Management of essential organizational resources for good performance in the CAPES Assessment

Gestão dos recursos organizacionais essenciais para o bom desempenho na Avaliação da CAPES

Danieli Artuzi Pes Backes
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ABSTRACT

Based on the rise of the evaluation of Brazilian higher education in recent years and its influence on the institutions evaluated, our study objective is the analysis of the indicators of graduate programs in Administration (PPGAs), considering the four-year period from 2013 to 2016, in order to identify its strategic behavior. Based on the theoretical combination applied in an unprecedented way to the field of study, the Theory of Resources and the institutional approach of isomorphism, we built three hypotheses, analyzed by different quantitative methods: linear regression, Pearson correlation, ratio and proportion. The results confirmed the first two hypotheses and complemented the third one, which attested that in addition to excellence programs, there is a high level of efficiency among PPGA professors from all strata. Through the combination of theories, we found that an effective organization in a regulated environment manages to organize all resources, processes, and routines in line with regulatory requirements. However, in the field, where the regulatory system also plays the financing role, the competitive issue emerges. We also found differences between the explanatory requirements for the concept of higher-level programs (5, 6, 7) and for the entire set of researched programs (4, 5, 6, 7), which made it possible to build a strategic framework for superior performance. With this study, we intend to contribute to the expansion of knowledge about the postgraduate evaluation system, as well as to shed light on the discussion of the impacts of Capes evaluation on PPGAs. Furthermore, we hope that this scientific research also fulfills its social and managerial role.

Keywords: Performance of Graduate Programs; Strategic behavior of Higher Education Institutions; RBV; programming of Brazilian graduate programs; isomorphic gifts

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RESUMO

A partir da ascensão da avaliação do ensino superior brasileiro nos últimos anos e sua influência sobre as instituições avaliadas, tomamos como objetivo de estudo a análise dos indicadores dos programas de pós-graduação *stricto sensu* em Administração (PPGAs), obtidos no quadriênio entre 2013 e 2016, visando identificar seu comportamento estratégico. Com base na combinação teórica aplicada de forma inédita ao campo de estudo, a Teoria dos Recursos e a abordagem institucional do isomorfismo, foram levantadas três hipóteses, analisadas por diferentes métodos quantitativos: regressão linear, correlação de Pearson, razão e proporção. Os resultados confirmaram as duas primeiras hipóteses e complementaram a terceira, que atestou que, além dos programas de excelência, há alto nível de eficiência entre os docentes de PPGAs de todos os estratos. Pela combinação das teorias, constatamos que uma organização efetiva em ambiente regulamentado é aquela que consegue organizar todos os recursos, processos e rotinas de forma alinhada às determinações regulatórias. Todavia, no campo em que o sistema regulatório também desempenha o papel de agente financiador, emerge a questão competitiva. Constataram-se diferenças entre os quesitos explicativos para o conceito dos programas de nível superior (5, 6, 7) e para todo o conjunto de programas pesquisados (4, 5, 6, 7), o que possibilitou a construção de um quadro de referência estratégico para o desempenho superior. Com esse estudo, pretendemos contribuir com a ampliação do conhecimento a respeito do sistema de avaliação da pós-graduação, assim como lançar luz na discussão dos impactos da avaliação da Capes sobre os PPGAs. Ademais, esperamos que essa pesquisa científica cumpra com o seu papel conceitual, social e gerencial.

Palavras-chave: Desempenho dos Programas de Pós-Graduação; Comportamento estratégico das Instituições de Ensino Superior; RBV; regulamentação dos programas de pós-graduação brasileiros; pressões isomórficas

Introduction

In Brazilian graduate programs, which comprise academic master's and doctoral degrees and professional master's and doctoral degrees, government regulation is present through bodies such as the Coordination for the Improvement of Higher Education Personnel - CAPES, which maintains a system evaluation method based predominantly on quantitative, impartial and uniform models. These criteria have as one of the objectives "the introduction of the principle of strategic induction" (BRASIL, 2010). They are applied both for the approval of a new program and for

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evaluating and guiding decisions made over time in already established programs (MACCARI et al., 2009; MACCARI et al., 2014).

In addition to the recommendation for accreditation and authorization to operate the programs, the pressure resulting from the evaluation is because CAPES establishes a ranking among the programs, which will directly reflect on the ability to raise funds (MACCARI et al., 2014; DIAS SOBRINHO, 2003, LARRÁN; HERRERA; ANDRADES, 2015). There are financial support programs for institutions that offer the graduate courses, such as the Graduate Support Program for Private Education Institutions (CAPES, 2022a). Moreover, the Graduate Support Program (CAPES, 2022b) for public institutions, and the Academic Excellence Program that is exclusively for courses with concepts of excellence - 6 and 7 (CAPES, 2022c). However, these resources are insufficient to maintain graduate programs and fund advanced research. Thus, professors and their research groups usually submit proposals to research funding institutions, and in this case, the concept of the program is a differential for the success of approvals.

Considering the formal pressures arising from the performance-based financing system (SFBD) and the informal ones, which include social legitimacy, which overlaps with educational organizations, freedom of action and decision-making may be limited (ZAPP; RAMIREZ, 2019; BACKES et al., 2020). Therefore, it is relevant to understand the performance strategies of managers in a highly regulated organizational field as a reference for other organizational fields in which some institutions depend on institutions that rule laws and regulations.

In the educational field, norms and rules prevail over organizational processes and structures (BACKES; SERRA; ZAROUR NETO, 2018). Institutional theory warns of the need to align with compliance, assuming that all institutions act similarly to comply with regulation (ANAFINOVA, 2020; DA SILVA et al., 2019; SEYFRIED; DÖRING; ANSMANN, 2022). However, this theoretical body can be questioned from the point of view that organizations cannot abandon their strategic perspectives in a free market economy because institutional pressures do not affect all organizations with the same intensity (DACIN, 1997).

It means that organizations need to strive for differentiation. This premise is reinforced in an environment where the regulatory body also plays the role of a development agency (GUERRA; SOUZA, 2020). In an SFBD, performance is understood

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as the results produced from available resources and evaluated through metrics based on pre-established indicators, and the institutions that occupy the first positions receive the most significant contributions (CROUCHER; WOELERT, 2016). Thus, it is important to evaluate organizations from a strategic theoretical lens focused on competitiveness, such as the Resouce-Based View, which offers a view of the possible articulations between resources and capabilities to guarantee a competitive advantage to the organization.

We start from the hypothesis that organizations in the same sector may have different behaviors, even suffering similar environmental pressures. For this reason, a strategic analysis of the responses of postgraduate programs to environmental pressures is pertinent, based on the combination of two theoretical bodies: the first, which prioritizes adequacy and compliance, and the second, which seeks to identify the practices adopted to obtain competitiveness in the organizational field of which they are part. Therefore, this study aims to analyze the quantitative indicators of the graduate programs in Administration (PPGAs), obtained in the four years between 2013 and 2016 to identify the programs' strategic behavior. It is the last four-year period evaluated, with results approved by CAPES.

In addition to this introduction, the study is composed of the theoretical framework, methodological procedures, results, discussion of results, and, finally, the conclusions.

The Combination of Resource-Based Visions with the Isomorphic Institutional Approach to the Analysis of PPGAs

In the institutional approach, organizations that assimilate and reproduce the sector's norms are seen as more legitimated by regulators and society. Legitimation by regulators occurs through accreditation and classification in terms of performance and, by society, through the recognition and credibility attributed to institutions that follow the practices endorsed by social actors (MEYER; ROWAN, 1977; DEEPHOUSE, 1996). Under the influences of the institutional environment, organizations comply with the pressures received and start to adopt similar strategies, practices, and structures.

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Higher education is one of the most regulated organizational fields, and constant pressures for compliance, in which organizational behaviors are shaped according to models considered ideal or legitimized (ANAFINOVA, 2020; LARRÁN et al., 2015). As there is a model that all institutions must follow, it is expected that, at some point, organizations will tend towards uniformity, which would be at odds with the concept of university, which derives from universal and not from a single case (SGUISSARDI, 2006). The evaluation system can generate pressures and uncertainties for the programs because it compares the performances through a ranking, whose concept is reflected in the ability to raise funds (DIAS SOBRINHO, 2003; LARRÁN, et al., 2015).

The degree of isomorphism grows in the same proportion as regulatory pressures. It results in higher formalization of rules and internal procedures, to the point where similarity can be observed in most components of an organizational field (MEJÍA; DEL VAL; COSCOLLAR, 2020). However, considering that institutional pressures are not absorbed in the same way by all organizations and that, in the case of the educational field, the regulatory body establishes rankings based on organizational performance (GUERRA; SOUZA, 2020), we rely on a strategic theoretical basis to understand the responses of graduate programs to CAPES standards. To analyze these organizations from a strategic point of view regarding the organization and strategic management of resources for organizational performance, we adopted the Resource-Based View.

The Resource-Based View (RBV) argues that the organization's performance is a function of the types of resources (physical, financial, human, and organizational, including talent) and the capabilities controlled by them. The greater their competitive differential, the better it controls and combines their resources and capabilities (WERNERFELT, 1984; BARNEY, 1991; GRANT, 1991; BARNEY; HESTERLY, 2011; MILLER, 2019; SERIKI, 2020). Thus, in this study, we propose to analyze the organizational field of graduate courses, specifically in the area of Administration, from two strategic perspectives. The first perspective is focused on the institutional field, in which we seek to verify how managers understand and respond to environmental pressures. The second perspective is focused on the strategic management of organizational resources and capabilities to examine how program managers manage and combine their resources and capabilities in response to threats or opportunities in the environment.

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LITERATURE REVIEW

Several studies relate one of the two theoretical fields that underlie this research, the Resource Theory and the Institutional Theory, with a focus on isomorphism, to higher education institutions, such as:

Morosini's (2001) research, based on an isomorphic institutional approach, examined different conceptions and strategies of university quality arising from international experiences. Among the main concepts, the following stand out: (a) quality, synonymous with isomorphism, reflected as a standardized institutional assessment and employability; (b) quality, synonymous with respect for specifics; and (c) quality, synonymous with equity.

The study by Pereira and Forte (2006), based on the RBV, aimed to identify the essential resources or competencies for HEIs in Fortaleza in the pre and post-LDB/96 periods. The applied questionnaires allowed us to identify the seven most relevant resources. The results showed a set of resources common to the two moments of history. At the same time, the environmental characteristics of each period translated needs for specific skills, highlighting the importance of adapting to external contexts.

Based on the RBV, Nassif and Hanashiro (2008) conducted research that aimed to identify the skills required of professors from private universities in the state of São Paulo as an element to increase competitiveness. They concluded that the HR area of the institutions does not perform actions to develop the competencies identified in the research and that the professors' distinctive competencies should focus on primordial development to constitute sources of sustainable competitive advantage for the universities.

In the research by Martins et al. (2013), based on the RBV, the strategies and allocation of resources in Brazilian graduate programs in Administration, Accounting, and Tourism were analyzed. The results showed that the programs aimed to improve performance based on the CAPES evaluation system. The programs that increased their grades consecutively in the three evaluation periods (2001 to 2009) used the CAPES evaluation system as a significant strategic guide.

In the study by Silva Junior et al. (2014), based on Institutional Theory, the objective was to discuss the articulations of private Higher Education Institutions (HEIs) around three aspects related to public policies for higher education: evalua-

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tion, regulation, and supervision. The results indicated the need to rethink public policies, as they interfere with university management without evaluating the practical effectiveness, causing the dynamics between the HEIs and these policies to assume a formalistic logic that causes damage to higher education and society.

Croucher and Woelert (2016) analyzed the Australian education system and identified clear isomorphic effects, such as: (a) changes in formal academic organizational structures; and (b) changes in the number of faculty and students in different academic organizational groupings. The authors concluded that, from the pressure of the evaluation system, there was an evident convergence regarding formal organizational structures and the numbers of students and staff in most university fields surveyed.

The research by Chedrawi, Howayeck, Tarhini (2019) aimed to investigate the influence of the Association to Advance Collegiate Schools of Business (AACSB) accreditation process on three Lebanese business schools. The researchers concluded that accreditation is a temporary isomorphic legitimacy tool but on a continuum that can lead to sustaining legitimacy in higher education.

Based on Institutional Theory, the study by Kezar, Bernstein-Sierra (2019) examined the Association of American Universities Undergraduate STEM (science, technology, engineering, and mathematics) and the ability to reformulate norms to improve the education system. The results showed that the influence of the Association of American Universities was a powerful motivator for institutions to change deeply rooted perceptions and behaviors based on three influencing behaviors: prioritization, social pressure, and recognition.

Based on the isomorphic institutional approach, Backes et al. (2020) set out to identify the presence of mimetic isomorphism based on the structural similarities of PPGA curricula, and to verify whether mimicry contributes to a similar performance in the CAPES ranking. The results indicated the existence of four groups of PPGAs with similar structures. They concluded that the presence of structural isomorphism is not correlated with performance. It is not evident to achieve the same results by mirroring the structures and procedures of the most legitimate organizations.

Other recent studies relate to the strengthening and inducing role of CAPES on program management, such as: (a) Santos and França (2022), who conducted research to analyze the process of formulating excellence indicators for the evaluation

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of CAPES and concluded that the path leading to the creation of the last National Graduate Assessment System (2011 to 2020) was decisive for the consolidation of the assessment system and for the structuring of indicators of excellence, capable of effectively measuring the quality of PPGs in Brazil; (b) Sgarbi et al. (2022), who evaluated the space that Brazilian PPGs in the areas of engineering give to professor training, following CAPES and with Law 9,394/96 on the Education Guidelines and Bases (LDB). They observed 0.39% of the subjects, 0.8% of the intellectual production, 0.93% of the final works, and 0.54% of the relevant intellectual production dialogue, with the pedagogical area, concluding that there is a devaluation of training professors in the analyzed programs. Perhaps a greater demand from CAPES in this regard could change the scenario; (c) in the study by Backes et al. (2021), the authors identified isomorphism between PPGs and concluded that CAPES, due to its inductive power, contributed to isomorphism, but that, in recent years, it has adopted measures to reduce similarities, avoiding the evolutionary commitment of national science; (d) Magnin and Takahashi (2021) verified how Brazilian researchers have responded to the policy of evaluating scientific productivity, formulated by CAPES and CNPQ. They found that the evaluation policy not only evaluates but strengthens and induces certain research practices and warn that, by not problematizing the context and voices, there is a risk of adopting functionalist positions. Such positions legitimize statements already in evidence, naturalizing reality and compromising the conception of the subject as an agent of transformation.

In addition to the latest studies conducted to assess the influence of CAPES on PPGs, all the other articles mentioned above are based on one of the strategic approaches, Resource-Based Theory or Institutional Theory, with an isomorphic approach. No studies were found employing the combination of the two strategic theories to explain the interactions of graduate programs. There was only one approximate study, which made use of three approaches. Backes, Serra, Zarour Neto (2018) used the strategic tripod approach to explain the behavior of Brazilian PPGs and concluded that, in this organizational field, the Institution-Based View prevails over other views due to regulatory pressures. Thus, this study intends to contribute to the discussion around the impact of institutional evaluation on the field of Brazilian graduate studies, considering the inductive effects and management strategies of graduate programs as responses to the institutionalized external environment.

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APES EVALUATION CRITERIA

Graduate programs in Administration are evaluated by CAPES according to the following criteria: (a) Program Proposal; (b) Faculty; (c) Student Body; (d) Intellectual Production; (e) Social Insertion (CAPES, 2022d). To contemplate these criteria and understand the organization of programs in terms of their resources and capabilities, we selected the quantitative variables available on the Sucupira Platform (CAPES, 2022e), as shown in Figure 1.

Figure 1 Variables applied in the study and their association with theoretical constructs

Analysis variable	Theoretical construct
PPGA concept	The CAPES Concept reflects the performance of the PPGA (MACCARI, et al., 2014), which is a function of the types of resources and capabilities controlled by the organization, and the greater its competitive differential, the better it controls and combines them (BARNEY ; HESTERLY, 2011).
PPGA age	PPGAs founded at the same time may have similar structural characteristics. It is due to the institutional pressures that tend to vary over time (DACIN, 1997). The CAPES evaluation system has changed over the years, implementing strict evaluation criteria from the modernization and computerization in 1990 (MACCARI et al., 2014).
Number of professors linked to the teaching staff	The number of professors indicates the scope of the program and the number of financial resources invested in the PPGA by the sponsoring institution. Thus, the teaching staff can reflect the institution's strategic planning. Professors also represent the most crucial resource, as all the results achieved by the program depend on them.
Number of research lines	Lines of research may indicate the program's concentration or diversification level. Lean programs tend to have fewer lines of research because CAPES (CAPES, 2016) regulates the number of professors to a minimum of four for each line of research.
Financed projects	Research projects must maintain alignment with research lines, and funded projects have relevant weight. This question depends on the ability of professors to obtain and conduct projects with external funding (CAPES, 2016).

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Funder	An organization's ability to raise funds is related to its credibility. A PPGA receives multiple types of funding, such as support for research and extension projects, scholarships, research grants, support for events, activities, resources, program structure, and maintenance.
Intellectual production	It is related to individual skills for scientific production and networking. They have bibliographic, technological, and technical production in line with the program's proposal (CAPES, 2016). Student production is also considered.
Student body	Participação na autoria das produções científicas do PPGA (em eventos, artigos e livros), tempo de conclusão do curso e qualidade das teses e dissertações (CAPES, 2016).
Completion work	Ability to fulfill all requirements and finalize credits. Measures: average degrees/total number of students, quality of production, uniform distribution of supervisees/size of permanent faculty - maximum of eight supervisees per professor (CAPES, 2016).
External member	It indicates a greater or lesser capacity for integration with other institutions. This item is evaluated as the program's capacity for social insertion, inter-organizational cooperation and articulation, socialization, and scientific development (CAPES, 2016).

Fonte: elaborada pela autora com base na literatura.

We developed the study hypotheses based on the analysis of each variable described above, which corresponds to a CAPES evaluation item. The first hypothesis (H1) considers that a set of resources forms every program. In this case, we assume that the greater the articulation of resources, the better the program's performance in the evaluation ranking, considering that the concept received by the program reflects its performance. In the case of the first place, the concept would represent the competitive advantage over the others. With the analysis of all the variables, we also intend to identify the key questions that guarantee the competitiveness of the programs and ensure a superior position in the ranking.

H1: The concept obtained by the PPGAs, which serves as a proxy variable for performance, derives from variables such as the number of: permanent professors,

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lines of research, research projects, student, final work, intellectual production, funders, external participant, and age .

In the second hypothesis, we started to assume that there are internal resources of PPGAs that are more important than others to obtaining the concept. We believe that the most relevant resource, Barney and Hesterly (2011) consider unique, difficult to be acquired by other organizations, and idiosyncratic, which can explain why some organizations outperform others, are the professor-researchers. We believe that all the results achieved by the program are dependent on the faculty, according to H2:

H2: There is a significant positive correlation between the faculty and all variables referring to the numbers of permanent professors, lines of research, research projects, student, final work, intellectual production, funders, external participant, and age (listed in Figure 1).

We believe that the faculty represents the institution's intellectual capital and refers to individual and organizational skills since the most valuable resources of an organization are people and their capabilities. These are the ones that will define the organizational and essential competencies and will be able to provide the desired competitive differential. We also assume that age is a variable positively related to the faculty because young courses tend to maintain a lean team. At the same time, older programs have more robust structures, as seen in Table 1. Furthermore, in this case, a dependency trajectory must be considered (BERNARDI, 2012). Thus, we propose a hypothesis related to the previous ones. We maintain that programs with higher concepts can extract the best results from their most relevant resources (the permanent faculty) compared to programs with lower concepts (MILLER, 2019; WERNERFELT). , 1984). Therefore, the third hypothesis is:

H3: Higher-rated PPGAs, which supposedly reflect superior performance, manage their resources more efficiently.

Next, the methods used are presented in order to make it possible to prove the hypotheses raised for the study.

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Methodological Procedures

In order to test the previously established hypotheses and achieve the objective of the study, we proposed to carry out exploratory research of a quantitative and cross-sectional nature, selecting, for the research, quantitative data informed by the programs to CAPES in the period of the "Coleta CAPES." The selected data are available for public consultation on the Sucupira Platform (CAPES, 2022e) and refer to the evaluation carried out from 2013 to 2016.

For this research, all graduate programs in Administration, with master's and doctoral degrees, with concepts 4, 5, 6, and 7 (on a scale of 1 to 7) were included, which were considered to have good performance and international excellence (Capes, 2021). Data were extracted from the Sucupira Platform, from 05/04 to 05/11/2018, in the field "Data reports sent from the collection", in the link referring to CAPES Collection and followed the pre-established documentary research script. After being collected, the arithmetic means of the data referring to the variables was performed: (a) lines of research; (b) research projects; (c) professor; (d) student; (e) completion work; (f) intellectual production; (g) funder; and (h) external participant. We emphasize that the variable "professors" refers to the permanent staff of the programs; the student body refers to the students enrolled in the researched period; and the final works also serve as a proxy variable to verify the flow of graduates. Age and program concepts were also included, with absolute values, as shown in Table 1.

Table 1 Dataset of graduate programs in Business Administration

	Program/University	C	DO	LP	PF	FI	PI	DI	TC	PE	I
1	UNIVERS. DE SÃO PAULO (USP)	7	44.5	8	94	27	265.5	225	79	325.5	43
2	FUND. GETÚLIO VARGAS/ SP (FGV/SP)	7	38	10.5	109	52	289	174.5	70.5	356.5	44
3	FUND. GETÚLIO VARGAS/RJ (FGV/RJ)	7	21	3.5	56	47	117.5	60.5	32	174.5	51
4	UNIV. FED. DO RIO DE JANEIRO (UFRJ)	6	23	5	43	17	76.5	115	48.5	147	45

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	Program/University	C	DO	LP	PF	FI	PI	DI	TC	PE	I
5	UNIV. VALE RIO DOS SINOS (UNISINOS)	6	14	2	33.5	54	79	91.5	28.5	159.5	18
6	UN. FED. RIO GRANDE DO SUL (UFRGS)	5	49.5	8	6.5	7	202	196	68.5	281	46
7	PONT. UN. CAT. DO PARANÁ (PUC/PR)	5	14.5	2	6	2	60.5	105.5	30	118.5	18
8	PONT. UN. CAT. RIO JANEIRO (PUC/RIO)	5	39.5	9	40.5	45	128	84.5	59.5	225	46
9	UNIV. FED. DA BAHIA (UFBA)	5	38	6	54	19.5	157.5	76.5	32	197.5	34
10	UNIV. FED. DE LAVRAS (UFLA)	5	18	3	55.5	32	87	92	30.5	200	43
11	UNIV. FED. DO PARANÁ (UFPR)	5	19	3.5	45.5	32	90	88	30	247.5	26
12	UNIV. PRESBIT. MACKENZIE (UPM)	5	17.5	3	31	30	59	104.5	44.5	165.5	19
13	UNIV. DE BRASÍLIA (UNB)	5	35	6.5	27	19.5	137	112	44	151.5	42
14	PONT. UN. CAT. RIO GRANDE SUL PUC/RS)	5	15.5	3	34	6	48.5	69	20	79	12
15	UNIV. REGION. DE BLUMENAU (FURB)	5	12.5	2	10.5	11.5	57.5	35	25.5	113.5	19
16	UNIV. NOVE DE JULHO (UNINOVE)	5	23.5	4	82	38	236.5	129.5	24.5	201	12
17	UNIV. DO VALE DO ITAJAÍ (UNIVALI)	5	13.5	5.5	43	26	72	79	20.5	127.5	15
18	UN. DE SÃO PAULO/RIB. PRETO (USP/RP)	5	25.5	4	31.5	28	181.5	106	29.5	169.5	14
19	PONT. UN. CAT. MINAS GERAIS (PUC/MG)	5	21	5.5	60	20.5	104.5	65	32	186	11
20	UNIV. DO GRANDE RIO (UNIGRANRIO)	5	16	3	29.5	29	49.5	44	16	116.5	11
21	UNIV. DE CAXIAS DO SUL (UCS)	5	16	2	34	15.5	110	47	18	214.5	12
22	ESC. SUP. DE PROPAG. E MARK. (ESPM)	5	12	3	10.5	13	48.5	41	13.5	120.5	8
23	CENTRO UNIVERS. DA FEI (FEI)	5	13.5	3	2.5	6	28.5	55	17.5	81	11
24	UNIV. FED. DO CEARÁ - UFC	4	15	2	28	11	68.25	40.5	14	81.25	9

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	Program/University	C	DO	LP	PF	FI	PI	DI	TC	PE	I
25	UNIV. FED. DO ESPÍRITO SANTO - UFES	4	16.5	2.25	37	15	67.25	52.75	17.5	135.75	16
26	UNIV. FEDERAL DE GOIÁS - UFG	4	13	2.3	13.7	5	33	25.3	5.3	43	4
27	UNIV. FED. DE MINAS GERAIS- UFMG	4	28.25	5.25	60.75	6	201	139	42.75	154.25	45
28	UN. FED. MATO GROSSO DO SUL -UFMS	4	15	3.75	12.25	14	47.25	41.25	18.25	71.5	10
29	UNIV. FED. DA PARAÍBA UFPB/JP	4	16	3.25	41.75	14.25	74	70.25	24.25	100.75	42
30	UNIV. FED. DE PERNAMBUCO - UFPE	4	26	3.5	50.5	9	95.5	122.5	43	137.5	23
31	UN. FED. RIO GRANDE DO NORTE - UFRN	4	12.5	3	13.75	4	47.5	83.5	19.5	64.75	40
32	UN. FED. DE SANTA CATARINA - UFSC	4	25	4	30.75	8	179.5	104.25	31.25	87.75	40
33	UN. FEDERAL DE SANTA MARIA - UFSM	4	21.5	3.5	76	34.25	258.75	84.5	28	257.25	15
34	UNIV. FED. UBERLANDIA - UFU	4	13.25	2.25	13.75	16	52	33.5	16.75	138.25	15
35	UNIV. FED. DE VIÇOSA -UFV	4	14	2	77.5	18.25	86	36	16.75	173.25	13
36	UN. MUN. SÃO CAETANO DO SUL - USCS	4	13.75	4	0.75	9	96.25	63.25	23	126.25	15
37	UN. EST. DE SANTA CATARINA - UDESC	4	13.5	3.5	58	31.5	53.25	39.5	11.75	234.5	8
38	UNIV. ESTADUAL DO CEARÁ -UECE	4	12.5	2.75	37.5	18	43.5	37.25	14.25	66	13
39	UNIV. EST. DE MARINGÁ - UEM	4	14.5	2.5	33.25	11	46.75	41	15.75	68	8
40	FUND. INST. CAPIX. PESQ. CONTABILID., ECONOMIA E FIN. (FUCAPE)	4	12.75	2	5.75	11	65.5	46.5	41.75	65.25	9
41	UNIV. FUMEC (FUMEC)	4	14	2	32	20	70.5	99.25	55.75	147.25	11
42	FACULD. MERIDIONAL (IMED)	4	11.6	2	23	16	85.6	32	9	121.33	4
43	UNIV. DA AMAZÔNIA (UNAMA)	4	11.75	2.75	26.25	22	60.75	41.25	15.75	111.25	9

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	Program/University	C	DO	LP	PF	FI	PI	DI	TC	PE	I
44	UNIVERSIDADE POSITIVO (UP)	4	13.5	2.5	11	17.25	46.5	90.5	25.75	73.25	13
45	UNIV. SALVADOR (UNIFACS)	4	12	3	9.25	10	34.75	61.5	17.5	73	18
46	UNIV. DE FORTALEZA (UNIFOR)	4	16.25	2.75	29.25	9	73.5	100.75	32.25	122	23
47	UM. METOD. DE PIRACICABA (UNIMEP)	4	13.75	2	1	2.25	113.75	23.75	4.5	87.75	7
48	UNIV. PAULISTA (UNIP)	4	11.25	2	4	8	33.5	34	12	66.25	13
49	UN. SUL DE SANTA CATARINA (UNISUL)	4	12.25	2.5	12.75	10.25	69.75	35.5	13	233.25	11

Source: CAPES (2022e).

Note: The values of variables 2 to 9 refer to the averages of 2013 and 2016. These values are the first and last year of the CAPES 2013-2016 four-year evaluation. Variables 1 and 10 are absolute values, referring to the CAPES Concept and age of the programs.

Legend:
C - Concept	PI – Intelectual production
DO - Professors	DI - Students
LP – Research lines	TC – Completion work
PF – Funded projects	PE – External participation
FI - Funders	I - Ager

The following are the multivariate methods applied in the treatment and analysis of data.

METHOD

The collected data were treated using three methods. One of them was linear regression, using the Ordinary Least Squares Method (OLS) to obtain parameters to establish relationships between the variables that represent the performance achieved by the programs. In order to avoid a common problem in cross-sectional data samples, heteroscedasticity (GUJARATI, 2006), the averages of the four years were calculated, resulting in the values presented in Table 1. To test the first hypothesis of the study (H1), we build the equation:

$$C = \beta_0 + \beta_1\, DO + \beta_2\, LP + \beta_3\, PF + \beta_4\, DI + \beta_5\, TC + \beta_6\, PI + \beta_7\, FN + \beta_8\, PE + \beta_9\, I + \varepsilon \qquad (1)$$

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...where β is a matrix of parameters to be estimated (including the intercept and the slopes), and ε is a vector of residuals or random errors. The dependent and independent variables included in the model are shown in Table 1 (caption).

For the analysis of the coefficients obtained, in addition to the Student's t-test parameters, the values of F and R^2 are observed for each variable. If Fcalculated > Ftabulated, then we conclude that at least one X explains Y. Therefore, we expect to get a p-value less than 10%, 5%, or 1%. The coefficient of determination (R2) varies from $0 < R2 < 1$. A well-adjusted model is considered one with values greater than 0.8; however, this number varies according to the area of knowledge and particularities of the study (GREENE, 2002). ; GUJARATI, 2006).

The Ramsey Reset test tests for specification errors, so the value of F must be significantly reduced. The leading causes for model specification errors are (a) omission of a relevant variable, (b) inclusion of an irrelevant variable, (c) adopting the wrong functional form, and (d) measurement errors. The White test identifies heteroscedasticity, and acceptance of the null hypothesis is desirable, with a probability above 10% (GREENE, 2002; GUJARATI, 2006).

The next stage of the study consisted of analyzing the correlation matrix. Verification was performed using Pearson's Correlation (r), which is the method in which "the correlation measures the direction and degree of the linear relationship between two quantitative variables" (DEVORE, 2006). Pearson's correlation coefficient (r) varies from -1 to 1, and the farther from zero the coefficient, the stronger the relationship (FIGUEIREDO FILHO; JUNIOR, 2010).

There are several rating scales for the strength of relationships. In this study, we adopted the Devore scale (2006), as shown in Figure 2.

Figure 2 CClassification of the relationship strengths between the variables according to the Value of ρ

ρ value	Interpretation	ρ value	Interpretation
0,00 a 0,19	Very weak correlation	0,20 a 0,39	Weak correlation
0,40 a 0,69	Moderate correlation	0,70 a 0,89	Strong correlation
0,90 a 1,00	Very strong correlation		

Source: Devore (2006).

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From the application of the methods explained, we proceed with the presentation of the results found in this research.

Results

This chapter presents each hypothesis tested, the method used, and the results found.

H1: The concept obtained by the PPGAs, which serves as a proxy variable for performance, derives from variables such as the number of permanent professors, lines of research, research projects, student, final work, intellectual production, funders, external participant, and age.

The coefficients found using multiple linear regression, obtained by the Ordinary Least Squares Method (OLS), are shown in Table 2.

Table 2 Explanation of the concept obtained by concept programs 4, 5, 6 and 7, from the independent variables DO, LP, PF, FI, PI, DI, TC, PE, I

Expaining variable	Parameter	Standard deviation	T statistics	ρ-value
Intercept δ	3.17130	0.257830	12.30	5.34e-015
DO	−0.00481673	0.0306198	−0.1573	0.8758
LP	0.134731	0.118922	1.133	0.2642
PF	−0.00560293	0.00584901	−0.9579	0.3440
FI	0.0321957	0.00986662	3.263	0.0023
PI	−0.000922754	0.00254723	−0.3623	0.7191
DI	0.00344660	0.00690075	0.4995	0.6203
TC	0.00144217	0.0148769	0.09694	0.9233
PE	0.00169797	0.00221856	0.7653	0.4487
I	0.0120436	0.00872887	1.380	0.1755

Note: Total observations: 49
$R^2 = 0.572488$ F = 5.802845 or p-value 0.000042.

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After verifying that the R² coefficient reached a median value. It indicates that the model does not have full explanatory power. The Ramsey Reset test presented a p-value of 0.00924294, attesting that the model is not fully adequate. We assume that the inclusion of irrelevant variables affected the model. So, we started testing the variables until we found the best formation. The best arrangement obtained is shown in Table 3.

Table 3 Explanation of the concept obtained by the PPGAs from the variables DO, PF, PI, FN

Explaing variable	Parameter	Standar deviation	T statistics	ρ-value
Intercept δ	3.22916	0.240033	13.45	3.40e-017
DO	0.0545163	0.0171065	3.187	0.0026
PF	−0.00155244	0.00556954	−0.2787	0.7818
PI	−0.00180440	0.00235503	−0.7662	0.4477
FI	0.0365106	0.00931862	3.918	0.0003

Note: Total observations: 49
R^2 = 0.503936   F = 11.17456 or p-valor 2.42e-06.

Considering only the variables that obtained satisfactory parameters according to the t-test as valid, the model with the best arrangement demonstrates that the number of professors and funders are the variables that present the best explanatory relationship for the concept of PPGAs. It means that an increase in a permanent professor implies a 0.05 increase in the concept and that the inclusion of support from a funder implies a 0.03 increase in the PPGA concept. The intercept coefficient is not part of the analysis; however, its estimation is necessary to avoid problems such as the endogeneity of the explanatory variables.

The next step consisted of testing the same variables for the PPGAs indicators according to the concept. After segregating the data, according to the concept obtained in the CAPES 2016 evaluation, we ran a new model only with the 23 PPGAs of concepts 5, 6, and 7. The best set of parameters obtained is presented in Table 4.

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Table 4 Explanation of the concept obtained by the PPGAs from the variables DO, PF, PI

Explaing variable	Parameter	Standar deviation	T statistics	ρ-value
Intercept δ	4.38691	0.266058	16.49	1.03e-012
DO	0.0218182	0.0168668	1.294	0.2113
PF	0.0192568	0.00570559	3.375	0.0032
PI	−0.00201292	0.00280581	−0.7174	0.4818

Note: Total observations: 23
$R^2 = 0.543850$ F = 7.550982 or p-vaue 0.001598

For concept programs 5, 6, and 7, only one variable explains the concept obtained by the programs. It means that the increase in a funded project implies 0.02 in the increase in the concept. The funded projects were the most important elements for obtaining superior concepts in the last evaluation.

Thus, we perceive the influence of variables or evaluation items on the programs' grades. The determining variables for concept programs 4, 5, 6, and 7 were "number of professors" and "number of funders". The determining factor in the programs considered national and international references was the "number of projects financed". It means that all programs that achieved superior concepts (5, 6, and 7) had the projects financed as differentials.

HYPOTHESIS 2 - H2

H2: There is a significant positive correlation between the faculty and all variables referring to the numbers of permanent professors, lines of research, research projects, student, final work, intellectual production, funders, external participant, and age.

In order to test the second hypothesis, we examined the correlations between the study variables, obtaining the coefficients shown in Table 5.

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Table 5 Correlações entre as variáveis referentes aos indicadores dos PPGAs de conceito 4, 5, 6 e 7

Variables	Conc.	Profs.	Res. Lines	Funded Proj.	Funder	Intel. Prod.	Students	Compl. Work	Ext. Partic.	Age
Concept	1	0.52	0.58	0.47	0.58	0.45	0.55	0.51	0.54	0.5
Professors	0.52	1	0.84	0.5	0.22	0.76	0.88	0.78	0.6	0.65
Research lines	0.58	0.84	1	0.54	0.3	0.62	0.8	0.67	0.56	0.62
Funded proj.	0.47	0.5	0.54	1	0.63	0.63	0.49	0.45	0.68	0.37
Funder	0.58	0.22	0.3	0.63	1	0.4	0.24	0.25	0.59	0.18
Intel. Prod.	0.45	0.76	0.62	0.63	0.4	1	0.68	0.58	0.7	0.42
Students	0.55	0.88	0.8	0.49	0.24	0.68	1	0.91	0.54	0.67
Compl. Work.	0.51	0.78	0.67	0.45	0.25	0.58	0.91	1	0.51	0.59
Ext. Particip.	0.54	0.6	0.56	0.68	0.59	0.7	0.54	0.51	1	0.33
Age	0.5	0.65	0.62	0.37	0.18	0.42	0.67	0.59	0.33	1

The number of permanent professors in the programs is the variable with the highest number of high-level positive relationships with the other variables. It has a median to a strong relationship with all variables except "funder". The finding confirms the second hypothesis, which assumes that professors are the most important strategic resource of a PPGA. The results affirm that the PPGAs of concepts 4, 5, 6, and 7 are doing a good management of the teaching staff so that they are productive and generate the desired results by the program.

The variable number of students also showed good levels of correlation with almost all variables except for "funder". It shows a good alignment with the professors, the research lines to which they are linked, and the amount of completed work. In fact, with this last variable, there is a strong relationship. The result demonstrates that programs are paying attention to student management and its articulation with the structure, schedule, and flow of PPGA processes. It is important to note that students have a substantial weight in the program evaluation, and their performance derives 35% of the evaluation grade (CAPES, 2016).

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Next, we evaluated the data from concept programs 5, 6, and 7 to observe new relationships between the complete set and the set of excellence programs (Table 6). In graduate programs, the faculty has great relevance and achieved higher coefficients, especially with the number of students, which resulted in a strong relationship (0.91). However, in the programs of this stratum, the resource that stood out the most was the student body, achieving more consistent relationships than the faculty. Another feature that stood out was the complete works. It means that top-rated programs can align students accurately with the program structure. Therefore, in the upper stratum PPGAs, as important as the professors, are the students and their final works.

Another statistical manipulation of the data was performed to observe the behavior of programs of excellence, those considered as international references (concepts 6 and 7). The coefficients obtained for this stratum of programs are high. The conclusions we draw from the results are varied, but the main ones point out that professors are highly productive. The funded projects are one of the most relevant items, and even this variable and age make up the most important relationships with the concept of the PPGAs.

Although hypothesis 2 was confirmed concerning the whole set of programs (concepts 4, 5, 6, and 7), we continue to observe the behavior of the "faculty" resource. This action was carried out to mitigate the effects of possible outliers in the data, especially those belonging to concept institutions 7, which may lead to violations of the correlation analysis rules (FIGUEIREDO FILHO; JUNIOR, 2010). Thus, we tested the correlations of the programs by stratum. In Table 6, there is a comparison between the different groups of programs focused on relations with the faculty.

Table 6. CComparison on the correlation of the faculty with the other variables, according to the concept of PPGAs

	PPGAs 4	PPGAs 5	PPGAs 7	PPGAs 6 e 7
Concept	0	0	0.75	0.77
Professors	1	1	1	1
Research lines	0.7	0.77	0.92	0.93

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Funded proj.	0.54	-0.1	0.95	0.95
Funder	-0.07	0	0.37	0.12
Intel. Prod.	0.75	0.59	0.98	0.95
Students	0.77	0.87	0.99	0.95
Compl. Work.	0.56	0.84	0.99	0.93
Ext. Particip.	0.26	0.44	0.96	0.94
Age	0.61	0.6	0.62	0.63

In all strata of programs, there is an alignment that varies from strong to very strong between the size of the faculty, student body, and lines of research. There is also good alignment between the final works and the intellectual production in all PPGAs, except for concepts 4 and 5, which have a moderate relationship with these variables. This means that most of the Grade 4 PPGAs fail to maintain satisfactory efficiency between the faculty and the final papers. On the other hand, part of the concept 5 PPGAs are not as efficient in keeping their faculty productive (intellectual production) as the PPGAs from other strata.

We did not verify the relationship between the professors and the concept of the program for PPGAs of concepts 4 and 5. Only the professors of PPGAs of excellence have a strong relationship with the concept obtained by the program. It is possible to notice that the programs of all strata are paying particular attention to the structure recommended by CAPES. The relationships between the professors and the number of research lines resulted in intensities ranging from firm to very strong. Finally, in the excellence programs (6 and 7), strong correlations are observed in multiple variables, leading us to propose the third hypothesis.

HYPOTHESIS 3 – H3

H3: Higher-graded PPGAs, which supposedly reflect superior performance, manage their resources more efficiently, especially the permanent faculty, which tends to produce the most important results for the program.

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The third hypothesis was tested by calculating the ratio between all assessment items (variables included in the study) and faculty. The ratio was used to evaluate the efficiency of the program's results concerning the permanent faculty size. All variables are performance measures that can be evaluated in terms of the efficiency and effectiveness of their management. This relationship includes the organization, structure, and management of the faculty to generate the expected results according to the plan, which, except for the concept and age, are nothing more than the resources managed by the PPGAs.

Table 7 was created to organize the data, given the high amount of information from the 49 programs, which highlights the 10 PPGAs that obtained the highest scores in each item. The best indicators of the proportion of the faculty to the achieved concept were obtained by programs from private institutions, including community ones. Eight of the 10 PPGAs that achieved better results in "completion of works", such as theses and dissertations, eight belong to private institutions. In addition, eight of the ten most efficient intuitions in the distribution of students among its faculty are private. The public institutions that stood out in the management of students are UFRJ, USP, and UFRN.

Most institutions with funded projects, in proportion to the faculty, are public (70%), including the first three. It may indicate that the PPGAs of these institutions have identified good opportunities to support research. On the other hand, it may be that funding agencies tend to contemplate a more significant number of projects by researchers from public institutions.

Table 7 PPGAs more efficient in terms of the results obtained by the faculty

	Concept	Proportion	Funded Projects	Proportion	Funder	Proportion	Intllectual Production	Proportion	Students	Proportion	Completion Works	Proportion
1	UNISINOS	0.428	UFV	5.535	UNISINOS	3.75	UFSM	12.03	FUMEC	7.089	FUMEC	3.98
2	ESPM	0.416	UDESC	4.296	UDESC	2.333	UNINOVE	10.56	PUC/PR	7.050	FUCAPE	3.274
3	FURB	0.392	UFSM	3.534	FGV/RJ	2.188	UCS	9.017	UP	6.703	PUC/PR	2.372
4	FEI	0.384	UNIVALI	3.358	UNIVAL	1.886	USP/RP	8.699	UFRN	6.68	UPM	2.257
5	UNIVALI	0.377	UFLA	3.067	UNAMA	1.872	UNIMEP	8.272	UNISINOS	6.464	UFRJ	2.252

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6	PUC/MG	0.370	UECE	3	UNIGRANRIO	1.812	IMED	7.342	UNIFOR	6.2	UNISINOS	2
7	UNIP	0.355	FGV/SP	2.861	UPM	1.714	UFSC	7.18	UPM	6.171	UNIFOR	1.984
8	UCS	0.350	PUC/MG	2.740	UFLA	1.702	UFMG	7.115	UNIVALI	6.169	UP	1.907
9	IMED	0.342	UFPR	2.628	UFPR	1.628	USP	7.011	UFRJ	5.471	FURB	1.784
10	UNAMA	0.340	UFPB/JP	2.609	UFSM	1.593	USCS	7	UNIFACS	5.125	USP	1.675

As for intellectual production, considering the ten programs that best led their faculty, intellectual production can be seen as a balance between PPGAs from public and private institutions. The set of results demonstrates that there is greater productivity of professors from private institutions, and the reason may be linked to both the instability of the employment relationship and the dynamics of the functioning of private organizations. These institutions generally have results-oriented management and clear goals for achieving objectives, which can lead the faculty to accept a more significant number of students for guidance, introducing them to a more intense, productive flow. Group management and engagement around strategic objectives can facilitate the achievement of superior concepts.

The PPGAs that stood out for the number of times they occupied a position among the ten most efficient programs due to the size of the permanent faculty are: UNISINOS (4), UNIVALI (4), UPM (3), UFSM (3) , USP (2), PUC/PR (2), UDESC (2), UFRJ (2), UFPR (2), UFLA (2), UP (2), UNIFOR (2) and FUMEC (2). Thus, regarding the third hypothesis, it is worth noting that there is diversity regarding the concepts of the programs that stood out in more than one evaluation item.

DISCUSSION

The results can affirm that there is a capacity to articulate a good part of the programs regarding managing their most valuable resources, the professors. However, the students also occupy a prominent position, as observed in the correlations found for the PPGAs of top concept. Given the results, we found that good resource management is not limited to programs of excellence. However, there is a general effort to develop mechanisms for involving faculty and students in the program's goals. There is evidence of the collective commitment to producing results since the CAPES assessment considers the products obtained by the permanent body as a whole and not just by individual productions.

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Managing the entire set of human resources is challenging, and the more significant, the larger the group. Human resources represent professionals' knowledge, experience, and intellectual capacity (BARNEY; HESTERLY, 2011). Students are also part of this set of vital resources, which generate essential competencies (PRAHALAD; HAMEL, 1990). To manage this second cluster of resources, it is necessary to balance the conduction of the entire group, as the final indicator results from the average performance and trajectory of the group of students in the program. CAPES (2016) evaluates the production of those enrolled and graduates regarding authorship in the scientific production of books, congress proceedings, or journals recognized by Qualis CAPES, also evaluating the time elapsed to complete the course and the quality of the final works.

The number of students can be strategic for a program, given that the composition of a smaller student body allows the application of stricter selection criteria and candidates with a more academic profile. On the other hand, a larger student body increases the chances of higher production. However, it increases the risk of not completing within the maximum time allowed or incurring low-quality production. However, for for-profit college PPGAs, quantity is a relevant factor (ALMEIDA; SANT'ANNA, LIMA, 2021). Furthermore, the programs can access resources, such as PROSUP (CAPES, 2022a) and PROAP (CAPES, 2022b), depending on the number of students. It was observed that the size of the faculty is decisive for the size of the student body. Also, the PPGAs have maintained a good balance in the distribution of students among research lines and the permanent teaching staff.

External members also achieved relationships that ranged from moderate, in PPGAs 5, 6, and 7, to very strong, in PPGAs 6 and 7. Regarding these actors, in the social insertion category, the evaluation items call attention to the inter-institutional articulation, more precisely regarding "integration and cooperation with other research and professional development programs and centers". Indeed, the programs assimilated this guideline well and began to work on forming networks. It occurred through partnerships for scientific production and submission of projects to funding bodies, the inclusion of external members in research lines, invitation to teach disciplines, and participation in events, in addition to what is already an institutionalized procedure, the participation of external members on defense benches.

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The product of the combined effort of professors and students is intellectual production, which has one of the most significant weights in the CAPES evaluation criteria. Based on the results observed in the study, all resources are mobilized for intellectual production. From an institutional point of view, the set of resources of PPGAs is meticulously organized to comply with the regulations of the regulatory body. This strategically organized arrangement makes it possible to achieve scientific production goals, guaranteeing superior performance and raising the program's concept. In this way, it is possible to outline the superior performance framework supported by the surveyed PPGAs, as shown in Figure 3.

Figure 3 Strategic framework for superior performance
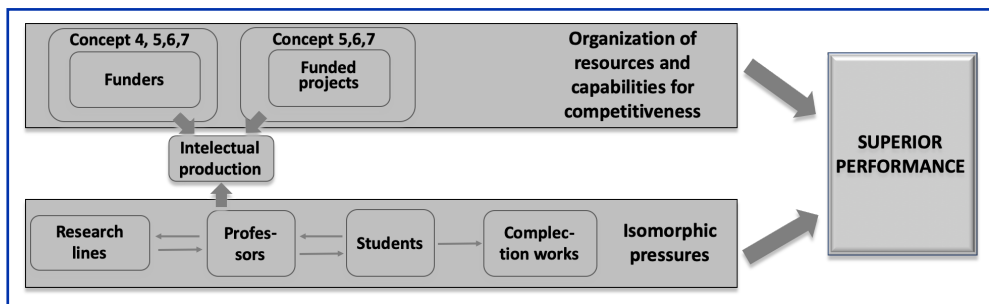
Managing the resources of a PPGA is challenging, mainly because all the results generated are highly dependent on human resources. Each employee's individual skills add value to the organization and can be understood as its intellectual capital (ROMÁN; VARGAS; LA FUENTE, 2021). However, freedom regarding the way of working, even for more experienced researchers, must be associated with the institutional norms and pressures of the field. It is an externality of regulated organizational fields and can lead agents to isomorphic behaviors, mirroring themselves in legitimate structures or sharing information perceived as adequate (MARTÍNEZ-FERRERO; GARCÍA-SÁNCHEZ, 2017; KEZAR; BERNSTEIN-SIERRA, 2019; ANAFINOVA, 2020).

The performance-based financing system (SFBD) regulation can induce organizations to behave in two ways, the first for adequacy and continuous quality improvement and the second for competition. One cannot lose sight of the fact that the best positions will be achieved by the institutions that manage to outperform the others in at least one evaluative aspect and, consequently, receive the largest share

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of funding. Internationalization is one of the efforts undertaken in the search for dif-ferentiation (ALMEIDA; SANT'ANNA; LIMA, 2021).

Even if some institutions do not have objectives aimed at competitiveness, such as public and community institutions, they are induced to enter the dynamics of the organizational field. In this way, they impose a similar work pace and func-tioning to other institutions. Otherwise, they may risk obtaining the lowest positions in the ranking, compromising their credibility and reputation. In the most extreme cases, programs can reach the point of being de-accredited and/or prevented from continuing to operate.

Active organizations tend to internalize evaluative norms as intrinsic to their way of functioning. Thus, reactive organizations can awaken to the need to reorga-nize their resources based on the evaluation feedback. Also, proactive organiza-tions can anticipate regulations and direct their entire resources towards broad and comprehensive goals without losing sight of alignment with the evaluation system. The possibilities of success or failure derive from how the organization assimilates, interprets, and responds to pre-established rules and from the ability to articulate its resources and capabilities.

Conclusion

The objective of this study was to analyze the quantitative indicators of the gradu-ate programs in Administration (PPGAs) in the evaluation quadrennium from 2013 to 2016 to identify the programs' strategic behavior. The results found showed that two of the hypotheses raised could be confirmed. In contrast, in the third hypothe-sis, it was possible to identify a high level of efficiency among the results produced by the professors of PPGAs from all strata and not only from the excellence pro-grams, as expected.

The productivity of professors of PPGAs from private institutions stood out among the ten most efficient programs in the evaluated items, making it evident that the management of PPGAs belonging to private HEIs is focused on results. At the same time, these programs manage to engage their human resources in achieving organizational goals and objectives. Furthermore, several PPGAs of public institu-

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tions with productive professors were identified, especially in terms of "funded projects" and "intellectual production". Of the 59 PPGAs surveyed, more than 50% (33) stood out among the ten most efficient PPGAs in at least one of the surveyed items, with 13 outstanding in more than one item. These findings attest that the PPGAs comply with CAPES recommendations regarding the organization, allocation of resources, and structural balance of the programs.

Based on the study's findings, it was possible to formulate the strategic performance model to reach a superior concept in which intellectual production is highlighted, which, in turn, is dependent on funded projects and funders of various activities carried out by the programs. It means that scientific research of quality and impact is dependent on funding. In the period studied, the sources of research funding were abundant, which benefited the programs that managed to mobilize their human resources to take advantage of them. It ended up harming the programs that had more numerous faculty or faced problems such as the ability to adapt to current changes, as they were organized based on more rigid and bureaucratic structures.

Criticism of an evaluation system that is also responsible for funding a large part of scientific production involves the stimulation of competitiveness. It means that it is not enough for programs to be references in the area. However, it is necessary to follow the evolution of the others, under the penalty of losing positions in the ranking, which can be reflected in the image before society and in the ability to raise funds. Despite the criticisms, in recent years, as a result of the improvement of CAPES' evaluation system, the Administration area had a qualitative leap. Many programs realized the need to reinvent themselves, and new entrants began to understand the need to learn the ways to continuous improvement and mobilize efforts, especially for internationalization initiatives, which was the great incentive of the evaluation body in the period studied.

It is possible to affirm that the evaluated programs follow a behavioral pattern to generate the results valued in the evaluation, characteristic of isomorphic pressures. However, some correlations indicated that there are PPGAs that adopt differentiation strategies or organize their resources for competitiveness. Some are efficient and effective, optimizing the results with the available resources. Others lose their effectiveness as they fail to generate the results that would have potential if compared to other programs with equivalent structures. In this way, it was possible

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to verify that, even with all the programs in an equally regulated environment, the articulated management of resources and capacities allows for differentiation in the results achieved.

With this research, we seek to contribute to higher education in Brazil and to the discussion around understanding the effects of CAPES evaluation on graduate programs (PPG). Through the results, we seek to elucidate the questions that made the difference in evaluating the last four-year period. We also hope that the findings can help PPGs in decision-making and allow a clearer understanding of the performance of other programs in the four-year period between 2013 and 2016. Finally, we hope this study can be consulted in future investigations in the area, fulfilling the social function of scientific research.

The main limitation of this study is related to the database available on the Sucupira Platform. In some cases, at the data collection stage, the first impression was that some programs did not fill in the "Coleta CAPES" forms correctly. Hence, it was possible to observe that large and traditional programs presented results below the average of too much. It is assumed that a study on the management of information and communication in PPGAs, mainly about the filling and transmission of data on the Sucupira Platform, can clarify facts related to this issue. We also recommend qualitative studies to understand the behavior of programs that did not follow the performance trend of the others, especially in terms of faculty productivity. In the same way, we suggest research on the individual productivity of the professors of the permanent body of each program, thus being able to identify the balance between the professors and the productive concentration. Finally, studies on the performance obtained in the CAPES assessment and the relationship with the strategic planning and self-assessment proposed by the PPGAs are indicated.

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