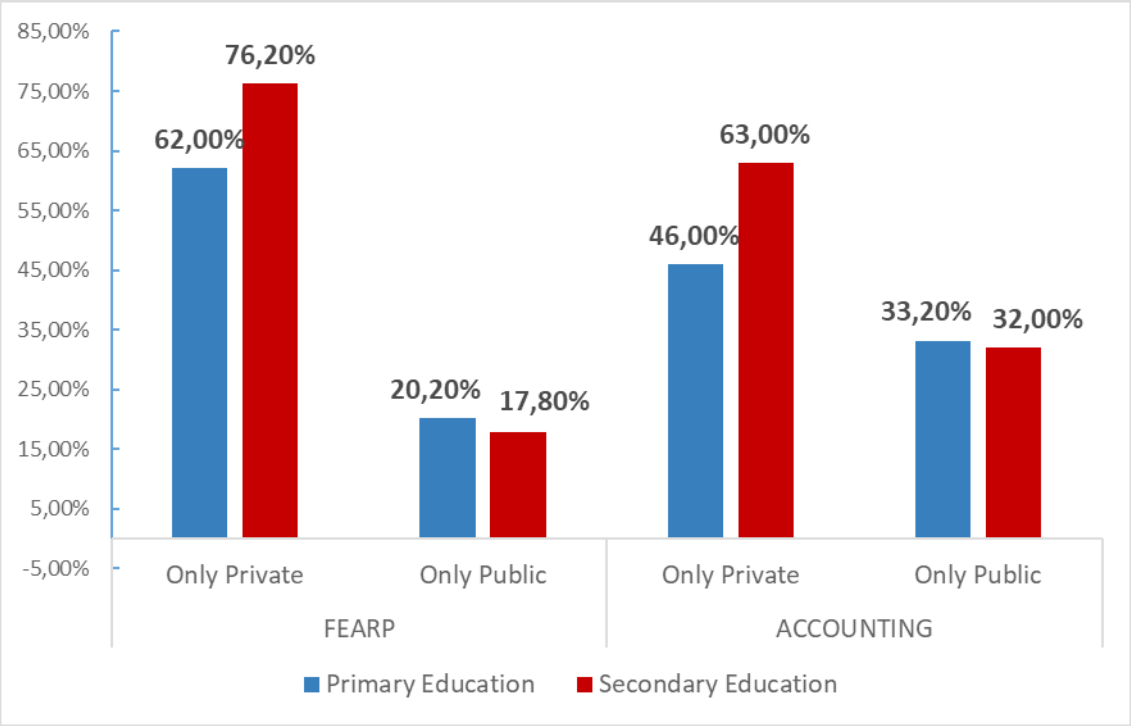


Figure 1. Origin of primary and secondary education

Source: Elaborated by the authors based on data from FUVEST (2015)

In terms of income, the mean income of FEARP students is 8.9 minimum wages. Specifically for Accounting students, it corresponds to 6.6 minimum wages. In addition, on average, only 18.8% of the students who enter FEARP indicate having a paid job, against 39% for new Accounting students.

Another relevant piece of information related to the origin of graduates is the fact that, on average, at FEARP, 31% of new students had already started another higher education course, with or without completing it. Among accounting students, this average amounts to 50%. That is also reflected in the new students' average age, being 19.4 years at FEARP and 20.7 years in Accounting.

3. Methodological procedures

The research design is based on the typology proposed in Beuren (2006). Thus, in terms of objectives, it is a descriptive study, as it describes the behavior of the research population. What the approach to the problem is concerned, it is a quantitative study, having used statistical tools for the data analysis.

As mentioned, the objective in this study is to verify whether a performance difference exists between the Accounting students who benefitted and did not benefit from the social inclusion program between 2010 and 2014. Therefore, the average grades were collected for 11 subjects taught in the first your of the Accounting course at FEARP-USP, being:

- First Semester
  - Introduction to Accounting I (SUB1)
  - Mathematics and Calculus Applied to Accounting (SUB2)
  - Economic Theory (SUB3)
  - Applied Informatics (SUB4)
  - Administration Theory (SUB5)
  - Introduction to Sociology (SUB6)

- Second Semester
  - Legal Entities (SUB7)
  - Portuguese for Business (SUB8)
  - Financial Mathematics (SUB9)
  - Fundamentals of Systems Analysis (SUB10)
  - Introduction to Accounting II (SUB11)

The analysis of the subjects was carried out according to the following variables:

i. Average of students with or without bonuses in the entrance exam, through the INCLUSP and PASUSP systems: the analysis was based on the average considering the fail marks and the average without fail marks. The average for passing a subject at USP is 5.0. An analysis was also carried out not by subject, but by the year of entry;
ii. Classification in the entrance examination: the course offers 45 places, not all of which are occupied on the first call. We used the classification 23 as a cut-off point, that is, the students classified until the 23rd position are placed in the first group and, from the 24th onwards, in the second group;
iii. Merging of the first two based on the analysis of students with and without bonus, from the grouping of classification in the entrance exam;
iv. Differences in number of pass grades.

To evaluate possible differences of means among the students, the Mann-Whitney non-parametric means test was used with a 95% confidence level, which was compared with the groups previously presented. For the other analyses, the Chi-square test was used, which is a non-parametric test that verifies whether or not the frequency at which a given event is observed in a sample deviates significantly or not from the frequency at which it is expected.

3.1 Construction of the database

As there is a lot of student movement within USP through internal transfers, re-entry by entrance exam, among others, the student base for the research was elaborated according to the following premises:

a. Students who re-entered the course through a second entrance exam, for whatever reason, were excluded at the second entrance;
b. Students who re-entered the university entrance examination, but who came from the course in Business Economics and Controllership, at this same unit, were also excluded, as they had already completed 95% of the subjects in their course of origin;
c. Students who entered by internal or external transfer;
d. Students who dropped out before the end of the first semester were excluded.

After excluding the individuals following the above criteria, the final base was composed of 218 students, 154 of whom had no bonus (70.6%) and 64 with a bonus (29.4%). To analyze the academic performance of these students, 2,074 grades of subjects were analyzed, being 1,414 of students without bonus (68.2%) and 660 of students with bonus (31.8%).

4. Results and discussions

In order to carry out the research, we found that analyzing the subjects for each of the years of the period studied was not feasible due to the small number of data. Therefore, the analyses were based on the data of all available years (2010 to 2014).

The first analysis of means was done for each of the 11 subjects the students had taken. The data in tables 2 and 3 show that no significant difference of means in relation to the analyzed variables was found only for SUB6 and SUB7. The content of the two disciplines is focused on humanistic areas.

In the comparison between students with and without bonus, a significant difference was only observed in the mean grade with fail marks for SUB10, in which the students with bonus obtained a higher average.

When analyzing the student's classification in the entrance exam, it was observed that no significant difference was observed only in the mean scores for SUB4, SUB6 and SUB7 while, in the mean scores with fail marks for SUB2 and SUB5, the average of the student with a higher classification than 23 was better than that of the students with a score of up to 23. In the means without fail marks, all students with a score of up to 23 had a higher average, although this difference is not always significant.

When analyzing the average of the students with classification up to 23, with and without bonus, no significant difference is observed. When analyzing students with scores above 23, on the other hand, significant differences are observed in the means with fail marks for SUB2, SUB4 and SUB10, and in the mean without fail marks only for SUB4. In SUB2, the students with bonus had a lower average and, in SUB4 and SUB10 the students with bonus obtained a higher average.

Table 2

Subjects first semester

Type of grade	Category	Sub 1		Sub 2		Sub 3		Sub 4		Sub 5		Sub 6	
		Mean	Mann	Mean	Mann	Mean	Mann	Mean	Mann	Mean	Mann	Mean	Mann
With Fail Marks	With bonus	6.892	0.070	5.765	0.417	5.993	0.649	7.719	0.146	7.275	0.543	7.374	0.070
	No bonus	6.376		6.157		5.993		7.600		7.333		6.835	
Without Fail Marks	With bonus	7.229	0.206	6.717	0.831	6.954	0.238	8.386	0.067	7.373	0.473	7.446	0.106
	No bonus	6.972		6.777		6.706		8.193		7.493		7.117	
With Fail Marks	Entrance exam until 23	6.942	0.007*	6.485	0.003*	6.421	0.040*	7.852	0.214	7.766	0.000*	7.326	0.137
	Entrance exam superior to 23	6.211		5.695		5.650		7.466		6.934		6.776	
Without Fail Marks	Entrance exam up to 23	7.328	0.014*	1.411	0.011*	6.924	0.259	8.272	0.519	7.858	0.000*	7.326	0.387
	Entrance exam superior to 23	6.821		1.193		6.660		8.232		7.107		7.149	
With Fail Marks	Ent. exam up to 23 - With Bonus	7.425	0.103	6.557	0.340	6.412	0.811	7.674	0.536	7.758	0.682	7.663	0.129
	Ent. exam up to 23 - No Bonus	6.717		6.455		6.425		7.926		7.769		7.157	
Without Fail Marks	Ent. exam up to 23 - With Bonus	7.556	0.207	7.129	0.400	6.946	0.945	8.180	0.646	7.758	0.588	7.663	0.129
	Ent. exam up to 23 - No Bonus	7.215		7.044		6.914		8.310		7.903		7.157	
With Fail Marks	Ent. exam sup. to 23 - With Bonus	6.466	0.282	5.197	0.049*	5.683	0.657	7.753	0.012*	6.917	0.663	7.151	0.277
	Ent. exam sup. to 23 - No Bonus	6.084		5.923		5.633		7.338		6.942		6.593	
Without Fail Marks	Ent. exam sup. to 23 - With Bonus	6.953	0.506	6.305	0.412	6.962	0.121	8.547	0.003*	7.079	0.635	7.274	0.431
	Ent. exam sup. to 23 - No Bonus	6.749		6.559		6.520		8.092		7.122		7.085	

Source: Elaborated by the authors based on research data

Table 3

Subjects second semester

Type of Grade	Category	Sub 7		Sub 8		Sub 9		Sub 10		Sub 11	
		Mean	Mann	Mean	Mann	Mean	Mann	Mean	Mann	Mean	Mann
With Fail Marks	With bonus	7.325	0.595	6.895	0.862	5.16	0.952	6.681	0.023*	6.143	0.538
	No bonus	7.320		6.938		5.055		5.851		6.121	
Without Fail Marks	With bonus	7.689	0.317	7.211	0.974	6.668	0.977	7.047	0.205	6.549	0.700
	No bonus	7.477		7.207		6.600		6.812		6.483	
With Fail Marks	Entrance exam until 23	7.579	0.063	7.226	0.014*	5.678	0.004*	6.644	0.001*	6.498	0.003*
	Entrance exam superior to 23	7.109		6.672		4.595		5.705		5.806	
Without Fail Marks	Entrance exam up to 23	7.732	0.080	7.481	0.015*	6.748	0.222	7.155	0.014*	6.716	0.026*
	Entrance exam superior to 23	7.391		6.976		6.484		6.669		6.304	
With Fail Marks	Ent. exam up to 23 - With Bonus	7.472	0.894	7.254	0.738	5.876	0.896	7.192	0.265	6.535	0.466
	Ent. exam up to 23 - No Bonus	7.627		7.215		5.591		6.404		6.480	
Without Fail Marks	Ent. exam up to 23 - With Bonus	7.783	0.829	7.544	0.689	6.530	0.344	7.192	0.796	6.780	0.584
	Ent. exam up to 23 - No Bonus	7.709		7.455		6.854		7.136		6.684	
With Fail Marks	Ent. exam sup. to 23 - With Bonus	7.218	0.531	6.612	0.609	4.600	0.891	6.306	0.040*	5.825	0.773
	Ent. exam sup. to 23 - No Bonus	7.052		6.700		4.592		5.437		5.797	
Without Fail Marks	Ent. exam sup. to 23 - With Bonus	7.616	0.243	6.942	0.693	6.829	0.362	6.927	0.116	6.343	0.909
	Ent. exam sup. to 23 - No Bonus	7.279		6.991		6.333		6.537		6.282	

Source: Elaborated by the authors based on research data

After the analysis by subjects, the mean grades were evaluated per semester and for all course subjects. As shown in Table 4, the main differences were found in the analysis of the entrance exam classification, that is, the students who ranked up to the 23rd place have higher averages than those with a lower classification - 24th downwards -, both in the first and in the second semester, considering average grades with or without fail marks. These results indicate the influence of background knowledge on academic performance, corroborating the results of Miranda *et al.* (2015). It is also observed in Table 4 that there is a significant difference in the annual average without fail marks, with a higher average among students with bonus. And in the annual average without fail marks of students who ranked higher than 23, students with bonus have a higher average.

Table 4
Differences per semester

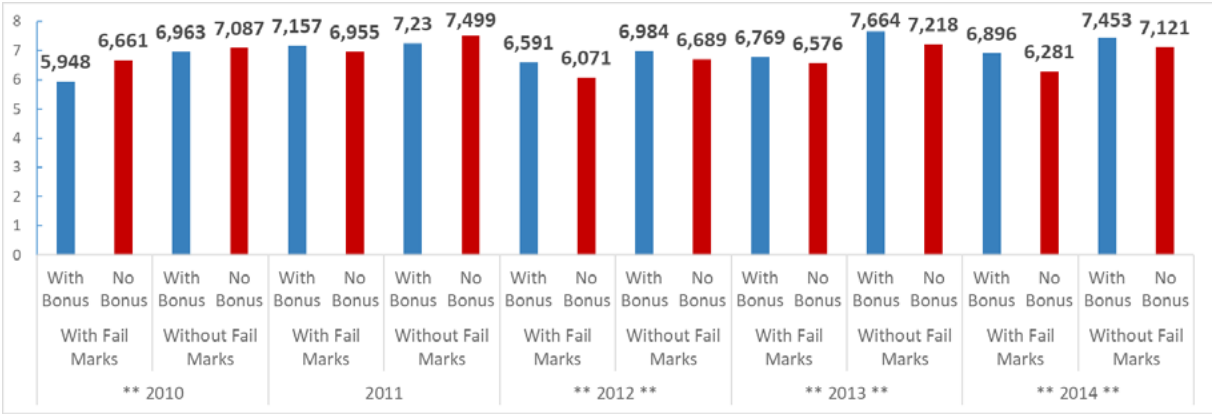
Type of Grade	Category	1st Semester		2nd Semester		1st full year	
		Mean	Mann	Mean	Mann	Mean	Mann
With Fail Marks	With bonus	6.861	0.186	6.451	0.181	6.679	0.065
	No bonus	6.739		6.259		6.525	
Without Fail Marks	With bonus	7.389	0.087	7.063	0.278	7.246	0.049*
	No bonus	7.250		6.956		7.123	
With Fail Marks	Entrance exam until 23	7.152	0.000*	6.731	0.000*	6.963	0.000*
	Entrance exam superior to 23	6.480		5.983		6.260	
Without Fail Marks	Entrance exam up to 23	7.494	0.000*	7.192	0.000*	7.361	0.000*
	Entrance exam superior to 23	7.124		6.810		6.989	
With Fail Marks	Ent. exam up to 23 - With Bonus	7.269	0.309	6.866	0.441	7.089	0.197
	Ent. exam up to 23 - No Bonus	7.100		6.671		6.906	
Without Fail Marks	Ent. exam up to 23 - With Bonus	7.557	0.480	7.187	0.920	7.393	0.539
	Ent. exam up to 23 - No Bonus	7.465		7.195		7.346	
With Fail Marks	Ent. exam sup. to 23 - With Bonus	6.553	0.389	6.131	0.242	6.366	0.170
	Ent. exam sup. to 23 - No Bonus	6.444		5.910		6.208	
Without Fail Marks	Ent. exam sup. to 23 - With Bonus	7.248	0.105	6.955	0.152	7.121	0.036*
	Ent. exam sup. to 23 - No Bonus	7.065		6.739		6.926	

Source: Elaborated by the authors based on research data

It is highlighted that the analysis of the average with fail marks, considering a 95% confidence level did not present a difference but, when considering a 90% confidence level, there would be a significant difference when, again, the students with a bonus would have a better average performance.

When analyzing the students' results by year of entry, it can be observed in graph 2 that, in almost all periods, significant differences of means were found, both with and without fail marks. In 2010, there was a difference only in the average with fail marks and the students without bonus had a higher average, which did not occur in the average without fail marks. Between the years of 2012 and 2014, there were significant differences though, both in the averages with and without fail marks and, in all periods, the average of the students with bonus was higher.

Considering the students' averages with fail marks during the entire analysis period (2010 to 2014), the result found in this study corroborates Golgher, Amaral and Neves' (2014) study, in which no significant difference was observed among the Accounting students. As already noted, however, this cannot be confirmed in the analysis by year of entry.



Graph 2. Evaluation per year of entrance

Source: Elaborated by the authors based on research data. Obs.: ** represents statistically significant difference of means

At the end of each subject, the students can be classified in four situations: passed, failed by grade, failed by attendance or failed by grade and attendance. The pass differences analyzed were between students with and without bonus, and also according to the entrance exam classification.

The data in Table 7 strengthen some of the findings presented earlier, mainly concerning their classification on the entrance exam, that, the students with better classifications did not only obtain higher averages, but also higher pass rates in the subjects, again indicating the influence of the students' background on their academic performance.

Table 5

Pass rate in subjects

Período	Bonificação			Classificação Vestibular		
	Qui-Quadrado	Sim	Não	Qui-Quadrado	Até 23	Acima de 23
2010	0,001*	78,1%	91,5%	0,000*	95,6%	80,3%
2011	0,015*	97,9%	88,0%	0,258	89,4%	92,7%
2012	0,230	88,5%	86,3%	0,812	86,2%	87,5%
2013	0,341	86,7%	87,1%	0,001*	93,5%	80,6%
2014	0,239	90,7%	83,3%	0,010*	94,5%	82,3%
Todos anos	0,768	88,6%	87,6%	0,000*	91,7%	84,8%

Source: Elaborated by the authors based on research data.

With regard to the students with and without bonus, differences can be observed only in the years 2010 and 2011. In 2010, the best results are found for the students without bonus, as observed in Table 6. In 2011, the students with bonus obtained a higher approval rate.

It is generally perceived that students entering through affirmative actions do not perform worse, going against the concerns pointed out by Pinheiro (2014) that the inclusion of these students in higher education courses would diminish their quality. Another point to be highlighted is the influence of the classification in the entrance exam, indicating that the students' background influences their academic performance, as shown in the studies by Miranda *et al.* (2015), Ferreira (2015) and Martins (2017).

5. Final considerations

According to the analysis of the literature, it is important to analyze the results of public policies and affirmative actions focused on education. Inclusion policies in higher education have occurred in a variety of ways, mainly through quotas and bonus systems. Studies have shown that, overall, there is no difference between students from these inclusion systems and students without bonus when their academic performance is analyzed and, as demonstrated, these analyses have expanded, but some areas, such as accounting, have not been addressed.

In view of the above, this study analyzed whether there is a difference in academic performance between Accounting students who benefit or not from the Social Inclusion Program at FEARP-USP. The analysis of the data showed that the fact that the students received some bonus to enter the university because they came from public school does not make them less able to obtain an appropriate academic performance within the University. In addition to having a proper academic performance in the university, many times, the analysis of the data shows that their performance can be superior to that of the students who did not have a bonus in the entrance exam, which ends up being reflected and validated in the semester and annual analyses.

It is also observed that what truly influences the academic performance in the University is the students' classification in the university entrance exam, regardless of whether they benefitted from the bonus. In eight of the eleven subjects taught in the first year of the Accounting course at FEARP-USP, the students with the lowest grade in the college entrance examination had lower performance levels than the students with the highest classification.

As a limitation, there is the fact that no larger time period was covered in the analysis, neither in terms of entry periods, as the USP bonus programs began in 2006, and in terms of a more longitudinal analysis involving the four course years.

As a suggestion for future work, we present studies that deepen the discussion about differences in dropout among the students benefitted or not by bonus systems, in the line of work done by Cardoso (2008), Bezerra and Gurgel (2012), Mendes Jr (2014) and Campos et. al. (2017). In addition to the analysis of performance data during the course, monitoring graduates who received a bonus or not is suggested, as in the research developed by UERJ (2011).

It is also suggested to analyze the performance of students in the business area through ENADE, like in the studies by Waltenberg and Carvalho (2012) and Carvalho and Cerqueira (2015). This research focus cannot be developed with USP students yet though, as the institution only voluntarily started to take part in the ENADE system in 2015.

As entering higher education involves the construction process of a new "I", that is, a new identity, qualitative research about the students' socialization process is suggested. Based on the work by Campos *et al*. (2017), research on the permanence of students who benefitted from affirmative actions is suggested, also considering the main difficulties they face in order to maintain or drop out of the course.

References

Alves, M. G. (2005) Como se entrelaçam a educação e o emprego? contributo da investigação sobre licenciados, mestres e doutores, *Interacções*, *201*(1), pp. 179–201.

Beuren, I. M. (2006) Como elaborar trabalhos monográficos em contabilidade. São Paulo: Atlas.

Bezerra, T. O. C. & Gurgel, C. R. M. (2012). A política pública de cotas na UERJ: desempenho e inclusão. Anais do *Encontro Nacional de Administração Públic*a *e Governança,* (pp. 1-16). Salvador, BA, Brasil, 5.

Campos, L. C., Machado, T. R. B., Miranda, G. J., & de Souza Costa, P. (2017). Cotas sociais, ações afirmativas e evasão na área de Negócios: análise empírica em uma universidade federal brasileira. *Revista Contabilidade & Finanças*, *28*(73), pp. 27-42. http://dx.doi.org/10.1590/1808-057x201702590

Cardoso, C.B. (2008). *Efeitos da política de cotas na Universidade de Brasília: uma análise do rendimento e da evas*ão. Dissertação de Mestrado, Universidade de Brasília, Brasília, DF, Brasil.

Carvalho, M.M. & Cerqueira, G.S. (2015). Análise do desempenho acadêmico dos cotistas dos cursos de medicina e direito no Brasil. Recuperado em 3 fevereiro, 2015, de http://flacso.org.br/?publication=opiniao-n15-analise-do-desempenho-academico-dos-cotistas- dos-cursos-de-medicina-e-direito-no-brasil

Castro, C. M. & Leite, E. M. (2006). Educação no Brasil: Atrasos, Conquistas e Desafios. In: *Brasil – O estado de uma na*ção. Brasília: IPEA.

Constituição da República Federativa do Brasil de 1988. (1998). Brasília. Recuperado em 24 abril de 2018, de http://www.planalto.gov.br/CCIVIL_03/Constituicao/Constitui%C3%A7ao.htm

Dallabona, C. A., & Schiefler Filho, M. F. O. (2011). Desempenho acadêmico de estudantes oriundos de escolas públicas: cursos de graduação do campus Curitiba da UTFPR. Anais do Congresso Brasileiro de Educação em Engenharia. Blumenau, SC, Brasil. 39.

Ferreira, M. A. (2015). *Determinantes do desempenho discente no ENADE em cursos de Ciências Contábeis.* Dissertação de Mestrado em Contabilidade Financeira, Universidade Federal de Uberlândia, Uberlândia, MG, Brasil.

Franco, A. P. (2008). Ensino superior no Brasil: cenário, avanços e contradições. *Jornal de Políticas Educacionais*, 4, pp. 53-63.

Fundação para o Vestibular da USP (FUVEST). Questionário de Avaliação Socioeconômica. Recuperado em 10 de novembro, 2015, de http://www.fuvest.br/.

Golgher, A. B., Amaral, E. F. L. & Neves, A. V. C. (2014). Avaliação de impacto do bônus sociorracial da UFMG no desempenho acadêmico dos estudante. *Mediações, 19*(1), pp. 214-248. http://dx.doi.org/10.5433/2176-6665.2014v19n1p214

Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. INEP. Censo escolar: resumo técnico. Brasília. 2013. 138p. Recuperado em 05 de fevereiro, 2016, de http://download.inep.gov.br/download/superior/censo/2012/resumo_tecnico_censo_educacao_ superior_2012.pdf.

Martins, Z. B. (2017). Determinantes do desempenho acadêmico: um estudo com alunos de graduação em Ciências Contábeis. *Anais do Encontro da ANPAD – EnANPAD*. São Paulo, SP, Brasil, 42.

Matos, M. S., Pimenta, S. G., Almeida, M. I. & Oliveira, M. A. C. (2012) O impacto do Programa de Inclusão Social da Universidade de São Paulo no acesso de estudantes de escola pública ao ensino superior público gratuito. *Revista Brasileira de Estudos Pedagógicos*, *93* (235), pp. 720-742. http://dx.doi.org/10.1590/S2176-66812012000400010

Matos, L.M.S., Ferreira, W., Pinheiro, A.C.D. & Dalmas, J.C. (2010) Avaliação do Sistema de Cotas para Estudantes Oriundos de Escolas Públicas e Afrodescendentes na Universidade Estadual de Londrina. Anais do Seminário de políticas públicas no Paraná: escola de governo e universidades estaduais. Curitiba, PR, Brasil, 1.

Mendes Jr, A. A. F. (2014) Uma análise da progressão dos alunos cotistas sob a primeira ação afirmativa brasileira no ensino superior: o caso da Universidade do Estado do Rio de Janeiro. *Ensaio: avaliação de política públicas em educa*ção, *22*(82), pp. 31-56. http://dx.doi.org/10.1590/S0104-40362014000100003

Miranda, G. J., da Silva Lemos, K. C., de Oliveira, A. S. & Ferreira, M. A. (2015). Determinantes do desempenho acadêmico na área de negócios. *Revista Meta: Avaliação*, *7*(20), pp.175-209. http://dx.doi.org/10.22347/2175-2753v7i20.264.

Munhoz, A. M. H. (2004). Uma análise multidimensional da relação entre inteligência e desempenho acadêmico em universitários ingressantes. *Faculdade de Educação da Universidade Estadual de Campinas.* Campinas, São Paulo, Brasil.

Nabeshima, C. K., Machado, M. E. L., Martins, G. H. R., Coto, N. P. & Dias, R. B. (2011). Análise do programa INCLUSP através do desempenho escolar, visando disciplinas básicas e específicas. *Revista de Pós Graduação*, *18*(4), pp. 219-233.

Peixoto, A. L. A., Ribeiro, E. M. B. A., Bastos, A. V. B. & Ramalho, M. C. K. (2013). Cotas e desempenho acadêmico na UFBA: um estudo a partir dos coeficientes de rendimento. In, *Coloquio de Gestión Universitaria em Americas, 13,* pp. 1-15. Universidade Federal de Santa Catarina. Florianópolis, SC, Brasil. http://dx.doi.org/10.1590/S1414-40772016000200013

Pinheiro, J. S. S. P. (2014). *Desempenho acadêmico e sistema de cotas: um estudo sobre o rendimento dos alunos cotistas e não cotistas da Universidade Federal do Espírito Santo.* Dissertação de mestrado não publicada, Centro de Ciências Jurídicas e Econômicas, Universidade Federal do Espírito Santo, Espírito Santo, Brasil.

Piotto; D. C. & Nogueira, M. A. (2013). Inclusão vista por dentro: a experiência via Inclusp. *Educação*, *36*(3), pp. 373-384.

Universidade do Estado do Rio de Janeiro (2011). Avaliação qualitativa dos dados sobre desempenho acadêmico. Recuperado em 03 de fevereiro, 2016 de http://www.caiac.uerj.br/rel.pdf

Waltenberg, F.D. & Carvalho, M. M. (2012) Cotas aumentam a diversidade dos estudantes sem comprometer o desempenho? *Sinais Sociais*, *20*(7), pp. 36-77.

repec

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 4, p. 197-209, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1573

Entrepreneurial Competencies and Performance of Undergraduate Programs: A Study of Its Relations Based on Center Directors' Perspective

Abstract

Context and Objective: The objective in this research is to evaluate how the universities' center directors perceive the entrepreneurial competencies of the course coordinators at the academic unit they manage, as well as how they are related with the performances of these courses according to the measures taken by the Department of Education.

Method: To reach this result, a survey was developed using Cooley's model (1990, 1991) to measure the entrepreneurial competencies. The statistical methods used included factor and correlational analysis. The sample consisted of 61 courses, divided among three universities: one public and two community colleges.

Expected results: Based on the findings, it can be confirmed that the coordinators' entrepreneurial competencies, according to their superiors' perceptions, are positive and significantly related when considering the set of competencies. When analyzed according to Cooley's proposal, however, the achievement competencies are not associated with the performance. A positive and significant association does exist between the planning and power clusters and performance. The practical implication of these findings can be related with the improvement of the academic units' management.

Key words: Entrepreneurial Competencies. Evaluation. Center Directors. Course Coordinators.

Suzete Antonieta Lizote
Ph.D. in Business Administration and Tourism from University of Vale do Itajaí (UNIVALI) and Professor at Universidade do Vale do Itajaí (UNIVALI). **Contact:** Rua Uruguai, 458. Centro. Florianópolis (SC). CEP: 88301-302.
E-mail: lizote@univali.br

Miguel Angel Verdinelli
Ph.D. in Sciences from University of São Paulo (USP) and Professor at University of Vale do Itajaí (UNIVALI). **Contact:** Rua Uruguai, 458. Centro. Florianópolis (SC). CEP: 88301-302.
E-mail: nupad@univali.br

Sabrina do Nascimento
Ph.D. in Business Administration and Tourism from University of Vale do Itajaí (UNIVALI) and PNPD/CAPES grantee Postdoctoral degree in Administration at Santa Catarina State University. **Contact:** Av. Madre Benvenuta, 2037, ESAG, Itacorubi. Florianópolis (SC). CEP: 88035-001.
E-mail: sabnascimento@gmail.com

Luciana Merlin Bervian
Ph.D. in Business Administration from University of Vale do Itajaí (UNIVALI) and Executive Secretary at University of Vale do Itajaí (UNIVALI). **Contact:** Rua Uruguai, 458. Centro. Florianópolis (SC). CEP: 88301-302.
E-mail: lumerlin@univali.b

Published in Portuguese and English. Original Version in Portuguese.

Received in 3/18/2017. Ask to Revise on 10/16/2017. Resubmitted on 4/18/2018. Accepted on 5/8/2018 by Dr.ª Márcia Maria dos Santos Bortolocci Espejo (Assistant Editor) and by Dr. Orleans Silva Martins (Editor). Published on 6/22/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

(cc) BY

1. Introduction

In emerging countries, one of the main drivers of development is higher education. It is not only responsible for leveraging economic and social advances, but also for transmitting the scientific and cultural experience accumulated by humanity. The importance of higher education and the institutions that promote it is linked to the expansion of cognitive resources, capable of meeting the demands of the changes the contemporary world is going through (Delors & Eufrázio, 1998).

In Brazil, after the enactment of Law 9.394/1996, which establishes the guidelines and bases of national education, there has been a significant increase in the supply of higher education courses and types of establishments. Despite the expanded offer, however, the universities join the set of functions traditionally associated with the transmission of knowledge linked to teaching, research and extension. This set of actions enables the preparation of competent professionals who, in their learning, carry out research on new technologies and innovations that meet the current competitive market and who also perform their social function through the community service.

In their main activity, universities strive to qualify new professionals to meet the needs of the labor market, which expects human capital capable of managing increasingly complex systems, whether in the area of industry, commerce or services. Investments in education contribute to the development of the society one lives in and not only increases the income but also the employability of the individual (Arrazola & Hevia, 2008). Given the changes due to globalization and their reflection in the business world, however, the university is expected not only to address its graduates' employability, but also that it contributes to the learning of entrepreneurship.

Entrepreneurship is a distinctive feature of an individual or even an organization. In the early twentieth century, Schumpeter (1949) defined entrepreneurship as taking risks and responsibilities in the design and implementation of a new business or in the transformation of an existing business. His definition included the idea of creative destruction by referring to the process of change that accompanies radical innovations. That is, for the author, entrepreneurship is an activity that changes the existing balance, with innovation as the main characteristic. McClelland (1971), on the other hand, considers the entrepreneur to be the creator of a new company or the manager who tries to improve an organizational unit by introducing productive changes. From McClelland's research, the study of entrepreneurship skills began as a necessary condition for the success of entrepreneurial initiatives.

At present, companies have been restructuring and rethinking their internal work processes, mainly due to market pressures from consumers, competitors, suppliers, governments and, especially, variables in the macro environment (Shabana, 2010). These restructurings aim to enhance efficiency, with the purpose of better acting in this competitive environment, thus guaranteeing survival in the market.

The impact of changing the competitive environment organizations are inserted in requires a constant search for new markets, new products, new business alternatives and greater efficiency in operating processes. Therefore, it is necessary to innovate. Innovation will be better acknowledged and received if it comes from stimulating environments of free initiative of internal entrepreneurship. (Santos, Lenzi & Casado, 2011). One of the foundations of entrepreneurship is linked to the entrepreneur's profile and the influence of the entrepreneur's emotional structure on the results of organizations or the implementation of innovation projects though. In this process, entrepreneurial organizations need to develop their intrapreneurial culture, while corporate entrepreneurs need to develop their skills and polish them in the framework of the organizational culture (Lenzi, 2008).

The theories of entrepreneurial culture are rooted in the theories of entrepreneurship. Discussions about this have broken the frontiers of the "new business" and have gained a place on the discussion list of large organizations. This has been occurring due to the growing need for sophistication of the economy and the production and service means, which require the formalization of knowledge that was previously obtained and recognized only empirically (Dornelas, 2008). In this sense, Feuerschütte, Alperstedt and Godoi (2012, p 511) point out that "In the last decades the evolution of the phenomenon of entrepreneurship has intensified as a result of the economic transformations, the reduction of the jobs and the mobilization of the professionals in search of new spaces to expose their talents".

In order to stimulate and develop the intrapreneurial spirit, many companies are investing in development programs for their collaborators. The main challenge is to offer motivation so that their employees can develop intrapreneurial behaviors. Dornelas (2003) comments that companies are starting to change their way of acting, presenting alternatives to stimulate and develop the intrapreneurial spirit of their employees and at the same time increase their profits.

Given this context, the general objective proposed in this study is to evaluate if the center directors perceive in the academic unit's course coordinators the entrepreneurial skills necessary for the course performance according to the measuring of the Department of Education. In order to do so, the managers' perceptions were assessed through a survey (Babbie, 1992) and, after ad hoc statistical procedures, the relationship between the perceived competencies and the performance measure was analyzed.

Studies of this nature can contribute significantly to teaching practices, seeking to direct actions in the scope of higher education that stimulate the presence of entrepreneurs as future agents of innovation. Likewise, the results achieved and their articulation with the theoretical framework can permit the planning of actions that contribute to the area of entrepreneurship at other educational levels.

After this introduction, the structure of this paper comprises the theoretical contribution necessary to understand the items to be studied, namely, entrepreneurial culture; intrapreneurship and entrepreneurial skills. Next, the methodological procedures are described, followed by the description and analysis of the data, where the obtained results are shown. Finally, the final considerations of the research and the bibliographic references used are presented.

2. Theoretical Framework

Next, the entrepreneurial culture and intrapreneurship and entrepreneurial skills are discussed.

2.1 Entrepreneurial culture and intrapreneurship

Entrepreneurship is an emerging and ever-evolving field of research, encompassing the themes of creation, innovation, and expansion of new ventures in the individual and organizational dimensions, with emphasis on intrapreneurship in existing organizations (Antoncic & Hisrich, 2003).

Today, as Shabana (2010) argues, companies are restructuring and rethinking their internal work processes due to market pressures from consumers, competitors, suppliers, governments and, above all, macro-environmental variables. Intrapreneurship is not only a way of seeking to increase the level of productivity and innovation of organizations, as Pinchot (1985) puts it. It is a form of coordination of the work and business processes in a more integrated way. In the same vein, Filion (2004) points out that, in order to be intrapreneurs, people need to have a high level of commitment to what they do and should be able to at least sustain the continuity of the action they initiate.

The ascent of intrapreneurship is closely related to the consolidation of an entrepreneurial culture. Culture as a concept has a diversified and extensive trajectory and can be used to represent sophistication. For example, naming a person as "cultured" may be used to describe customs and rituals that societies develop. In recent decades, it has referred to the climate and the practices the organizations develop when dealing with people (Schein, 2009).

The network of relationships between the economic environment and the influences of the manager's entrepreneurial culture needs to be open to changes. It is complex and constituted by external factors that are in constant interaction with the organization's internal factors. In addition, it serves to sustain the corporate culture, influences its performance and its ability to learn from the external environment and, therefore, its ability to be competitive. In this network, the economic environment itself and the relationship between the organization and the market stand out as external factors. Regarding internal subjective factors, relationships involve the human resources' characteristics and openness to change. Entities that do not develop the ability to perceive internal and external stimuli quickly and therefore transform them into new projects/improvements are bound to be excluded from the market (Minguzzi & Passaro, 2000).

Minguzzi and Passaro (2000) argue that external environmental factors can only be modified in the long run and that the economic environment is composed of actors present in the environmental system where the company operates (customers, suppliers, competitors, management, consultants). According to them, the entrepreneurial culture is constituted by subjective and internal factors of the organization and the entrepreneur. They refer to the entrepreneur's behavioral as a component of the entrepreneurial culture, emphasizing that the "cultural inventory" consists of the entrepreneur's personal qualities.

This conceptual discussion has made managers look for a "correct type of culture", aiming for it to serve as a reference to herald certain values. In this sense, managers associate organizational culture with effective performance, in a relationship in which, the stronger the culture, the more effective the organization (Schein, 2009). In addition, being a code of values and beliefs that shape a firm's decision-making patterns, the organizational culture drives its behavior in order to block a strategy or serve as a catalyst for it. It is typically triggered from the top down, starting from the main manager (Goodes & Company, 1999).

The entrepreneurial culture is shaped by factors that mainly involve the entrepreneurial profile, which in turn interferes in organizational performance, and innovation. Innovation is directly related to the ability to develop new technologies aiming for competitive advantages. A key point to be stressed is that the various fragments of behavior and culture, which involve the understanding of innovation, need to be built on the basis of a manager's systematic skill set or patterns of thinking and acting. And this building creates possibilities to implement innovative actions throughout the organization (Dougherty, 2004).

Considering that people are resources and that the profile of the manager shapes the culture of the company, it is emphasized that the organization that fosters an entrepreneurial culture may stand out in relation to its competitors if it presents a set of distinguished resources and resource-based entrepreneurial management. In addition, Porter's position (1981) emphasizes that the improvement in the organizational performance innovates and updates the competitive advantages over time.

The corporate entrepreneur is the employee who stands out for his actions in the organizational environment, that is, who is an integral part of the entity. Intrapreneurs are agents of change because they are individuals who have ideas and turn them into profitable realities for the company. Pinchot (1985) already pointed out that the internal entrepreneurs are endowed with distinguished qualities and that the perceived characteristics highlight the innovative profile. This author points out that they are those who, based on an idea, receiving freedom, incentive and resources, dedicate themselves enthusiastically in transforming this idea into a successful product. Jennings and Young (1990) emphasize that corporate entrepreneurship is the process of developing new products or processes.

Wunderer (2001) mentions that the intrapreneur is an employee of the company who innovates, identifies and creates business opportunities, assembles and coordinates new combinations or arrangements of resources to add value. This assertion complements the concept developed by Pryor and Shays (1993), who pointed to intrapreneurship as the creation of an environment in which innovation can flourish and transform ordinary people into successful entrepreneurs who take on responsibilities and roles within the company.

Longenecker and Schoen (1975) established three core components of corporate entrepreneurship: 1) innovation - entrepreneurship is associated with innovative or creative action and involves the creation of products, services, processes, business, markets, alternative materials and structural changes in the organization; 2) autonomy - the entrepreneur should enjoy autonomy to make the decision to use resources, set goals, choose strategies for action and seek relevant opportunities; and 3) risk proneness - every entrepreneurial initiative involves some degree of risk and, the greater the factor of innovation, the greater the uncertainty.

Intrapreneurship consists of a system that accelerates innovations within organizations, as Pinchot (1985) argues, exploiting opportunities and aiming to earn above-average returns by making better use of the collaborators' entrepreneurial talents. These, in turn, are free to act, although with constraints as they are not the owners of the business. According to Zilber and Brancalião (2008) however, this action should take into account the environment the company is inserted in and the identification of opportunities that can generate new business.

2.2 Entrepreneurial competencies

The interpretations on competence are based on the conceptions of different areas of the human and social sciences, based on which their foundations and concepts are elaborated. Among the models, it is important to highlight the model that considers that competence needs to be observed in the action to be identified and understood. And as a result of its expression, it reveals how the subject articulates his resources to face situations of work and personal life. It can thus be understood as a construct that encompasses different personality traits, skills and knowledge.

From an organizational perspective, Prahalad and Hamel (1990) explain that competence would be the ability to combine, mix and integrate resources, products and services. Le Boterf (1997, 2003), from an individual perspective, states that it is not just a state or knowledge that one has and is not the result of training. According to him, competence is a concept under construction, is based on individual characteristics and will arise in the professional context.

Another definition from the same individual perspective is that of Durand (2006), who considers it as a broad combination of personal characteristics, skills and knowledge, which result in behaviors that can be evaluated and observed. On the other hand, competence according to Nassif, Andreassi and Simões (2011, 38) "can be considered as a final level of an individual's characteristic, approaching different personality traits, abilities and knowledge, starting from the influences of experiences, training, education, family and other demographic variables". Drejer (2002) defines it as a phenomenon composed of four elements: technology, people, organizational structure and organizational culture. In this same sense, Paiva Jr, Guerra, Oliveira, & Alves (2006) affirmed that they are necessary at the individual, group, organizational and societal levels and that entrepreneurial competencies reflect effective actions of the entrepreneurial leader, being framed at the individual level. According to Munck, Souza and Zagui (2012, p. 378) "when observing individual competencies as a development tool, the organization will be concerned with carrying out a planning that envisions this as a promising device for emancipating organizational competencies".

According to Snell and Lau (1994), entrepreneurial competencies are the combination of entrepreneurial actions, being a body of knowledge, motivations or directions, attitudes or views that can contribute to the devising or practice of the business in different ways. Man and Lau (2000), in turn, consider competencies to be superior characteristics that make the individual stand out due to different personality traits, skills and knowledge, manifested in attitudes. As Le Boterf (2003) adds, these traits are influenced by traditional and family education and experience.

For Antonello (2005), entrepreneurial competencies are a set of skills and attitudes that enable individuals to print their vision, strategies and actions in the creation of tangible and intangible value for society. In this same line of thought, Lenzi (2008) and Santos, Lenzi and Casado (2011) argue that they originate in the constant results of corporate entrepreneurs. Lenzi (2008:46) states that "just as a person can polish his own skills, an entrepreneur can build and tailor his individualities to create entrepreneurial competence."

Through a theoretical review, Mitchelmore and Rowley (2010) presented four categories of competency analysis: a) business and management competencies: focus on resource development, operational and strategic aspects; b) human competencies and relationships: focus on culture, leadership and people; c) conceptual and relationship competencies: focus on communication, relationship with stakeholders and decision making; and, d) entrepreneurial competencies: focus on innovation.

Based on Rosa and Lapolli (2010), Schmitz adopted as a concept of entrepreneurial competence the "behavior, skill and attitude of an individual who, in the face of critical work situations, gets inspired to seek solutions, which will result in institutional benefit and fulfillment of the individual's need for accomplishment". His qualitative study, developed in the university context with institutional managers, showed that independence and self-confidence were the most recurrent.

Developing a quantitative research in order to identify the entrepreneurial skills and to be able to relate them to the different aspects of the entrepreneurs and the businesses they develop implies the use of classifications. Among the existing ones, for this study, the classification by Lenzi (2008) was chosen. It is based on the work of Cooley (1990, 1991), which highlights ten characteristics of entrepreneurial conduct, grouped into three clusters, namely:

1. achievement cluster, consisting of the search for opportunities and initiatives (BOI), calculated risk-taking (CRC), demand for quality and efficiency (EQE), persistence (PER) and commitment (COM);
2. planning clusters, which encompasses the search for information (BDI), establishing goals (EDM), and systematic planning and monitoring (PMS);
3. power cluster, including persuasion and networking (PRC) and independence and self-confidence (IAC).

This model is currently used by the United Nations Development Program (UNDP), and also by the Brazilian Micro and Small Business Support Service (SEBRAE), for entrepreneurship training programs such as the Program for Entrepreneurs and Future Entrepreneurs (EMPRETEC).

3. Material and Methods

The data for this study were produced with the center directors (or equivalent position) at three universities, being one public and two community colleges. For this purpose, a survey was carried out using a questionnaire, in which the respondents were asked to evaluate the competencies of the course coordinators (or equivalent position) who are subordinate to them. All the directors received the research instrument in person due to the confidentiality of the data.

The questionnaire, in accordance with Cooley's (1990, 1991) proposal, contained a first part related to the entrepreneurial competencies of the achievement cluster, including: search for opportunities and initiatives (BOI), calculated risk-taking (CRC), demand for quality and efficiency (EQE), persistence (PER) and impairment (COM). The second part included all three competencies of the planning cluster: search for information (BDI), setting goals (EDM), and systematic planning and monitoring (PMS). Finally, the third part comprised the two competencies of the power cluster, which are related to persuasion and networking (PRC) and to independence and self-confidence (IAC).

For each of the competencies, the center director answered three questions regarding the competency he believed the coordinator possessed. The answers were to be given on a five-point interval scale, and then the three values were added up for statistical processing. Scores equal to or greater than twelve (12) indicate the presence of this competency.

Sixty-one (61) questionnaires were considered in which there were no missing data in any of the thirty questions. Of this number, thirteen came from the public university and the remaining 48 were distributed equally between the two community colleges. In the data processing, the factorial model and correlation analysis were used.

The analysis of common and specific factors, commonly called factor analysis, was used in an exploratory way. Before performing the analyses, Cronbach's alpha coefficient was calculated for the set of the ten competences and the item-total correlation, according to the procedure suggested by Churchill Jr. (1979). Next, the Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests (BST) were used to confirm the feasibility of using factor analysis. To extract the factors, the principal components method was used, which does not require multinormality, and the factors were extracted according to the Kaiser criterion, that is, based on eigenvalues greater than one when using the correlation matrix to generate those values.

Other restrictions applied were that the factor loadings should be greater than or equal to 0.60 in magnitude and the commonality greater than or equal to 0.4. The variance extracted by the factor in the case of one-dimensionality should be greater than or equal to 50%. The Kolmogorov-Smirnov test was used to evaluate the normality of the distribution of the sums of the three values for each competence, and asymmetry and kurtosis were calculated (Hair Jr., Black, Babin, Anderson, & Tatham, 2009). Finney and DiStefano (2006) state that data with asymmetry coefficients of up to 2 and kurtosis up to 7, in module, can be considered almost normal.

The factor scores for the different courses were then generated. In order to do so, we used the ten competences as a set and also separately, according to the clusters proposed in Cooley's model, that is, achievement, planning and power. Factor scores were used to evaluate the relation between competencies and course performance, measured by the preliminary course concept (CPC) the Department of Education assigns through a specific method. These concepts are available on the homepage of the Brazilian Institute of Educational Studies and Research Anísio Teixeira - INEP.

4. Results

The competency data in the sample obtained, which comprised 61 valid questionnaires and 30 variables, were transcribed to a spreadsheet for preprocessing. Initially, the values attributed by the center directors were added to the competencies of the coordinators and ten new variables were created. The value 12 was taken as an indicator that the competency was present in the coordinator according to the center director.

Thus, the competency that was most present was the search for information (BDI) with 46 occurrences, followed by persuasion and networking (PRC) with 42 and commitment (COM) with 40 scores equal to or higher than 12. The least frequent competencies were (BOE) with only 29, demand for quality and efficiency (EQE) and setting goals (EDM) with 30 occurrences of values equal to or greater than 12. In the evaluation of the center directors, 12 coordinators possess the ten manifest competencies and nine others have no added score equal to or higher than 12, which means that they do not manifest any competency according to the directors.

Then, before carrying out the factorial analyses, the procedures described in the previous section were performed. Thus, following the suggestion by Churchill Jr. (1979), reliability was evaluated through Cronbach's alpha and item-total correlations to confirm the fit of the data. Cronbach's alpha corresponded to 0.9084, well above the suggested minimum of 0.7. In turn, the item-total correlations were higher than 0.5 for all competencies. In both cases, it is confirmed that the data are fit to proceed with the factor analysis. Ratifying this condition, the KMO and BST tests were performed. The coefficient for the Kaiser-Meyer-Olkin test was 0.814 and the p-value of Bartlett's test was 0.000. Thus, it was verified that the data are feasible for processing using factor analysis.

Although the extraction method used in the factor analysis does not require multinormality, the normality of each of the competencies was evaluated, considered as the sum of the values of the three questions used. Therefore, the Kolmogorov - Smirnov test was used and, because the presence of normality had to be rejected for all ten competencies, asymmetry and kurtosis were calculated. As shown in Table 1, all values are within the ranges suggested by Finney and DiStefano (2006) to be considered quasinormal.

Table 1
Descriptive statistics of competencies

Competencies	Mean	Standard Deviation	Asymmetry	Kurtosis
BOI – Search for Opportunities and Initiatives	10.98	2.419	-0.514	0.099
CRC – Calculated Risk-Taking	11.66	1.999	-0.399	-0.193
EQE – Demand for Quality and Efficiency	11.10	2.166	-0.263	-0.923
PER - Persistence	11.72	2.318	-0.637	0.069
COM - Commitment	12.31	2.248	-0.422	-1.095
BDI – Search for Information	12.39	2.131	-0.718	0.895
EDM – Establishing Goals	11.10	1.981	-1.179	1.955
PMS – Systematic Planning and Monitoring	11.69	2.384	-0.509	-0.408
PRC – Persuasion and Networking	12.16	2.091	-0.621	-0.156
IAC – Independence and Self-Confidence	11.56	2.592	-1.089	1.211

Source: research data (2014).

Next, the exploratory factor analyses were executed, through which further adjustments were made. The competencies were addressed using the sets of the model by Cooley (1990, 1991) and considering the ten competencies simultaneously. When using the minimum values described in the methodological procedures, the factors presented in Table 2 were obtained.

Table 2

Factor loadings, explained variance and percentage of variance extracted by the factor for the set of competencies as a whole and for the achievement, planning and power clusters

Competency	Factor 1	Competency	Factor 1	Competency	Factor 1	Competency	Factor 1
CRC	-0.8600	BOI	-0.6898	BDI	-0.6747	PRC	0.8534
EQE	-0.8075	CRC	-0.8811	EMD	-0.8428	IAC	0.8534
COM	-0.7819	EQE	-0.8609	PMS	-0.8666	**Var. Expl.**	**1.4564**
BDI	-0.6486	COM	-0.8648	**Var. Expl.**	**1.9165**	**% of Var.**	**0.7282**
EDM	-0.7682	**Var. Expl.**	**2.7412**	**% of Var.**	**0.6388**		
PMS	-0.8209	**% of Var.**	**0.6853**				
PRC	-0.7651						
IAC	-0.6122						
Var. Expl.	**4.6481**						
% of Var.	**58.10**						

Legend:
BOI – Search for Opportunities and Initiatives
CRC – Calculated Risk-Taking
EQE – Demand for Quality and Efficiency
PER – Persistence
COM – Commitment
BDI – Search for Information
EDM – Establishing Goals
PMS – Systematic Planning and Monitoring
PRC – Persuasion and Networking
IAC – Independence and Self-Confidence

Source: research data (2014).

With each of the factors extracted in the multivariate analysis, the factor scores were calculated for the different courses. Then, the correlation analyses with the preliminary course concept (CFC) coefficients were executed, taken from the homepage of the Brazilian Institute of Educational Studies and Research Anísio Teixeira – INEP.

The analysis of the relationship between the factor scores deriving from the joint processing of the set of competencies, excluding the search for opportunities and initiatives (BOI) and persistence (PER), and the preliminary course concept (CPC), a correlation was found between these variables. In Table 3, the correlations between the competencies and the CPC were shown.

Table 3

Correlations between preliminary course concept (CPC) and factor scores of set of competencies (a) and clusters: achievement (b); planning (c); and power (d).

Correlation (A)	Set	Preliminary Course Concept (CPC)
Set	1	0,2563 P=0,046
Preliminary Course Concept (CPC)	0,2563 P=0,046	1
Correlation (B)	**Achievement**	**Preliminary Course Concept (CPC)**
Achievement	1	0,1593 p=0,220
Preliminary Course Concept (CPC)	0,1593 p=0,220	1
Correlation (C)	**Planning**	**Preliminary Course Concept (CPC)**
Planning	1	0,2571 p=0,046
Preliminary Course Concept (CPC)	0,2571 p=0,046	1
Correlation (D)	**Power**	**Preliminary Course Concept (CPC)**
Power	1	0,2963 p=0,020
Preliminary Course Concept (CPC)	0,2963 p=0,020	1

Source: research data (2014).

As presented in Table 3a, a positive and statistically significant ($p < 0.05$) association exists. For the achievement cluster, the calculation of the linear correlation coefficient did not demonstrate a significant result, as shown in Table 3b, which reveals a p-value superior to 0.05. For the planning cluster, the scores are again significantly correlated with the CPC (Table 3c). The same is true for the factor scores of the power cluster (Table 3d).

5. Final considerations

The purpose of this research was to analyze the relationship between the entrepreneurial skills the center directors perceive in the coordinators of the courses under their administrative responsibility and the performance of the courses those teachers coordinate. Therefore, a representative sample of 61 courses was selected, belonging to three universities in the state of Santa Catarina, being one public and free and two community and paid colleges. Thus, the main research problem was to evaluate if the perceived competencies are associated with the performance of the several courses, according to the measure the Department of Education uses, through the indicator called the preliminary course concept.

Before looking for the answer to this question, the behavior of the ten entrepreneurial competencies in Cooley's model (1990, 1991) was analyzed in the sample, chosen to develop this study. Thus, the data were processed considering the sum of the three questions that measured each of them. The results indicated that the three clusters they were divided in, according to the model, are not confirmed as dimensions of the construct when factor analysis was performed. The solution obtained was one-dimensional after the exclusion of the competencies search for opportunities and initiatives and persistence.

Regardless of this condition, individual analyses were also performed for each of Cooley's proposed clusters of achievement, planning and power. It was verified in these analyses that the planning cluster exhibits erratic behavior according to the center directors, with the competency that refers to persistence differing from the other four.

After recognizing those conditions, the associations that motivated this study could be evaluated. Consequently, the data treatment was divided into two different moments: one in which the construct was addressed generally and another where each cluster of the Cooley model was considered independently.

As a response to the initial inquiry, it can be concluded that the entrepreneurial skills the coordinators possess, according to the center directors, are positive and significantly related to the performances of the courses those teachers coordinate. When separating the competencies according to the clusters they were divided in according to the model used, however, shows that it is the achievement cluster that is not significantly linked to the performance. This is consistent with the fact that all the competencies the directors perceived behave in a one-dimensional way when excluding two of them that belong to the achievement cluster.

These findings may contribute to the improvement of academic management from both the theoretical and practical points of view. In the first aspect, by putting up for debate the importance of entrepreneurship not only for student training, but also as a necessary action for the managers to consider. From the practical point of view, it is the responsibility of the center directors to monitor the performance of the courses, taking into account the entrepreneurial capacity they perceive in the coordinators. According to the results presented here, the achievement cluster can be emphasized, as planning and power are clearly associated with performance.

Some limitations may be mentioned, such as not having considered in the analyses the coordinators' self-assessment of their entrepreneurial skills or how long the directors and coordinators have occupied their mandate. It is therefore suggested that future studies include other aspects that may enhance the understanding of the results achieved. In this sense, a topic of greater academic and practical interest is to analyze the entrepreneurial orientation the course, the center or the university itself can manifest.

References

Antonello, C. S.(2005). A metamorfose da aprendizagem organizacional: Uma revisão crítica. Ruas, R.L., Antonello, C.S., & Boff, L.H. *Os novos horizontes da gestão*: aprendizagem organizacional e competências. Porto Alegre: Bookman.

Antoncic, B. &Hisrich, R.B. (2003).Clarifying the intrapeneurship concept. *Journal of Small Business and Enterprise Development*, *10*(1), pp. 7-24. doi: https://doi.org/10.1108/14626000310461187

Arrazola, M. &Hevia, J. (2008). Three measures of returns to education: an illustration for the case of Spain. *Economics of Education Review*, *27*(3), pp. 266-275. doi: https://doi.org/10.1016/j.econedurev.2006.10.004

Babbie,E. (1992). *The practice of social research.* Belmont: Wadsworth.

Churchill JR., G.A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, *16*(1), pp. 64-73. doi:https://doi.org/10.2307/3150876

Cooley, L. (1990). *Entrepreneurship Training and the strengthening of entrepreneurial performance*. Final Report. Contract. Washington: USAID.

Cooley, L. (1991).*Seminario para fundadores de empresa*. Manual del Capacitador. Washington: MSI.

Delors, J. , Eufrázio, J.C. (1998). Educação: um tesouro a descobrir. Relatório para a UNESCO da Comissão Internacional sobre Educação para o século XXI. São Paulo: Cortez, MEC, UNESCO.

Dornelas, J.C.A. (2003). *Empreendedorismo corporativo*: como ser empreendedor, inovar e se diferenciar em organizações estabelecidas. 2. ed. Rio de Janeiro: Elsevier.

Dornelas, J. C. A. (2008). *Empreendedorismo*: transformando ideias em negócios. 3. ed. rev. e atual. Rio de Janeiro, RJ: Campus.

Dougherty, D. (2004). *Organizando para a inovação*. Handbook de estudos organizacionais, *3*, pp. 337-360.

Drejer, A. (2002). *Strategic management and core competencies*. Quorumbooks, USA.

Durant, T. (2006). *L'alchimie de la compétence*. Revue française de gestion, *160*, pp. 261-292.doi: 10.3166/rfg.160.261-292.

Feuerschütte, S. G., Alperstedt, G.D.,& Godoi, C.K. (2012).*Empreendedorismo e competência*: *um ensaio sobre complementariedade e convergência dos construtos*. Revista Eletrônica de Gestão Organizacional, *10*(3), pp. 509-538.

Filion, L.J.(2004).*Entendendo os intraempreendedores como visionistas*. Revista de Negócios, *9* (2), pp. 65-80. doi: http://dx.doi.org/10.7867/1980-4431.2004v9n2p%25p

Finney, S.J., & Distefano, C. (2006). Non-normal and categorical data in structural equation modeling. In: Hancok, G.R., &Muelleer, R.O. *Structural equation modeling*: a second course. Charlotte, NC: Information Age Publ.

Goodes, M.R.& Company, W. (1999).Transformando a cultura de uma empresa global: em empregado de cada vez. In: Dauphinhais, G.W. &Price, C. *Abrindo o jogo*. Rio de Janeiro: Editora Objetiva.

Hair Jr., J.F., Black, K.W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. (2009).*Análise multivariada de dados*. 6. ed., Porto Alegre: Bookman.

Jennings, D.F.& Young, D.M. (1990). An empirical comparison between objective and subjective measures of the product innovation domain of corporate entrepreneurship. *Entrepreneurship Theory and Practice*, *15*(1), pp. 6-20.

Le Boterf, G. (1997). *Construire la compétence collective de l'entrepriese*. Gestión, Paris, *22*(3), pp. 82-85.

Le Boterf, G. (2003). *Desenvolvendo a competência dos profis*sionais. 3 ed., Porto Alegre: ArtMed.

Lenzi, F.C. (2008). *Os empreendedores corporativos nas empresas de grande porte*: um estudo da associação entre tipos psicológicos e competências empreendedoras. Tese de doutorado,Universidade de São Paulo, São Paulo, SP, Brasil.

Longenecker, J. & Schoen, J.E. (1975). The essence of entrepreneurship. *Journal of Small Business Management*.

Mant, T.W.Y. & Lau, T. (2000). Entrepreneurial competencies of SME owner/managers in the Hong Kong services sector: A qualitative analysis. *Journal of Enterprising Culture*, *8*(3), pp. 235-254. doi: https://doi.org/10.1142/S0218495800000139

McClelland, D.C. (1971). *Entrepreneurship and achievement motivation*: approaches to the science of sócio-economic development. In: Leygel, P. (org.). Paris: UNESCO.

Minguzzi, A. &Passaro, R. (2000). The network of relationships between the economic environment and the entrepreneurial culture in small firms. *Journal of Business Venturing*, *16*, pp. 181-207.

Mitchelmore, S. & Rowley, J. (2010). Entrepreneurial competencies: a literature review and development agenda. *International Journal of Entrepreneurial Behaviour& Research*, *16*(2), pp. 92-111. doi: https://doi.org/10.1108/13552551011026995

Munc, L., Souza, R.B. &Zagui, C. (2012). A gestão por competências e sua relação com ações voltadas à sustentabilidade. *REGE*, *19*(3), pp. 371-389. doi: http://dx.doi.org/10.5700/issn.2177-8736.rege.2012.49909

Nassif, V.M.J.,Andreassi,T.&Simões, F. (2011). Competências empreendedoras: há diferenças entre empreendedores e intraempreendedores? *Revista de Administração e Inovação*, *8*(3), pp. 33-54. doi: https://doi.org/10.5773/rai.v8i3.858

Paiva Jr, F.G.O., Guerra, J.R.F., Oliveira, M.A.F. & Alves,V.S.(2006). A contribuição das competências empreendedoras para a formação de dirigentes em sistemas de incubação. *Anais Encontro Nacional de Engenharia de Produção*, Fortaleza, CE, Brasil, 26.

Pinchot, G. (1985). *Intrapreneuring*. New York, NY: Harper & Row.

Porter, M. (1981). The contributions of industrial organization to strategic management. *Academy of Management Review*, *6*(4), pp. 609-620. doi: 10.2307 / 257639.

Prahalad, C.K.& Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, *68*(3), pp. 79-90.

Pryor, A.K.& Shays, E.M. (1993). Growing the business whithintrepreneurs. *Business Quartely*, London.

Rosa, S.B.&Lapolli, E.M. (201). Santa Catarina: um estado que é uma vitrine de talentos. In: Lapolli, E.M., Franzani, A.M.B. & Souza, V.A.B. (Orgs). *Vitrine de talentos*: notáveis empreendedores em Santa Catarina. Florianópolis: Pandion.

Santos,S.A. dos, Lenzi, F.C. & Casado, T. (2011). *Talentos inovadores na empresa*: como identificar e desenvolver empreendedores corporativos. Curitiba: Ibpex.

Schein, E.H. (2009). *Cultura organizacional e liderança*. São Paulo: Atlas.

Schmitz, A.L.F. (2012). *Competências empreendedoras*: os desafios dos gestores de instituições de ensino superior como agentes de mudanças. Tese de Doutorado,Universidade Federal de Santa Catarina, Florianópolis, SC, Brasil.

Schumpeter, J.A. (1949). *The theory of economic development*: an inquiry into profits, capital, credit, interest, and the business cycle. Cambridge: Harvard University Press.

Shabana, M.A. (2010). Focusing on intrapreneurship: an employee-centered approach. *Advances in Management, Kolhapur*, *3*(12), pp. 32-37.

Snell, R., & Lau, A. (1994). Exploring local competences salient for expanding small business. *Journal of Management Development*, *13*(4), pp. 4-15. doi: https://doi.org/10.1108/02621719410057032

Wunderer, R. (2001). Employees as "co-intrapreneurs" - a transformation concept. *Leadership & Organization Development Journal*, *22*(5), pp. 193-211. doi: https://doi.org/10.1108/EUM0000000005676

Zilber, S.N., &Brancalião, H.F. (2008). Da identificação de oportunidades a ação intraempreendedora: estudo de caso no setor sucroalcooleiro brasileiro. *Anais do Encontro Anual daAssociação Nacional dos Programas de Pós-Graduação emAdministração*, Rio de Janeiro, RJ, Brasil, 33.

repec

REPeC, Brasília, v. 12, n. 2, art. 5, p. 210-228, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1811

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ABRACICON
ACADEMIA BRASILEIRA DE CIÊNCIAS CONTÁBEIS

ISSN 1981-8610

Professor, Can I Use my Mobile Phone? A Study on the Use of the Student Response System (SRS) in the Educational Process of Accounting Students

Abstract

Objective: This study seeks to investigate accounting students' perception on the use of the Student Response System (SRS) in the educational process.

Method: In this survey research with a quantitative approach, the aim is to describe accounting students' perceptions. This research was developed in a public HEI with two classes of the Accounting for Diverse Entities course during the 1st and 2nd bimester of the academic year 2016. At the end of the 2nd bimester, questionnaires were applied to collect the data.

Results: SRS is easy to use and makes the classes more interactive. A strong relationship exists between the perceptions that SRS helps students as a didactic tool and that it is beneficial for learning. It was verified that there was no relevant significant difference in terms of students' perceptions between the classes. Nevertheless, relevant differences were found in the analysis according to gender and age.

Contributions: The evidences found support that SRS improves the educational process. Therefore, faculty can use it to encourage greater student involvement and active attitudes, as well as to promote an environment different from traditional teaching.

Keywords: Student response system; Accounting students; Education process, Survey; Accounting education

Vitor Hideo Nasu
Ph.D. candidate in Controllership and Accounting from University of São Paulo (USP). **Contact:** Avenida Prof. Luciano Gualberto, 908, Butantã, São Paulo/SP, CEP: 05508010.
E-mail: vnasu@usp.br

Luís Eduardo Afonso
Free Lecturer from University of São Paulo (USP) and Associate Professor at University of São Paulo (USP). **Contact:** Avenida Prof. Luciano Gualberto, 908, Butantã, São Paulo/SP, CEP: 05508010.
E-mail: lafonso@usp.br

Published in Portuguese and English. Original Version in Portuguese.

Received in 2/23/2018. Ask to Revise on 3/29/2018. Resubmitted on 4/29/2018. Accepted on 4/30/2018 by Dr. Gerlando Augusto Sampaio Franco de Lima (Assistant Editor) and by Dr. Orleans Silva Martins (Editor). Published on 6/29/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

(cc) BY

1. Introduction

New learning patterns have originated from the intensive use of mobile devices and the internet (Pathways Commission, 2012). For this reason, students expect visual stimuli and the insertion of technologies in the educational process to stay interested and motivated in class (Sprague & Dahl, 2010). Cheong, Bruno, and Cheong (2012) argue that new-generation students are technology savvy and, therefore, educators should employ up-to-date pedagogical resources the students already use. With easy access to smart devices, they are an alternative to engage students during the educational process (Cheong *et al.*, 2012).

Active learning practices are increasingly demanded as traditional classes fail to keep students' attention and involvement. This situation is particularly present in higher education in accounting sciences, as perceived in research (Behn, Ezzell, Murphy, Rayburn, Stith & Strawser, 2012; Gaviria, Arango & Valencia, 2015). Gaviria *et al.* (2015) state that, sometimes, students are not interested in the pedagogical process because they consider it monotonous and passive. In response to this scenario, accounting teachers started using the Student Response System (SRS), although its diffusion is timid (Carnaghan, Edmonds, Lechner & Olds, 2011; Chatham & Davidson, 2011).

In its latest version (web-based SRS), the SRS consists of the use of personal devices, such as mobile phones and tablets, and software connected to the internet. Its functioning is based on the system of quizzes (questions and answers) and basically comprises three stages: (i) the teacher presents a question, usually multiple-choice; (ii) students answer the question through the devices; and (iii) the software receives the answers through the internet and provides feedback to the teacher and students, traditionally using graphs. Based on this process, studies suggest that SRS can encourage active learning, interactivity and enhance students' attention and involvement (Caldwell, 2007; Carnaghan & Webb, 2007; Lea, 2008; Zhu, 2007). Accounting teachers' incipient use of SRS (Carnaghan *et al.*, 2011; Chatham & Davidson, 2011), however, arouses concerns about the use of this technology in the classroom. Based on this framework, the following research question is proposed: What is the perception of Accounting students about the use of SRS in the educational process? Based on this question, the objective is to examine student perceptions about the use of SRS in accounting education.

The focus of the study is to verify the perception of Accounting students - being the main users of this educational technology - about a pedagogical resource of relatively recent use in accounting education, which can possibly enhance learning. Beckert, Fauth and Olsen (2009) point out that the analysis of students' perceptions about SRS is a logical step to verify its effectiveness. Thus, assessing the SRS from the students' perspective can provide indications about the usefulness of the equipment for the educational process. In addition, Gaviria *et al.* (2015) affirm that mastering and employing various techniques and teaching methods helps Accounting teachers and students to have a more fluent pedagogical process. The use of SRS can collaborate with Accounting teachers and students to improve the flow and speed of classes (Caldwell, 2007). Finally, Apostolou, Dorminey, Hassell and Rebele (2016) explain that testing and analyzing technological resources in the educational process is essential to structure educational models based on up-to-date teaching methods. This is especially important in the context of curriculum innovation (Apostolou *et al.*, 2016), an element of great attention in accounting education.

The article is structured, in addition to this introductory section, in four parts. Section 2 presents a review of the literature, a space dedicated to the discussion of the web-based SRS and its relation to learning, as well as the description of previous research on the use of this technological resource in the scope of accounting education. Section 3 explains the methodological procedures of the study. Then, section 4 presents the results. Finally, the conclusions and limitations of the research, as well as the directions for future studies, are reported in section 5.

2. Literature review

This section presents the theoretical current the SRS is related with. In addition, it explains the operation of the SRS and its general characteristics, also discussing how this pedagogical resource can help students' learning. Finally, related background studies are described in order to highlight the context this research is inserted in and the background literature findings are discussed in confrontation with those of the present research.

2.1 Active learning

The use of SRS in accounting education has been associated and studied within the educational theoretical current called Active Learning. For example, research by Carnaghan and Webb (2007), Edmonds and Edmonds (2008), Marshall and Varnon (2012) and Premuroso, Tong and Beed (2011) is based on this theoretical current to analyze their research foci. The seminal work of Bonwell and Eison (1991), however, argues that the term "Active Learning" has been employed more intuitively than consensually.

Despite the lack of a formalized concept, Gainor, Bline, and Zheng (2014), Sivan, Leung, Woon and Kember (2000) and Sullivan (2009) point out that Active Learning is characterized by the use of instructional techniques that actively involve the student in the education process, opposing the conventional teaching model that aims at passive content absorption. In this sense, the nonconformity with the teacher-centered educational process and the students' passive posture represents a key point of active learning (Sivan *et al.*, 2000; Sullivan, 2009). In addition, Bonwell and Eison (1991) enumerate general characteristics present that are commonly associated with pedagogical strategies that promote active learning: (i) students are involved in the learning process beyond acting as passive listeners; (ii) the emphasis is placed on the development of students' skills instead of information transmission; (iii) students are involved in broader reasoning; (iv) students are engaged in activities; and (v) greater emphasis is placed on the exploration of students' attitudes and values. Based on these characteristics and considering the context of higher education, Bonwell and Eison (1991) propose, as a definition under construction, that active learning is "instructional activities involving students in doing things and thinking about what they are doing" (p.19). Therefore, learning is as relevant as thinking about what has been learned.

The literature reviews on the SRS support a strong relationship of this technological resource with active learning. Kay and LeSage (2009), for example, indicate that the benefits of greater attention, involvement, interaction and discussion by the students can be promoted in the use of SRS. These aspects, if the characteristics discussed by Bonwell and Eison (1991) are taken into account, are closely related to Active Learning, as they encourage the students to leave the position of passive listeners and to act as active debaters and participants in the contents taught. Likewise, literature reviews by Fies and Marshall (2006) and Rana, Dwivedi and Al-Khowaiter (2016) show that SRS provides for greater involvement and interactivity, supporting the idea that this educational technology can offer effective contributions to the education process because it is considered an active teaching technique.

Studies indicate changes in the way learners learn (Lea, 2008; Sivan *et al.*, 2000), mainly due to the profile of the new generations (e.g. millennials), which are commonly characterized by multitasking and impatience (Lea, 2008). Gainor *et al.* (2014) report that current accounting students tend to prefer teaching and learning processes that advance faster and are more engaging, while traditional techniques, such as unilateral (teacher-student) communication, are losing importance. In this context, supported by active learning, the SRS can be important to promote greater interaction and involvement of the students, while representing a modern pedagogical resource compatible with the profile of the new generations. Therefore, the analysis of how SRS is used in the educational processes of Accounting students, especially to stimulate active learning, is relevant to the extent that benefits can be generated for students, teachers and educational institutions.

2.2 Web-based SRS

The most modern generation of SRS rests on the use of mobile devices such as smartphones, phablets and tablets, in combination with software, interlinked through the internet (Carnaghan *et al.*, 2011). The system works in the form of quizzes. The teacher asks the students a question, oral or visually, and they answer through their devices. The software receives the answers and produces the answer graph, providing the teacher and students with immediate feedback on the evaluation result. To illustrate this technology, Figure 1 displays an example of web-based SRS.

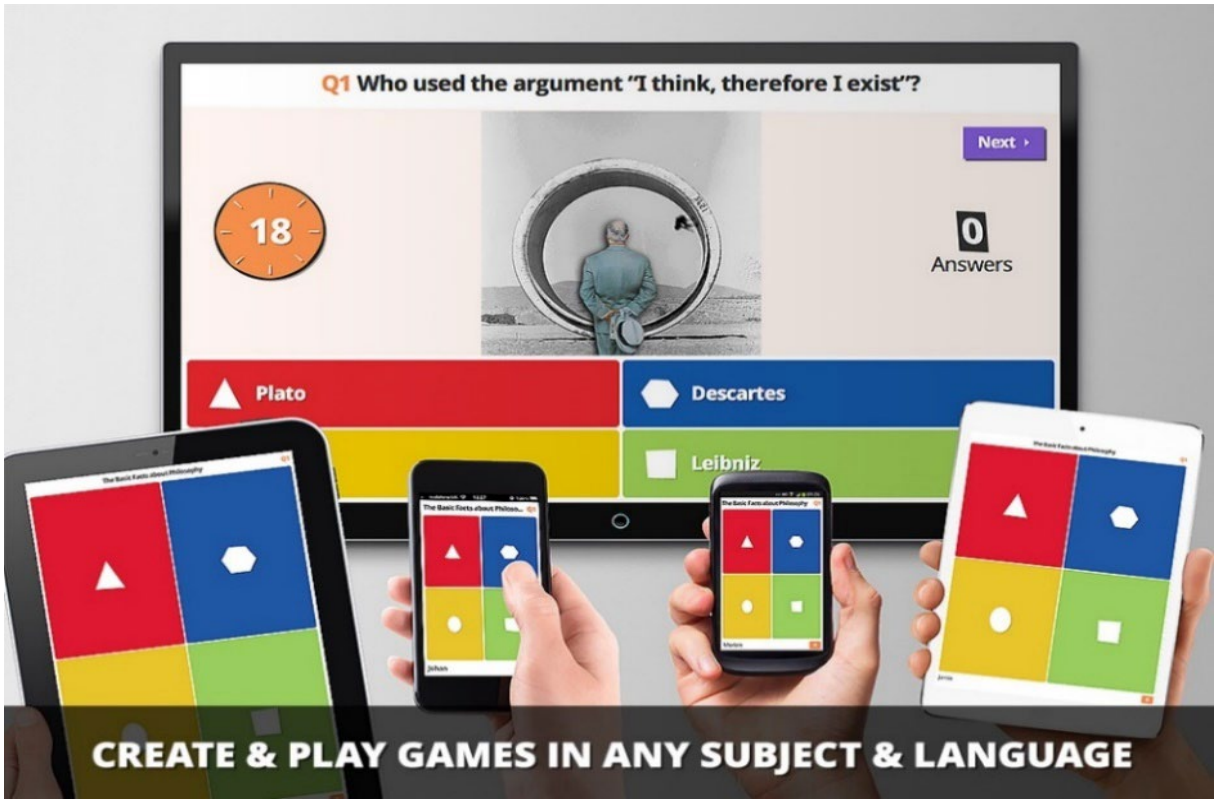


Figure 1. Example of web-based SRS

Source: https://medium.com/@rotemtam/build-a-kahoot-clone-with-angularjs-and-firebase-b8b30891d968

Immediate feedback is important because it allows the teacher to quickly verify students' mistakes and correct answers. Thus, additional explanations can be provided to enhance learning. Likewise, the SRS can indicate the students' level of understanding in each topic, permitting adjustments in the time and effort spent. In addition, the rapid feedback conveyed to students is essential because it enables them to monitor their performance in each class. Students with low performance can modify their study habits to improve their performance before the evaluations (Edmonds & Edmonds, 2008).

The web-based SRS can be used both in face-to-face and distance learning, as the students' responses are sent over the internet (Carnaghan *et al.*, 2011). Another advantage is that this technology can play a central or peripheral role in the classroom (Caldwell, 2007), that is, there is flexibility in the timing of its use. In addition, it can promote an active learning environment as students need to be alert to answer questions and perform well. In addition, increased involvement, participation and student concentration in class are other advantages reported in the literature (Caldwell, 2007, Carnaghan *et al.*, 2011, Kay & LeSage, 2009, Lea, 2008 and Zhu, 2007). It is also emphasized that the students' responses are anonymous, preventing embarrassing situations (Freeman, Blayney & Ginns, 2006).

On the other hand, there are some challenges to using SRS. Firstly, the use of remote devices can cause distractions. Therefore, the teachers should attentively exert control over the activities with the devices. Second, the web-based SRS demands proper connection with the Internet. In this sense, the provision of wi-fi signal to the devices is imperative. Alternatively, computer labs may be used, although the advantage of device mobility is lost. Finally, it is noted that not all students may have devices compatible with SRS software. In this case, the equipment needs to be provided to these students so that the activity can be performed. Otherwise a possible solution is to develop the quiz activity in groups.

Based on the above considerations, it is verified that the use of web-based SRS in the educational process has benefits and challenges that need to be taken into account before its implementation. It is emphasized that the use of the technology should be aligned with the academic objectives in order to achieve the expected results.

2.3 How can SRS help the students' learning?

The SRS can help the educational process, mainly in three dimensions: (i) Active Learning; (ii) Immediate Feedback; and (iii) Interactivity. According to studies (Carnaghan and Webb, 2007; Edmonds & Edmonds, 2008; Eng, Lea & Cai, 2013; Kay & LeSage, 2009; Lea, 2008; Mula and Kavanagh, 2009), SRS favors active learning because it encourages students' greater participation and involvement during classes. Although pushing the buttons or touching the screen of the devices may not be seen as an active practice, teachers report that students tend to be more willing to answer questions (Caldwell, 2007). In addition, by knowing what quizzes will be applied, students can become more attentive to lessons and read contents in advance. Edmonds and Edmonds (2010), in congruence with the literature notes, found evidence that the use of SRS in the Management Accounting classes, according to the students, promotes a more efficient and favorable environment for Active Learning. In this way, by encouraging greater student participation in classes, the SRS contributes to the practice of active learning processes.

The immediate feedback provided by SRS is another key aspect that contributes to learning. Carnaghan and Webb (2007) point out that the quality of information increases for students when feedback on activities is provided quickly, because there is no delay between performing the activity and its correction, making it easier to associate feedback with the questions and content. In the same line of reasoning, Edmonds and Edmonds (2008) emphasize that immediate feedback allows students to change their study habits and monitor their performance periodically. In addition, Kulik and Kulik (1988) found, through meta-analysis, that quiz-based activities are generally more effective when they provide immediate rather than delayed feedback. In accounting education, the results by Chui, Martin and Pike (2013) support this idea. The authors conducted a quasi-experiment with control (N = 32) and treatment classes (N = 28) in the subject Accounting Principles during one semester. The control group answered the printed quizzes on paper with delayed feedback (corrected during the next class), while the treatment class answered the quizzes using the SRS with immediate feedback. When comparing the classes' performance on the quizzes, it was verified that the treatment class performed statistically better ($t = 2.31$; sig. < 0.01) than the control class.

Instant feedback is equally important for the teachers. As Zhu (2007) points out, the SRS can be used to gather feedback about the class progress. The teacher can associate low student performance with some content and reinforce explanations. Likewise, content the students find easy may require less exposure time. Thus, the class time can be managed more efficiently.

Finally, studies report that the SRS can support the educational process when it instigates greater interactivity and discussion in the classroom (Caldwell, 2007; Cunningham, 2008; Engel *et al.*, 2013; Kay & LeSage, 2009), mainly in the student-teacher and student-student relationships. This interactivity is important for learning because, if the students do not feel engaged in the teaching-learning process, less effort will be made and, consequently, poor performance will be achieved. In addition, Cohn and Johnson (2006) argue that social interaction helps to understand the content and students can learn more from the interaction and exchange of experiences. Therefore, classroom interactivity is a crucial aspect for learning, which the SRs can help to become more present in the academic context.

2.4 SRS in accounting education: findings about student perception

Lea (2008) aimed to verify if the students' perception about the use of SRS in the discipline of Management Accounting changes over time. The author was particularly interested in analyzing the relationship between the use of SRS and ten elements related to students (Frequency, Preparation, Focus, Active Learning, Interactivity, Instant Feedback, Understanding, Content Depth, Fun and Learning Improvement). Therefore, the study was developed with two classes in two different periods (Fall 2006 = 20 students; Spring 2007 = 13 students). The SRS was used in almost all the 15 meetings of the discipline, applying surveys at the beginning and end of the semesters. The mean tests showed that there was no difference in perception about the use of SRS between the classes in the 10 aspects considered (sig.> 0.10), nor was any difference found over time (sig.> 0.10).

Segovia (2008) sought to investigate the impact of SRS in the learning of Introductory Accounting students. The Fall 2002 class (n = 44) answered online quizzes using WebCT software; Summer 2003 (n = 31) answered the quizzes with the assistance of the SRS. The overall performance of the classes was statistically different (F = 0.56, sig. <0.10), with the Summer 2003 group achieving a better performance. In addition, the study aimed to evaluate students' perceptions about the use of SRS by means of surveys with questions measured using a Likert scale. As the main findings, it is appointed that the students did their best to answer the questions; they had enough time to think about the answers; and tend to perceive greater participation in class. In addition, it was verified that they preferred classes using the SRS.

Beekes (2009) developed a case study on the use of SRS in the discipline of Management Accounting at Lancaster University (UK). The results were based on questionnaires, applied at the end of the course with 117 students, and on the researcher's observation. The results of the questionnaires indicated that SRS is easy to use (mean = 3.8, scale = 1 to 5 points) and increases classroom fun (mean = 3.6). The study also shows that SRS encourages students to engage in positive attitudes related to the discipline, especially in terms of participation.

Humphries and Whelan (2009) developed experiments with students in Business Communication and Accounting Principles I, in order to verify the impact of SRS on learning. There was no statistically significant difference between the performance of the control and treatment groups. Therefore, the evidence supports that SRS does not increase students' learning in relation to the traditional teaching method. In addition, a survey was applied at the end of the SRS use period, which indicated, on a scale from 0 (completely disagree) to 10 (totally agree), that the technology is easy (mean = 6.77) and that the immediate feedback is useful (mean = 6.16).

Chatham and Davidson (2011) conducted a study about the perceptions of students in Business Law, Introduction to Financial Accounting and Intermediate Accounting concerning the use of SRS. Two SRS models were used; one based on radio frequency (i>clicker) and another web-based (> clickerTM). The students answered between two and six questions per meeting. At the end of the subjects, the researchers applied surveys (n = 860). As the main results, it is noted that students liked to use the SRS (94.88%); understood that there was greater participation in the classroom (92.59%); perceive the technology as useful and would recommend the SRS for future use (97.20%). Beekes (2009), Chatham and Davidson (2011), Humphries and Whelan (2009), Lea (2008) and Segovia (2008) found evidence from Accountancy students that generally sustains the SRS' beneficial contribution to the education process. More specifically, the students reported that this technology is easy to use and increases the students' participation in the classes and fun in the classroom; and that it is useful for teaching. What the SRS model is concerned, most accounting education literature analyzes the models based on infrared signal or radiofrequency (Beekes, 2009; Carnaghan & Webb, 2007; Chui *et al.*, 2013; Cunningham, 2008; Edmonds & Edmonds, 2008; Eng *et al.*, 2013; Humphries & Whelan, 2009; Lea, 2008; Premuroso *et al.*, 2011; Segovia, 2008, 2006). Only Chatham and Davidson (2011) assess the web-based SRS model. Therefore, it is important to develop further research on this model in order to verify if the results remain consistent with those of earlier versions of the SRS.

3. Methodological procedures

This study is characterized as survey research, which uses questionnaires and interviews to ask individuals about their attitudes, beliefs, information and other factors (Cozby & Bates, 2012). This method was used in this study to question the Accounting students about their experience with the use of SRS in the training process. For the data analysis, the quantitative approach was used. In addition, the research qualifies as descriptive because it aims to characterize the students' perception about the use of SRS. The context of the research, the participants and the data collection instrument are detailed below.

3.1 Context, SRS and participants

The research was carried out in a public higher education institution with students of the discipline Accounting for Different Entities (CED) during the 1st and 2nd bimester of the academic year. The annual, compulsory CED course is offered in the 4th year of the Accounting course. According to the previous planning of the subject, the content taught in the 1st and 2nd bimesters was, respectively, Industrial Accounting and Agricultural Accounting.

For the selection of web-based SRS, five products were analyzed: ClickerSchool; I> Clicker; Kahoot! Socrative; and Quiz Socket. The selection criteria were as follows: (i) usefulness for the discipline; (ii) ease of use; and (iii) cost of the technological resource. After testing the five types of SRSs and considering the prior established criteria, we selected the Kahoot! (www.getkahoot.com).

Fifty-four students from two groups constituted based on criteria established by the educational institution participated in the study. At the beginning of the research, all the participating students received and signed the free and informed consent form. The two classes were named "Class 1" (N = 28) and "Class 2" (N = 26). The classes for both groups took place on Thursday evenings and were taught by the same teacher. Class 1 had classes in the first hour (19:20 to 21:00) and Class 2 in the second (21:15 to 22:55). In the first two months, four quizzes were applied to the classes, totaling 24 questions on Industrial Accounting. In that period, Class 1 answered the quizzes on paper, while Class 2 used the SRS. In the second two-month period, five quizzes were applied, totaling 31 questions on Agricultural Accounting. Class 1 started using SRS and Class 2 discontinued its use and began to answer the quizzes on paper. This procedure was adopted so that both classes used the technological resource and students could perceive similarities and differences between traditional classes (paper exercises) and classes using SRS (technology use). In addition, the aim was to avoid Resentful Demoralization (Gall, Gall & Borg, 2003; Smith, 2015), which is the circumstance in which different levels of motivation of the participants are caused by different treatments. For the sake of clarification, Figure 2 shows the SRS usage procedure throughout the study.

Period/Class	Class 1 (n = 28)	Class 2 (n = 26)
1st bimester (Industrial Accounting)	No SRS	SRS
2nd bimester (Agricultural Accounting)	SRS	No SRS

Figure 2. Classes' SRS usage procedure during the research

Source: the authors

The quizzes were the same for both groups, without any difference in the quantity or difficulty of the questions, preserving equal treatment. In most cases, the quizzes took place at the end of the meetings, with questions about key content points. The students answered all the quizzes applied with the help of the SRS through their personal mobile phones. For this process to take place properly, a pilot test was carried out with 77 students from three CED classes during the 4th bimester of the academic calendar of the previous year. This test revealed the need for three easily movable routers to provide wi-fi signal in the classroom, which was only available at the time of the SRS activity to avoid distractions with the devices.

3.2 Instrument and data collection

To evaluate the use of the SRS in the education process, questionnaires were applied to the 54 students at the end of the 2nd bimester. In order to increase the response rate, we followed the recommendation of Mertens (2010) on the in loco application of questionnaires, in the printed form. Even so, one student did not answer the questionnaire. Thus, there were 53 respondents.

The questionnaire was structured in two parts: (a) sociodemographic characteristics of the students (gender, age, family income range and insertion in the job market); and (b) 14 questions on the use of SRS. These questions were elaborated in the affirmative format. Students scored their perception of the statements between 0 (totally disagree) and 10 (totally agree). According to the guidelines for the elaboration of questions by Cozby and Bates (2012), only the extreme ends of the scales were labeled. This was done to avoid bias or suggest answers. With the exception of one question, all were based on the SRS literature. In Table 1, the questions and the basic literature are described.

Table 1

Questions about the use of SRS

Question	Description	Literature
Q1	The SRS is easy to use.	Beekes (2006); Carnaghan and Webb (2007); Cunningham (2008); Humphries and Whelan (2009)
Q2	The SRS helped me as a didactical resource.	Beckert *et al*. (2009); Carnaghan and Webb (2007); Cunningham (2008); Marshall and Varnon (2012); Mula and Kavanagh (2009); Premuroso *et al*. (2011); Sprague and Dahl (2010).
Q3	The SRS made the class more interactive than the traditional classes.	Beckert *et al*. (2009); Cunningham (2008); Lea (2008).
Q4	The SRS benefited my learning.	Cummings e Hsu (2007); Cunningham (2008); Eng *et al.* (2013); Lea (2008); Mula e Kavanagh (2009); Premuroso *et al*. (2011); Sprague e Dahl (2010).
Q5	The SRS should be used in other disciplines.	Carnaghan e Webb (2007); Chui *et al*. (2013); Premuroso *et al.* (2011).
Q6	The SRS made it easier for me to learn the subjects that do not use it.	Premuroso *et al.* (2011); Sprague e Dahl (2010).
Q7	The use of the SRS helped me to stay concentrated in the classes.	Beekes (2006); Cunningham (2008); Eng *et al.* (2013); Humphries e Whelan (2009); Lea (2008); Premuroso *et al*. (2011).
Q8	I remained more actively engaged in the classes due to the use of the SRS.	Beckert *et al.* (2009); Chatham e Davidson (2011); Cummings e Hsu (2007); Segovia (2008).
Q9	I faced no difficulties to understand the questions applied with the help of the SRS.	Premuroso *et al.* (2011); Segovia (2008).
Q10	The use of the SRS encouraged me to attend the classes more often.	Beekes (2006); Duncan (2006); Eng *et al*. (2013); Humphries e Whelan (2009); Lea (2008); Marshall e Varnon (2012); Premuroso *et al.* (2011).
Q11	The SRS enhanced my motivation in the classes.	Eng *et al*. (2013); Humphries e Whelan (2009); Lea (2008).
Q12	The number of questions applied with the help of the SRS was appropriate.	Premuroso *et al.* (2011).
Q13	The time to answer the questions was satisfactory.	Carnaghan e Webb (2007); Segovia (2008).
Q14	The instructions provided were appropriate to handle the SRS.	*Elaborated by the researchers.

It is important to note that part (b) of the questionnaire presented in Table 1 results from the pilot test previously mentioned. In addition to being important for the operational part of the research (internet access, need for routers), the pilot test contributed to improve the questionnaire, mainly in two aspects: (i) substitution and quantity of the questions; and (ii) measuring scale. Regarding the first point, the preliminary version of the questionnaire contained 12 statements, two of which were withdrawn and four added to the final version. This procedure was necessary as it contributed to better relate the SRS to the learning and to its use. Concerning the second point, the measuring scale was changed from 1 to 10 points (preliminary version) to 0 to 10 points (final version). It was noted that some students answered 0 (zero) in the preliminary version of the questionnaire, which is why this adjustment was made.

Finally, it is emphasized that the instruments used for the data analysis were MS Excel and Stata version 13. The first was used for data processing and table formatting. The second was used to perform the statistical procedures, mainly tests of average, medians and correlation analysis.

4. Results

Table 2 shows the characteristics of the research participants. Overall, most participants are male (58.5%), but there is some difference between the groups. Class 1 consists of 67.9% of male students and 32.1% of female students. In contrast, Class 2 presents 48.0% of male students and 52.0% of female students. The students were grouped by age into two categories: (1) less than or equal to 25 years; and (2) above 25 years. It is noticed that both classes are predominantly composed of students aged up to 25 years (Class 1 = 57.1%, Class 2 = 64.0%). A significant proportion of students report a monthly family income superior to five minimum wages (Class 1 = 50.0%, Class 2 = 48.0%). Finally, in terms of job market insertion, it is worth noting that most students in both groups perform some type of activity (Class 1 = 85.7%, Class 2 = 80.0%). Overall, 83% of the participants work.

Table 2
Sociodemographic profile of the students

Sociodemographic Profile	Class 1 (n = 28)		Class 2 (n = 25)		Total (n = 53)	
	Freq.	%	Freq.	%	Freq.	%
Gender	28	100.0%	25	100.0%	53	100.0%
Male	19	67.9%	12	48.0%	31	58.5%
Female	9	32.1%	13	52.0%	22	41.5%
Age	28	100.0%	25	100.0%	53	100.0%
=< 25 years	16	57.1%	16	64.0%	32	60.4%
> 25 years	12	42.9%	9	36.0%	21	39.6%
Monthly family income	28	100.0%	25	100.0%	53	100.0%
Up to 1 minimum wage[1]	0	0.0%	0	0.0%	0	0.0%
Between 1 and 3 minimum wages	5	17.9%	4	16.0%	9	17.0%
Between 3 and 5 minimum wages	9	32.1%	9	36.0%	18	34.0%
More than 5 minimum wages	14	50.0%	12	48.0%	26	49.1%
Job market	28	100.0%	25	100.0%	53	100.0%
Inactive	2	7.1%	0	0.0%	2	3.8%
Training	2	7.1%	5	20.0%	7	13.2%
Job	24	85.7%	20	80.0%	44	83.0%

[1] The Brazilian minimum wage at the time of data collection was considered (R$880.00).

Next, Table 3 reports the descriptive statistics of the second part of the questionnaire, with the 14 questions on the use of SRS in the education process. First, in all the questions, except for Q3 and Q14, extreme minimum and extreme values are observed. That is, at least one student disagreed totally and another agreed totally with the statements. The high median values reveal that most students tend to agree with the questions though. In addition, the means indicate that the students are more likely to agree, as they are closer to the maximum scale (10).

The questions Q3 (mean = 9.70, sd = 0.97), Q14 (mean = 9.64, sp = 0.83) and Q1 (mean = 9.19, sd = 1.81) are highlighted, whose averages are the highest. This indicates that, in the students' view, the SRS makes the class more interactive compared to traditional classes. The instructions provided were appropriate for the correct handling of the technology, and the SRS is easy to use.

On the other hand, for Q6 (mean = 5.40, sd = 3.06) and Q10 (mean = 5.34; sd = 5.34), the mean values are lower. These values lead to the conclusion that students agree with less intensity that SRS increases the ease of learning and encourages class attendance.

The results are consistent with those reported by Beckert *et al.* (2009), Beekes (2006), Carnaghan and Webb (2007), Chatham and Davidson (2011), Cummings and Hsu (2007), Edmonds and Edmonds (2008, 2010), Lea (2008), Premuroso *et al.* (2011) and Segovia (2008), studies in which evidence was found that the use of SRS benefits the process and the educational environment in general.

Table 3
Student perception of the SRS

Question	Description	N	Min.	Max.	Median	Mean	SD
Q1	The SRS is easy to use.	53	0	10	10	9.19	1.81
Q2	The SRS helped me as a didactical resource.	53	0	10	8	7.81	2.25
Q3	The SRS made the class more interactive than the traditional classes.	53	5	10	10	9.70	0.97
Q4	The SRS benefited my learning.	53	0	10	8	8.00	2.08
Q5	The SRS should be used in other disciplines.	53	0	10	10	8.87	1.82
Q6	The SRS made it easier for me to learn the subjects that do not use it.	53	0	10	6	5.40	3.06
Q7	The use of the SRS helped me to stay concentrated in the classes.	53	0	10	8	7.25	2.56
Q8	I remained more actively engaged in the classes due to the use of the SRS.	53	0	10	8	7.51	2.56
Q9	I faced no difficulties to understand the questions applied with the help of the SRS.	53	0	10	8	7.42	2.18
Q10	The use of the SRS encouraged me to attend the classes more often.	53	0	10	5	5.34	3.05
Q11	The SRS enhanced my motivation in the classes.	52	0	10	7,5	6.79	2.80
Q12	The number of questions applied with the help of the SRS was appropriate.	53	0	10	10	8.89	1.76
Q13	The time to answer the questions was satisfactory.	53	0	10	8	7.72	2.36
Q14	The instructions provided were appropriate to handle the SRS.	53	6	10	10	9.64	0.83

Considering that the data of the questions do not adhere to the normal distribution and did not present homogeneity of variance, next, the Spearman correlation matrix (Table 4) is reported. The positive correlation between questions Q2 and Q4 (coef. = 0.8423; sig. <0.01) is emphasized, which indicates that there is a strong association between the perception that SRS helped the students as a didactic resource and was perceived as beneficial to learning. Another noteworthy significant correlation was verified between questions Q10 and Q11 (coef. = 0.6753; sig. <0.01), suggesting that the encouraging effect of the SRS to attend classes and the increase of student motivation in the classes are related issues. Also, the relationship between questions Q7 and Q8 (coef. = 0.7945; sig. <0.01) reveals that active involvement and student concentration are strongly correlated. Other significant correlations, between questions Q1 and Q3 (coefficient = 0.4811; sig. <0.01) for example, can also be observed.

Table 4

Spearman's correlation matrix of questions on SRS use

Questions	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Q1	1.000													
Q2	0.283**	1.000												
Q3	0.481***	0.384***	1.000											
Q4	0.322**	0.842***	0.291**	1.000										
Q5	0.231	0.544***	0.450***	0.622***	1.000									
Q6	0.060	0.276**	0.091	0.286**	0.402***	1.000								
Q7	0.377***	0.294**	0.350**	0.299**	0.397***	0.297**	1.000							
Q8	0.150	0.191	0.278**	0.233	0.352**	0.257*	0.795***	1.000						
Q9	0.444***	0.150	0.131	0.203	0.180	-0.123	0.211	0.098	1.000					
Q10	0.209	0.191	0.202	0.228	0.330**	0.191	0.595***	0.615***	0.181	1.000				
Q11	0.063	0.239*	0.301**	0.293**	0.437***	0.314**	0.499***	0.522***	0.105	0.675***	1.000			
Q12	0.233*	0.104	0.161	0.203	0.102	0.076	0.216	0.311**	0.078	0.110	0.317**	1.000		
Q13	0.230	0.212	-0.017	0.190	0.095	0.102	0.189	0.088	0.426***	0.076	0.109	-0.088	1.000	
Q14	0.469***	0.180	0.477***	0.166	0.229	0.014	0.162	-0.008	0.156	0.034	0.123	0.199	-0.009	1.000

*** Sig. < 0.01; ** Sig. < 0.05; * Sig. < 0.10.

Based on parts (a) and (b) of the questionnaire, students' perceptions were analyzed according to their characteristics (class, gender and age range). Table 5 shows the means, standard deviations and significance of the statistical tests used in the comparison of student perception per class. The Shapiro-Wilk's and Levene's tests were executed for each question, considering the assumptions of the t-test. For the questions in which these were verified, the t-test was used. Otherwise, Mann-Whitney's U test was used, which is the nonparametric alternative to the t-test (Cohen, Manion & Morrison, 2007; Smith, 2015). Analyzing the results of the statistical tests (Sig. column), it is verified that all the values are superior to the significance level of 0.10, usually accepted in the applied social sciences. This indicates that there was no difference in perception about the 14 aspects questioned concerning the use of SRS when analyzed specifically by class.

Table 5
Comparison of students' perception about SRS by class

Question	Description	Class 1 (n = 28)		Classe2 (n = 25)		Sig.
		Mean	SD	Mean	SD	
Q1[a]	The SRS is easy to use.	9.32	1.95	9.04	1.67	0.577
Q2[a]	The SRS helped me as a didactical resource.	7.71	2.37	7.92	2.13	0.743
Q3[a]	The SRS made the class more interactive than the traditional classes.	9.75	0.97	9.64	1.00	0.685
Q[b]	The SRS benefited my learning.	7.89	2.42	8.12	1.64	0.985
Q[a]	The SRS should be used in other disciplines.	8.93	2.04	8.80	1.58	0.800
Q6[a]	The SRS made it easier for me to learn the subjects that do not use it.	5.39	2.95	5.40	3.24	0.993
Q7[a]	The use of the SRS helped me to stay concentrated in the classes.	7.50	2.25	6.96	2.89	0.449
Q8[a]	I remained more actively engaged in the classes due to the use of the SRS.	7.57	2.28	7.44	2.89	0.854
Q9[a]	I faced no difficulties to understand the questions applied with the help of the SRS.	7.50	2.25	7.32	2.14	0.767
Q10[a]	The use of the SRS encouraged me to attend the classes more often.	5.29	3.20	5.40	2.93	0.893
Q11[ac]	The SRS enhanced my motivation in the classes.	6.85	2.94	6.72	2.69	0.867
Q12[b]	The number of questions applied with the help of the SRS was appropriate.	8.93	2.07	8.84	1.37	0.362
Q13[a]	The time to answer the questions was satisfactory.	7.96	2.38	7.44	2.36	0.426
Q14[b]	The instructions provided were appropriate to handle the SRS.	9.75	0.59	9.52	1.05	0.529

[a]t-test (two-tailed) for independent groups; bMann-Whitney's U-test; cClass 1 = 27 answers.

The same procedures to verify the assumptions were adopted to compare the students' perception about the use of SRS per gender (Table 6). For the questions that met the assumptions, the t-test was used. In the opposite case, Mann-Whitney's U-test was applied. In Q3 (sig. <0.10), Q5 (sig. <0.05) and Q13 (sig. <0.10), values below the significance level of 0.10 were obtained. Thus, it can be affirmed that the male students perceived more intensely than the female students that the SRS makes the class more interactive in relation to the traditional classes; that the equipment should be used in other disciplines, and that the time to answer the questions was satisfactory.

Table 6
Comparison of students' perception about SRS by gender

Question	Description	Male (n = 31)		Femiale (n = 22)		Sig.
		Mean	SD	Mean	SD	
Q1[b]	The SRS is easy to use.	9.10	2.07	9.32	1.39	0.865
Q2[a]	The SRS helped me as a didactical resource.	8.16	1.95	7.32	2.57	0.180
Q3[b]	The SRS made the class more interactive than the traditional classes.	9.87	0.56	9.46	1.34	0.086
Q4[a]	The SRS benefited my learning.	8.13	1.93	7.82	2.30	0.596
Q5[b]	The SRS should be used in other disciplines.	9.36	1.02	8.18	2.42	0.039
Q6[a]	The SRS made it easier for me to learn the subjects that do not use it.	5.61	3.05	5.09	3.12	0.546
Q7[a]	The use of the SRS helped me to stay concentrated in the classes.	7.65	2.17	6.68	3.00	0.180
Q8[a]	I remained more actively engaged in the classes due to the use of the SRS.	7.94	1.81	6.91	3.31	0.153
Q9[a]	I faced no difficulties to understand the questions applied with the help of the SRS.	7.71	1.81	7.00	2.60	0.246
Q10[a]	The use of the SRS encouraged me to attend the classes more often.	5.52	3.12	5.09	3.01	0.622
Q11[ac]	The SRS enhanced my motivation in the classes.	7.20	2.37	6.23	3.27	0.219
Q12[b]	The number of questions applied with the help of the SRS was appropriate.	8.68	2.04	9.18	1.26	0.388
Q13[b]	The time to answer the questions was satisfactory.	7.94	2.76	7.41	1.68	0.071
Q14[b]	The instructions provided were appropriate to handle the SRS.	9.68	0.65	9.59	1.05	0.779

[a]t-test (two-tailed) for independent groups; bMann-Whitney's U-test; cMale = 30 answers.

There seems to be no theoretical basis in the literature to consistently justify the existence of perception differences per gender among Accounting students. For this reason, a difference in some other observable characteristic may be generating this result. In order to better understand this difference, the ages of the male students (mean = 26.41 years) were compared with those of the female students (mean = 24.22 years). The t-test showed that the male mean is significantly higher than the female (t = -1.51, p <0.10). Thus, even though they had a lower average age, the female students reported less intense agreement for questions Q3, Q5 and Q13. This result goes against the initial expectation and against the evidence from the literature, as younger individuals tend to perceive the use of technology in teaching more favorably than older students.

Due to this counterintuitive result, next, the perception is analyzed by age range. The same procedures previously reported were used to verify the test assumptions.

Table 7

Comparison of students' perception about SRS by age range

Question	Description	=< 25 years (N = 32)		> 25 years (N = 21)		Sig.
		Mean	SD	Mean	SD	
Q1[b]	The SRS is easy to use.	8.81	2.22	9.76	0.54	0.125
Q2[a]	The SRS helped me as a didactical resource.	8.03	2.07	7.48	2.50	0.384
Q3[b]	The SRS made the class more interactive than the traditional classes.	9.53	1.22	9.95	0.22	0.134
Q4[a]	The SRS benefited my learning.	8.25	2.00	7.62	2.18	0.283
Q5[a]	The SRS should be used in other disciplines.	9.16	1.87	8.43	1.69	0.156
Q6[a]	The SRS made it easier for me to learn the subjects that do not use it.	6.13	2.99	4.29	2.88	0.031
Q7[a]	The use of the SRS helped me to stay concentrated in the classes.	7.50	2.34	6.86	2.89	0.377
Q8[a]	I remained more actively engaged in the classes due to the use of the SRS.	7.84	2.58	7.00	2.51	0.245
Q9[a]	I faced no difficulties to understand the questions applied with the help of the SRS.	7.09	2.32	7.91	1.90	0.188
Q10[ac]	The use of the SRS encouraged me to attend the classes more often.	5.56	3.01	5.00	3.15	0.517
Q11[a]	The SRS enhanced my motivation in the classes.	7.36	2.44	5.95	3.12	0.076
Q12[b]	The number of questions applied with the help of the SRS was appropriate.	8.88	2.06	8.91	1.22	0.557
Q13[a]	The time to answer the questions was satisfactory.	9.19	2.09	7.00	2.63	0.073
Q14[a]	The instructions provided were appropriate to handle the SRS.	9.66	0.75	9.62	0.97	0.876

[a]t -test (two-tailed) for independent groups; bMann-Whitney's U-test; c=<25 years = 31 answers.

As reported in Table 7, the tests indicated statistically significant differences for Q6 (sig. <0.05), Q11 (sig. <0.10) and Q13 (sig. <0.10). That is, students up to 25 years old perceived more strongly than students over the age of 25 that SRS increased the ease of learning when compared to traditional (non-SRS) classes. Similarly, students up to age 25 reported that SRS increased motivation in class compared to students over 25 years of age. These findings are consistent with the idea that technology is more attractive to younger students, who are more familiar with and interested in mobile technologies (Cheong *et al.*, 2012; Lea, 2008). Finally, we found a statistically significant difference for Q13, with students up to 25 years of age agreeing more strongly that the time to send the answers to the quizzes was satisfactory.

5. Final considerations

The use of mobile technologies has reached increasingly broad spheres and circumstances. High mobility devices and applications have been progressively incorporated into society due to their practicality and utility. In this regard, the educational area also needs to take advantage of the potential benefits that can derive from the use of these resources. This aspect is particularly important in higher education in Accounting. Behn *et al.* (2012) noticed that, despite the technological advance, several undergraduate accounting courses remained stagnant. Watty, McKay, and Ngo (2016), for example, evidence the resistance of accounting teachers regarding the adoption of technology, suggesting stagnation from the viewpoint of using educational technology.

Therefore, the incorporation of technologies into education processes is relevant (Gaviria *et al.*, 2015; Pathways Commission, 2012), particularly in the context of curriculum innovation and the structuring of up-to-date educational models (Apostolou *et al.*, 2016). In this sense, in this study, the students' perception about the use of SRS in the education process was evaluated, a technological resource that can provide an active learning environment, greater interactivity and student involvement in the classroom (Carnaghan *et al.*, 2011; Carnaghan & Webb, 2007; Edmonds & Edmonds, 2008; Eng *et al.*, 2013; Kay & LeSage, 2009; Lea, 2008; Zhu, 2007).

The results suggest, in general, that the use of SRS was beneficially perceived, which is consistent with the findings of earlier studies (Beckert *et al.*, 2009; Beekes, 2006, Carnation & Webb, 2007; Chatham & Davidson, 2011; Cummings & Hsu, 2007; Lea, 2008; Premuroso *et al.*, 2011; Segovia, 2008). It is worth noting that SRS makes classes more interactive compared to traditional teaching. This finding is relevant to the extent that interactivity is related to active learning, providing environments more conducive to learning and greater focus on the students. In addition, evidence has been obtained that shows a strong correlation between the perception that SRS helps students as a didactic tool and the perception that SRS is beneficial for learning. When comparing students' perceptions per class, there were no statistically significant differences in the perspective on the use of SRS. When the analysis takes gender into account, however, evidence has been obtained that male students agreed more strongly that SRS makes classes more interactive; that SRS should be used in other disciplines; and that the time taken to answer the questions of the quizzes was satisfactory. In order to better understand these results, the students' perceptions were analyzed per age, which showed that students up to 25 years of age stated that SRS enhanced the ease of learning. In contrast, students over the age of 25 had the opposite perception. This finding is consistent with the view that young people, being more familiar with mobile technologies, tend to perceive their use as more beneficial. Nevertheless, further research on perception differences according to the students' gender remains necessary. Finally, it is emphasized that students up to 25 years of age felt more motivated in class because of the use of SRS.

Important implications for accounting teaching can be identified. First, the evidence supports that the use of SRS encourages greater interactivity compared to traditional classes. In this case, this pedagogical resource can help teachers who aim to engage their students more in the education process. Second, the lack of a significant difference of perception between the classes suggests that the SRS tends to be seen in a similar way, without the use of this technology favoring one or another group of students. Based on this finding, it is found that the technology is used in a broad manner. Lastly, the use of SRS can benefit mostly male classes of up to 25 years of age even further, as students with those characteristics reported more intensely that the SRS supports the learning and motivation. Hence, it is suggested that teachers assess the sociodemographic profiles of their classes to enhance the effectiveness of teaching through methods and pedagogical tools compatible with the students' characteristics.

As the main limitation of the study, it is pointed out that the results were obtained from the students' perspective, through a survey. Therefore, there may have been bias in the responses (e.g. halo effect), because they knew they were participating in a survey. According to the recommendations of Cozby and Bates (2012), however, it is emphasized that only the extreme levels of the concordance scale were labeled to guide the respondents about its meaning and so as not to indicate responses or create bias.

Finally, as an extension of this research, students' perception about the use of more types and models of SRS with different characteristics is suggested. This is important to verify the effectiveness of technological resources (Beckert *et al*., 2009) and students' preference. In addition, the use of diverse types of SRS can provide guidance on its appropriate use for different activities (e.g. quizzes with theoretical, practical, calculation, reflection, sensitive questions etc.). Thus, using and reporting various academic practices based on the SRS contributes to better understand how this technology can improve the pedagogical process, especially in the scope of accounting education.

References

Apostolou, B., Dorminey, J. W., Hassell, J. M., & Rebele, J. E. (2016). Accounting education literature review (2015). *Journal of Accounting Education*, *35*, pp. 20–55. https://doi.org/10.1016/j.jaccedu.2016.03.002

Beckert, E., Fauth, E., & Olsen, K. (2009). Clicker satisfaction for students in human development : differences for class type , prior exposure , and student talkativity. *North American Journal of Psychology*, *3*(11), pp. 599–612.

Beekes, W. (2006). The "Millionaire" method for encouraging participation. *Active Learning in Higher Education*, *7*(1), pp. 25–36. https://doi.org/10.1177/1469787406061143

Beekes, W. (2009). Is that your final answer? Encouraging student participation using a personal response system. *The Enhancing Series Case Studies: Student Centred Learning in Business and Management, Hospitality, Leisure, Sport, Tourism.*, pp. 76–86. Recuperado em 30 de maio, 2018,de http://eprints.lancs.ac.uk/47175/

Behn, B. K., Ezzell, W. F., Murphy, L. A., Rayburn, J. D., Stith, M. T., & Strawser, J. R. (2012). The Pathways Commission on Accounting Higher Education: Charting a National Strategy for the Next Generation of Accountants. *Issues in Accounting Education*, *27*(3), pp. 595–600. https://doi.org/10.2308/iace-10300

Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom*. *ASHE-ERIC Higher Education Report*. Washington, DC. Recuperado deem 30 de maio, 2018, de https://files.eric.ed.gov/fulltext/ED336049.pdf

Caldwell, J. E. (2007). Clickers in the large classroom: Current research and best-practice tips. *CBE - Life Sciences Education*, *6*, pp. 9–20. https://doi.org/10.1187/cbe.06–12–0205

Carnaghan, C., Edmonds, T. P., Lechner, T. A., & Olds, P. R. (2011). Using student response systems in the accounting classroom: Strengths, strategies and limitations. *Journal of Accounting Education*, *29*(4), pp. 265–283. https://doi.org/10.1016/j.jaccedu.2012.05.002

Carnaghan, C., & Webb, A. (2007). Investigating the Effects of Group Response Systems on Student Satisfaction, Learning, and Engagement in Accounting Education. *Issues in Accounting Education*, *22*(3), pp. 391–409. https://doi.org/10.2308/iace.2007.22.3.391

Chatham, M. D., & Davidson, D. (2011). Assessing student and instructor satisfaction using an audience response system in Introductory Business Courses. *Business Education Innovation Journal*, *3*(1), pp. 43–50.

Cheong, C., Bruno, V., & Cheong, F. (2012). Designing a Mobile-app-based Collaborative Learning System. *Journal of Information Technology Education: Innovations in Practice*, *11*, pp. 97–119.

Chui, L., Martin, K., & Pike, B. (2013). A quasi-experimental assessment of interactive student response systems on student confidence, effort, and course performance. *Journal of Accounting Education*, *31*(1), pp. 17–30. https://doi.org/10.1016/j.jaccedu.2013.01.002

Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education* (6th ed.). New York: Routledge/Taylor & Francis Group.

Cohn, E., & Johnson, E. (2006). Class Attendance and Performance in Principles of Economics. *Education Economics*, *14*(2), pp. 211–233. https://doi.org/10.1080/09645290600622954

Cozby, P. C., & Bates, S. C. (2012). *Methods in behavioral research* (11th ed.). New York: McGraw-Hill.

Cummings, R. G., & Hsu, M. (2007). The effects of student response systems on performance and satisfaction: an investigation in a tax accounting class. *Journal of College Teaching & Learning*, *4*(12), pp. 21–26.

Cunningham, B. M. (2008). Using Action Research to Improve Learning and the Classroom Learning Environment. *Issues in Accounting Education*, *23*(1), pp. 1–30. https://doi.org/10.2308/iace.2008.23.1.1

Duncan, D. (2006). Clickers : A New Teaching Aid with Exceptional Promise. *Astronomy Education Review*, *5*(1), pp. 70–88.

Edmonds, C. T., & Edmonds, T. P. (2008). An Empirical Investigation of the Effects of SRS Technology on Introductory Managerial Accounting Students. *Issues in Accounting Education*, *23*(3), pp. 421–434. https://doi.org/10.2308/iace.2008.23.3.421

Edmonds, C. T., & Edmonds, T. P. (2010). An examination of the links between SRS technology and an active learning environment in a managerial accounting course. In A. H. Catanach & D. Feldmann (Eds.), *Advances in Accounting Education*, pp. 81–100. Emerald Group Publishing Limited. https://doi.org/10.1108/S1085-4622(2010)0000011007

Eng, L. L., Lea, B.-R., & Cai, R. (2013). Use of Clickers for Assurance of Learning in Introductory Financial Accounting. In *Advances in Accounting Education: Teaching and Curriculum Innovations,* 14, pp. 269–291). https://doi.org/10.1108/S1085-4622(2013)0000014018

Fies, C., & Marshall, J. (2006). Classroom Response Systems: A Review of the Literature. *Journal of Science Education and Technology*, *15*(1), pp. 101–109. https://doi.org/10.1007/s10956-006-0360-1

Freeman, M., Blayney, P., & Ginns, P. (2006). Anonymity and in class learning: The case for electronic response systems. *Australasian Journal of Educational Technology*, *22*(4), pp. 568–580.

Gainor, M., Bline, D., & Zheng, X. (2014). Teaching internal control through active learning. *Journal of Accounting Education*, *32*(2), pp 200–221. https://doi.org/10.1016/j.jaccedu.2014.03.003

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: an introduction* (7th ed.). Boston: Allyn & Bacon.

Gaviria, D., Arango, J., & Valencia, A. (2015). Reflections about the Use of Information and Communication Technologies in Accounting Education. *Procedia - Social and Behavioral Sciences*, *176*, pp. 992–997. https://doi.org/10.1016/j.sbspro.2015.01.569

Humphries, S. A., & Whelan, C. (2009). Effectiveness of Interactive Technology in Business Education. *Business Education Innovation Journal*, *1*(2), pp. 56–61.

Kay, R. H., & LeSage, A. (2009). Examining the benefits and challenges of using audience response systems: A review of the literature. *Computers & Education*, *53*(3), pp. 819–827. https://doi.org/10.1016/j.compedu.2009.05.001

Kulik, J. A., & Kulik, C.-L. C. (1988). Timing of Feedback and Verbal Learning. *Review of Educational Research*, *58*(1), pp. 79–97. https://doi.org/10.3102/00346543058001079

Lea, B.-R. (2008). Clickers Adoption in a Small Class Setting. *Decision Line*, *39*(4), pp. 7–11.

Marshall, L. L., & Varnon, A. W. (2012). An Empirical Investigation of Clicker Technology in Financial Accounting Principles. *Journal of Learning in Higher Education*, *8*(1), 7–18. Recuperado de https://pdfs.semanticscholar.org/d3e3/181482beabceb03cd2dd50f0f8dd5f9cc4fd.pdf#page=14

Mertens, D. M. (2010). *Research and evaluation in education and psychology: integrating diversity with quantitative, qualitative, and mixed methods* (3rd ed.). London: SAGE Publications Ltd.

Mula, J. M., & Kavanagh, M. (2009). Click Go the Students , Click-Click-Click : The efficacy of a student response system for engaging students to improve feedback and performance. *E-Journal of Business Education & Scholarship of Teaching*, *3*(1), pp. 1–17.

Pathways Commission. (2012). *The Pathways Commission: Charting a national strategy for the next generation of accountants*. Recuperado em 30 de maio, 2018,de http://commons.aaahq.org/posts/a3470e7ffa

Premuroso, R. F., Tong, L., & Beed, T. K. (2011). Does using clickers in the classroom matter to student performance and satisfaction when taking the introductory financial accounting course? *Issues in Accounting Education*, *26*(4), pp. 701–723. https://doi.org/10.2308/iace-50066

Rana, N. P., Dwivedi, Y. K., & Al-Khowaiter, W. A. A. (2016). A review of literature on the use of clickers in the business and management discipline. *International Journal of Management Education*, *14*(2), pp. 74–91. https://doi.org/10.1016/j.ijme.2016.02.002

Segovia, J. (2006). The use of personal response system in accounting courses. *Accounting Instructors' Report*, *Winter*. Recuperado em 30 de maio, 2018, de https://blog.cengage.com/use-personal-response-system-accounting-courses/

Segovia, J. (2008). Personal response system and its effects on student learning. *Accounting Instructors' Report*, *Winter*, pp. 1–5. Recuperado em 30 de maio, 2018,de https://blog.cengage.com/personal-response-system-effects-student-learning/

Sivan, A., Leung, R. W., Woon, C., & Kember, D. (2000). An Implementation of Active Learning and its Effect on the Quality of Student Learning. *Innovations in Education and Training International*, *37*(4), pp. 381–389. https://doi.org/10.1080/135580000750052991

Smith, M. (2015). *Research methods in accounting* (3rd ed.). London: Sage.

Sprague, E. W., & Dahl, D. W. (2010). Learning to click: An evaluation of the personal response system clicker technology in introductory marketing courses. *Journal of Marketing Education*, *32*(1), pp. 93–103. https://doi.org/10.1177/0273475309344806

Sullivan, R. (Robin). (2009). Principles for Constructing Good Clicker Questions: Going beyond Rote Learning and Stimulating Active Engagement with Course Content. *Journal of Educational Technology Systems*, *37*(3), pp. 335–347. https://doi.org/10.2190/ET.37.3.i

Watty, K., McKay, J., & Ngo, L. (2016). Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education. *Journal of Accounting Education*, *36*, pp. 1–15. https://doi.org/10.1016/j.jaccedu.2016.03.003

Zhu, E. (2007). Teaching With Clickers. *Center for Research on Learning and Teaching - Occasional Papers*, pp. 1–8. Recuperado em 30 de maio, 2018, de http://www.crlt.umich.edu/sites/default/files/resource_files/CRLT_no22.pdf

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 6, p. 229-249, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1693

Academic Delay of Gratification and Its Relation with Learning Self-Regulation Strategies

Abstract

Context and Objective: Academic delay of gratification refers to individuals' ability to self-regulate and is one aspect of the self-regulation of learning, that is, of the set of thoughts, feelings and actions an individual produces to achieve the desired academic objectives. The objective in this study was to analyze the academic delay of gratification, verifying its relation with the learning self-regulation strategies.

Method: Descriptive and quantitative survey research. The sample consisted of 133 Accounting students from the Federal University of Minas Gerais (UFMG).

Results and Contributions: After the development of Kruskal-Wallis and Spearman correlation tests, it was verified that female students made greater use of the learning strategies, while students who do not have a paid job while studying were more prone to academic delay of gratification. At the same time, it was concluded that, overall, the academic delay of gratification is positively correlated with the learning strategies, specifically the metacognitive and cognitive (rehearsal, elaboration and organization) strategies and the management of time and the study environment. Through this study, we intend to contribute to the analysis of the self-regulated attitudes Accounting students develop and, at bottom, provide important information to improve the teaching-learning process.

Key words: Academic delay of gratification, Learning strategies, Accounting.

Lua Syrma Zaniah Santos
Master's student in Controllership and Accounting at Federal University of Minas Gerais (UFMG). **Contact:** Av. Antonio Carlos, 6627, Pampulha, Belo Horizonte (MG), CEP: 31270-901.
E-mail: luasyrma@gmail.com

Juliana Ribeiro Souza
Master's student in Controllership and Accounting at Federal University of Minas Gerais (UFMG). **Contact:** Av. Antonio Carlos, 6627, Pampulha, Belo Horizonte (MG), CEP: 31270-901.
E-mail: julianaribeiro.jrs@gmail.com

Jacqueline Veneroso Alves da Cunha
Ph.D. in Controllership and Accounting from the University of São Paulo (USP) and Associate Professor at Federal University of Minas Gerais (UFMG). **Contact:** Av. Antonio Carlos, 6627, Pampulha, Belo Horizonte (MG), CEP: 31270-901.
E-mail: jvac@face.ufmg.br

Bruna Camargos Avelino
Ph.D. in Controllership and Accounting from the University of São Paulo (USP) and Adjunct Professor at Federal University of Minas Gerais (UFMG). **Contact:** Av. Antonio Carlos, 6627, Pampulha, Belo Horizonte (MG). CEP: 31270-901.
E-mail: bcavelino@gmail.com

Published in Portuguese and English. Original Version in Portuguese.

Received in 9/26/2017. Ask to Revise on 5/15/2018. Resubmitted on 5/25/2018. Accepted on 5/25/2018 by Drª. Márcia Maria dos Santos Bertolocci Espejo (Assistant Editor) and by Dr. Orleans Martins (Editor). Published on 6/29/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

1. Introduction

The teaching-learning process is characterized by the involvement of the elements: student, teacher, content and institution. Using pedagogical and didactic techniques, the teacher has the role of teaching the content and students need to develop their own techniques to learn it (Silva & Oliveira, 2010). In this sense, throughout their academic experience, the students make use of strategies to regulate their learning.

According to Pintrich (1999), learning regulation can refer to student cognition when solving a problem, and may also be related to aspects such as time management and the learning environment. During the course, to stay focused on their academic goals, the student should make some choices, such as going out with friends or studying for an exam in order to get a good grade. This preferred choice characterizes the academic delay of gratification (Bembenutty & Karabenick, 2004).

Bembenutty and Karabenick (2004) state that the delay of gratification refers to the preference for a greater reward, distant in time, in relation to a smaller reward now available. According to the authors, in academic terms, the delay corresponds to the students' postponement of available opportunities to pursue academic goals that are temporarily remote, but more valuable.

Academic delay of gratification is an individual ability to regulate and is an aspect of the self-regulation of learning, that is, the set of thoughts, feelings, and actions generated by someone to achieve the desired academic goals (Bembenutty & Karabenick, 2004). According to Zimmerman and Schunk (1989), self-regulated individuals are persistent, strategic and able to evaluate their performance, which is not the case with those who are hardly self-regulated.

In this perspective, the self-regulated student develops the learning strategies, which include cognition, metacognition and resource management. Through cognition, he understands how information is processed and encoded and establishes ways of memorizing content. In metacognition, he plans, monitors and self-regulates his performance. And through resource management, he manages and controls the physical and social environment and the resources available (Testa, 2006).

Considering the significant number of international studies carried out in this area (Mischel, Shoda & Peake, 1988, Bembenutty & Karabenick, 1998; Bembenutty, 1999 and Bembenutty, 2007; Avci, 2013; Stolarski, Ledzińska, & Matthews, 2013; Milfont & Schwarzenthal, 2014; Watson e Milfont, 2017), few Brazilian studies have focused on the academic delay of gratification with regard to the learning self-regulation procedures, such as Testa and Freitas (2005), Pavesi and Alilprandini (2016) and Aguiar and Silva (2017). Thus, in line with the above, we have the following research question: what is the relationship between the academic delay of gratification and the strategies of learning self-regulation?

Thus, this study aims to analyze the academic delay of gratification, verifying its relation with the learning self-regulation strategies. To do so, it will be necessary to: evaluate how the students' academic gratification is delayed; identify the learning strategies adopted by the students; verify the relationship between the academic delay of gratification and the learning strategies used.

The relevance of this study is initially justified by the still perceptible lack of research evidencing empirical results and its implications in the Brazilian teaching and learning process (Silva, Leal, Pereira & Oliveira, 2015). The study contributes to the analysis of the self-regulated attitudes developed by Accounting students, which permits the evaluation of their learning strategies. Bandura (1997) and Zimmerman (2000) point out that the most successful students use appropriate learning strategies and maintain a high level of motivation and self-regulation during skill acquisition, which can explain individual differences among students. These constructs are linked and are essential for decision taking and successful human development (Watson & Milfont, 2017).

Self-regulated learning strategies impact the learning outcomes, helping students to acquire and retain knowledge in a structured and methodological way. Being able to appropriately manage the time and environment of the study, as well as having the ability to give up daily distractions in pursuit of an academic goal, can be a central element for effective learning, as emphasized by Testa and Freitas (2005). Thus, as described by Watson and Milfont (2017), the delay of the gratification tasks measures the search for future objectives, in line with the academic context of an undergraduate course, in which students spend some years of their lives in search of mainly long-term objectives. In that sense, it is important to verify the students' use of these mechanisms, as this analysis can support educators and teaching institutions' actions in the attempt to improve the teaching and learning cycle.

2. Theoretical Framework

2.1 Social Cognitive Theory and Action Control Theory

In distinct settings, scholars have investigated the mechanisms involved in the learning process. In this study, two theories were especially important for the construction of arguments. Initially, we have the Social Cognitive Theory, designed by Albert Bandura, who considers the agency's perspective for self-development, adaptation and change (Bandura, 1986). This means that the individual can intentionally influence his own path and circumstances. In this perspective, people are self-organized, proactive, self-regulating and self-reflective, and can contribute to and influence events around them.

The Social Cognitive Theory is a consolidated theoretical foundation in the field of social learning and constitutes an explanatory framework for human action and development (Bandura, 1986; Azzi, 2010).

According to Bandura (1986), the first characteristic of human agency is intentionality and, in this approach, intentions are formed by the plans and action strategies that will permit its accomplishment. The second characteristic relates to the temporal extension of the agency from the anticipation, that is, the prediction of the probable results of one's actions in order to guide the efforts in advance. Being cognitively represented in the present, imagined futures serve as guides to current behavior and also function as motivators. Cognitive theory considers that agents are self-regulators and not just planners and predictors, as individuals are agents of action and self-investigators of their functioning. In this way, through functional self-awareness, people reflect on their self-efficacy, as well as on the integrity of their thoughts and actions, making adjustments when they deem this necessary. This personal agency occurs in a social context and suffers socio-structural influences (Bandura, 1986).

In this perspective, the individual has the possibility to develop his ability to control the nature and quality of his lives. People are seen as active agents who exert some influence in their own motivation and action (Bandura, 2009). The individual, in this context, has a self-referential system that enables him to act intentionally towards specific goals, to plan his actions and to anticipate possible outcomes (Bandura, 2009).

Perceived self-efficacy plays a central role in Social Cognitive Theory, being an important construct of the latter, which is related to the beliefs of someone in his potential to organize and perform actions necessary to produce certain achievements (Bandura, 1997). In this conjuncture, the learning mechanisms addressed in this research are self-regulating mechanisms individuals use for the purpose of understanding information, monitoring their performance and learning, monitoring and managing the physical and social environment, as well as available resources.

Another theoretical contribution related to this research refers to the considerations of the Action Control Theory, which deals with the individual aspects and the capacity to regulate emotions, cognitions, behaviors and self-regulating strategies, so that success can be achieved in the actions planned (Branco, Peixoto & Alvim, 2013). In addition, the delay in gratification would be a consequence of the students' successful use of volitional control strategies (Kuhl, 1985; Snow *et al*., 1996). In addition, Kuhl (1985) points out that, when individuals experience internal or external distraction of enacted intentions, there are several strategies that will help them remain focused on the task, including selective attention and control of coding, motivation, emotion, environment, and information being processed.

The Action Control Theory explains how the personal styles of action control - orientation to action and state - exert influence on the regulation of human actions. The primordial component of the theory is intention, that is, an objective that guides the individual towards the attainment of his goals. In this theory, the mediating role of volitional control between the initial intention and the concrete action is also emphasized, considering elements that understand the subject's present mode of action and the planning for future actions (Kuhl, 1985; Branco, Peixoto & Alvim, 2013).

Kuhl (1985) and Branco, Peixoto and Alvim (2013) note that the orientation towards action is characterized by conscious decision making, by the use of self-regulating strategies consistent with the activity itself and by the emotional profile adapted to situations of failure. The presence of these elements permits a more effective resumption of the course of action. The student with a strong action orientation is active in the educational process and the criticality in self-assessment makes it possible to more clearly plan future actions for different objectives. In this type of orientation, the teacher is the mediator of learning. Hence, the action-oriented individuals starts the actions effectively to achieve the goals and remain more focused until the activity is concluded.

On the other hand, state-orientation denotes the tendency to reduce persistence in the face of failure in the academic environment. In this orientation, distractions easily divert attention from the activity and the resumption of decision making is slower for these individuals and the use of self-regulation strategies is predominantly disorganized.

The two theoretical frameworks previously mentioned supported the analyses of this study. The use of learning strategies can be related to the individual's willingness to delay the academic gratification, and in this context, understanding the following key concepts is paramount: self-regulation of learning and academic delay of gratification.

2.2 Self-regulation of learning and academic delay of gratification

Self-regulation of learning relates to the strategies students use to regulate their cognition in order to control their learning (Pintrich, 1999). It refers, therefore, to the "thoughts, feelings and actions generated by someone to achieve the academic goals" (Zimmerman, 1988, p. 73).

Pintrich and DeGroot (1990) emphasize the existence of three components of self-regulation of learning that are particularly important for academic performance: the student's metacognitive strategies, control and effort management in academic activities and the cognitive strategies students use to understand and memorize the content studied. These strategies can be divided into three groups: cognitive strategies, metacognitive strategies and learning resource management. This classification was established by McKeachie, Pintrich, Lin and Smith (1986) and will be adopted in this study, as it has the advantage of being clear and concise (Filcher & Miller, 2000).

Cognitive strategies are essential to understand how information is processed in the learning environment. With regard to the metacognitive strategies, they allow the student to plan, monitor and self-regulate their performance. No less important, learning resource management strategies are strategies used to organize and control the physical and social environment as well as the resources available. The latter are subdivided into four groups: management of time and the study environment, effort, learning and help seeking (Pintrich, Sminth, Duncan & McKeachie, 1991).

In a survey of learning self-regulation strategies, Zimmerman and Martinez-Pons (1986) identified fifteen categories of strategies students used during class, homework, and while studying. These include strategies of self-evaluation, structuring of the environment and memorization.

In addition, the process of self-regulation is closely linked to the academic delay of gratification, or delay in academic gratification, as some authors call it. For Mischel (1996), the delay in gratification is a component of the self-regulation system.

The academic delay of gratification is related to students' postponement of opportunities, which were immediately available to respond to impulses, in favor of pursuing important academic rewards or goals that are more remote in time but also more valuable (Bembenutty & Karabenick, 1998). This delay in gratification is an integral part of the self-regulation process, which can be considered as a manageable but not always conscious activity, in which cognitive operations and motivational determinants get organized to accomplish some goals.

One of the issues pertaining to self-regulation of learning relates to the student's ability to remain focused on an objective, taking care that learning-related activities and tasks are not impaired by non-learning activities. Thus, the academic delay of gratification is basically related to the student's choice between an immediate gratification and an apparently better later gratification (Bembenutty and Karabenick, 2004).

Testa (2006) argues that a successful student needs to resist the temptations that immediate gratification brings to enhance the likelihood of reaching more distant and presumably more important goals.

It is noted, therefore, that the delay of gratification is a process distinct from procrastination, characterized as a behavior common to people, especially when related to daily tasks (Enumo & Kerbauy, 1999). Procrastinating consists of postponing the onset, development or termination of an activity (Ferrari, Johnson & Mccown, 1995), which can directly and negatively affect the performance of the individual at work, in school, relationships, and at home. The delay of gratification, by contrast, is related to the postponement of opportunities, a process of choice that, when applied, can favor academic success.

2.3 Background studies

As far as empirical research on the research theme is concerned, the studies of Mischel, Shoda and Peake (1988), Bembenutty and Karabenick (1998), Bembenutty (1999), Bembenutty (2007), Avci (2013) and Watson and Milfont (2017) can be cited internationally. The first investigated a series of experiments that analyzed the behavior of preschool children in postponing gratifications and, a decade later, analyzed 95 of these children, already adolescents. The authors concluded that children who chose to delay gratification when preschoolers years later were academically and socially more competent than those who preferred immediate gratification.

Bembenutty and Karabenick (1998) examined the intent of 369 psychology students to delay gratification in academic settings. Therefore, they developed the Academic Delay of Gratification Scale (ADOGS), which contained items to identify the respondents' proneness to delay gratification. The results indicated a large network of associations between the delay of gratification and the use of learning strategies, especially in relation to the management of time, study environment and effort. They concluded that students who postponed gratification also tended to exercise control over other aspects of their learning environment. Bembenutty (1999) analyzed the behavior of 102 university students enrolled in mathematics courses in relation to the delay of gratifications, also through the application of ADOGS. Based on the results, it could be inferred that the delay of gratification and its motivational determinants differ according to two main orientations: towards tasks and towards performance.

In Bembenutty's study (2007), 364 college students enrolled in introductory courses in psychology at a public university were examined in order to ascertain whether ethnic and gender differences influenced the gratification delay behavior. The conclusion was that female students from ethnic minorities are more willing to delay gratification than white males. Their grades were lower though, which can be explained by their low level of self-confidence in performing the tasks.

Avci (2013) carried out a study of 508 university students to investigate the relations among self-regulation, future time perspectives and the delay of gratification in the academic field. According to the research results, the students set distant goals for themselves and goals with their current actions, valuing actions that allowed them to reach their goals and overcome the problems caused by environmental distractions that prevented them from achieving those goals more easily.

Watson and Milfont (2017) analyzed a sample of 345 graduate students through an autoregressive cross-lag analysis and their results showed a two-way relationship between self-control and gratification delay, i.e. self-regulation predicted change in gratification delay and vice-versa.

In the context of Brazilian studies, Testa and Freitas (2005) aimed to identify the profile of undergraduate students in Administration in relation to the delay of gratification in academic situations and in relation to self-regulation of time and learning environment. To do so, they conducted an exploratory-descriptive survey of 292 undergraduate students in Business Administration and three other courses from two universities in Porto Alegre. The authors found that self-regulation may be high in some aspects and low in others, reflecting different abilities of individuals.

Pavesi and Alilprandini (2016) investigated the self-regulated learning profile of distance learning students from three higher education institutions of different knowledge areas in Brazil. The findings were that there was a high level of student self-regulation in relation to goal setting and structuring of the environment, and a moderate level of self-regulation in relation to task strategies, time management, self-assessment and help seeking.

In a comparative analysis of the Accounting students' in face-to-face and distance education courses regarding the use of self-regulated strategies in learning, Aguiar and Silva (2017) concluded that the strategies the accounting students used most were goal setting and planning and memorization.

3. Method

3.1 Definition of research characteristics, sample and data source

This research is characterized as a survey, as a questionnaire was used for support. In addition, regarding the objectives, it is a descriptive study in which the behavior and the relationship between the variables of learning strategies and the academic delay of gratification are evidenced. It presents a quantitative approach, using statistical tests such as descriptive statistics and correlation (Beuren, 2008), using secondary and primary sources to meet the general objective of analyzing the academic delay of gratification, verifying its relation with the strategies for self-regulation of learning.

The non-probabilistic sample consisted of 133 undergraduate students from the Accounting course, enrolled in the Faculty of Economic Sciences (FACE) of the Federal University of Minas Gerais (UFMG), which ranked first in the classification of the *Ranking Universitário Folha* (RUF) in the year 2015, in which each of the 40 undergraduate courses with the largest number of new students in Brazil are evaluated. In the sample selection process, we took into account accessibility criteria.

3.2 Data Collection

To verify the relationship between the learning self-regulation mechanisms and the academic delay of gratification, a questionnaire was applied to the sample students. The respondents had access to the printed questionnaire, applied in person by the researchers with the consent of the professors of the disciplines, in six classes of the course. The choice of the disciplines was based on criteria of accessibility and/or availability of teachers to assist in the research, considering classes of different course periods, involving students of the first years, intermediate and final period. Therefore, the non-probabilistic characteristics of the research sample are highlighted. Data were collected during May and June 2017.

The instrument used consisted of three parts: (i) general information about the participant, including information about gender, age, marital status, practice of some activity concomitant with the course, whether paid or not, among others; (ii) scale to identify learning strategies: cognitive strategies, metacognitive strategies and resource management. In this study, part two of the MSLQ (Motivated Strategies for Learning Questionnaire) was used, previously developed by the National Center for Research to Improve Postsecondary Teaching and Learning of the University of Michigan, adopted in the main research on the subject, which had undergone validations in several countries and areas of knowledge (Chen, 2002); and (iii) scale to evaluate the academic delay of gratification, using ADOGS (Academic Delay of Gratification Scale), developed and validated by Bembenutty and Karabenick (1998). Regarding this last scale, although it has been developed almost two decades ago, its assertions are general and timeless and can be used in different times and contexts. The scales analyzed in this study were translated by the authors and verified by two full-time doctoral professors at UFMG, all knowledgeable in the English language so that possible translation errors were avoided.

In the scale of learning strategies, part two of the MSQL, fifty statements were presented to the students, who should evaluate the extent to which the statement was true about himself, on a scale ranging from 1 (not true about me) to 7 (very true about me). The higher the score marked by the student, the greater the adoption of the type of strategy proposed. For example, in the following assertion: "When I study for my classes, I practice saying the material to myself," the respondent should indicate the degree of truthfulness of the statement when applied to his real life. The proxy used for the analysis of the learning strategies consisted of the total score obtained by the student in the scale in question - part two of the MSQL.

The ADOGS scale, on the other hand, provided students with ten choices that had two alternative courses of action (A and B). The student should score on a scale from 1 to 4, in which: (1) would certainly choose A, (2) would probably choose A, (3) would probably choose B, and (4) would certainly choose B. The higher the student's score, the greater the propensity to use the academic delay of gratification. For example, in view of the assertions: "(A) Going to a party the night before a test in this course and study only if you have time, OR (B) Studying first and going to the party only if you have time," the student should indicate which of the two he would choose and, moreover, the degree of propensity to choose when the situation was applied to his real life. The proxy used to analyze the academic delay of gratification was the student's total score on the ADOGS.

Finally, the research was carried out with the participants' consent, after due clarification: participation would be voluntary and the students could cancel or interrupt their participation at any time without penalty or impact on their situation in the course or grades; the respondent's anonymity would be guaranteed, so that there would be no risk of individual data being identified; and the analysis of the results would be made and disclosed in aggregate form.

In addition, the questionnaire was only applied after the completion of a pre-test at the Federal University of Minas Gerais (UFMG), in which 20 students from the Master's course in Controllership and Accounting completed the research instrument and suggested modifications that were incorporated into the final version. On average, it took 30 minutes for the students to complete the questionnaires, and all questionnaires were used, except for those obtained in the pre-test.

3.3 Data Analysis Techniques

Based on the tools listed in the previous topic, analyses were performed based on descriptive statistics, reliability analysis of the scales (Cronbach's alpha), Kruskal-Wallis test and Spearman's correlation, in order to find the behavior and the relationship between the learning self-regulation instruments the Accounting students used and the academic delay of gratification in this context.

Descriptive statistics are used to describe and characterize the sample, through the analysis of the frequency and dispersion of variables (Maroco, 2010). Thus, through this technique, the characteristics of the study sample can be evidenced. According to Hair Jr, Black, Babin, Anderson and Tatham (2009: 126), this refers to "an assessment of the degree of consistency between multiple measures of a variable". It is a test in which the consistency of an individual's responses is measured at two points in time to ensure that the responses are not very varied and that a measure taken at any time is reliable (Hair Jr *et al.*, 2009). Still according to the authors, Cronbach's alpha stands out as a widely used coefficient to measure reliability. This coefficient varies from 0 to 1, with values from 0.60 to 0.70 being considered the lower limit of acceptability. Thus, the reliability of the scales that measure learning strategies and the extension of academic gratification can be tested.

The Kruskal-Wallis test is used "to test whether two or more samples come from the same population or from different populations, or if the samples come from populations with the same distribution" (Maroco, 2010, p. 227). In this way, one can verify if there is a difference among the characteristics of the respondents and the adopted learning strategies or the academic delay of gratification choices in the populations under analysis. It should be noted that the term population refers to a set of individuals who possess a certain characteristic within the study sample here, such as the set of individuals who perform some kind of paid activity.

The Spearman correlation test is characterized as a measure of non-parametric association between two at least ordinal variables, so that it is not necessary to take into account the distribution assumptions of the variables (Maroco, 2010). This coefficient measures the intensity and sense of the association between two variables, and can vary from -1 to 1. The closer the coefficient is to the extreme values (-1 and 1), the greater the association or relationship between the variables. The sign shows the sense of this relationship, which can be negative or positive. Thus, the relation of the learning strategies with the academic delay of gratification can be evaluated.

4. Analysis of Results

4.1 Profile of respondents

Based on the data obtained through the questionnaires, it was verified that, among the respondents, 42.9% are female and 57.1% male. In the studies by Bembenutty and Karabenick (1998) and Bembemutty (1999) on the subject of the delay of gratification, there was a predominance of female students, representing about 60% of the sample.

Table 1 summarizes the respondents' profile.

Table 1
Respondents' profile

Identification		Frequency	%
Gender	Female	57	42.9%
	Male	76	57.1%
	Not informed	0	0.0%
	Total	**133**	**100.0%**
Civil Status	Single	112	84.2%
	Married/Fixed Partner	21	15.8%
	Divorced	0	0.0%
	Total	**133**	**100.0%**
Type of Teaching Institution where secondary education was taken	Public	78	58.6%
	Private	55	41.4%
	Not informed	0	0.0%
	Total	**133**	**100.0%**
Paid Job	Yes	116	87.2%
	No	17	12.8%
	Total	**133**	**100.0%**

Source: elaborated by the authors.

Regarding the marital status, 84.2% of the students analyzed are single, while 15.8% are married or live with a fixed partner. Of the unmarried students, 86.6% engaged in some type of paid job. In addition, 58.6% of the respondents took most of the high school in public schools and 87.2% had some type of paid activity (scientific initiation project with scholarship, internship, employment, etc.). When carrying out a similar analysis segregating by gender, 78.9% of the women are single, 59.6% attended high school in public school and 84.2% are engaged in paid activity. As for men, 88.2% are unmarried, 57.9% attended high school in public schools and 89.5% are engaged in paid work. These are, therefore, similar profiles.

4.2 Scale analysis

The scales used in the study were the second part of the MSQL (Motivated Strategies for Learning Questionnaire), which identifies learning strategies (cognitive, metacognitive and resource management) and ADOGS (Academic Delay of Gratification Scale), which assesses the academic delay of gratification.

To verify the reliability of these scales, Crohnbach's Alpha test was run in SPSS statistical software. For the MSQL scale, an alpha of 0.857 was obtained while, for ADOGS, the alpha was 0.749. As shown above, the acceptability threshold ranges from 0.60 to 0.70. This means that the scales used in the study have acceptable degrees of reliability.

The scale of learning strategies originated from the translation of the statements that made up the second part of MSQL. These statements were segregated and classified according to Pintrich *et al.* (1991). The classifications obtained were: cognitive strategies - subdivided into rehearsal, elaboration, organization and critical thinking; metacognitive strategies; and resource management strategies - subdivided into management of time and the study environment, effort, learning and help seeking. In this scale, students should assess how strongly the statement was true about themselves, on a scale ranging from 1 (not true about me) to 7 (very true about me). The higher the total score obtained in the scale, the greater the adoption of the learning strategies. Table 2 shows the classifications and results of the application of this scale for each statement in the instrument.

Table 2
Application results of Motivated Strategies for Learning Questionnaire - MSQL

			Mean	Standard Deviation	Frequency (%)						
					1	2	3	4	5	6	7
Cognition	Rehearsal	8. When I study for my classes, I practice saying the material to myself.	**4.56**	1.868	7	10	14	12	21	16	20
		15. When studying for my classes, I read my class notes and the course readings over and over again.	**4.44**	1.936	11	9	13	15	16	19	17
		28. I memorize key words to remind me of important concepts in this class.	**5.23**	1.531	2	5	7	12	22	31	21
		41. I make lists of important items for each course and memorize the lists.	3.53	1.857	18	17	17	15	14	14	5
	Elaboration	31. I try to relate ideas in one subject to those in other courses whenever possible.	**5.12**	1.697	2	8	9	13	16	26	26
		22. When I study for a class, I pull together information from different sources, such as lectures, readings and discussions.	3.05	1.894	28	20	16	16	7	5	8
		33. When reading for class, I try to relate the content to what I already know.	**5.52**	1.433	1	4	4	10	21	31	29
		36. When I study for a course, I write brief summaries of the main ideas from the readings and my class notes.	**4.86**	1.955	8	7	12	10	17	18	28
		38. I try to understand the content of the class by making connections between the readings and the professor's presentation in class.	**4.95**	1.639	4	6	10	12	26	23	19
		50. I try to apply ideas from course readings in other activities, such as lectures and discussions.	3.98	1.794	10	15	15	20	17	13	10
	Organization	1. When I study the readings for my classes, I outline the content to help me organize my thoughts.	**4.41**	2.004	11	8	17	14	14	15	21
		11. When I study for my classes, I go through my class notes and try to find the most important ideas.	**4.95**	1.860	8	4	11	11	16	28	22
		18. I make simple diagrams or tables to help me organize the course content.	3.59	2.016	20	17	17	10	14	10	11
		32. When I study for a course, I go over my class notes and make an outline of important concepts.	**4.95**	1.821	6	8	7	13	20	22	24
	Critical Thinking	7. I often find myself questioning things I hear or read in my classes to decide if I find them convincing.	**4.61**	1.546	4	6	11	24	26	16	13
		16. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.	3.93	1.548	7	13	17	25	21	13	4
		20. I treat the course content as a starting point and try to develop my own ideas about it.	3.77	1.718	11	15	18	20	19	10	7
		35. I try to relate ideas of my own with what I am learning in my classes.	**4.93**	1.528	1	5	17	14	20	26	17
		40. Whenever I read or hear an assertion or conclusion in class, I think about possible alternatives.	**4.02**	1.758	10	13	13	20	21	16	7

		Mean	Standard Deviation	Frequency (%)						
				1	2	3	4	5	6	7
Metacognition	2. During class time, I often miss important points because I'm thinking of other things.	**5.04**	1.725	4	7	7	16	23	14	29
	5. When reading for my classes, I make up questions to help focus my reading.	3.80	1.858	12	18	17	16	16	11	10
	10. When I become confused about something I'm reading in class, I go back and try to figure it out.	**5.27**	1.513	3	2	9	12	19	34	21
	13. If the class readings are difficult to understand, I change the way I read the content.	**4.27**	1.693	6	12	14	20	21	17	10
	23. Before I study new course content, I skim it to see how it is organized.	3.35	1.896	20	21	15	14	13	9	8
	24. I ask myself questions to make sure I understand the material I have been studying in the classroom.	**4.04**	1.856	10	17	11	20	18	12	12
	25. I try to change the way I study in order to fit the course requirements and the professor's teaching style.	**4.19**	1.693	6	13	16	22	19	15	9
	26. I often read texts for my classes but find out that I didn't understand what it was all about.	**4.37**	1.971	13	6	16	15	16	16	18
	30. I try to think through a text to decide what I am supposed to learn from it rather than just reading it over when studying for my classes.	3.83	1.773	14	14	8	25	20	14	5
	45. When studying for my courses I try to determine which concepts I don't understand well.	**5.49**	1.363	2	1	5	17	17	31	27
	47. When I study for class, I set goals for myself in order to direct my activities in each study period.	**4.20**	1.811	10	11	14	18	21	15	11
	48. If I get confused taking notes in class, I make sure I sort it out afterwards.	**4.49**	1.752	6	10	13	17	20	21	13

			Mean	Standard Deviation	Frequency (%)						
					1	2	3	4	5	6	7
Resource Management	Time and Study Environment	4. I usually study in a place where I can concentrate on my class work.	**5.29**	1.604	2	7	5	12	19	29	26
		12. I make good use of my study time for my classes.	3.68	1.555	11	13	22	24	17	11	2
		21. I find it hard to stick to a study schedule.	**4.14**	1.841	10	13	13	20	18	14	12
		34. I have a regular place set aside for studying.	**4.23**	1.996	13	13	10	12	20	17	15
		39. I make sure I keep up with the weekly readings and assignments for the courses.	3.14	1.754	20	22	23	10	10	11	4
		42. I attend class regularly.	**5.88**	1.552	2	4	3	7	9	26	49
		46. I often find that I don't spend very much time on my classes because of other activities.	3.84	2.236	26	8	13	10	12	14	17
		49. I rarely find time to review my notes or readings before an exam.	3.88	1.927	16	13	11	23	15	10	12
	Effort	6. I often feel so lazy or bored when I study for my classes that I quit before I finish what I planned to do.	**4.48**	1.964	7	14	14	12	17	14	22
		17. I work hard to do well in my classes, even if I don't like what we are doing.	**4.53**	1.612	4	7	16	19	27	13	14
		29. When course work is difficult, I give up or only study the easy parts.	3.07	1.684	20	23	23	14	11	4	5
		43. Even when course materials are dull and uninteresting, I manage to keep working until I finish.	**4.04**	1.815	11	14	10	27	14	14	10
	Learning	3. When studying for my classes, I often try to explain the material to a classmate or a friend.	3.77	1.905	17	13	14	17	19	11	9
		14. I try to study with other students from my class to complete the course assignments.	3.65	2.178	26	14	10	11	11	15	13
		19. When studying for my classes, I often set aside time to discuss the content with a group of students from the class.	2.65	1.763	37	20	18	5	9	10	1
	Help Seeking	9. Even if I have trouble learning the content in my classes, I try to do the work on my own, without help from anyone.	**4.52**	1.881	7	13	11	14	20	16	19
		27. I ask the professor to clarify concepts I didn't understand well.	**4.50**	1.828	10	4	17	10	23	24	12
		30. I try to think through a text to decide what I am supposed to learn from it rather than just reading it over when studying for my classes.	3.83	1.773	14	14	8	25	20	14	5
		44. I try to identify students in class whom I can ask for help if necessary.	**4.79**	1.981	9	11	5	10	17	23	23

Source: Pintrich *et al.* (1991).

In general, concerning the "rehearsal" strategies in the cognition category, three of the four statements listed showed a greater trend to adopt this type of strategy (average score superior to 4 points/higher frequency of scores superior to 4). As a result, on average, the respondents tend to rehearse content, read and reread study notes, and learn keywords to memorize important concepts. Regarding the "elaboration" strategies, four of the six statements listed showed a stronger trend to use this strategy, which means that the students try to relate the contents of different disciplines; content taught with the knowledge they already had; draw up summaries and try to establish links between the readings and the teacher's presentation.

For the subcategory "organization", three of the four statements listed showed a stronger trend to adopt this type of strategy (average score superior to 4 points/higher frequency of scores higher than 4). Therefore, the students, in an attempt to organize thinking, on average, they tend to outline the content, to create notes and to reread notes. For "critical thinking", three of the five statements presented showed a stronger trend to adopt this strategy. The respondents ask questions about the contents, seeking to identify possible relationships with personal ideas.

In the category "metacognition", nine of the twelve statements showed a greater predisposition to adopt this type of strategy. Thus, if the students find it difficult to understand a particular subject, they try to change the study method, be it by elaborating questions, reading texts differently, listing doubts and seeking solutions.

Considering the resource management strategies, in the subcategory "time and study environment", four of the eight statements listed showed a trend to adopt this type of strategy, but a balance was found among the respondents as, similarly, four assertions did not show a trend to adopt this type of strategy. There was no consensus on the issue of time regulation and the choice of the best study environment. For the subcategory "effort", three of the four statements indicated the adoption of this strategy. The students try to make efforts to carry out the activities, but when they encounter difficulties, they do not finish them.

Regarding "learning", there were no trends in the use of this strategy, so students were not inclined to share knowledge and hold discussions with colleagues. Finally, the "help seeking" strategy is aligned with the results of the learning management strategy, as it was observed that the students do not seek help other than from the teacher.

In summary, it was verified that the self-regulated students develop the learning strategies in order to understand the information; establish ways of memorizing content; planning and monitoring their performance. Therefore, these results corroborate the study by Testa (2006). In addition, they are aligned with Social Cognitive Theory (Bandura, 1986), in the sense that the individual can intentionally influence his own path and circumstances; and the Action Control Theory, which deals with the individual aspects and the capacity to regulate emotions, cognitions, behaviors and self-regulating strategies to achieve success in the actions planned (Branco, Peixoto & Alvim, 2013).

The academic delay of gratification scale originated from the translation of the ten choices between two alternative courses of action that made up the ADOGS scale, developed by Bembenutty and Karabenick (1998). In it, the student should choose from a scale numbered 1 to 4, in which: (1) would certainly choose A, (2) would probably choose A, (3) would probably choose B, and (4) would certainly choose B. The higher the total score obtained on the scale, the greater the propensity to delay academic gratification. Table 3 presents the results of the application of this scale for each choice in the instrument.

Table 3

Application results of Academic Delay of Gratification Scale – ADOGS

Academic Delay of Gratification Scale - ADOGS	Mean	Standard Deviation	Frequency (%)			
			1	2	3	4
1. (A) Going to a concert or favorite sports event and studying less for this course, although this may mean getting a lower grade on a test you'll have tomorrow, OR (B) Staying at home and studying to increase your chances of getting a higher grade.	**2.60**	0.95	13	35	32	20
2. (A) Spending more time with your friends and studying as much as you can a short time before the class, OR (B) Studying a little every day for a test in this course and spend less time with your friends.	2.19	0.99	30	32	28	10
3. (A) Losing several classes to accept an invitation for a very interesting trip, OR (B) Postponing the trip until the end of the course.	**2.53**	1.15	27	20	27	26
4. (A) Going to a party the night before a test in this course and studying only if you have time, OR (B) Studying first and going to the party only if you have time.	**3.12**	0.81	2	20	41	37
5. (A) Spending most of your time studying only the interesting course content, even if this may mean you will not get such a good grade, OR (B) Studying the entire content to increase your chances of doing well in the course.	**2.90**	0.87	6	25	42	27
6. (A) Skipping class when the weather is good to enjoy it and trying to get someone's notes later, OR (B) Participating in class to make sure you won't lose anything, despite knowing that the weather outside is good.	**2.97**	0.93	8	20	39	33
7. (A) Going out with your friends to have fun and trying to finish the task when you get home later that night, OR (B) Staying in the library to make sure you'll finish a course task you're expected to hand in the next day.	**2.74**	0.96	11	28	36	25
8. (A) Studying for this course in a place with many pleasant distractions, OR (B) Studying in a place where there are less distractions to enhance the probability of you learning the content.	**3.41**	0.77	3	8	34	55
9. (A) Going out right after class to do something you like even if this means you may not understand the content for the test, OR (B) Staying in after class to ask the professor for explanations about the content of the test you haven't understood.	**2.26**	0.94	24	37	29	10
10. (A) Choosing a professor for this course who is funny even if (s)he doesn't do a good job explaining the content, OR (B) Choosing a professor for this course who is not that funny but who does a good job explaining the content.	**3.35**	0.79	3	11	35	51

Source: elaborated by the authors.

Overall, it was noticed that among the ten alternatives, nine showed the students' trend towards decisions that lead to the academic delay of gratification (average scores above 2.25 points/higher frequency of scores higher than 2).

The choice that did not exceed the average of 2.25 presented an average of 2.19, which is considered close to the minimal value listed for a trend towards delay. Thus, it is observed that, on average, the respondents tend to postpone available opportunities in favor of pursuing academic goals that are temporarily remote, but more valuable. This result corroborates the findings of the creators of the scale, Bembenutty and Karabenick (1998), and the Action control theory, where even amidst diverse distractions, individuals find strategies that will help them remain focused on their activity, including environment, motivation and selective attention, as illustrated by the average of 3.41 in question number eight.

4.3 Analysis of sample distribution

The Kruskal-Wallis test permits verifying if there is a difference between the characteristics of the respondents and the adopted learning strategies or the academic delay of gratification choices. Initially, the Kruskal-Wallis test was carried out using SPSS between the variables gender, marital status, type of institution to attend high school, performance of some kind of paid or unpaid activity concomitant with the course, and the variables total score on the learning strategy questionnaire and total score on the academic delay of gratification scale.

Next, the statistical significance of the results was evaluated and it was verified that there is evidence of significant differences between the learning strategies adopted and the gender of the respondents. Considering a level of significance of 0.05%, female students, with a significance of 0.01 and an average score of 76.89, tended to develop more learning strategies than male students, as displayed in Table 4.

This result is in line with the findings of Bembenutty (2007), who analyzed whether ethnic and gender differences influenced the behavior of extending bonuses. The author found that female students of ethnic minorities are more willing to postpone gratification than white males. It should be pointed out that, in this study, only the gender variable was investigated, while issued related to ethnic origin were not included in the analysis.

Table 4
Result of Kruskal-Wallis test for learning strategies and gender

Kruskal-Wallis		Classification		
Learning Strategies x Gender		FEM	N	Mean classification*
Chi-Square	6,567	0	76	59.59
df	1	1	57	76.89
Sig.	0.01	Total	133	

Legend: *Mean position of the group regarding all observations according to the Kruskal-Wallis test.

Source: elaborated by the authors.

In addition, evidence of significant differences was found between the academic delay of gratification choices and the accomplishment of some kind of paid activity concomitant with with the course, as evidenced in Table 5.

Table 5
Result of Kruskal-Wallis test for delay of gratification and paid job

Kruskal-Wallis		Classification		
Delay x Paid Job		Paid Job	N	Mean classification*
Chi-Square	4.016	0	17	84.44
df	1	1	116	64.44
Sig.	0.04	Total	133	

Legend: *Mean position of the group regarding all observations according to the Kruskal-Wallis test.

Source: elaborated by the authors.

Considering a significance level of 0.05%, the students who do not perform some kind of paid activity concomitant with the course, with a significance of 0.04 and an average score of 84.44, are more prone to the academic delay of gratification than students who perform some type of paid activity.

4.4 Analysis of the correlation between learning strategies and the academic delay of gratification

In order to evaluate the possible relationship between students' learning strategies in undergraduate Accounting courses and the academic delay of gratification, each respondent's scale scores were added up. In the scale of learning strategies, consisting of fifty assertions, the student could get a score between 50 and 350 points. In the delay of gratification scale, composed of ten alternatives, the student could reach a score between 10 and 40 points. The higher the score, the greater the adoption of learning strategies and the probability of using the academic delay of gratification.

Thus, through the Spearman correlation test, carried out in SPSS, a positive and statistically significant correlation (0.407) was observed between the learning strategies and the academic delay of gratification, as presented in Table 6. Thus, these variables are related so that the adoption of learning strategies increases the likelihood of students adopting the delay, that is, postponing available opportunities in favor of pursuing academic goals that are remote in time but more valuable.

Table 6
Spearman correlation between strategies and delay

	LS	ADG
LS	1.00	
ADG	**0.407****	1.00

Source: elaborated by the authors.

The results evidenced in Table 6 demonstrate that, in fact, Cognitive theory applies in the context of the accounting students, and it has been observed that people are self-organized and self-regulating, being able to contribute and also influence the events around them. In addition, the study also verified that the positive correlation found between the use of learning strategies and the academic delay of gratification reveals that individuals may have the ability to regulate their emotions, cognitions, behaviors and self-regulation strategies in order to achieve success in the actions they plan. When they prefer to study first and only go to a party if they have time left, for example, they exemplify this competence and autonomy. Thus, the premises of the Action control theory were also confirmed, which guided the investigations in this study, materializing that even amidst diverse distractions, there are strategies that will help individuals to remain focused on their activity.

These findings corroborate those of Bembenutty and Karabenick (1998), a study that developed the Academic Delay of Gratification Scale (ADOGS), which contained items to identify respondents' proneness to delay gratification, and whose results indicated an association between the academic delay of gratification (ADG) and the use of learning strategies (LS).

Given that there was a positive and statistically significant association between the learning strategies and the delay of gratification, we aimed to identify which types of learning strategies most correlate with the academic delay of gratification. Therefore, the classification of the types of strategies adopted by Pintrich *et al.* (1991) was adopted: cognitive strategies (COG) - subdivided into rehearsal (REH), elaboration (ELA), organization (ORG) and critical thinking (THIN); metacognitive strategies (META); and resource management strategies (MANA) - subdivided into management of time and the study environment (TIM), effort (EFF), learning (LEA) and help seeking (HEL). These classifications were considered as new variables, whose scores were obtained by adding up the students' scores in each question related to each type of strategy.

After the definition of these new variables and their respective scores, the Spearman correlation test between the variables and the academic delay of gratification were again performed. It was verified that there are positive and statistically significant relationships between the delay and the learning strategies of metacognition, cognition and resource management, in this order of intensity, as presented in Table 7.

Table 7

Spearman Correlation between strategy categories and delay

	COG	META	MANA	ADG
COG	1.000			
META	0.630**			
MANA	0.344**	0.543**		
ADG	**0.342****	**0.418****	**0.213***	1.000

Source: elaborated by the authors.

The analysis of the subdivisions among these types of strategies showed that the subdivisions of cognitive rehearsal, elaboration and organization are positive and significantly related with the delay, in this order of intensity. What the subdivisions of the resource management strategies are concerned, only the management of time and study environment revealed a (positive) significant association with the academic delay of gratification. These results are displayed in detail in Table 8.

Table 8

Spearman Correlation between strategy subcategories and delay

	REH	ELA	ORG	THIN	META	TIM	EFF	LEA	HEL	ADG
REH	1.000									
ELA	0.487**									
ORG	0.495**	0.568**								
THIN	0.227**	0.607**	0.314**							
META	0.403**	0.523**	0.555**	0.445**						
TIM	0.187*	0.286**	0.215*	0.256**	0.381**					
EFF	0.062	0.134	0.152	-0.029	0.256**	0.229**				
LEA	0.079	0.051	0.173*	0.155	0.288**	0.003	0.103			
HEL	0.177*	0.190*	0.297**	0.185*	0.376**	0.192*	0.170			
ADG	**0.319****	**0.334****	**0.253****	0.165	0.418**	**0.207***	0.144	0.073	0.129	1.000

Source: elaborated by the authors.

Thus, it is inferred that, among the types of learning strategies, the strategies related to cognition (rehearsal, elaboration and organization) and to the management of the time and study environment are those that are more related to the extension. In this way, the adoption of these strategies is in line with the students' propensity to extend academic gratification.

Again, the results are in line with the findings of Bembenutty and Karabenick (1998), who also identified time management as one of the types of learning strategies most associated with overtime. In summary, the research results demonstrate that respondents tend to postpone available opportunities in pursuit of academic goals that are temporarily remote, but more valuable.

5. Final Considerations

This study sought to verify the relationship between the academic delay of gratification and the learning strategies, involving the students of the Accounting course at the Federal University of Minas Gerais. Student activities require a range of self-regulating efforts and mechanisms to succeed in the various tasks performed in this course. In the case of a higher-education course, students are constantly engaged in tasks such as group work, classes, assessments, lectures or research activities.

As reinforced by Lemos (2016), learning strategies are seen as facilitators in this process and concern efforts or any activities students undertaken in a conscious manner, in order to strengthen the processes of information acquisition, transformation, storage and use.

The academic delay of gratification is an individual ability to regulate and is an aspect of self-regulation of learning. Therefore, the self-regulated student moves toward the learning strategies, which include cognition, metacognition and resource management.

The results of this study corroborate previous research, such as Bembenutty and Karabenick (1998) and also Bembenutty (2007). A first finding of this research refers to the fact that female students use more of the learning strategies when compared to male students and are therefore more likely to delay their academic gratification. Similarly, students who do not engage in some kind of paid activity concomitant with the course tend to make choices more characteristic of the academic delay of gratification than students who perform some type of paid activity.

Regarding the relationship between the learning strategies and the academic delay of gratification, a positive and significant correlation was observed between both, so that the adoption of these strategies increases the probability of academic delay of gratification. More specifically, metacognitive strategies were more strongly and positively correlated with the academic delay of gratification. As for the cognitive and resource management strategies, among the first only essay, elaboration and organization, were shown to be significant and positively associated with the delay; in relation to the second, only time management correlated positively with the academic delay of gratification.

Given this situation, it is important that students use learning strategies not only during classes, but also involving their entire social context, through both cognitive and metacognitive techniques as well as through resource management, developing their autonomy and regulating the learning.

As contributions, it is expected that this study will generate positive impacts for educational institutions, teachers and students. Recognizing possible difficulties in the students' self-regulation process, the members of the institution have the opportunity to identify maladaptive cognitions, seeking alternatives to help the students to cope with situations of discomfort in the university. Teachers, in turn, may have access to information that is important to improve the course's teaching process as, by knowing the profile of their students, they can stimulate them to develop strategies for the self-regulation of learning, as well as to prioritize rewards over a longer period of time, as the deferment of gratifications is a controllable, though not always conscious, activity. Students, with the help of teachers and educational institutions, can visualize improvements in the teaching-learning process, which may positively impact their academic performance.

In addition, in the social sphere, especially in the psychological field, the study findings reinforce the ideas that the individual can influence his own path and the circumstances, in an intentional way; being able to regulate the emotions, cognitions, behaviors and self-regulating strategies to be successful in the planned actions. Thus, we have demonstrated that the delay in gratification is a consequence of the successful use of volitional control strategies, that is, individuals are able to evaluate situations and control their wills, giving up impulsive decision making; as well as tending to exert control over other aspects of their learning environment.

For accounting professionals, the study appoints that, to be successful, it is necessary to be resistant to the temptations immediate gratification brings, so that the probability of reaching more distant and presumably more important goals is increased. The results show that 87.2% of the students analyzed perform some type of paid activity, a fact that deserves attention, as this expressive percentage suggests that the students seek some income, either to complement the family income or even to maintain themselves at the university. This feature is also linked to the fact that the course is offered at night, allowing the opportunity to work during the day and study at night. This reality makes research on the subject more important.

As limitations of this study, it should be emphasized that the results found do not go beyond the sample surveyed. In addition, the limitations of the data collection instrument itself, which may present errors or biases, are highlighted. That is, because the questionnaire was composed of scales that involve self-reporting, this does not guarantee an exact correspondence between the actual behavior and the verbalized behavior, for some reasons: a) the reported behavior differs from the actual behavior because covert events are not legitimately recognized; b) the reported behavior is not the real but the socially desirable behavior, considering influences from the individual's history of reinforcement; and c) the participant does not fully understand the items that make up the instrument used, resulting in different meanings for participant and researcher (Kohlsdorf and Costa Júnior, 2009). In order to try to minimize the discrepancy between the data obtained from the self-report and the actual behavior, all the necessary clarification was provided in the questionnaire itself, and contact with the research was available in order to solve any kind of doubt.

For future investigations, we propose verifying if these relations are confirmed in different samples. For example, we suggest investigating higher education institutions (HEI) with lower rankings than UFMG in the *Ranking Universitário Folha* (RUF), in order to compare the results found in higher ranked and worse ranked HEI. We also propose that more in-depth qualitative analyses be carried out in order to contribute to aspects of the causes and other relevant factors that may interfere in the relations between the use of learning strategies and the academic delay of gratification.

References

Aguiar, J. H. S., & da Silva, A. C. R. (2017). Aprendizado autorregulado em contabilidade: uma análise comparativa entre discentes de modalidade presencial e a distância. *Revista Catarinense da Ciência Contábil*, *16*(48), 7-23.

Avci, S. (2013). Relations between self regulation, future time perspective and the delay of gratification in university students. *Education*, *133*(4), 525-537.

Azzi, R. G. (2010). Mídias, transformações sociais e contribuições da teoria social cognitiva. *Psico*, *41*(2), 252-258.

Bandura, A. (1986). *Social foundations of thought and action:* a social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (2009). Social cognitive theory of mass communication. *Media Psychology, 3*(3), p. 61-90. DOI: 10.1207/S1532785XMEP0303_03

Bembenutty, H. & Karabenick, S. A. (1998). Academic delay of gratification. *Learning and Individual Differences, 10*(4), 329–346. DOI: https://doi.org/10.1016/S1041-6080(99)80126-5

Bembemutty, H. (1999). Sustaining motivation and academic goals: The role of academic delay of gratification. *Learning and Individual Differences,* 11(3), 233-257. DOI: https://doi.org/10.1016/S1041-6080(99)80002-8

Bembenutty, H. & Karabenick, S. A. (2004). Inherent association between academic delay of gratification, future time perspective, and self-regulated. *Learning Educational Psychology Review, 16*(1), 35-57.

Bembenutty, H. (2007). Self-regulation of learning and academic delay of gratification: Gender and ethnic differences among college students. *Journal of Advanced Academics*, 18(4), 586-616. DOI: https://doi.org/10.4219/jaa-2007-553

Beuren, I. M. (2008). *Como elaborar trabalhos monográficos em contabilidade - teoria e prática.* São Paulo: Atlas.

Branco, E. M. da S. C., Peixoto, M. A. P, & Alvim, N. A. T. (2013, nov-dez). Escala do controle da ação para o diagnóstico de desempenho em estudantes de Enfermagem. *Revista Brasileira de Enfermagem, 66*(6), pp. 942-948. DOI: http://dx.doi.org/10.1590/S0034716720130006000020.

Chen, C. S. (2002). Self-regulated learning strategies and achievement in an introduction to information systems course. *Information Technology, Learning and Performance Journal, 20*(1), 11-25.

Enumo, S. R. F. & Kerbauy, R. R. (1999). Procrastinação: descrição de comportamento de estudantes e transeuntes de uma capital brasileira. *Revista Brasileira de Terapia Comportamental e Cognitiva*. 1(2), 125-133.

Ferrari, J. R., Johnson, J. & Mccown, W. (1995). *Procrastination and task avoidance*: Theory, research and treatment. New York: Plenum Press.

Filcher, C., Miller, G. (2000). Learning strategies for distance education students. *Journal of Agricultural Education, 41*(1), 60-68.

Hair Jr., J. F., Black, W. C, Babin, B. J., Anderson, R. E, & Tatham, R. L. (2009). Análise multivariada de dados. (6 ed.). Porto Alegre: Bookman.

Kohlsdorf, M., & Costa Júnior, Á. L. (2009). O autorrelato na pesquisa em psicologia da saúde: desafios metodológicos. *Psicol. Argum*., Curitiba, v. 27, n. 57, p. 131-139, abr./jun. 2009.

Kuhl, J. (1985). Volitional mediators of cognition-behavior consistency: Self-regulatory processes and action vs. state orientation. In: *Action control:* From cognition to behavior, edited by J. Kuhl &J. Beckmann. New York: Springer-Verlag, 101-128. DOI: https://doi.org/10.1007/978-3-642-69746-3_6

Lemos, L.S. (2016). *Estratégias de aprendizagem de estudantes de pedagogia:* relações com características demográficas e autopercepção de desempenho. Tese de Doutorado. Universidade Estadual de Campinas, Campinas, SP, Brasil.

McKeachie, W. J.. Pintrich, P. R.. Lin, Y. -G.. & Smith, D. A. F. (1986). *Teaching and learning in the college classroom:* a review of the research literature. AnnArbor, MI: University of Michigan. National Cent. er for Research to Improve Postsecondary Teaching and Learning.

Milfont, T. L., & Schwarzenthal, M. (2014). Explaining why larks are future-oriented and owls are present-oriented: Self-control mediates the chronotype-time perspective relationships. *Chronobiology International*, *31*(4), 581–588. DOI: 10.3109/07420528.2013.876428.

Mischel, W. (1996). From good intentions to willpower. In: *The psychology of action:* Linking cognifion and motivation to behavior, edited by I'. M. Gollwitzer & J. A. Bargh. New York: Guilford Press, 197-218.

Mischel, W., Shoda, Y., & Peake, P. K. (1988). The nature of adolescent competencies predicted by preschool delay of gratification. *Journal of personality and social psychology*, 54(4), 687.

Pavesi, M. A., & Alliprandini, P. M. Z. (2016). Análise da aprendizagem autorregulada de alunos de cursos a distância em função das áreas de conhecimento. *Educação, Formação & Tecnologias,9*(1), p. 3-15.

Pintrich, P. R., Degroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33-40. DOI: 10.1037//0022-0663.82.1.33

Pintrich, P. R.; Johnson, G. R. (1990). Assessing and improving students' learning strategies. *New Directions for Teaching and Learning*, (42), 83-92.

Pintrich, P. R, Smith, D. A. F., Duncan, T. & Mckeachie, W. J. (1991). *A Manual for the Use of the Motivated Strategies for Learning Questionnaire* (MSLQ). Recuperado em 19 abril, 2017, a partir de https://www.researchgate.net/publication/271429287_A_Manual_for_the_Use_of_the_Motivated_Strategies_for_Learning_Questionnaire_MSLQ.

Pintrich, P. R. (1999). Taking control of research on volitional control: Challenges for future theory and research. *Learning and Individual Differences, 11*(3), 335–354. DOI: https://doi.org/10.1016/S1041-6080(99)80007-7

Ranking Universitário Folha - RUF. (2015). Recuperado em 20 junho, 2017, a partir de http://m.ruf.folha.uol.com.br/2015/ranking-de-cursos/ciencias-contabeis/.

Silva, D. M., Leal, E. A., Pereira, J. M. & Oliveira Neto, J. D. (2015). Estilos de aprendizagem e desempenho acadêmico na Educação a Distância: uma investigação em cursos de especialização. *Revista Brasileira de Gestão de Negócios, 17* (57), 1300-1316. DOI: http://dx.doi.org/10.7819/rbgn.v17i57.1852

Silva, D. M., Oliveira Neto, J. D. (2010). O impacto dos estilos de aprendizagem no ensino de Contabilidade. *Contabilidade Vista e Revista, 21* (4), 123-156.

Snow, R., L. Como, & D. Jackson. (1996). Individual differences in affective and conative functions. In: *Handbook of educational psychology,* edited by D. Berliner & R. Calfee. New York: Macmillan, 243-310.

Stolarski, M., Ledzińska, M., & Matthews, G. (2013). Morning is tomorrow, evening is today: Relationships between chronotype and time perspective. *Biological Rhythm Research, 44,* 181–196. DOI: https://doi.org/10.1080/09291016.2012.656248

Testa, M. G. (2006). A influência das preferências por contato social e da autoregulação dos recursos de aprendizagem do estudante na efetividade dos cursos desenvolvidos na Internet. Tese de doutorado, Universidade Federal do rio Grande do Sul, Porto Alegre, RS, Brasil.

Testa, M. G., & Freitas, H. (2005). Auto-Regulação da Aprendizagem: analisando o perfil do estudante de Administração. In: XXIX Encontro Nacional da ANPAD (Enanpad), Brasília. *Anais...* ANPAD: Brasília, 2005. Recuperado em 20 de maio, 2018, em: http://gianti.ea.ufrgs.br/files/artigos/2005/2005_163_ENANPAD.pdf.

Watson, S. J., & Milfont, T. L. (2017). A short-term longitudinal examination of the associations between self-control, delay of gratification and temporal considerations. *Personality and Individual Differences*, *106*, 57-60. DOI: http://dx.doi.org/10.1016/j.paid.2016.10.023 0191-8869.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In: Boekaerts, M., Pintrich, P. R., and Zeidner, M. (eds.) *Handbook of Self-Regulation*, Academic Press, San Diego, CA. pp. 13-39.

Zimmerman, B. J., & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American educational research journal, 23*(4), 614-628. DOI: 10.3102/00028312023004614

Zimmerman, B. J., & Schunk, D. H. (2001). *Self-regulated learning and academic achievement: theoretical perspectives.* Routledge. DOI: 10.1007/978-1-4612-3618-4.

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

REPeC, Brasília, v. 12, n. 2, art. 7, p. 250-266, Apr./Jun. 2018
Available online at *www.repec.org.br*
DOI: http://dx.doi.org/10.17524/repec.v12i2.1803

Broadening the benefits of PBL: a "good" problem

Abstract: This study addresses the characteristics of a "good" problem for a management accounting course that applies the Problem Based Learning (PBL) method, in which undergraduate students are expected to define their own problems. In this case, PBL is applied as an integrative discipline, from the middle to the end of the course. The innovation is to take advantage of students' practical knowledge and context and to expand the potential of PBL, including the identification and design of a problem, as well as the solution supported by the literature. The empirical part takes place in class groups of students, using the "action research" methodology. We particularly focused on the intrinsic and utility characteristics of good problems of 17 groups that attended the course in 2014 and 2015. The main implications of the study are: (i) highlight an opportunity to broaden the potential benefits of PBL by better characterizing a good problem for the PBL approach; (ii) discuss critical issues for PBL which are different from the traditional approach; (iii) use the eleven characteristics for a good problem in PBL in a segmented manner; and (vi) provide evidence that the role of the professor requires adaptation due to the level of uncertainty this approach encourages.

Keywords: Problem Based Learning; Problem design; Management accounting; Problem characteristics; Accounting Education.

Fábio Frezatti
Ph.D. in Controllership and Accounting from University of São Paulo (USP) and Professor at University of São Paulo (USP). **Contact:** Av. Prof. Luciano Gualberto, 908, FEA 3, sala 226, Cidade Universitária, São Paulo (SP), CEP: 055008- 010.
E-mail: frezatti@usp.br

Daniel Magalhães Mucci
Ph.D. in Controllership and Accounting from University of São Paulo (USP) and Ph.D. in Applied Economics from University of Antwerp and Visiting Professor at Regional University of Blumenau (FURB). **Contact:** Rua Antônio da Veiga, 140, Sala D-202, Itoupava Seca, Blumenau (SC), CEP: 89030-903.
E-mail: danielmmucci@gmail.com

Daiana Bragueto Martins
M.Sc. in Accounting from Federal University of Paraná (UFPR) and Professor at Londrina State University (UEL). **Contact:** Rodovia Celso Garcia Cid - Pr 445, Km 380, Caixa Postal 6001, Departamento de Ciências Contábeis, Campus Universitário, Londrina (PR), CEP: 86051-990.
E-mail: daiana@uel.br

Published in Portuguese and English. Original Version in Portuguese.

Received in 2/14/2018. Ask to Revise on 5/15/2018. Resubmitted on 5/24/2018. Accepted on 6/26/2018 by Drª. Márcia Maria dos Santos Bertolocci Espejo (Assistant Editor) and by Dr. Orleans Martins (Editor). Published on 6/29/2018. Organization responsible for the journal: Abracicon

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

1. Introduction

Previous scholars from the educational field have been suggesting that Problem Based Learning (PBL) can address the organizational demands in terms of professional knowledge, skills and attitudes to reduce the distance between theory and practice (Stanley & Marsden, 2012; Milne & McConnell, 2001; Breton, 1999). The PBL approach consists in three pillars, which are the problem, the student, and the teacher (Majoor *et al*., 1990; Schmidt, 1983; Savery, 2006). In this paper, we focus on the problem pillar, as it can be considered a vehicle to integrate theoretical discussions into the business reality (Duch, Groh, & Allen, 2001; Hmelo-Silver, 2004; Hansen, 2006; Savery, 2006). Problems should be based on real-life situations identified in practice, so that they represent authentic contexts and are related to the future roles the students are to perform within the job market (Hallinger & Lu, 2012).

The context of this study is connected to the area of business and focuses on an undergraduate accounting course with two distinct branches, which are financial accounting and management accounting (Horngren, Foster & Datar, 2000; Frezatti, Aguiar, & Guerreiro, 2007). The study is developed in an integrative course in the area of management accounting, favoring topics such as strategy, budgeting, costs, performance indicators, information systems and controlling, that is, the typical elements in an organization's management process (Anthony *et al*., 2014).

Valuing what students know (Schmidt, 1983; Branda, 2009; Hmelo-Silver, 2004; Zwaal & Otting; 2015) and reinforcing the need for conceptual knowledge were the targets in developing and designing the course that is the subject of this study (Martins & Frezatti, 2015; Halliger & Lu, 2012; Hung, 2006). Here, the students, by means of self and independent learning, study concepts again depending on need and interest, in accordance with the problems developed in their own groups (Schmidt, 1983; Hmelo-Silver, 2004; Dochy, Segers, Bossche, & Gijbels, 2003; Zwaal & Otting; 2015; Scott, 2014). Thus, more than proposing the solution to problems, the course proposes to develop the student's ability to identify a relevant problem, structure it in an intelligible format and subsequently propose a reasonable solution.

The gap to be addressed involves how to broaden students' abilities through the choice of subject matter, the structuring of cases and problems, and the solutions to the problems, in a non-homogeneous environment in terms of interest and conceptual knowledge, given that the students' professional experience can derive from working as an intern, as a junior employee, a manager, a director or even a business owner. If on the one hand the environment is rich, on the other, the challenge is in providing guidance, orientation and boundaries to the development of problems that can involve a variety of themes and approaches.

A situation in which students have professional experience, involving knowledge that has been or will be presented in the educational environment, providing freedom for them to be able to identify a relevant problem to be addressed in the classroom within their context of professional experience creates an opportunity to bring real life to the classroom. At the same time, however, this reduces the "controllability" of the environment for the professor. The group's choice of problem brings a very strong degree of responsibility and constructivism to the classroom.

Despite being very rich, this situation creates an enormous problem for teachers to understand and evaluate problems in a way that is perceived as relevant and similar in terms of difficulty and contribution. They need to have tools at their disposal that permit discussing and guiding the elaboration and structuring of a problem that is relevant and part of the students' experience, which is essential so as not to undermine the whole model for developing PBL. Not accepting a problem, using arguments that are not very "objective" and perceived as being "to the teacher's taste and preference", may cancel the potential benefits of the students' contribution, primarily when the students' interests are not aligned with the course objectives. On the other hand, accepting a problem that does not result in the benefits of the approach simply to motivate the student is not seen as appropriate.

The design of the problem in the management accounting area is developed based on the possibility of the student experiencing it in an organization. After identifying the problem, this is legitimized when all the group members consider it to be of interest. Thus, the problem chosen comes to be of interest from the group's perspective and does not necessarily meet the learning objectives of the discipline and of the course's pedagogical project, nor of the institution. For this reason, a clear approach that allows the teacher to analyze, judge and assume a position regarding the appropriateness and quality of the problems, from the "inside out", is essential.

The problem is the most "objective" element when there is a clear definition of need and utility for the group that will apply it. Having a good problem involves context (Hung, 2006; Hallinger & Lu, 2012), its relevance to society (Hmelo-Silver, 2004; Zwaal and Otting, 2015; Ribeiro, 2008; Hung, 2006; Hansen, 2006; Savery 2006), and its authenticity in relation to the issues (Hallinger & Lu, 2012; Scott, 2014). In medicine, the word context has more to do with the way the problem is directed (Dolmans, Snellen-Balendong, & Van der Vleuten, 1997). In accounting, then, the word is strongly associated with the way in which the student lives and develops (Stanley & Marsden, 2012; Milne & McConnell, 2001; Breton, 1999).

Therefore, based on the framework presented by Sockalingam and Schmidt (2011) about the characteristics of a "good" PBL problem, this paper discusses the following research question: *how and to what extent can analyzing and validating student-designed problems in a management accounting PBL course be effective?*

The purpose of this study is to analyze and discuss the intrinsic and utility design characteristics of good PBL problems that are proposed by groups of students in a management accounting course that applies the PBL approach. Therefore, we evaluate the problems proposed by the students to investigate whether these problems attend to the characteristics the literature suggests as relevant to characterize an effective problem for the PBL approach.

As contributions, it is understood that this study comes to add to the lack of research discussing the design of a problem (features and functions), within the learning objectives proposed by PBL (Barrows, 1986; Duch, 2001; Hung, 2006; Jonassen & Hung, 2008; Dolmans *et al*., 1997; Sockalingam & Schmidt, 2011). Moreover, it expands the usefulness of the method in a skill valued in the field of management accounting, in which discussion of the PBL methodology has become more intense (Stanley & Marsden, 2012; Milne & McConnell, 2001).

A contribution from the practical point of view, via the use of the Sockalingam & Schmidt's (2011) approach, is the increase in the potential of professors' assertiveness regarding the use of problems brought by students, using the guidance proposed in the study. This is unlike other areas, in which the problem is developed by professors, such as medicine (Dolmans *et al*, 1997) and microbiology (Sockalingam & Schmidt, 2011). Lastly, it legitimizes collaborative work in integrating course objectives with individual and student group expectations.

2. Literature Review and Theoretical Framework

The PBL teaching-learning process consists of three fundamental elements: the problem, the student, and the tutor (Majoor *et al*., 1990). The problems are essential and are seen as the "heart" of the PBL method (Hung, 2006), as they trigger the whole teaching-learning process (Sockalingam and Schmidt, 2011). The literature has shown that a problem's design can be inappropriate to achieve the PBL objectives (Hung, 2006).

Recently, different authors have proposed models to address this gap in the literature, among which we highlight the seven tips by Dolmans *et al*. (1997), the 3C3R (Hung, 2006), and the eleven characteristics proposed by Sockalingam and Schmidt (2011).

Dolmans *et al*. (1997, pp. 185-186) present 7 (seven) principles for the effective development of a problem in PBL, which we list next: (i) the content of the problem should adapt well to the students' prior knowledge; (ii) it should contain various suggestions that stimulate the students to elaborate on and develop; (iii) it should cover a relevant context for the future profession; (iv) it should propose basic concepts to encourage the integration of knowledge; (v) it should encourage self-learning; (vi) it should increase the students' interest in the course, underpinning discussion about possible solutions and/or alternatives; (vii) it should be aligned with the course objectives.

The model discussed by Hung (2006) divides the components of a good PBL problem into main components (features) and cognitive process components, or actions the problem generates. The main components are content, context and connection. Content covers the knowledge developed via the scope and depth of the problems. The problem should include a valid context for the area of knowledge and be of depth. The possibility of connection would be the link between the content and context. The expected cognitive processes are research, creating a line of thought, and discussion. In this sense, the problem should favor self-directed student research, allowing students to develop a line of reasoning to discuss the problem. Finally, it should direct a process of synthesis, which integrates the lessons the students learned.

Sockalingam and Schmidt (2011) characterized a good PBL problem from the perspective of students of microbiology. The students were asked: "What is your perception of a good problem and why?" Based on the analysis of the results, the authors presented eleven PBL problem characteristics, which they divided into 2 (two) groups called features and functions.

The features are elements of problem design, such as format, clarity, familiarity, difficulty and relevance, while the functions consist of expected potential results from working with the PBL problem, such as the link between the problem and the learning objectives, the problem arousing interest, stimulating critical analysis, promoting self-learning, stimulating elaboration, and promoting group work (Sockalingam & Schmidt, 2011). The model proposed by Sockalingam and Schmidt (2011) was used as a base for the purposes of this article.

Considering Sockalingam & Schmidt (2011)'s research, some elements are considered to compare, analyze for the sake of validation and consolidate what students consider relevant for the suitability of a problem from the PBL perspective.

The starting point are the 11 elements (Sockalingam & Schmidt, 2011), many of which are common in various contributions found in the literature (Scott, 2014; Zwaal and Otting, 2015; Mühlfelder, Konermann & Borchard, 2015; Martins & Frezatti, 2015; Martins & Espejo, 2015). The two different types of characteristics are separated and are: (i) those intrinsic to the problem and (ii) utility characteristics.

The **intrinsic features of the problem** (Table 1) should be found within the problem and can be affected by the problem developers, who analyze, understand and perceive them. For some of them, it is relatively easy to identify and express the actions needed to improve them. For others, this is more difficult given the degree of subjectivity and complexity to operate the analysis, understanding and improvements. They are: (i) familiarity with the problem, (ii) difficulty of the problem, (iii) relevance of the problem, (iv) clarity of the problem, and (v) format.

The investigated authors (Sockalingam & Schmidt, 2011) did not indicate a quantitative approach to address the issue and a rubric was created to carry out this evaluation. The literature does not specify operational criteria to determine each of the features for validating problems designed by the students. Thus, the approach of Brodie and Gibbings (2009) was considered in structuring the rubric laid out in Table 1. As shown in the analysis, however, placing the problem identified by the students into a model with quantitative specifications is very complex and in some cases even unfeasible, primarily concerning the utility characteristics.

The relationship between the features takes into account that format and familiarity provide the clarity for the students to understand the problem. Format can be addressed in the tutor sessions, but familiarity depends on the background experience with the discipline, i.e. being conceptual and acquired in the classroom during previous disciplines and/or experience in organizations, which is not feasible during the PBL course itself. As a result of this combination, the students will perceive the difficulty of the problem and the relevance for the participants' context in the plenary group. Difficulty can motivate as well as discourage, depending on the effort the participant finds necessary. In an environment of great difficulty, the perceived relevance of the problem may not be properly understood. A very low level of difficulty can attract students' attention as an activity to be overcome, but not as a challenge that provides relevant additions to knowledge. These elements together have an impact on the utility characteristics (Sockalingam & Schmidt, 2011).

In turn, the **utility characteristics of the problem** will influence the students. They are influenced by the intrinsic characteristics, can be listed and tend to indicate how intensely (Sockalingam & Schmidt, 2011) the problem: (i) links in with the learning objectives; (ii) arouses interest; (iii) stimulates critical analysis; (iv) promotes self-learning (v) stimulates elaboration; and (vi) promotes group work. Similar to the intrinsic characteristics, the operationalization of the utility characteristics of the problem is presented in Table 2.

In the way it was presented by Sockalingam & Schmidt (2011) there exists a "causal" relationship between the intrinsic and utility characteristics of the problem. This means that, in order to achieve results and enjoy benefits, the quality of the problems used in PBL is linked to the fact that they can have particular properties and characteristics (Van Berkel & Schmidt, 2000; Zwaal & Otting, 2015). It should be emphasized that, in the work by Sockalingam & Schmidt (2011), the weighting of importance was indicated from the students' viewpoint.

Table 1
Specifications of intrinsic characteristics of the problems

Intrinsic characteristics	Reference	Criteria	Rubric		
			Totally meets (3)	Partially meets (2)	Does not meet (1)
Familiarity with the problem	Duch (2001); Dolmans *et al*. (1997); Hmelo-Silver (2004); Scott (2014); Sockalingam & Schmidt (2011).	**Concept:** Forms part of the students' experiential knowledge and is inserted into the seven topics present in the specification of possible sub-issues. **How to address:** Mapping of issues required to analyze the problem. Application of the diagnostic questionnaire and proof of knowledge mapping.	They had been exposed to all of the concepts required in the discipline	They had been exposed to more than one concept required in the discipline	They had not been exposed to any of the concepts required in the discipline
Clarity of the problem	Sockalingam & Schmidt (2011, 12); Schmidt and Moust (2000); Van Berkel & Schmidt (2000).	**Concept:** Adaptation of what we are referring to is comprehension by others besides those who structured the problem. **How to address:** Alignment between title, words, analogies, examples, metaphors and figures. Alignment with the hypotheses, in the case of the management accounting program this is vital and has various impacts on the other intrinsic characteristic items.	Students, teacher and tutors understand the problem	Students or teacher or tutors understand the problem	Neither students nor teacher nor tutors understand the problem

Intrinsic characteristics	Reference	Criteria	Rubric		
			Totally meets (3)	Partially meets (2)	Does not meet (1)
Difficulty of the problem	Duch(2001); Jacobs, Dolmans, Wolfhagen, & Scherpbier (2003); Sockalingam & Schmidt (2011, 4, 12); Zwaal and Otting (2015).	**Concept:** Difficulty is related to the range of the problem, potential for solution, degree of structuredness, interdiscipinarity, problem dynamic, multiplicity of understanding, etc. Characterization of the difficulty lacks a perspective that operationalizes the concept. In any event, very easy problems are as undesired as those that are too complex. **How to address:** Problems that can be resolved without consulting the literature but with common sense are too easy. They have a negative impact as they fail to bring benefits to the learning objectives. Problems where the knowledge required was not presented in any discipline or is too complex are considered too difficult. Problems regarding large entities are more difficult than those involving smaller ones.	Problems of large organizations and that involve more than one issue	Problems of small companies and more than one issue	Problems of small companies and a single issue
Relevance of the problem	Sockalingam & Schmidt (2011); Hmelo-Silver (2004); Zwaal and Otting (2015); Ribeiro (2008); Hung (2006); Hansen (2006); Savery (2006).	**Concept:** They understand that, besides being an actual problem, it benefits an organization or people. **How to address:** Identify the beneficiary of the solution to the problem: a company at one extreme and society at the other end.	Organizations and society benefit	Organizations benefit	It is not clear who benefits
Format	Sockalingam & Schmidt (2011, 16); Barrows (1986); Ribeiro (2008); Hmelo-Silver (2004); Zwaal and Otting (2015).	**Concept:** Length of the text that specifies the problem. It cannot be too long. The existence of images or graphs improves the perception of appropriateness. **How to address:** Those who present only the description.	There is a description, images and graphs, sufficiently clear for the sake of comprehension	There is only a description, though sufficiently rich for the purpose of comprehension	There is only a description and it is not sufficient for comprehension

Table 2

Specification of utility characteristics of the problems

Intrinsic characteristics	Reference	Criteria	Rubric		
			Totally meets (3)	Partially meets (2)	Does not meet (1)
Link between the problem and learning objectives	Sockalingam & Schmidt (2011, 16); Duch(2001); Dolmans *et al*. (1997).	**Concept:** The quality of the problem makes achieving the learning objectives viable. **How to address:** It should be clear how the problem relates to the learning objectives: (i) identify a relevant problem, (ii) structuredness of the problem taking into account hypotheses and consistent required concepts.	Fits into the course objectives; integrate the knowledge already acquired, the hypotheses and the concepts.	Partially fits into the course objectives. One or more hypotheses do not promote a good interface with the problem as well as the concepts.	Does not fit into the course objectives. The hypotheses do not promote an interface with the problem, as well as the concepts.
Problem arouses interest	Sockalingam & Schmidt (2011, 16); Duch (2001); Hmelo-Silver (2004); Dolmans *et al*. (1997).	**Concept:** The problem is related to day to day occurrences, that is, it is applicable or of use. **How to address:** Analysis of degree of reality contained in the problem, with it being found in many "relevant" organizations.	The problem reflects a real day-to-day organizational situation regarding at least one management accounting issue.	The problem partially reflects a real day-to-day organizational situation regarding at least one management accounting issue.	The problem does not reflect a real day-to-day organizational situation regarding at least one management accounting issue.
Stimulates critical analysis	Sockalingam & Schmidt (2011); Duch (2001).	**Concept:** There is the potential to seek various alternatives for solutions. **How to address:** The search for alternative solutions is considered feasible.	The students exhibited judgment and choices based on fact, information, logic or reasoning.	The students partially exhibited judgment and choices based on fact, information, logic or reasoning.	The students exhibited judgment and choices without proof in fact, information, logic or reasoning.
Problem promotes self-learning	Sockalingam & Schmidt (2011, 12); Dolmans *et al*. (1997); Duch(2001); Van Berkel & Schmidt (2000).	**Concept:** Given balanced difficulty, the students can individually carry out self-learning. **How to address:** Research or interviewing specialists is needed to search for the answer.	They presented references different from those supplied by the teacher; they carried out interviews with specialists and visits to an organization.	They presented few references and/or did not carry out interviews with specialists and/ or visits to an organization.	They only used the material made available by the teacher.
Stimulates elaboration	Sockalingam & Schmidt (2011, 16); Dolmans *et al*. (1997).	**Concept:** As long as it is easy to understand, it will arouse interest and can be quickly solved **How to address:** The solution itself indicates this. Giving up indicates the opposite.	They presented a creative and innovative solution to the problem that can or cannot be applied in practice.	They presented a partial solution to the problem, but it cannot be applied in practice.	They did not present a solution to the problem.

Intrinsic characteristics	Reference	Criteria	Rubric		
			Totally meets (3)	Partially meets (2)	Does not meet (1)
Promotes group work	Sockalingam & Schmidt (2011, 16); Duch(2001); Van Berkel & Schmidt (2000).	**Concept:** Team working to resolve the problem **How to address:** Visibility of teamwork	All members of the team participated actively in solving the problem / Conflicts in the group have to be treated	Part of the group participated actively in solving the problem / Conflicts resulted in part of the activities not being carried out by one or more students	Only one student participated actively in solving the problem / Conflicts caused the students to give up.

3. Methodological Design of The Study

3.1 Research field

The institution was chosen because (i) it is interested in active learning processes, (ii) it provides professors with the freedom to provide new approaches to the learning process, (iii) it joins students with a high-level educational background, permitting the adaptation of styles during the course. Thus, we are concerned with a case in which both the individual students and the particular groups are focused on.

The course in this study is optional and offered in the evenings with the mission to integrate knowledge offered in several prior disciplines. It comprises 32 classroom hours, divided into 16 meetings with the students held exclusively in class (all persons in the same room). The structure of the classes involves division into six blocks: (i) hybrid classes (expository and group work), (ii) tutorial sessions, (iii) sharing of partial results, (iv) sharing of final results via films presented on Youtube, (v) a knowledge test and (vi) self-evaluation and peer-evaluation.

Even though the course has been offered on five occasions, the problems developed in the last two editions (2014 and 2015) were chosen for analysis, as the course design and procedures were applied in a more homogeneous way.

Regarding the learning objectives communicated to the students, these were: *to apply learning via the identification, analysis and proposal of solutions for problems arising in Brazilian companies involving the field of management accounting, by means of group projects.*

It is worth noting that, while the professor defined the themes and content, the students were responsible for selecting the real-life problems and the teams for elaborating them. When the students identified the problems in the companies where they worked, these were categorized according to Ribeiro (2008) as problems that demand real solutions for real people or organizations.

3.2 Problem

In this course, the problem is a central point that interlinks the academic world of theories and scientific research with professional practice, represented by the job market. Each group identified, analyzed, discussed and solved an authentic management accounting problem that was drawn in its original form from the professional reality of a Brazilian company (Araujo & Arantes, 2009). As each student identified a problem, and considering that each group contained at least three and at most six members, each team chose only one of the problems, by means of legitimization, to be constructed and elaborated throughout the course. From this perspective, it can be observed that the student departs from the context and then creates a problem.

It should be highlighted that neither the professor nor the students knew which team worked on what problem, which represented a challenge for both to direct the whole teaching-learning process of the course. Thus, it is observed that the course focuses on the context of each group and values not only knowledge, but also attitudes and skills.

The solution to the problem was discussed by means of tutorial sessions, which stimulated the exchange of background knowledge, knowledge acquired via independent self-learning, and knowledge obtained from interviews carried out with key people in the organizations. Thus, the construction of knowledge takes place via reflection, dialogue and the exchange of experience between the teacher and the student, in which both share their life experiences. The solution proposed for the problem was presented via scientific reports, including theoretical reflections and analyses of the problem studied. Each team presented both the partial (this took place in the middle of the course) and final results (in the last classes) to the whole group. These final results were exhibited through the creation of a video posted on Youtube.

Thus, it is shown that the PBL course provided the students with the experience of resolving real, complex problems taken from the business context (Hmelo-Silver, 2004; Duch, Groh and Allen, 2001; Boud & Feletti, 2003; Hansen, 2006). Thus, this study aims to investigate whether the problems identified, analyzed, discussed and solved in this course can be considered good PBL problems. For this purpose, scores were developed and attributed according to the 11 characteristics presented by Sockalingam and Schmidt (2011), based on the rubrics listed in Tables 1 and 2.

3.3 Student

In this educational environment, as mentioned previously, the student is the center of the teaching-learning process. As shown in Table 4, in terms of generation, most students (65%) are between 20 and 25 years old (Table 3). The students worked in small teams of three to seven members, which proposed to cover the literature while assuming responsibility for their own learning as, throughout the course, no lectures on the management accounting issues applied to each problem took place.

The students already had prior knowledge that was developed via interdisciplinarity, building on material from previous years, such as budgeting and planning, cost accounting, and controlling, among others. It should be highlighted that background knowledge also comes from the life experience gained in each student's professional practice, as shown in Table 4. Thus, choosing a problem from a real-life business setting was possible given the profile of the students.

Table 3
Characteristics of groups and students/groups

	2014	2015
Age group*		
Between 20 and 25	25	18
Between 26 and 30	6	10
Over 30	3	4
Did not reply	1	0
Professional experience*		
Business owner	1	1
Employee	11	14
In internship or with experience of internship	18	14
Has worked but is not currently working	4	3
Has never worked	1	0
Number of students	47	46
Number of groups	7	10
Average size of groups	6.71	4.6

* Not all students answered our preliminary survey about their individual characteristics.

The students worked together in the same group throughout the course. Stanley and Marsden (2012) emphasize that this is the way to guarantee that the students develop teamwork responsibly within the teaching-learning process. Moreover, by working with problems, students constitute part of their professional life experience and of the context they are immersed in. Thus, this study is presented in accordance with Stanley and Marsden (2012), who emphasize the importance of teamwork in order to solve non-structured accounting problems that are similar to those found in professional practice.

Each group of students, as well as formatting the problem, searched for a solution to a problem that explores a specific area of study, with solutions that are potentially applicable to their contexts of origin. Students were responsible for interviewing key people in organizations and applying tools and scientific research resources, while endeavoring to solve the problem.

3.4 Teachers

As already mentioned, teachers assume the role of facilitators in an environment of uncertainty, considering that the students' freedom of choice generates this consequence. The learning in PBL takes place via reflection, dialogue and the exchange of experience between the teacher and student, in which both share the process of constructing knowledge that is embedded in the problem (Decker & Bouhuijs, 2009).

It was observed that the course professor and tutors are responsible for encouraging the participation of all team members in the tutorial sessions, maintaining the focus of the group on the solution to the problem and on the learning objectives listed, evaluating performance, verifying the students' understanding, and certifying that the group achieves the learning objectives proposed in the course. That is, it is extremely important for the teacher to know how to evaluate whether the problem chosen by the students and used in the course promotes the utility characteristics proposed by Sockalingam and Schmidt (2011) and to what extent. Thus, he or she can better guide the groups in constructing the problem and achieving the objectives set out in the pedagogical program, both for this course and the accounting sciences course.

The professor assisted the students in the problem solving process, especially by providing clarification when erroneous concepts regarding management accounting issues were addressed in the problems, and also with literature recommendations that assisted the groups to solve their respective problems. In other words, the professor's role was quite evident in the tutorial sessions.

In accordance with Ribeiro (2008), the teacher, in interacting with the work teams, sought to understand how the students were constructing their own knowledge, while synthesizing together with the teams the knowledge acquired in each tutorial session. Moreover, the tutorial sessions set out to identify and work with the groups that were struggling most, so that they could reach the same stage most of the groups had achieved during the various phases of the course, in order to have equal participation from all of the groups.

3.5 Action research

The methodology that permitted the development of the activities during the semester was "Action Research" (Coughlan & Coughlan, 2002) as, although the set of activities was envisaged and defined in advance, it required well specified stages relating with the students. It is understood as a "work in progress" (Wright, Smith, & Duncan, 2011) and, as advocated by Mettetal (2001, p. 108), in the classroom "[...] consists of systematic investigation regarding what works in the classroom, with the aim of improving the students' learning." Additionally, Wright, Smith and Duncan (2011) understand that, regarding the technique being applied in studies that use PBL, it is satisfying to recognize that people learn in different ways, which allows the students to make choices on the direction of their own learning.

The "action research" cycles used in the study are: (i) understanding the study context, (ii) obtaining the data on the stakeholders involved in the process (students), (iii) feedback for the stakeholders (students) regarding the data obtained, (iv) analysis of the data, (v) plan of action (vi) implementation and (vii) evaluation. The continuity is based on the fact that, at the end of the cycle, a new one begins.

4. Development, Analysis and Discussion

The course was taught once a year and the fifth version took place in the first semester of 2015. Given how the course has evolved, the last two versions, that is, 2014 and 2015, will be analyzed. In total, there are 17 cases that address very different issues.

Eleven areas were examined separately, in two different ways. The characteristic elements were considered and scores were attributed in accordance with Table 1. There was no concern with weighting the elements in the total calculation but, qualitatively, more attention was given to familiarity and difficulty. For the total, the percentage points obtained in relation to the potential number of points was calculated and, the higher the points obtained, the higher the adherence of the problem to the characteristics. Regarding the **intrinsic characteristics**, the main aspects considered were:

- **Familiarity**: this was addressed in two different ways: (i) a diagnostic questionnaire applied before the course began and (ii) identification of the issues that could underlie the problem the group would like to address. This attitude involved two elements, which are the potential for clarity and the link with the institutional objectives. It was observed that some problems derived from the content of courses the students had previously studied. In some cases, the problems were addressed, but not with the intensity that they would require. Issues related to psychology, for example, were the most demanded among the cases with reference points that went beyond accounting.

- **Format:** the size and the additional elements to the text, such as illustrations and graphs, were considered and encouraged. In the case analyses, this aspect was reasonably homogeneous, as no group was motivated to present anything other than construction via an essay in the structuring of the problem. Regarding the size of the problem description, no great disparity was perceived that led to very long or very short descriptions. What was evident was that some essays were clearer, others more repetitive, and others more or less objective with regard to what would be relevant to the problem.
- **Clarity:** leading on from familiarity and format, the alignment of hypotheses with the problem and with the conceptual content that would be needed to develop and solve the problem was considered. Both clarity and difficulty were legitimized by presenting the problem to the whole class, accepting that the problems would be clear and would contain similar difficulties.
- **Difficulty:** multidisciplinarity, size of institution and demand for references were considered. The big problem in this area was the overlapping of a complex subject with size of organization, which made the problem complexity relatively high in some cases. The opposite occurred, that is, problems with simple demands in terms of knowledge and applied in small company environments, which made the difficulty low.
- **Relevance:** this basically proposes perceiving who would benefit from the solution to the problem. Problems that benefitted only part of the population in a company would be less relevant than something that could affect the entire company or a region for example. Thus, this area is connected to size and links the element to be researched beyond the entity.

After analyzing the indicated areas, it is expected that the rest of the items be achieved, given the causal relationship that exists between them. Thus, the other six elements in the model can only be completely analyzed after the end of the course. For some of them, a specifically collected variable is available, while the analysis of others depends on a proxy.

- **Linking the problem with the learning objectives**. This was previously envisaged via familiarity and clarity. As a follow-up, after the end of the course, the extent to which the problem was linked with the learning objectives was evaluated.
- **Problem arouses interest**. Perceived in the group discussions, this can be followed up by attendance at meetings and student effort. In some groups, class attendance became a problem to be addressed, but was not generalized.
- **Stimulates critical analysis**. The existence of more than one alternative solution to a problem or the perception that the problem initially identified addressed simple reasoning. These discussions occurred during the tutorial sessions and this can be shown by means of follow-up and, in some cases, by the minutes.
- **Problem promotes self-learning**. The search for solutions involves references, contacts and interviews at companies and discussions with the professor and tutors. The students' initiative is perceived in this sense and the minutes partially reflect this element.
- **Stimulates elaboration.** The development of the problem and discussions indicates that this area is being achieved. Drop-out or non attendance of groups shows the opposite.
- **Promotes group work.** Working in groups is visible when it takes place in the classroom. The minutes should report meetings and contributions, but this support cannot always be considered reliable.

After the analysis, the problems were compiled in a comparative way as shown in Table 5. The attribution of scores, following rubrics 1 and 2, permits comparative observation. The evaluation can be perceived by the relationship between evaluations of the intrinsic characteristics and of the utility characteristics. A number of cut-off points were established and attention is drawn to four possibilities:

- **Problems with high intrinsic quality and high utility quality (AA)**
  There were seven problems and, in general, issues commonly found in business areas with well established conceptual requirements. A lesson for teachers of future groups is that the effort to reach the five intrinsic characteristics should continue to be valued and discussed with the students.
- **Problems with high intrinsic quality and low utility quality (AB)**
  There were three groups. Investigating the causes of the characteristics' performance reveals that they seem to be more linked to the profile of the group members. Teachers of future groups should consider whether the composition of teams could not be different, with greater crises to establish the problem, which might enhance the motivation and involvement.
- **Problems with low intrinsic quality and high utility quality (BA)**
  There were two groups and the occurrence and they brought very different issues for situations in which the available literature was not readily usable in a multidisciplinary way. The high result in terms of utility characteristics derives from the fact that the group leader assumed a more aggressive posture, "carrying the weight" of the project. As a lesson for teachers of future groups, questions that are very complex and applied to relatively small institutions could be reflected upon.
- **Problems with low intrinsic quality and low utility quality (BB)**
  There were five groups and, in general, the focus of attention was small companies, which would not be a problem, with challenges not perceived as very significant. The groups were very dependent on the leaders and, in their absence, stagnated. As a lesson for teachers of future groups: greater attention to the combination of dependency on the leadership and the challenge.

Table 5

Comparison of evaluations of problems

Group	Title	Intrinsic characteristic scores						Utility characteristic scores	Total characteristic scores
		Format	Familiarity	Clarity	Difficulty	Relevance	Total		
1	Management of Burgeria	1	2	2	2	2	9/15=60	14/18=78	23/33= 70
2	Evolution of cash to accrual method for accounting period	2	2	3	3	2	12/15=80	16/18=89	28/33=85
3	Differences in expenditure on long term projects	2	2	3	2	2	11/15=73	11/18=61	22/33=67
4	Estimation of costs in globalized environment – Healthcare	1	2	2	2	2	9/15=60	12/18=67	21/33=64
5	Risk in implementing vaccines	1	3	2	1	1	8/15=53	11/18=61	19/33=58
6	Internal controls as a management tool	2	1	1	2	2	8/15=53	9/18=50	17/33=52
7	Surfers' association	1	2	1	2	2	8/15=53	12/18=67	22/33=61
8	Advertising film producer	1	2	1	2	2	8/15=53	12/18=67	20/33=61
9	Maintain or change a business?	1	2	2	2	1	8/15=53	11/18=61	19/33=58
10	Performance evaluation at a Brazilian company that became French	1	1	1	2	1	6/15=40	10/18=56	16/33=48
11	Target cost in garments	2	3	2	2	2	11/15=73	15/18=83	26/33=79
12	Sandal shop	2	2	1	2	2	9/15=60	14/18=78	23/33=70
13	Gas station	1	2	1	1	2	7/15=47	11/18=61	18/33=55
14	Use of budgetary reserves	2	1	2	2	2	9/15=60	10/18=56	19/33=59
15	Lack of fuel	2	1	2	2	2	9/15=60	10/18=56	19/33=59
16	The problem was not the supplier	2	2	2	2	2	10/15=67	10/18=56	20/33=61
17	Is pizza a good business?	2	2	2	2	2	8/15=53	8/18=44	16/33=48

5. Concluding Remarks

The purpose of this study was to discuss the intrinsic and utility design characteristics of good PBL problems in a management accounting course that applies the PBL approach. This study provides some guidelines about how to evaluate good PBL problems students proposed in their teams, based on their experiences and contexts. As this environment is not teacher-controlled, it is important that the professor has tools to evaluate how the proposed problems can be changed, arranged, or developed to fit the learning goals of a PBL course. These discussions are relevant as the problem is a fundamental issue for the PBL approach.

The extension of PBL's applicability in areas of business provides a relevant opportunity to look at the approach and attends a profile of students that have the potential to advance in their learning beyond the solution to the case in itself. It is not proposed that this approach be extended and generalized indiscriminately for any course and moment in a course, but, it is an alternative for similar contexts, where the students have more opportunity for contact with a given organizational reality, have academic maturity acquired over time, as well as knowledge in the course in question. Moreover, from the teachers' point of view, the approach requires professionals who want to take risks, which can be supported by the institu-

tions where they carry out their work. It is very important to understand and balance active learning tools with more traditional approaches and the composition of courses undergoes constant adjustments among the various pedagogical project elements of each institution.

The opportunity arises as a result of the context of having these elements and the organization of the courses available. In any case, the proposal developed in this study considers a displacement of risk from the students' viewpoint, in having the freedom to construct their problem and, from this perspective, consolidate their learning. They assume greater risk, being unfamiliar with the method, do not always have a vision of what they can do in terms of constructing a solution, and they still have to decide which type of problem they will be dedicating an important part of their time to during the semester. What is more, all of the elements are addressed collectively, in a small group where abilities and attitudes are encouraged. Even though all of this is similar to the workplace, it is not known exactly to what extent it is similar, and in what depth this will affect their performance evaluation. It is in this point that the role of the teacher emerges, being decisive for the students' success, not only in the short term in the course evaluation, but also as a tool for incorporating lessons into a *modus operandi* that proves to be individual due to the context of what takes place.

The teacher needs to have the maturity to balance his/her involvement with the students in order to avoid solving all of the students' problems, but should also have the sensitivity to distance him or herself at moments when this is the only possibility for the student to experience the lesson in the context and to an individual extent. Moreover, the risk assumed by the teacher is much greater than what he/she is accustomed to in situations of lectures and exercises and cases in which he/she already has the answer. With this approach, the answers are constructed together with the students, in their time. On the other hand, the lessons learned by the teacher are considerable as he or she is challenged and needs to have answers for elements the teacher would not necessarily value at first. This is important and not necessarily seen as positive. In any event, the proposal does not need to be radical and the level of freedom can be that which the context can use in an appropriate way.

Linking problem, students, and teachers, the intrinsic and utility characteristic tools cause an important impact in the process and its results in making dialogue between teachers, students, and their groups viable, in the sense of orientation to develop the course. In this sense, separation of the model into its intrinsic and utility characteristics (Sockalingam & Schmidt (2011) has practical effects in terms of validation of the problems and their corresponding validation results, not only in a "yes" or "no" to the problems, but also organization and guidance for improvements.

After all, more than having a tool that allows the students to learn in a more context-sensitive and practical way, the aim is to have an approach at their disposal that is long-lasting and effective in their lives, and which will be perceived at appropriate times in the course of their individual careers.

6. References

Anthony, R. N., Govindarajan, V., Hartmann, F. G. H., Kraus, K., & Nilsson, G. (2014). *Management Control Systems: European Edition*. New York, NY: McGraw-Hill.

Araújo, U. F., & Arantes, V. A. (2009). *Comunidade, conhecimento e resolução de problemas: o projeto acadêmico da USP Leste*. In U. F. Araújo & G. Sastre (Orgs.). Aprendizagem baseada em problemas no ensino superior. (pp. 101-122). São Paulo: Summus.

Barrows, H. S. (1986). A taxonomy of problem-based learning methods. *Medical Education*, 20(6), 481-486. https://doi.org/10.1111/j.1365-2923.1986.tb01386.x

Boud, D., & Feletti, G. (2003*). The Challenge of Problem-Based Learning*, London: Kogan Page Limited.

Branda, L. A. (2009). *A aprendizagem baseada em problemas: o resplendor tão brilhante de outros tempos*. In U. F. Araújo & G. Sastre (Orgs.). Aprendizagem baseada em problemas no ensino superior. (pp. 205-236). São Paulo: Summus.

Breton, G. (1999). Some empirical evidence on the superiority of the problem-based learning (PBL) method. *Accounting Education*, 8(1), 1-12. https://doi.org/10.1080/096392899331008

Brodie, l.; & Gibbings, P. (2009). Comparison of PBL assessment rubrics. In: *Proceedings of the Research in Engineering Education Symposium*, University of Melbourne, p. 1-9. Palm Cove, QLD: REES. Retrieved from https://eprints.usq.edu.au/5480/2/Brodie_Gibbings_REES_2009_PV.pdf.

Coughlan, p.; Coghlan, D. (2002). Action research: action research for operations management, *International Journal of Operations & Production Management*, v.22, n.2, p. 220-240. https://doi.org/10.1108/01443570210417515

Decker, I. R., & Bouhuijs, P. A. J. (2009). *Aprendizagem baseada em problemas e metodologia da problematização: identificando e analisando continuidades e descontinuidades nos processos de ensino aprendizagem*. In U. F. Araújo & G. Sastre (Orgs.). Aprendizagem baseada em problemas no ensino superior. (pp. 177-2014). São Paulo: Summus

Dochy, F., Segers, M., Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: a meta-analysis. *Learning and Instruction*, 13, 533-568. https://doi.org/10.1016/S0959-4752(02)00025-7

Dolmans, D. H. J. M., Snellen-Balendong, H., & van der Vleuten, C. P. M. (1997). Seven principles of effective case design for a problem-based curriculum. *Medical Teacher*, 19(3), 185–189. doi:10.3109/01421599709019379

Duch, B. J. (2001). *Writing problems for deeper understanding*. In.: B. J. Duch; S. E. Groh & D. E. Allen. The power of problem-based learning: a practical "how to" for teaching undergraduate courses in any discipline. (pp. 47-53). Virginia: Stylus Publishing.

Duch, B. J., Groh, S. E., & Allen, D. E. (2001). *Why problem-based learning? A case study of institutional change in undergraduate education*. In B. J. Duch, S. E. Groh, & D. E. Allen. The power of problem-based learning: a practical "how to" for teaching undergraduate courses in any discipline. (pp. 3-12). Virginia: Stylus Publishing.

Frezatti, F.; Aguiar, A. B.; Guerreiro, R. (2007). Diferenciações entre a contabilidade financeira e a contabilidade gerencial: uma pesquisa empírica a partir de pesquisadores de vários países. *Revista Contabilidade & Finanças,* (44), 9-22. Retrieved from http://www.scielo.br/pdf/rcf/v18n44/a02v1844

Hallinger, P. , & Lu, J. (2012). Overcoming the Walmart Syndrome: Adapting Problem-based Management Education in East Asia. *Interdisciplinary Journal of Problem-Based Learning*, 6(1). https://doi.org/10.7771/1541-5015.1311

Hansen, J. D. (2006). Using problem-based learning in accounting. *Journal of Education for Business*, 81(4), 221-224. https://doi.org/10.3200/JOEB.81.4.221-224

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn?. *Educational psychology review*, 16(3), 235-266. https://doi.org/10.1023/B:EDPR.0000034022.16470.f3

Horngren, C. T.; Foster, G.; Datar S. M. (2000). *Cost accounting*. São Paulo: Prentice-Hall.

Hung, W. (2006). The 3C3R model: A conceptual framework for designing problems in PBL. *Interdisciplinary Journal of Problem-based Learning*, 1(1), 6. https://doi.org/10.7771/1541-5015.1006

Jacobs, A. E., Dolmans, D. H., Wolfhagen, I. H., & Scherpbier, A. J. (2003). Validation of a short questionnaire to assess the degree of complexity and structuredness of PBL problems. *Medical Education*, 37(11), 1001-1007. https://doi.org/10.1046/j.1365-2923.2003.01630.x

Jonassen, D., & Hung, W. (2008). All problems are not equal: Implications for problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 2(2), 4, 6-28. https://doi.org/10.7771/1541-5015.1080

Majoor, G. D., Schmidt, H. G., Snellen-Balendong, H., Moust, J. C. H. & Stalenhoef-Halling, B. (1990). *Construction of problems for problem-based learning*. In Z. Nooman, H. G. Schmidt & E.S. Ezzat (Eds.), Innovation (pp. 114-122). New York: Springer.

Martins, D. B., & Frezatti, F. (2015). Problem-Based Learning no Ensino em Contabilidade Gerencial: Experiência numa Instituição de Ensino Superior. *Proceedings from Congresso USP de Controladoria e Contabilidade*. São Paulo, Brasil, Retrieved from http://www.congressousp.fipecafi.org/web/artigos152015/290.pdf.

Martins, D. B., & Espejo, M. M. S. B. (2015). *Problem Based Learning – PBL no ensino de contabilidade: guia orientativo para professores e estudantes da nova geração*. São Paulo: Atlas.

Mettetal, G. (2001). *Classroom action research as problem-based learning*. In.: LEVIN, B. B. Energizing teacher education and professional development with problem-based learning, pp.108-120.

Milne, M. J., & McConnell, P. J. (2001). Problem-based learning: a pedagogy for using case material in accounting education. *Accounting Education*, 10(1), 61-82. https://doi.org/10.1080/09639280122712

Mühlfelder, M., Konermann, T., & Borchard, L. M. (2015). Design, implementation, and evaluation of a tutor training for problem based learning in undergraduate psychology courses. *Journal of Problem based Learning in Higher Education*, 3(2). https://doi.org/10.5278/ojs.jpblhe.v0i0.1195

Ribeiro, L. R. C. (2008). *Aprendizagem baseada em problemas (PBL): uma experiência no ensino superior*. São Carlos: EdUFSCar.

Savery, J. R. (2006). Overview of problem-based learning: definitions and distinctions. *Interdisciplinary Journal of Problem-based Learning*. 1(1), 9-20. https://doi.org/10.7771/1541-5015.1002

Schmidt, H. G. (1983). Problem-based learning: rationale and descriptions. *Medical Education*, 17, 11-16. https://doi.org/10.1111/j.1365-2923.1983.tb01086.x

Schmidt, H. G., & Moust, J. H. C. (2000). *Processes that shape small-group tutorial learning: A Review of Research*. In D. H. Evensen, & C. E. Hmelo. (Eds.). Problem-based learning: A research perspective on learning interactions. Mahwah, NJ: Lawrence Erlbaum, pp 19-52.

Scott, K. S. (2014). A Multilevel Analysis of Problem-Based Learning Design Characteristics. *Interdisciplinary Journal of Problem-Based Learning*, 8(2). http://dx.doi.org/10.7771/1541-5015.1420.

Sockalingam, N., & Schmidt, H. G. (2011). Characteristics of Problems for Problem-Based Learning: The Students' Perspective. *Interdisciplinary Journal of Problem-Based Learning*, 5(1). Available at: http://dx.doi.org/10.7771/1541-5015.1135

Stanley, T., & Marsden, S. (2012). Problem-based learning: Does accounting education need it?. *Journal of Accounting Education*, 30(3), 267-289. https://doi.org/10.1016/j.jaccedu.2012.08.005

Van Berkel, H. J., & Schmidt, H. G. (2000). Motivation to commit oneself as a determinant of achievement in problem-based learning. *Higher Education*,40(2), 231-242. https://doi.org/10.1023/A:1004022116365

Wright, S. L.; Smith, M.; & Duncan, M. (2011). *Student perceptions and experiences of problem-based learning in first year undergraduate sports therapy*. In.: DAVIES, J.; GRAAFF, E.; KOLMOS, A. (Eds.). PBL across the disciplines: research into best practice. Aalborg University Press, pp. 92-105.

Zwaal, W., & Otting, H. (2015). Aligning principles and practice in problem-based hospitality management education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 16, 22-29. https://doi.org/10.1016/j.jhlste.2015.01.001

REPeC, Brasília, v. 12, n. 2, Guidelines for Authors, p. 267-269, Apr./Jun. 2018
Available online at *www.repec.org.br*

Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis

ISSN 1981-8610

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;

Copyright © 2018 REPEC. All rights, even translation, are reserved. It is allowed to quote part of articles without prior permission if the source is identified.

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.