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Academic and scientific overview of the graduate brazilian courses in environmental accountability

Panorama academico-científico da contabilidade ambiental na pós-graduação brasileira

Panorama académico-científico de la posgraduación brasileña en contabilidad ambiental

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KEYWORDS
Brazilian graduation courses in Accounting. Teaching and research in Environmental Accountability. Environmental Accounting.

Abstract: The objective of this article is to present the brazilian posgraduate program in Accounting with an emphasis on the teaching and research of Environmental Accounting in order to, based on the information collected, elaborate a prognosis of the area. It is characterized as documentary, bibliometric, descriptive and mixed research, for which secondary data extracted from the Sucupira da Capes platform, CNPq Research Groups and Brazilian scientific journals dedicated to Accounting were used. The scarce number of postgraduate courses in Accounting in Brazil stands out in view of the number of enrollments and graduates in the area; little representativeness of Environmental Accounting themes in the disciplines, dissertations and theses, this situation being replicated in the research developed by the research groups and in the scientific publications in Brazilian journals with insignificant percentages in relation to the total publication. These results confirm findings of previus research that constituted the theoretical framework of this work. This article's main contribution is to alert researchers in the area as to the need to focus on Environmental Accounting issues, both in teaching and in research, in order to collaborate with the sustainable development of the country. The lack of these items was evident after the treatment of the information raised. Another important contribution was to highlight the themes of Environmental Accounting effectively addressed.

PALAVRAS-CHAVE
Pós-graduação brasileira em Contabilidade. Ensino e pesquisa em Contabilidade Ambiental. Contabilidade Ambiental.

Resumo: *O objetivo deste artigo é apresentar a pós-graduação brasileira em Contabilidade com ênfase no ensino e pesquisa da Contabilidade Ambiental para, a partir das informações levantadas, elaborar um prognóstico da área. Caracteriza-se como pesquisa documental, bibliométrica, de natureza descritiva e mista, para o que foram utilizados dados secundários extraídos da plataforma Sucupira da Capes, dos Grupos de Pesquisa do CNPq e de periódicos científicos brasileiros dedicados a Contabilidade. Destacam-se o escasso número de cursos de pós-graduação existentes no Brasil em Contabilidade frente ao número de matrículas e de graduados na área; pouca representatividade de temas da Contabilidade Ambiental nas disciplinas, nas dissertações e teses, replicando-se esta situação nas pesquisas desenvolvidas pelos grupos de pesquisa e nas publicações científicas em periódicos brasileiros com percentagens pouco significativas em relação a publicação total. Estes resultados confirmam achados das pesquisas que constituíram o referencial teórico deste trabalho. Este artigo tem como principal contribuição alertar pesquisadores da área quanto a necessidade de focar temas da Contabilidade Ambiental, tanto no ensino quanto na pesquisa, de forma de colaborar com o desenvolvimento sustentável do País. A carência destes quesitos ficou em evidência após o tratamento das informações levantadas. Outra contribuição importante foi ressaltar os temas da Contabilidade Ambiental efetivamente tratados.*

PALABRAS CLAVE
Cursos de posgrado Brasileños en Contabilidad. Docencia e investigación en Contabilidad Ambiental. Contabilidad Ambiental.

Resumen: *El objetivo de este artículo es presentar el programa de posgrado brasileño en Contabilidad con énfasis en la enseñanza e investigación de la Contabilidad Ambiental para, a partir de la información recompilada, elaborar un pronóstico del área. Se caracteriza por la investigación ser documental, bibliométrica, descriptiva y mixta, para lo cual se utilizaron datos secundarios extraídos de la plataforma Sucupira de Capes, Grupos de Investigación del CNPq y revistas científicas brasileñas dedicadas a la Contabilidad. El escaso número de cursos de posgrado en Contabilidad en Brasil se destaca teniendo en vista el alto número de inscripciones y graduados en el área; hay poca representatividad de los temas de Contabilidad Ambiental en las disciplinas, disertaciones y tesis, replicándose esta situación en la investigación desarrollada por los grupos de investigación y en las publicaciones científicas en revistas brasileñas con porcentajes insignificantes en relación con la publicación total. Estos resultados confirman hallazgos de investigaciones que constituyeron el marco teórico de este trabajo. La principal contribución de este artículo es alertar a los investigadores en el área sobre la necesidad de enfocar temas de Contabilidad Ambiental, tanto en la enseñanza como en la investigación, para colaborar con el desarrollo sostenible del país. La falta de estos elementos fue evidente después del tratamiento de la información. colectada. Otra contribución importante fue destacar los temas de Contabilidad Ambiental efectivamente abordados.*

Introduction

Accounting is the Social Science that deals with qualifying and quantifying the assets of people and companies evaluating their fluctuations over time (Gonçalves & Heliodoro, 2005). Therefore, it can be seen as a support system for organizations as it provides them with qualitative and quantitative information useful in the decision-making processing.

For years and since its beginnings, the information collected by the accounting sector was aimed only at economic decision-making. Based on society's growing concern for environmental issues that began in the 1970s aiming the economic development of nations, organizations began to design and implement market, financial and service strategies aligned with sustainable activities (Gonçalves & Heliodoro, 2005).

This gave rise to the so-called Environmental Accounting, which has as one of its purposes the study of the phenomena that results from the environmental behavior of companies, making it possible to present the benefits and losses these could cause to the environment. Environmental Accounting aims to identify and measure environmental events, clarify and record them by processing economic-financial transactions related to environmental protection, preservation and recovery, in order to demonstrate the asset situation of an entity as well as generate the information that supports the user, serving as a parameter in their decision-making processes (Calixto, 2006; Paiva, 2003; Ribeiro & Rossato, 2017). Environmental Accounting only gained the status of a branch of accounting science in 1998 following the publication of the Financial and Accounting Report on Environmental Liabilities and Costs by the Intergovernmental Accounting and Reporting Working Group (Ribeiro & Rossato, 2017).

To keep up with the changes adopted by nations to achieve or approach sustainable development, organizations had to evolve. According to Gonçalves and Heliodoro (2005), companies went through 5 phases, namely a) without preparation, during which they reacted negatively refusing to adopt new strategies which included environmental variables; b) of compliance with legislation, at more reactive stance that would allow them to comply with environmental requirements; c) of recognition of competitive advantages by proactively adhering to environmental policies; d) of eco-efficiency where environmentally sustainable activities were seen as a “business opportunity” and not just as costs, and e) of sustainability, which makes companies understand that sustainable activities are stakeholders priorities

In order for companies implementing Environmental Accounting, technical preparation is needed on several related issues. Among those, there can be mentioned questions such as current environmental policy, expenses and gains associated with the environmental control, legal proceedings involving environmental reasons and associated fines to recover degraded areas, environmental risks, possible devaluations to be suffered after an environmental audit and investments made in environmentally appropriate technology (Holland, 2004; Theóphilo, Sacramento, Neves & Souza, 2000; Yakhou & Dorweiler, 2004).

The knowledge of the mentioned topics can be reached in Postgraduate courses in Accounting Sciences (PPGCC). The growing social importance on topic of sustainability (Santos, Silva, Souza & Sousa, 2001), the need for companies to measure environmental assets and liabilities (Ribeiro & Rossato, 2017) while establishing socio-environmental management practices (Cosenza, Mamede & Laurencel, 2010) and the incipient scientific production on the subject (Machado et al., 2012) were the reasons that led to the question of the present study: how Brazilian postgraduate studies in the area of Accounting are facing the challenges of the sustainability paradigm especially in the teaching and research of Environmental Accounting?

It is worth mention that the sustainability paradigm is here understood as” one that expresses today the desire of almost all societies, anywhere in the world, for a situation in which the economic,

social and environmental aspects are treated equally. So, it is not enough to just have economic growth, technological advancement and institutions; but, yes, to think about the technological revolution and the institutional framework aiming at social well-being with the strengh inherent to it" (Montibeller-Filho, 2007, p. 59).

Therefore, the objective of this work is to present Brazilian postgraduate studies recognized by the Coordination for the Improvement of Higher Education Personnel – CAPES in Accounting with an emphasis on teaching and research in Environmental Accounting, in terms of geographic location, level (master's degree and/ or doctorate), curricular structure, disciplines, production of dissertations and theses, defended and approved in the courses, topics covered by the Research Groups of the National Council for Scientific and Technological Development - CNPq, as well as the scientific production of professionals and student bodies as published in Brazilian scientific journals in Accounting/Accounting Sciences. The analysis of this information, extracted from the Sucupira Platform and the group of selected journals, will allow the elaboration of the academic-scientific panorama for the area followed by its prognosis.

This article consists of 5 more items, containing, respectively, the regulatory framework for Brazilian Postgraduate Studies, theoretical framework, methodological procedure, presentation of the data collected and its analysis and the prognosis and conclusions of the study developed.

Theoretical elements of the research

Regulatory Framework for Brazilian Postgraduate Studies

Santos and Azevedo (2009) highlight the importance of Postgraduate courses due to their role in producing knowledge from scientific research whose fundamental objective, according to the regulatory framework and public policies, is the transformation of universities into permanent centers of creative activity.

In Brazil, the regulatory framework began with the Education Guidelines and Bases Law (LDB) (Law 4,024/61) which define and regularizes the Brazilian education system based on the principles present in the Federal Constitution of 1934 (História do Ensino de Línguas no Brasil, 2009), establishing, in its article 69, that Higher Educations Institutions (HEI) could teach undergraduate, postgraduate, specialization, improvement and extension courses.

In 1965, the Report 977, also known as Sucupira Report, was drawn up, defining the nature and objectives of Brazilian postgraduate courses, presenting their fundamental characteristics, training levels (Master's and Doctorate), minimum duration of courses, defining areas of concentration, minimum requirements that HEIs must establish in these courses and finally indicating the Federal Education Council for approval of the courses and the Ministry of Education to validate and register diplomas (Coordination for the Improvement of Higher Education Personnel, CAPES , 2018) .

In 1998, CAPES recognized the Professional Master's degree and in 2017, the Minister of State for Education, Mr. Mendonça Filho, through ordinance 389, established the master's and professional doctorate modalities for stricto sensu postgraduate studies (CAPES, 2018) .

According to Santos and Azevedo (2009), before 1934 there were already postgraduate courses in operation in Brazil, 11 of which were doctorate and 27 master's levels. The regulatory framework came to strengthen the policy of training professionals (teachers for university teaching and researchers) with a high level to attend the expansion of public and private institutions as it can be seen in the five National Postgraduate Plans - PNPGs whose objectives were to emphasize the training of teachers for higher education, requiring that the IES teaching staff have a minimum of teachers with master's and doctorate degrees.

The report monitoring the goals of the VI PNPG (2011-2020) points out the evolution in

master's and doctorate courses offered in Brazil, with a projected expansion by 2020 of 20.8% and 30.7%, respectively, registering as a direct consequence, the increase in human resources with the respective degrees, highlighting that by 2020 there will be expected 4,5 doctors for every thousand inhabitants. It also highlights support for the theme of internationalization and the importance of planning the expansion of the National Postgraduate System to meet the strategic needs for the country's development (Brasil, 2017a).

In 1999, the Directory of the National Environmental Education Program - ProNEA was created, linked to the MEC and the Ministry of the Environment (MMA). Also in 1999, law nº 9,795/1999 was published (and its regulation through Decree nº 4,281/2002), which finally established the National Environmental Education Policy (PNEA), according to which it became mandatory to address the environmental topic at all levels of education (Sinay, Dalbem, Loureiro & Vieira, 2013) . ProNEA is in tune with the Treaty on Environmental Education for Sustainable Societies and Global Responsibility, drawn up within the scope of the Rio-92 Global Forum with the strategy to address environmental issues with the construction of themes to incorporate the environmental dimension, themes such as Environmental Law, Complex Science, Eco-efficient Technology, Ecological Economy, Green Policy and Environmental Education (Brasil, 2003).

ProNEA attributes the inclusion of these themes in the international agenda to the Stockholm Conference (1972); to the International Environmental Education Program - PINEA of 1975, the recognition of education as a strategy for building sustainable societies; and to the 1st Tbilisi Intergovernmental Conference (USSR in 197) the establishment of the educational process aimed at solving concrete environmental problems through interdisciplinary approaches and active and responsible participation of individuals and communities (Sinay et al., 2013).

In relation to the accounting area, Beuren (2021) highlights that the first two academic master's programs in the country were created in 1970, one at USP and the other at FGV-RJ, and a third one was created in 1978 at PUC/SP. After a long period, four more were created in 1998 (UFRJ), 1999 (Fecap), 2000 (Unisinos) and in 2004 (UnB/UFPB/UFPE/UFRN). The first doctoral course was created in 1978 at USP. Costa and Martins (2016) state that in June 2016, 28 stricto sensu postgraduate programs in the accounting area were operating in Brazil.

Environmental Accounting

According to Calixto (2006, p. 66), Environmental Accounting has been a topic under discussion in Brazil since the beginning of the 1990s, which is understood by Ribeiro and Rossato (2017) as a complement to asset accounting. In his research published in 2006, Calixto observes that only 9.8% of undergraduate courses in Accounting Sciences included Environmental Accounting in their programs from the year 2000 onwards, with emphasis on private HEIs. This low representation was mainly due to the existence of few professionals qualified to teach the subject, a fact also observed by Galvão and Tenório (2009). After reviewing the works researched by several authors, such as Barbieri and Sousa (2005), carried out in Brazilian universities, Calixto (2006), confirms the need to value education in general and in Accounting, in particular, highlighting the importance of including the environmental impact variable in this sector to prepare future decision makers capable of facing the multiplicity of challenges in the area. He also highlights, in a negative way, the slowness that characterizes the typical behavior of businesspeople, administrators and accounting professionals who do not react with the desired speed to changes in today's dynamic world.

In the articles of Consenza et al. (2010), Ferreira, Três, Garcia, Bittencourt Junior & Ferreira (2009), Paiva (2003), Ribeiro and Rossato (2017) and Tinoco and Kraemer (2004), there are presented concepts related to the theme of

Environmental Accounting and in the articles produced by Ferreira et al. (2009), Machado et al. (2012), Tinoco and Kraemer (2004) companies' disclosure practices through Sustainability Reports were evaluated. Ferreira et al. (2009) emphasize that although environmental heritage cannot be measured according to the criteria established by accounting principles and standards, its value can be defined by the actions implemented with the aim of reducing negative impacts on the environment, in order to preserved it, thus contributing to achieve sustainability.

For Gonçalves and Heliodoro (2005, p. 84), the importance of Environmental Accounting in managers' decision-making lies in its use to demonstrate the company's environmental responsibility, in addition to assuming a strategic role by highlighting proactive actions adopted by companies. Therefore, environmental accounting has sought to establish a long-term perspective, emphasizing the importance of going beyond the short-term vision of conventional accounting (Tregidga & Laine, 2022). Along these lines, Galvão and Tenório (2009) clarify that "all information that, if not evidenced, or poorly evidenced, can lead to a serious error regarding the assessment of the enterprise and its trends, which fully applies to information on the environmental performance of companies".

Galvão and Tenório (2009) studied the inclusion of Environmental Accounting in the IES curriculum matrix of undergraduate courses in Accounting Sciences in Recife, where they identified that this discipline was offered by a small number of Faculties, often with its theme diluted into several disciplines.

Palma, Oliveira and Viacava (2011), after evaluating HEI courses at Brazilian Federal Universities looking for themes that would allow understanding the nuances of sustainable development, such as sustainability, environmental management and corporate social responsibility, concluded that universities should adopt a more active stance in this direction, to train students capable of taking an active role in today's society. These researchers suggest an expansion of research in Postgraduate Programs.

Sinay et al. (2013), carried out a research into those programs in the area of Administration to identify the effective inclusion of environmental management in teaching, noting that the interest in teaching this theme began at the first decades of the 21st century, with the development and publication of scientific articles containing the description and critical analysis of sustainable movements, the identification of social practices, the involvements with social and environmental management and the environmental education of professionals from different areas. This group of researchers also emphasizes Brazil's slowness in defining concrete actions and responsibilities for the topic in teaching this specific area.

In the area of Environmental Accounting, Angotti and Ferreira (2017) point out a seminal research developed by David Linowes in 1968 in which he disapproved the way in which the financial results of corporations were presented since they failed to speak out about the resources invested in socio-environmental actions. The reason for this was, according the researcher, due to the lack of knowledge on how to do it at the time.

Despite the first work on Environmental Accounting being published in 1968, the 1970s saw timid development, with studies in this sector, it was only in the 1990s with Angotti and Ferreira (2017), Mathews (1997) and Deegan (2002), that the environment became focus of academic research.

Methodological elements of the research

The objective of this work is to present the current panorama of Brazilian postgraduate studies in Accounting with an emphasis on teaching and research of Environmental Accounting.

This is a documentary research as it is based on secondary data obtained from official documents: Sucupira Platform, CAPES Public Domain website, websites of the CNPq Research Groups and of the institutions involved as well as from Brazilian scientific journals. It is also a bibliometric research since it characterizes

scientific production. In relation to the analysis of secondary bases information, is research is classified as mixed: qualitative, when addressing subjective aspects, and quantitative, when analyzing objective aspects. As for its objective, it is characterized as descriptive (GIL, 2008), as it observes facts, records them, analyzes them and interprets them without any interference,

This study consists of two parts, namely: (1) presentation of the academic panorama of Brazilian postgraduate studies in Accounting and in Environmental Accounting; and (2) the presentation of the scientific panorama of Brazilian postgraduate studies in Accounting and Environmental Accounting.

The first part consisted of surveying the Brazilian institutions recognized by CAPES in the 2013-2016 four-year period, which offer postgraduate courses (master's, doctorate and professional master's degrees), exclusively in Accounting/Accounting Sciences, presenting their locations, origins, as well as disciplines, syllabuses, dissertations and theses effectively focused on Environmental Accounting issues. Data collection took place between June/2018 and January 2019.

In the second part, they were searched in the Groups of CNPq research (dgp.cnpq.br/dgp/faces/consulta/consulta_parametrizada.jsf) the terms: “Accounting” and “Environmental Accounting” and selected according to the group’s objectives and/or highlighted topics those groups studies that deal with Environmental Accounting as discussed by Holland, 2004; Theóphilo, Sacramento, Neves & Souza, 2000; Yakhou & Dorweiler, 2004. Of these, the name of the group, the institution in which it was based, the year of its installation and the topic studied in Environmental Accounting were compiled with the purpose of verifying the representativeness of academic research in this area.

After selecting Brazilian scientific journals that include the words Accounting or Accounting Sciences in their title, titles and abstracts were analyzed collecting those dealing with environmental accounting. There were selected those of Holland, 2004; Theóphilo, Sacramento, Neves & Souza, 2000; Yakhou & Dorweiler, 2004, making it possible to conclude about the importance given by researchers to this topic. The period evaluated goes from the origins of the journals until December 2018.

The analysis of the results made it possible to outline the current panorama of Accounting in general and of Environmental Accounting in particular in Brazilian higher education institutions, a panorama that allowed us to outline the prognosis for the area.

Results presentation

Academic Aspects

This subitem presents the origin of postgraduate courses in Accounting in Brazil, distributed by institution, level and region. Next, the subjects offered by each course are presented, separating those specifically related to Environmental Accounting. Identical work was carried out to characterize the dissertations and theses in the area.

Origin, Evolution, Geographic Distribution, Level and Qualis Score

Accounting is contained in the broad area of Social Sciences. Table 1 presents the number of Accounting Sciences programs per area of Applied Social Sciences.

Table 1
Number of Programs in Applied Social Sciences

COURSES	TOTAL	%
Administration, Accounting and Tourism	225	100
Administration	183	81.3
Accounting	30	13.3
Tourism	12	5.3

Source: own elaboration (research carried out in July/2018 in Brazilian institutions recognized by CAPES in the four-year period 2013-2016**)**

According to a survey carried out on the Sucupira Platform (

https://sucupira.capes.gov.br/sucupira/public/consultas/coleta/programa/listaPrograma.jsf) in 2018, there were 30 postgraduate programs in Accounting Sciences-PPGCC in operation, in the basic area of Accounting Sciences. These programs are carried out in 27 HEIs with a total of 44 courses, taking into account that the same PPGCC can have different modalities: master's degree (M), doctorate (D) and professional master's degree (MP). In Table 2, the courses are listed in order of appearance, accompanied by the years of origin, the institution and the Brazilian state where the courses operate.

Table 2
List of PPGCCs in Brazil by Recommendation date

HEI		UF	Course level by year of installation		
Name	**Acronym**		**M**	**D**	**MP**
University of Sao Paulo	USP	SP	1970	1978	
Pontifical Catholic University of São Paulo	PUC/SP	SP	1978		
FECAP University Center	UniFECAP	SP	2002		
Federal University of Santa Catarina	UFSC	SC	2003	2013	
Federal University of Paraná	UFPR	PR	2004	2014	
University of São Paulo/Ribeirão Preto	USP/RP	SP	2005	2013	
Blumenau Regional University	FURB	SC	2005	2008	
Federal university of Bahia	UFBA	BA	2006		
Federal University of Minas Gerais	UFMG	MG	2007	2017	
Federal University of Pernambuco	UFPE	FOOT	2006	2016	
University of Brasilia	UNB	DF	2007	2007	
Federal University of Paraiba	UFPB [1]	PB	2007	2007	
			2014	2015	
Federal University of Rio Grande do Norte	UFRN [1]	RN	2007	2007	
			2014		
Mackenzie Presbiterian University	UPM	SP			2007
Capixaba Institute of Accounting Research Foundation, Economy and Finance	FUCAPE-ES [2]	ES	2008	2009	2003
Federal University of Espírito Santo	UFES	ES	2009		
Federal University of Uberlândia	UFU	MG	2012	2016	
State University of Maringá	EMU	PR	2013		
Federal University of Rio de Janeiro	UFRJ	RJ	2013	2014	
Capixaba Institute of Accounting Research Foundation, Economy and Finance	FUCAPE-RJ	RJ			2014
Rural Federal University of Pernambuco	UFRPE	FOOT	2014		
Fipecafi College	FIPECAFI	SP			2015
Community University of the Chapecó Region	UNOCHAPECO	SC	2015		
Goias Federal University	UFG	GO	2015		
Federal University of Rio Grande do Sul	UFRGS	LOL	2015		
Federal University of Mato Grosso do Sul	UFMS	MS	2016		
Federal University of Rio Grande	FURG	LOL	2016		
TOTAL PROGRAMS		30	26	14	4
			TOTAL 44 COURSES		

1 – In these HEIs there are two programs: Accounting – UNB – UFPB - UFRN for the Academic master's and doctorate and Accounting Sciences for the Academic master's and doctorate.
2 – At this IES there are two programs: Administration and Accounting Sciences for the master's degree and doctorate, Academic and Accounting Sciences for the Professional master's degree.

Source: own elaboration

Although the LDB regulated Postgraduate Programs (PPG) in 1961, defining the nature of these courses in 1965, it was only in 1970 that the first master's degree in Accounting took place and a doctorate in 1978, both at USP/SP. . The same period of time occurred between the regulation of the professional master's degree (1978) and the actual emergence of the first course at this level, which took place in 2003 at FUCAPE/ES.

Only at the beginning of the 21st century, 32 years after the recommendation of the first PPGCC, there was an expansion in the number of authorized courses, with 15 HEIs being authorized in the first decade (2001 to 2010) and between 2011 and 2018, another 13 HEIs, showing that it took 48 years for the PPGCC to be tentatively offered in the south and southeast region, in the Northeast the courses only arrived in 2006, and in the north of the country until the date of this research there are no PPGCC courses offered.

The doctoral courses took 29 years (1978-2007) within a more dispersed regional distribution, namely Brasília; Paraíba, Rio Grande do Norte; Santa Catarina, Espírito Santo.

The data presented in Table 2 allowed the geographic location, represented in Figure 1, of the courses in operation.

Figure 1
Location of PPGCC

Source: own elaboration

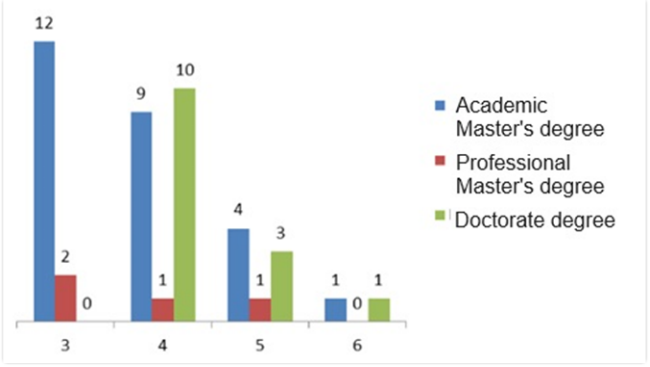
From Figure 1, it can be seen that the courses expansion policy is still deficient in the Northeast Region, where only 4 states are served (3 of them with master's and doctorate degrees) of the 9 existing ones; in the Central-West, the state of Mato Grosso does not have any course and only in the Federal District (UNB) there is a master's and doctorate course. In the South and Southeast Regions, all states have PPGCCs, except for Rio Grande do Sul were there is no doctorate course, and in the North Region there are no PPGCCs.

It can then be concluded that the number of existing courses is not very significant, despite the representativeness of undergraduate Accounting courses in terms of number of enrollments and number of graduates. The hypothesis behind this low course offering is the fact that Accounting is, for the CNPq, a subarea of Administration (according to Table 1), which as a whole may disguise the low offering.

Figure 2 shows the number of courses in the country, per grade and per level, and the distribution of courses per level, respectively.

It can be highlighted that the first PPGCC recommended by CAPES in 1970, offered by USP, is the only program that has the maximum grade of 6; 32% of courses have a grade of 3, 45% of courses have a grade of 4 and 18% have a grade of 5.

Figure 2
CAPES evaluation of courses by level



Source: own elaboration

Subjects offered

The titles and syllabuses of the subjects listed

for each course were researched in order to verify whether they contain, totally or partially, environmental themes or whether they are not directed to the theme.The key words that were applied to reach results concerning to this topic were applied: environmental, sustainability and corporate social responsibility.

Of a total of 1292 subjects offered, only 44 (3.4%) are entirely about Environmental Accounting, 62 (4.8%) due to their nature (contemporary topics, special topics, various seminars and others) contain some Environmental Accounting topics, and the remaining 91.8% do not deal with Environmental Accounting topics at all.

It is worth noting that of the 44 subjects characterized as Environmental Accounting, none are listed as mandatory in institutional documents. The main themes covered in the 44 disciplines are listed in Table 3.

Table 3
Topics covered in subjects entirely dedicated to Environmental Accounting

Environmental Accounting Topics	Total Disciplines
Recognition, measurement, disclosure of environmental accounting and environmental costs	13
Management Accounting and Environmental Controlling	7
Accounting and the environment	6
Financial Environmental Accounting	6
Managerial Environmental Accounting	6
Environmental and Environmental Performance Indicators (measurement and evaluation)	6
Benchmarking, standards, guidelines and environmental policies	4
Environmental accounting, social accounting	4
Economic valuation of environmental and cultural impacts	4
Cultural assets and environmental assets	2
GAIA-Management of environmental aspects and impacts	2
Environmental Balance	2
Environmental and social responsibility	2
SICOGEA - Environmental Management Accounting System	2
Quality and Environmental Costs	1
New trends in social and environmental accounting research	1

Source: own elaboration

Considering that the topic of environmental accounting is located in disciplines such as contemporary topics, special topics, various seminars and others, it can be inferred that there is little participation of disciplines entirely dedicated to Environmental Accounting, going against the recommendations of researchers in the area in global terms. Since the 1970s, the entire academic world has focused on studies that seek sustainable development, which is not observed in the area studied. These numbers confirm the findings of Galvão and Tenorio (2009), Palma, Oliveira and Viacava (2011) and Sinay et al. (2013) who highlight, respectively, the scarce number of disciplines entirely dedicated to Environmental Accounting, the need for universities to be more active in introducing the environmental variable, and the country's slowness in defining, and subsequently implementing, concrete actions and social practices on socio-environmental management.

Dissertations and theses

Initially, all dissertations and theses published on the Sucupira Platform in the area of Accounting Sciences were collected, totaling 4,388. After applying filters to the title containing the keywords environmental, sustainability and social and corporate responsibility, only 62 (1.41%) were found which deal with Environmental Accounting topics.

It should be noted that the Doctoral Courses at UFPE and UFU, as well as the Academic Master's Courses at UFMS and FURG, do not produce dissertations and theses on the platform, as they began their activities after 2016.

The main topics covered in dissertations and theses in Environmental Accounting are contained in Table 4.

Table 4
Main topics in Environmental Accounting

Topics in Environmental Accounting
Regulatory environment and social disclosure

Topics in Environmental Accounting
Assessment of the socioeconomic and environmental impact of financial compensation
Social and environmental accounting
Control of socio-environmental projects
Environmental costs
Demonstration of added value
Socio-economic-environmental performance and socio-environmental disclosure
disclosure and cost of equity capital
Disclosure of information about disasters in the environment'
Disclosure of information about environmental impacts
Socioeconomic and environmental balance
Environmental disclosure reflections of different regulatory frameworks
Accounting evidence of social and environmental performance
Disclosure of environmental information, environmental expenses and socio-environmental risks
Environmental spending in Brazil
Voluntary socio-environmental spending and obtaining tax benefits
Ecological ICMS in environmental preservation
Impacts on disclosure and socio-environmental investments
Environmental performance indicators highlighted in sustainability reports
Influence of aspects of corporate governance on environmental disclosure
Influence of expenses and environmental disclosure on the quality of accounting information
Information on business sustainability and its relationship with socio-environmental investments
Environmental valuation metric
Environmental liabilities
Internal control practices and environmental risk management
Practices for disclosing environmental provisions and contingent liabilities

Source: own elaboration

Again, in this regard, the percentage of dissertations and theses dealing with Environmental Accounting topics is not significant, confirming the findings of Calixto (2006) regarding the bias in the preparation of future decision makers, as he found a negligible percentage of supply of Environmental Accounting discipline in Brazilian universities.

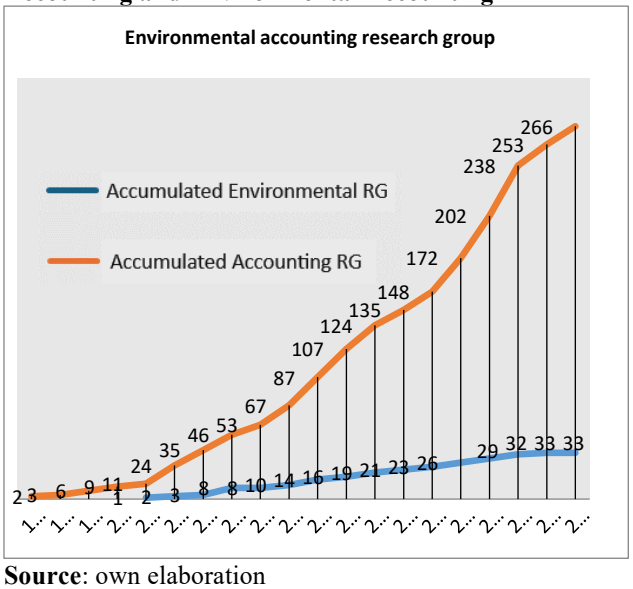
Scientific Panorama

This item contains a survey of CNPq research groups certified in December 2018 and dealing with Environmental Accounting, as well as scientific articles published by Brazilian magazines throughout their active period.

Research groups

This subitem was constructed from a search on the CNPq research groups website, where (in December 2018) a total of 266 Accounting groups were found. When applying the Environmental Accounting filter, 33 (12.5%) groups were obtained. The evolution over time of the numbers of groups in Accounting and Environmental Accounting is presented in Figure 3. When checking which of them actually belong to the HEIs previously surveyed, 15 were obtained, which had their line objectives evaluated and the repercussion resulting in 13 (5%) groups in HEIs effectively dealing with the topic of Environmental Accounting. These 13 groups with their respective years of training are presented in Table 5. And in Table 6 there are presented the themes covered by the selected research groups.

Figure 3
Evolution of the number of research groups in Accounting and Environmental Accounting



Source: own elaboration

Accounting research groups began in 1995 at USP and at the State University of Paraíba. Only after 6 years did the first group in Environmental Accounting begin, also at USP. The groups in the two areas (Accounting and Environmental Accounting) grew in number from then on, but with very different growth rates, as it can be seem in Figure 3, where the curve that represents the evolution in number of Research Groups again reflects the slowness in the area in reacting to changes in the current world.

Table 5
Relationship between HEI research groups and PPGCC

HEI	GROUP	TRAINING YEAR
USP	Socio-environmental studies in accounting	2001
	Center for Accounting and Environmental Studies	2009
	Indicators for Corporate Sustainability	2013
USP/RP	Accounting Information Study Group - InCont - FEA-RP/USP	2003
UFPB	Accounting-Financial Management, Control and Measurement	2004
UFBA	Management Accounting Research Laboratory	2004
UFRJ	Environmental Accounting and Social Reporting Group	2006
UFSC	NPGO-Research Center for Governance in Organizations	2006
	Center for Environmental and Accounting Studies	2009
FURG	Accounting and Finance Research and Extension Center	2007
UNB	Corporate Socio-Environmental Responsibility Research Center	2008
FUCAPE	CESO - Center for Organizational Sustainability Studies	2013
UFES	Environmental Accounting and Corporate Sustainability.	2014

Source: own elaboration

It is observed that of the 27 HEIs with PPGCC listed in table 2, only 10 institutions host the 13 research groups in Environmental Accounting. It is noteworthy that USP hosts 4 of these groups, 1 of which is in Ribeirão Preto/SP.

The themes covered by these groups are broad and function as an "umbrella". It is worth highlighting that there are many current challenges in the modern world for accounting professionals, such as those mentioned in the introduction and theoretical framework of this article, namely: questions about current environmental policy, expenses and gains associated with environmental control, legal proceedings involving the company for environmental reasons and associated fines, costs to recover degraded areas, environmental risks, possible devaluations to be suffered after an environmental audit and investments made in environmentally appropriate technology. In this sense, it is necessary to commit to postgraduate studies to establish studies and research that guide professionals.

Table 6
Main Environmental Accounting topics covered by Research Groups

Topics highlighted by Research Groups
Assessment of the costs of undesirable by-products (pollution) and proposals for alternatives to avoid them.
Studies of environmental events that influence the financial situation of companies
Studies on ways to demonstrate corporate socio-environmental responsibility.
Training accounting professionals capable of facing the challenges of environmental and social changes.
Management for the sustainability of organizations, covering environmental aspects, especially in the search for innovation
Identification of instruments for measuring environmental impacts caused by organizations.
Indicators and indices of sustainable performance of companies: measures and goals for adequate management control
Interactions of Accounting, Controllership and Financial Administration with social and environmental activities.
Global climate change.
Accounting Transparency and Social and Environmental Accounting.

Source: own elaboration

Scientific Journals

For the purposes of analyzing the publications of teaching and student bodies, national scientific

journals that contain in their titles the words: accounting, and accountability, with QUALIS between strata A1 and B3 were identified, and the tittle, year of origin, federation unit (UF), frequency, QUALIS classification, total articles published in Accounting, in general, and in Environmental Accounting, in particular were collected and presented in Table 7. The data was collected from the date of origin of each journal until December 2018 and the classification corresponds to that of the period 2013-2016 of evaluation.

In Table 7 it can be seen that 24% of journals have QUALIS A2, 24% QUALIS B1, 33% QUALIS B2 and 19% QUALIS B3; 76% of journals are published every four months; 14% quarterly and 10% semi-annually.

Regarding the regional location of the institutions that publish the journal, it is observed that 72% are in the south and southeast regions, while the remainder, 28%, in the Northeast and Central-West regions. When compared with institutions that offer PPGCC courses, it appears that the journals correspond to the same regions.

In relation to the percentages of articles on Environmental Accounting, these are not very significant, demonstrating that PPGCC teachers/researchers and students are still not aware of the importance and relevance of this topic, despite it having been in evidence for several decades. The two journals with the highest percentages of publications in Environmental Accounting (6% and 8%, respectively) are Sociedade, Contabilidade e Gestão and Revista Ambiente Contábil. Other journals reach 4%, with some of them not publishing in the area.

Table 7
Brazilian Journals in Accounting

Periodical Name	Year of origin	UF	Frequency	Qualis	Total Articles	Environmental Accounting Quantity	%
Contabilidade Vista & Revista	1989	MG	Quarterly	A2	385	6	2%
Revista Contabilidade & Finanças (Online)	2001	SP	Quarterly	A2	344	2	1%
RCO - Revista de Contabilidade e Organizações	2005	SP	Quarterly	A2	236	1	0%
Revista Contemporânea de Contabilidade	2004	SC	Quarterly	A2	295	5	2%
Revista Universo Contábil	2007	RS	Quarterly	A2	400	2	1%
Contabilidade, Gestão e Governança	1998	RS	Quarterly	B1	341	2	1%
BASE - Revista de Administração e Contabilidade da Unisinos	2004	DF	Quarterly	B1	358	8	2%
Enfoque: Reflexão Contábil	2005	PR	Quarterly	B1	346	5	1%
Revista de Educação e Pesquisa em Contabilidade	2008	DF	Quarterly	B1	241	1	0%
UNB Contábil	1998	DF	Quarterly	B1	340	3	1%
Tecnologias de Administração e Contabilidade	2011	SP	Semiannual	B2	35	0	0%
Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ	1996	RJ	Quarterly	B2	275	3	1%
Revista de Gestão, Finanças e Contabilidade	2011	BA	Quarterly	B2	185	4	2%
Sociedade, Contabilidade e Gestão	2006	RJ	Quarterly	B2	239	15	6%
Pensar Contábil	2001	RJ	Quarterly	B2	343	7	2%
Reunir: Revista de Administração, Ciências Contábeis e Sustentabilidade	2011	PB	Quarterly	B2	158	2	1%
Revista Catarinense da Ciência Contábil	2001	SC	Quarterly	B2	288	3	1%
RC&C - Revista de Contabilidade e Controladoria	2009	PR	Quarterly	B3	209	6	3%
Revista Mineira de Contabilidade	2000	MG	Quarterly	B3	356	14	4%
RACE - Revista de Administração, Contabilidade e Economia (Online)	2005	SC	Quarterly	B3	340	14	4%
Revista Ambiente Contábil	2009	RN	Semiannual	B3	284	24	8%
Totais					5998	127	2%

Source: own elaboration

Conclusions

In this article, the panorama of Brazilian postgraduate studies in Accounting Sciences was constructed with an emphasis on Environmental Accounting. This work allowed the construction of the prognosis presented below, which confirms the opinions of previously published works on the subject, such as those mentioned in the Introduction.

The number of Brazilian PPGCC courses is scarce taking in mind the recommendation of the VI PNPG about the need to plan the expansion of the National Postgraduate System

to meet the strategic needs for the country's development; as well as the importance of a degree in Accounting in terms of the number of incoming students and graduates in the area. The 2016 Higher Education Census Report: Main Results, prepared by the Directory of Educational Statistics - DEED of the Ministry of Education and Culture - MEC, places the degree in Accounting Sciences in the 4th place for the period between 2009 and 2016 throughout Brazil (Brasil, 2017b). This demonstrates the need to create new courses to absorb the potential of candidates graduating in Accounting Sciences. The courses to be created should be located, especially, in regions of the country not yet served or partially served (North region and Central-West and Northeast regions, respectively), supported by a public policy of equitable induction of PPGCC in Brazil.

There is a need to strengthen teaching and research in Environmental Accounting, with professionals trained in disciplines that support this area. When listing topics included both in the disciplines and those covered in dissertations, theses, research groups and scientific articles published in Brazilian journals in Accounting Sciences, it was found that the technical topics of Environmental Accounting present insignificant percentages in relation to the topics in the area of Accounting, thus demonstrating that researchers, teachers and students still do not recognize the due importance of Environmental Accounting for the area and for society. This fact also demonstrates the lack of oxygen in the area as a reflection of themes with little focus on the challenges of Contemporary Society.

To keep up with the changes in today's world, where society is actively increasing in defending environmental quality, knowledge of topics associated to Environmental Accounting is necessary, as mentioned by several researchers in the Introduction and Theoretical Framework of this work. The topics covered by the PPGCC currently do not include even half of those recommended by the sector's literature, demonstrating that recognition of the importance of Environmental Accounting is evolving at a slow pace in Brazil and in Accounting Sciences.

The low number of scientific articles published in Accounting/Accounting Sciences journals on Environmental Accounting topics leads to the need to create new journals or change current policies, with policies that address and emphasize Environmental Accounting topics.

As a final conclusion of this research, it is confirmed that, within the scope of Environmental Accounting, Brazilian postgraduate studies are not yet preparing professionals capable of facing current challenges, especially those related to the ability to qualify and quantify personal actions. and organizational aspects, benefits arising from the respective implementations and damage caused to the environment. Without this ability, the preservation of the environment is limited and the advancement of the country's sustainable development is hampered.

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