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ORGANIZATIONAL AMBIDEXTERITY IN HIGHER EDUCATION INSTITUTIONS: PROPOSITION OF EVOLUTIVE STAGES OF AMBIDEXTERITY

AMBIDESTRALIDADE ORGANIZACIONAL EM INSTITUIÇÕES DE ENSINO SUPERIOR: PROPOSIÇÃO DE ESTÁGIOS EVOLUTIVOS DE AMBIDESTRIA

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ABSTRACT

Purpose – The general objective of the research was to propose evolutionary stages of organizational ambidexterity.
Design/methodology/approach – The research methodology was classified as an exploratory and descriptive study, whose method of data collection was through a questionnaire, the sample was census by adherence, from a population of 110 higher education institutions (HEI), participating in the study 79 cases, distributed throughout the Brazilian territory.
Findings – It is noteworthy that HEI are part of the same economic group, and even though 96% of the cases were classified as ambidextrous organizations, there was a great dispersion between them, suggesting some heterogeneity of the investigated cases.
Originality – With the findings, the proposition of the existence of different levels of ambidexterity arose. This phenomenon, in a preliminary way, was labeled as the Degree of Maturity of Ambidextrous Organizational

Keywords - Ambidextrous Organizations, Organizational Ambidexterity, Private Higher Education Institutions.

RESUMO

Objetivo – O objetivo geral da pesquisa foi propor estágios evolutivos da ambidestralidade organizacional.
Design/Metodologia/abordagem – A metodologia da pesquisa é classificada como um estudo exploratório e descritivo, cujo método de coleta de dados foi através de questionário, a amostra foi censitária por adesão, de uma população de 110 instituições de ensino superior (IES), participaram da pesquisa 79 instituições de ensino, distribuídos em todo território brasileiro e os respondentes da pesquisa foram os reitores ou diretores gerais.
Resultados – Destaca-se que as IES fazem parte do mesmo grupo econômico, e mesmo que 96% dos casos foram classificados como organizações ambidestras e houve uma grande dispersão entre elas, sugerindo heterogeneidade entre os casos investigados.
Originalidade – Com os achados, levantou-se a proposição da existência de diferentes níveis da ambidestralidade, a esse fenômeno, de forma preliminar, foi chamado de Grau de Maturidade da Ambidestralidade Organizacional.

Palavras-chave - Organizações Ambidestras, Ambidestralidade Organizacional, Instituições de Ensino Superior Privadas.

1 INTRODUCTION

Innovation can be understood as the accumulation of technology that evolves from the current state, allowing the organization to reach healthy profit margins (SCHUMPETER, 1985). For a company to be classified as an innovator, it can carry out exploitation actions (incremental innovation), aimed at improving the existing production system, looking for increasing efficiency, and/or exploration actions (radical innovation), aimed at the exploration of new products, services, markets and technologies (MARCH, 1991).

But how to compete in an environment where competing companies are also innovative? The challenge is even greater. One possibility for managers is to develop an excellent innovation process, to simultaneously conduct several innovation projects. The balance between intensity (number of projects) of innovations characterized as exploitation and exploration allows the company to enjoy a prominent position in relation to its competitors. In this sense, organizations that achieve this balance are defined as ambidextrous organizations (MARCH, 1991; TUSHMAN & O'REILLY III, 1996; O'REILLY & TUSCHMAN, 2004).

It is important to highlight that the more mature the industry in which the company is inserted, the greater the competition and complexity of it (PORTER, 1996). The main evidence for realizing that the industry is mature is the finding that companies no longer grow organically, that is, growth does not happen by expanding the market, gaining new customers and prospecting for new units, but through the acquisition or merger of companies, this action is known as non-organic growth, signaling the unequivocal maturity of the industry.

In Brazil, in recent years (2008-2019), there have been several mergers and acquisitions in the education sector. A survey published by KPMG Brasil indicates that the number of M&A carried out in the education sector between the years 2008 and the first quarter of 2019 totaled 294 M&A transactions, and 43% of executives in this industry intend to acquire another institution in the next 12 months (MOURA, 2019).

Therefore, among the managers who work or will work in this industry, the data suggest that it will be even more competitive and complex, constantly needing deep reflections on its management model, including administration of resources and its organizational skills, especially its capacity of innovation.

Thus, this paper started with the problem of the unknown degree of ambidexterity in pri-

vate HEI, aiming, thus, to propose evolutionary stages of ambidexterity in these organizations.

As for the methodology, the research was classified as an exploratory study, whose method of data collection was through a questionnaire. The researcher's ability to produce effects on variables was classified *as ex post facto*; the time dimension was classified as transversal; the research environment was the field; and the individuals' routine remained unchanged, being classified as a real routine. The sample was census by adherence, with 79 HEI distributed throughout the national territory. Respondents to the survey were deans (in the case of universities or university centers) and general directors (for colleges). To assess the degree of ambidexterity, the scale developed by Lubatkin et al. (2006) was adopted.

2 ORGANIZATIONAL AMBIDEXTERITY

In 1963, against the background of limited theories of rationality, there were debates about the balance of exploration and exploitation activities, emphasizing the role of goals (Cyert and March, 1963). But it was in 1991 that March disseminated the concept of "organizational ambidexterity": at the time, he signaled a concern on the part of researchers to develop studies that investigated an **organization's adaptive process**, emphasizing the various and new possibilities (exploration) of investment, with the clear and old certainties (exploitation) of resource consumption units.

Anchored in studies on organizational learning, March (1991) presented that an important dilemma for managers refers to the allocation of resources and efforts in exploration and exploitation actions, which can generate an imbalance, causing some negative impacts on the firm's management.

For Tushman and O'Reilly III (1996), the dilemma to be overcome touches the ability of managers and organizations to identify and overcome short and long-term needs. For this, according to Tushman and O'Reilly III (1996, p. 24), it is necessary that "managers periodically destroy what was created, in order to reconstruct a new organization more suitable for the next wave of competition or technology".

According to March (1991), **ambidextrous organizations** are pragmatically those that manage to deliberately maintain and nurture a balance between exploitation and exploration actions, which is why they receive such designation.

Popadiuk (2015, p. 176) shows that ambidexterity can be contextual or structural, being that:

- **Contextual**: refers to the methods, practices and processes used by the organization to achieve ambidexterity. Gibson and Brikinshaw (2004) define contextual ambidexterity as the behavioral capacity to simultaneously demonstrate alignment and adaptability between business units.
- **Structural**: refers to the organizational form or design that contains separate structures for exploration, exploitation and also competencies, systems, incentives, processes and distinct cultures for each organizational unit (BENNER; TUSHMAN, 2003)

To highlight the main characteristics of the two approaches described above, a comparative table adapted by Popadiuk (2015, p. 73) is presented in Box 1.

Box 1 - Comparison between structural and contextual ambidexterity

	structural ambidexterity	contextual ambidexterity
How is ambidexterity achieved?	The focus on alignment and the adaptability of activities are done separately in the units or teams.	Employees divide their time between the focus on alignment and the skills of adapting activities.
Where are decisions made about the division between alignment and adaptability?	At the top of the organization.	On the front line: sales, supervisors and office workers.
Top management role	Define the structure and trade-off between alignment and adaptability	Develop the organizational context in which individuals act.
Nature of the roles	Relatively well defined.	Relatively flexible.
Competence of employees	More experts.	More generalists.

Source: Popadiuk (2015, p. 73) adapted from Gibson & Birkinshaw (2004).

Tushman and O'Reilly III (2004) suggest a series of actions for an organization to achieve ambidexterity. Box 2 summarizes each of the strategies proposed by the authors:

Box 2 - Ambidextrous leadership

alignment	exploitation business	exploration business
strategic intent	cost, profit	innovation, growth
critical task	operations, efficiency, incremental innovation	adaptability, new products, revolutionary innovation,
competence	operational	entrepreneur
structure	formal, mechanistic	adaptable
controls, rewards	margins, productivity	goals and growth
culture	efficiency, low risk, quality, customers	take risks, speed, flexibility, experimentation,
leadership role	top-down, authoritarian	visionary, engaging

Source: Tushman & O'Reilly III (2004, p. 6)

Next, the main results of two different empirical pieces of research that used the same constructs and authors will be presented.

2.1 Empirical pieces of research on organizational ambidexterity

The first work to be addressed is by authors Nicholas Tay (University of San Francisco) and Robert Lusch (University of Arizona), entitled Agent-Based Modeling of Ambidextrous Organizations: Virtualizing Competitive Strategy, published by IEEE Intelligent Systems. In its genesis, the research used the definitions of ambidexterity defended by March and Tushman & O'Reilly (the same authors used in this research). An important element used by researchers refers to the time horizon for analysis. Using agent-based modeling (ABM), the authors built a virtual competitive market, and their research hypotheses were:

a) Stable environment, in which organizations with a high level of exploitation and low level of exploration will perform better over time; and

b) Turbulent environments, in which organizations with a high level of exploitation and a moderate or high level of exploration will perform better over time.

Using the sophisticated ABM data analysis technique in their tests, the authors pointed out that even if an organization is ambidextrous in a turbulent market, it will not have a competitive advantage; however, organizations like this have a more evolved learning ability than other companies. Once controlled the variables as the authors proposed, ambidextrous organizations, through their exploration and exploitation skills, learn 20% faster than others. Another important item highlighted in this research was the indication of researches addressing the theme of ambidexterity with the use of ABM in service companies.

The second work, by authors Paul Bierly and Paula Daly, both from Baylor University, entitled Alternative Knowledge Strategies, Competitive Environment and Organizational Performance in Small Manufacturing Firms, published in 2007 in the journal Entrepreneurship Theory and Practice, examined the relationship between strategic knowledge, involving exploration and exploitation actions with performance in small industries, including moderation variables involving the external environment.

The main hypothesis of the research sought to prove that exploration and exploitation actions are complementary constructs, with the level of exploration being positively correlated with the level of exploitation. The research results show that the relationship between exploration and performance is linear and positive, and the relationship between exploitation and performance is concave. Furthermore, they indicate that external environmental factors exercise moderation between knowledge and performance strategy, specifically when it comes to the exploration ability in high-tech industries, and also that exploitation actions in high-tech environments were associated with greater performance.

Regarding limitations, the researchers indicate that analyzing performance over a period of just 3 years is not enough to capture the long-term effects of exploration actions. The authors also point out that the results provide a unique and valuable insight into the small manufacturers participating in the research, making it impossible to generalize the study. They also emphasize that the replication of research in service providers would make it possible to understand a much more complex sector of companies, especially small ones.

It is noteworthy that, in both works, there is a strong indication for conducting research on organizational ambidexterity in service providers. In the present research, the investigated companies are all service providers. More details on the population and sample are presented in the next topic.

3 RESEARCH METHODOLOGY

To facilitate the understanding of the methodology adopted in this work, the research planning prepared by Cooper and Shindler (2003) was adopted. When dealing with the degree of crystallization of the research question, the study is classified as exploratory. The researcher's power to produce effects on variables was classified with an ex-post-facto study. The data collection method was based on interrogation / communication, and a questionnaire was used as data collection instrument. As for the purpose of the study, this one is classified as descriptive research. The classification on the dimension of time is considered transversal. As for the nature of the research, it is classified as a quantitative study. The research environment is defined as a field environment. Finally, it should be noted that the survey did not change the daily routines of the companies investigated.

3.1 Sample, subject and data collection procedure

The research population totaled 110 institutions, of which 79 participated in the research: an awareness rate of 71%. As the data collection instrument was sent, via electronic form, to all directors or deans (top managers) of the HEI belonging to a certain educational group, the sample is characterized as census by adherence. The survey was available for responses from 06/27/2016 to 07/12/2016.

Table 1 presents in an analytical way (by regional) the number of participants (N), the arithmetic mean and the sum of a) courses in operation, b) administrative technicians, c) teachers and d) students enrolled in undergraduate courses. These data are secondary, sent by the company and the position refers to June 2016. As the company manages the result of its HEI by regional, this same classification was maintained for the presentation of the research results.

Table 1 - Operational characteristics of the investigated HEI

regional		courses in operation	technical-administrative staff	teaching staff informed in the 2015 census	undergraduate students
CO *("Centro Oeste" / Midwest)*	n	21	21	21	21
	mean	12.66	142.71	13,229.61	127.19
	sum	266.00	2,997.00	277,822.0	2,671.00
NN *("Norte e Nordeste" / North & Northeast)*	n	11	11	11	11
	mean	10.90	156.72	4,005.18	110.81
	sum	120.00	1,724.00	44,057.00	1,219.00
SE *("Sudeste" / Southeast)*	n	9	9	9	9
	mean	16.00	85.77	6,416.00	172.33
	sum	144.00	772.00	57,744.0	1,551.00
SP1 *(Sao Paulo 1)*	n	11	11	11	11
	mean	30.27	201.27	13,039.72	234.63
	sum	333.00	2,214.00	14,3437.0	2,581.00
SP2 *(Sao Paulo 2)*	n	18	18	18	18
	mean	13.889	70.72	5,518.38	106.88
	sum	250.00	1,273.00	99,331.00	1,924.00
SUL *("Sul" / South)*	n	9	9	9	9
	mean	11.22	44,66	3,342.11	80.88
	sum	101.00	402.00	30,079.00	728.00
total	n	79	79	79	79
	mean	15.36	118.75	8,259.11	135.11
	sum	1,214.00	9,382.00	652,470.00	10,674.00

Source: own authorship (2018)

In the questionnaire used in this research, there were closed, multiple-choice questions. The data collection instrument used was divided into 4 stages: a) characterization of the manager, b) characterization of the HEI, c) institution's ability to ambidexterity and, finally, d) management of business resources. However, the intent of this paper is to focus the results of items "a" and "c".

3.2 Measurement scale and data analysis technique

The scale adopted to measure the degree of ambidexterity of the organizations investigated in this research was originally developed by Lubatkin et al. (2006). The choice of this scale is justified both by its depth in the theoretical perspective and by its adaptability from the empirical perspective. This scale was originally published in the Journal of Management, in October 2006, in the work entitled Ambidexterity and Performance in Small-to-Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration.

In a practical way, the respondents assessed their company's effort in the last 3 years, and using a five-point Likert scale, ranging from (1) very small, (2) small, (3) medium, (4) large and (5) very large. It is noteworthy that this scale has already been used in several Brazilian studies, such as Scandelari and Cunha (2013), Soares et al. (2017) and Soares et al. (2018).

It is noteworthy that each variable and each term used in the questions was meticulously analyzed by the vice-presidents of the institutions, aiming to verify the level of clarity of the questions investigated. The questionnaire followed up on a preliminary basis, evaluated by specialists in HEI management and by researchers in innovation. Afterward, some pre-tests were carried out with other researchers, HEI managers and two vice-presidents of the investigated company, which made it possible, after several adjustments, to obtain the final version. Box 3 presents the variables used in the research regarding the organizational ambidexterity construct.

Box 3 - Organizational ambidexterity

factor	code	variable
Exploration actions	1.1	It proceeds to search for technological solutions thinking "out of the box", that is, search for solutions outside the company's limits, researching different technologies from the current ones.
	1.2	It explains the company's performance due to the exploration of innovative technologies, that is, it bases its success on its ability to explore new technologies.
	1.3	Focus on creating new products and/or services.
	1.4	It seeks creative and differentiated ways to satisfy the needs of its students.
	1.5	It uses new products to operate in new markets.
	1.6	It uses new services to operate in new markets.
	1.7	It uses innovation to satisfy the needs of its students.
Exploitation actions	2.1	It seeks to gradually improve the quality of its products and services.
	2.2	It seeks to gradually reduce the costs of its products and services.
	2.3	It seeks to gradually increase the degree of reliability of its products and services.
	2.4	It seeks to increase the levels of automation in its operations.
	2.5	It frequently researches the satisfaction of current students.
	2.6	It develops its product or service offerings, carefully observing the characteristics of current students.
	2.7	It seeks to strengthen and deepen relations with its current students.

Source: Adapted from Lubatkin et al. (2006).

For data analysis, SPSS (Statistical Package for the Social Sciences) software in its 20th version was adopted. The statistical techniques performed were descriptive statistics and cluster analysis. Regarding cluster analysis, it is important to highlight that it aims to group cases according to some pattern or similarity established by the researcher. In this sense, the technique contributed as

a classification method for the elaboration of taxonomy (Cooper & Schindler, 2003)

4. PRESENTATION AND DATA ANALYSIS

Table 2 shows the total population (by Brazilian region), the total number of respondents, followed by the percentage that respondents correspond to in relation to the population investigated by region.

Table 2 - Population and sampling

Regional	Total of HEI	HEI participants	% of respondents
SUL	14	9	64.29%
SP1	13	11	84.62%
SP2	21	18	85.71%
SE	19	9	47.37%
CO	28	21	75.00%
NN	15	11	73.33%
sum	**110**	**79**	**71.82%**

Source: Own authorship.

Regarding the population and the sample, it is evident that there was a strong adherence of respondents to the questionnaire. This is due to the company's institutional support for research. The region with the highest participation was SP2, totaling an awareness rate of 85.71%, while the region with the lowest value was the South region, with 64.29%.

4.1 Characteristics of managers

When investigating the sex of managers that answered the survey, it was noted that 63.3% of HEI investigated are managed by men, while 36.7% are run by women. When analyzing the data by regional, the regional SP1 stands out as the regional with the highest number of men in management (90.9%), and the regional SE presents itself as the regional with the highest participation of women in command (66.7%).

Regarding the **age group** of the respondents, it is possible to note that in the regionals CO (47.6%), NN (63.6%), SE (66.7%) and SUL (55.6%), managers are among 36 and 44 years old. In the regional SP1, 54.5% of managers are between 45 and 54 years old. Regional SP2 (16.7%) and SP1 (36.4%) are the ones with more managers over 55 years old.

As for the **education** of managers, it is possible to note that respondents with postgraduate Lato Sensu (40.5%) and Master's degrees (48.1%), together, add up to more than 88% of the managerial staff. Of the total, only 8% are doctors. When investigating the scientific background of managers, a greater concentration is noted in Human Sciences (38%), Applied Social Sciences (32.9%) and Engineering (8%). Still, it is noteworthy that just over 5% of HEI managers have dual degrees.

Regarding the **experience** of each manager in higher education, 54.4% of respondents have worked for 11 to 20 years; of these, a large portion (66.7%) operates in units in the SUL regional. Another highlight refers to the regional CO, which has the shortest operating time among all the regional ones.

When investigating **working time for the company**, it is noted that 73% of managers work

for up to 10 years at the company. The regional that has the managers with the least time in the company is the SUL one. It should be noted that the investigated HEI, together, gather a total 652,470 students, which are distributed, in decreasing order, as follows: 1st Regional CO (43%); 2nd Regional SP1 (22%); 3rd Regional SP2 (15%); 4th Regional SE (9%); 5th Regional NN (7%); 6th Regional SUL (5%).

4.2 Degrees of exploration and exploitation

This section presents the level of exploration and exploitation of the HEI participating in the research. Initially, the averages are presented, then the HEI are classified as a) non-innovative, b) HEI with a high level of exploration, c) HEI with a high level of exploitation and, finally, d) ambidextrous HEI. In turn, Tables 3 and 4 present the averages by regional in an analytical way.

Table 3 - Exploration level by regional

As for the actions of your unit, related to the RESEARCH and DEVELOPMENT OF NEW TECHNOLOGIES, in the last 3 years, how do you interpret that your unit (HEI) has behaved in:							
Regional	**1.1 Search for technological solutions thinking "out of the box", that is, search for solutions outside the company's limits, researching technologies different from current ones**	**1.2 Explains the company's performance in terms of exploring innovative technologies, that is, it bases its success on its ability to explore new technologies**	**1.3 Focus on creating new products and/or services**	**1.4 Search for creative and differentiated ways to satisfy the needs of its students**	**1.5 Uses new products to operate in new markets**	**1.6 Uses new services to operate in new markets**	**1.7 Use innovation to meet the needs of its students**
CO	3.95	4.19	4.19	4.24	3.90	3.86	4.00
NN	4.00	3.82	3.36	4.00	3.82	4.09	4.18
SE	4.22	4.33	4.56	4.11	3.89	3.78	4.00
SP1	3.73	3.64	3.73	4.09	3.64	3.64	3.82
SP2	4.11	4.17	4.39	4.44	4.06	4.11	4.44
SUL	3.67	3.89	3.56	4.44	3.67	3.78	4.22
overall average	**3.96**	**4.04**	**4.03**	**4.24**	**3.86**	**3.90**	**4.13**

Source: Own authorship (2018).

Table 4 - Exploitation level by regional

As for the actions of your unit, related to IMPROVEMENT and BETTER USE OF CURRENT TECHNOLOGIES, in the last 3 years, how do you interpret that your unit (HEI) has behaved in:							
Regional	**2.1 Seeks to gradually improve the quality of its products and services**	**2.2 Seeks to gradually reduce the costs of its products and services**	**2.3 Seeks to gradually increase the degree of reliability of its products and services**	**2.4 Seeks to increase the levels of automation in its operations**	**2.5 Frequently researches the satisfaction of current students**	**2.6 Develops its product or service offerings, carefully observing the characteristics of its current students**	**2.7 Seeks to strengthen and deepen relations with its current students**
CO	4.10	4.33	4.00	3.90	3.38	4.10	3.71
NN	4.09	4.82	4.45	4.00	4.18	3.73	3.64
SE	4.33	4.89	4.33	4.22	3.89	3.89	4.00
SP1	4.18	3.82	3.91	3.82	3.55	3.73	4.00
SP2	4.28	4.33	4.22	4.06	4.17	3.78	4.06
SUL	4.56	4.67	4.67	4.11	4.33	4.22	4.33
overall average	**4.23**	**4.43**	**4.22**	**4.00**	**3.86**	**3.91**	**3.92**

Source: Own authorship (2018).

When analyzing the results of variable **1.1**, it is possible to notice that the regional SE has a value higher than 6.57% of the general average, which is 3.96. It is also noteworthy that the regional SUL obtained the lowest average, totaling 3.67 points, that is, 7.45% below the general average. To a lesser extent (-5.93%), the same happens with the regional SP1. Then, observing the general average, it is possible to see that managers are looking for technological solutions outside the company's limits.

In variable **1.2**, an average of 4.04 points was obtained, that is, 2.02% above the average of variable 15.1. In this variable, HEI located in the SE region remain with the highest average, being 7.31% higher than the general average. In this analysis, a data that draws attention refers to the

average of the regional SP1, which totals 3.64 points, 9.95% lower than the general average. When dealing with the general average, it is possible to state that the investigated managers explain much of their performance due to the exploitation of innovative technologies.

When checking the data for variable **1.3**, it is possible to note, through the general average (4.03 points), that managers pay great attention to the creation of new products or services. However, it should be noted that there is a difference of -16.44% in the average of the regional NN compared to the general average. Regarding this concept, this is the biggest difference found. In contrast, the regional SE and SP2 have averages higher than the general average, being 13.17% and 9.03%, respectively.

The variable that obtained the highest average of this construct is **1.4**, indicating that managers, in terms of exploration actions, channel more energy to creatively meet the needs of their students. The averages of all regions are higher than 4 points, but the regional SP2 and SUL have an average of 4.44 points, being 4.81% higher than the general average.

Variables **1.5** and **1.6** have similar averages and are the lowest averages of this concept, totaling 3.86 and 3.90 points, respectively. In both variables, the regional SP1 has the lowest averages (3.64 points), and the regional SP2 the highest, with the overall average of variable 1.5 being 5.05% and 5.17% higher than the general average of the variable 1.6. For these two variables, it is not possible to affirm that the investigated HEI do not use new products or services to operate in new markets, but in this case, they stood out with the lowest scores in the concept.

The last variable in the concept, **1.7**, stood out with the second highest overall average, accumulating 4.13 points. This represents that the managers of the HEI investigated in the last 3 years use innovation to meet the needs of their students. The region that stands out with the highest average is SP2, 7.70% higher than the general average. The only regional that was below 4 points was SP1 (3.82 points).

Variable **2.1** stands out, since it obtained the second highest average of the studied concept, totaling 4.23 points. SUL region has a score 7.75% higher than the general average, standing out with regard to the gradual search to improve the quality of products and services. In this variable, all regional ones accumulated more than 4 points; the lowest averages were from the regional CO and NN, with 4.10 and 4.09 points, respectively. This next variable stands out in the research, as it obtained the highest average among the variables studied, both in those that measure the degree of exploration and in those that measure the degree of exploitation.

The variable **2.2** obtained the general average of 4.43 points, and the averages of the regional SE (4.89) and NN (4.82) were above the average in 10.35% and 8.75%, respectively. However, the region that obtained the biggest negative difference in relation to the average was SP1. It is worth mentioning that this difference is greater than 13.82%, being the biggest difference in relation to the general averages of the studied concept. With these averages, it is evident that the focus on gradually reducing the costs of its products and services is shared among everyone in the company.

Variable **2.3** presents an overall average of 4.22 points. When analyzing the averages by regional, it is evident that the regional SUL had the highest score, with 4.77 points. The regional SP1 obtained an average 7.26% below the general average, totaling 3.91 points. Regionals CO, NN, SE and SP2 obtained scores above 4 points, signaling a strong effort on the part of managers to increase the degree of reliability of their products and services provided to society.

As for variable **2.4**, the regional that obtained the highest score regarding the expansion of automation levels in its operations was SE, accumulating 5.56% above the general average. The general average was 4.00 points, and the regional one that obtained the lowest average was SP1, accumulating an average of 3.82 points.

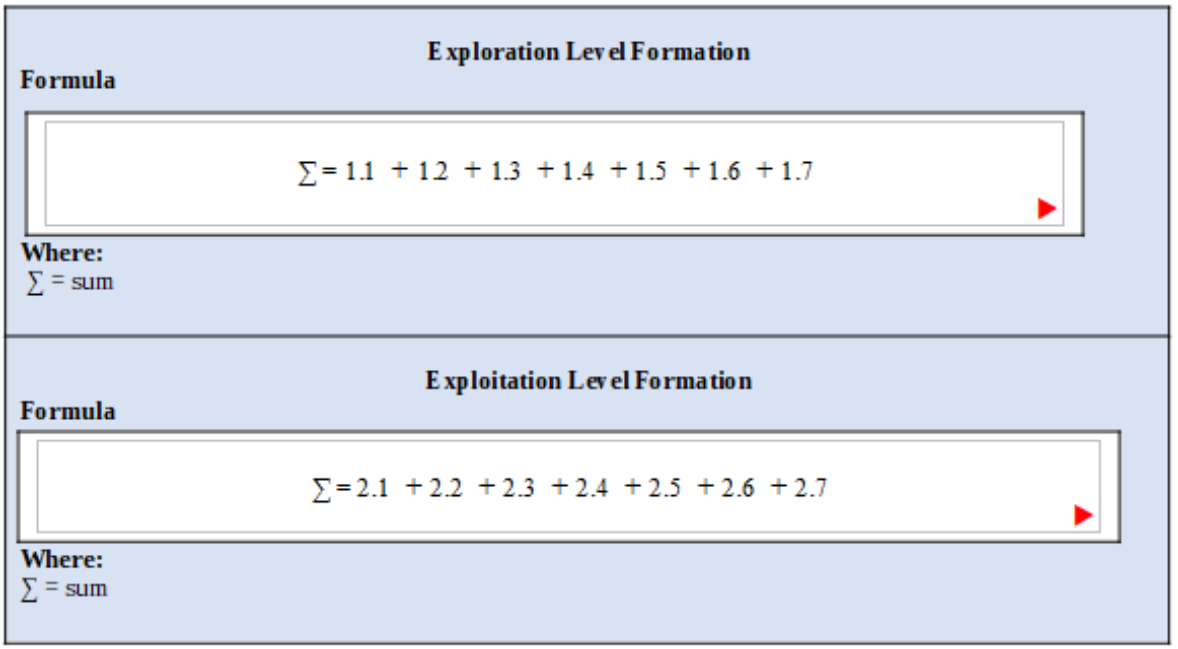
When checking the result of variable **2.5**, one element draws attention: this was the vari-

able with the lowest overall average of the construct, totaling 3.86 points. Another fact that stands out is the average of the regional CO, which accumulated 3.38 points, that is, 12.43% below the general average. Still on the regional CO, this is the lowest average of the studied construct. The region that obtained the best average was the NN, 8.32% higher than the general average.

Variables **2.6** and **2.7** obtained close general averages, with 3.91 and 3.92 points, respectively. Here, the regional SUL and NN stand out. The regional SUL obtained the highest averages both in the variable that investigates whether the HEI develops its product or service offerings, carefully observing the characteristics of its current customers, adding 4.22 points, and in the variable that verifies whether the HEI seeks to narrow and deepen the relations with its customers, in which it presented an average of 4.33 points, that is, 10.43% above the general average. In both cases, the regional NN obtained the best average, with 3.73 and 3.64 points, 4.71% and 7.33% lower than the general average.

After knowing the average of each variable by regional, the averages were added to form the level of exploration and exploitation. Box 4 illustrates this operation:

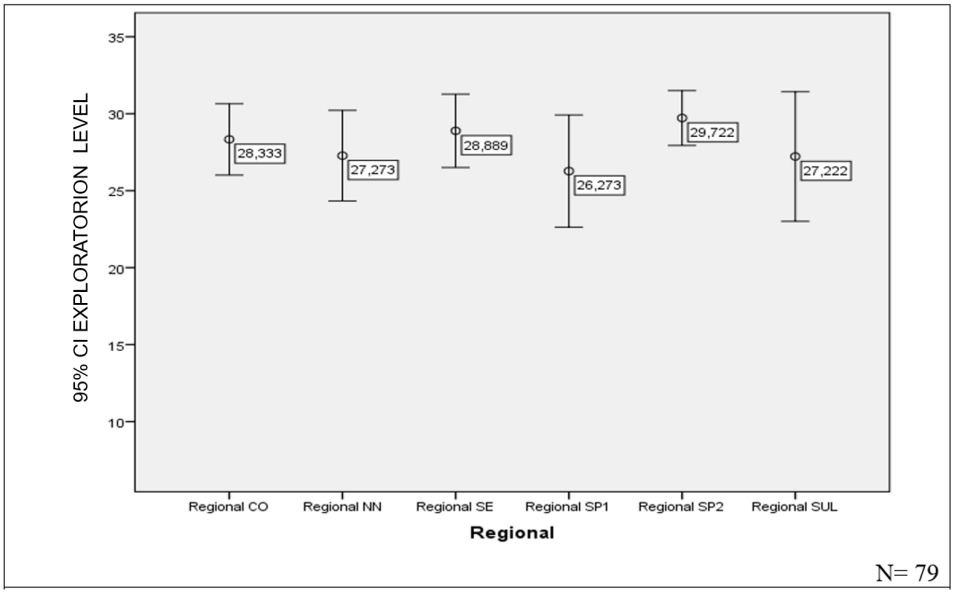
Box 4 - Formation of exploration and exploitation level

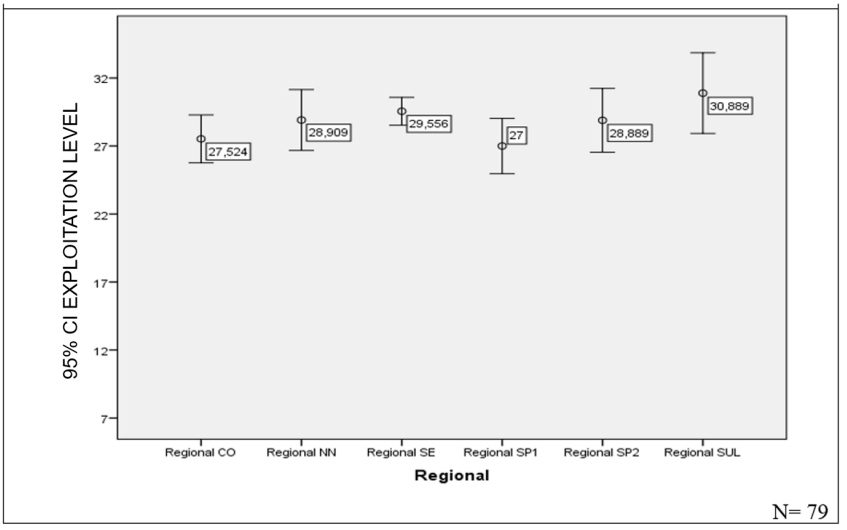


Source: Own authorship (2018).

Arithmetically, the level of exploration and exploitation is calculated by HEI, ranging from a minimum of 7 points to a maximum of 35 points. This information is necessary for the formation of the ambidexterity index. Graph 1 shows the averages and the confidence interval by region. In this graph, it is possible to verify that there is no statistically significant difference between the averages when considering the confidence interval (95%) of the regional ones.

Graph 1 - Exploration and exploitation levels





Source: Own authorship (2018).

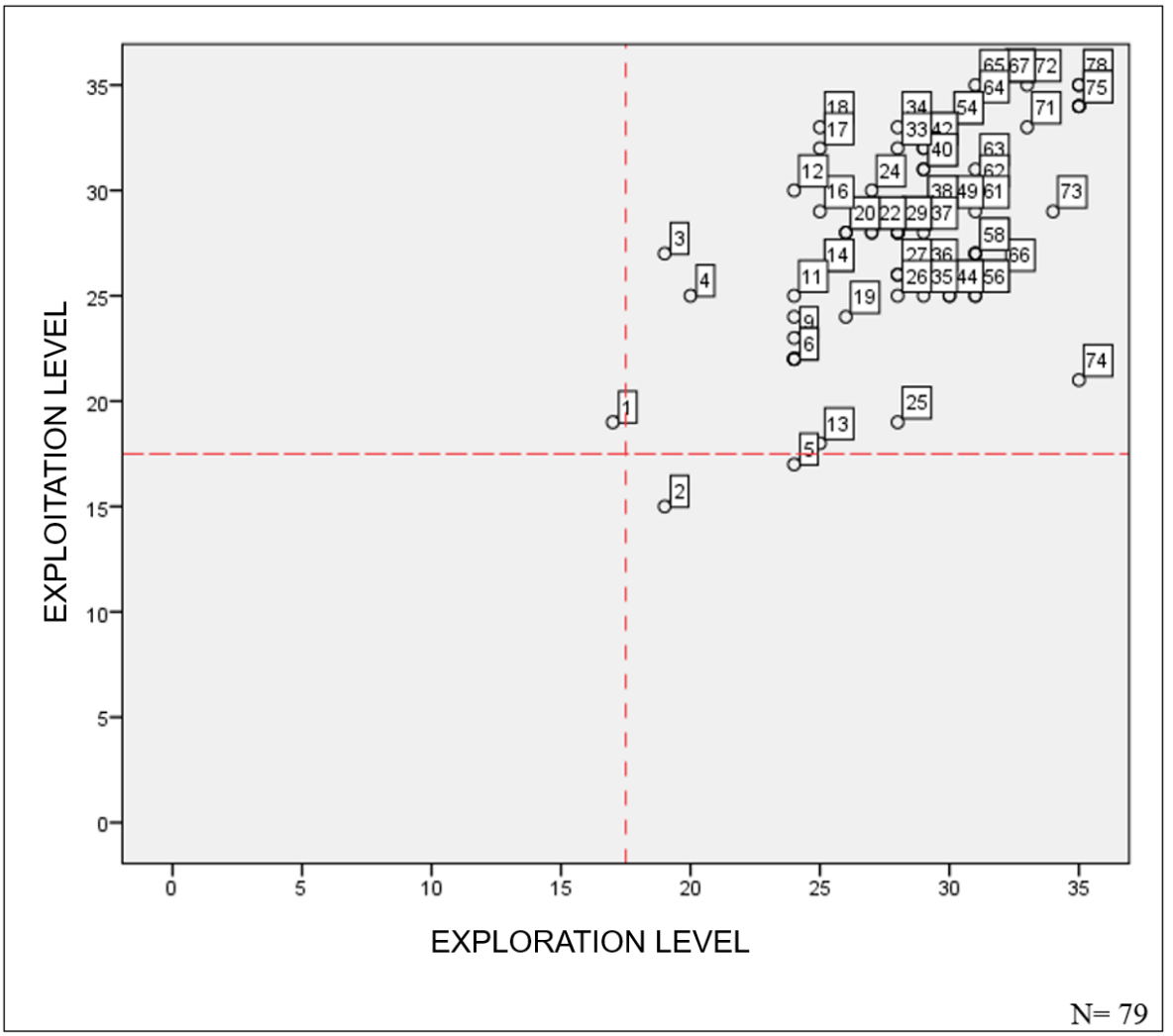
After obtaining the level of exploration and exploitation of each of the investigated HEIs, it is possible to verify which one will be classified as ambidextrous HEI. The next section details this process further.

4.1 Degree of organizational ambidexterity

After knowing the Y axis (exploration level) and X axis (exploitation level) loads, Graph 2 (Ambidexterity level) is presented, based on the analysis model proposed by Lubatkin et al. (2006). These are the loads used to classify HEI:

a) **Non-innovative**: HEI between Y (7 to 17.5) and X (7 to 17.5);
b) **High level of exploration**: HEI between Y (17.5 to 35) and X (7 to 17.5);
c) **High level of exploitation**: HEI between Y (7 to 17.5) and X (17.5 to 35);
d) **Ambidextrous Organizations**: HEI between Y (17.5 to 35) and X (17.5 to 35).

Graph 2 - Organizational ambidexterity level



Source: Own authorship (2018).

An observation is necessary on the graph. The values presented by it represent the cases. Thus, it is possible to identify the condition / position of each of the 79 HEI participating in the research. Still, as shown, it is possible to verify that, except for 3 HEI (#1, #2 and #5), all of them were concentrated in the ambidextrous organizations' quadrant. Thus, it must be considered that:

a) No HEI was considered a **non-innovative organization**;
b) Only one organization is strongly oriented towards **exploration** (case #1);
c) In the case of organizations strongly oriented towards **exploitation**, there are only two of them, namely cases #2 and #5;
d) In the **ambidextrous organizations'** quadrant there are the remaining 76 cases.

It should be emphasized that, even though there was a large concentration of cases in the

last quadrant, there was still considerable heterogeneity in the cases investigated. With this in mind, the proposition was raised that there would be an evolution between the degree of ambidexterity, that is, there are institutions that are in an ambidexterity stage more evolved than others. This phenomenon was called the **degree of ambidexterity maturity.**

To materialize the aforementioned proposition, a K-means cluster analysis was performed, dividing the population into 4 groups. Before presenting the groups, it is important to note that the researchers carried out 3 cluster tests, which are explained below.

1) By carrying out the TwoStep Cluster, although the quality cluster was higher than 0.5, signaling a good agglomeration, SPSS proposed the creation of only 2 clusters, not being possible to establish the degree of maturity regarding ambidexterity;

2) The Hierarchical Cluster was not used, as the research theory is clear;

3) In the realization of K-means, this was initially performed to generate 5 clusters. At the time, 2 clusters were generated with 2 cases in each one. When analyzing the averages of the cases, not so much difference was noted, that is, it would not be necessary to divide them into 2 groups;

After the explanation above, the averages of the degree of ambidexterity of each of the clusters formed are presented in Table 5.

Table 5 - Cluster creation

grouping variable	cluster			
	group 1	group 2	group 3	group 4
DEGREE OF AMBIDEXTERITY (centroid)	67	37	47	57

Source: Own authorship (2018).

After SPSS generated the centroids and grouped the cases to them, clusters were formed. As previously mentioned, 4 clusters were formed, which represent the level of maturity of ambidexterity in the investigated companies. The groups were titled and a brief description at each level was given. It is noteworthy that this description is an extrapolation of the quantitative data and the management characteristics will be better described after carrying out comparative qualitative studies.

Level I - Embryonic (Group 2): the organizations participating in this cluster, although classified as ambidextrous, are still in the initial stage of organizational ambidexterity. It is the first stage of ambidexterity;

Level II - Structured (Group 3): it refers to the second stage of ambidexterity. At this level, exploration and exploitation actions are (possibly) monitored and there is a procedural flow to which they are submitted and monitored;

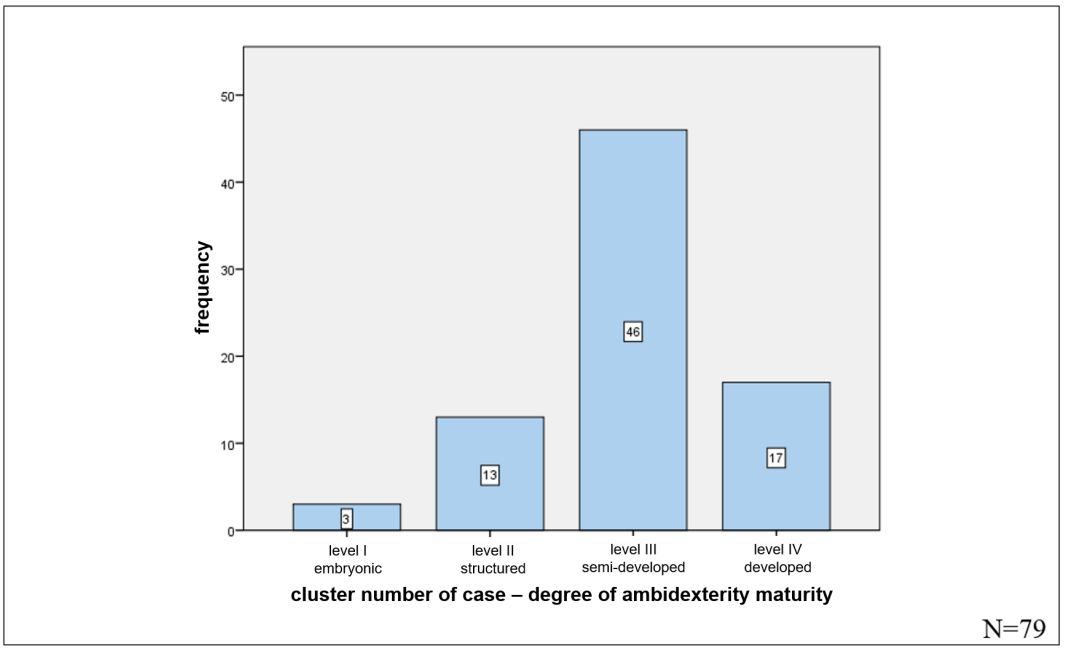
Level III - Semi-developed (Group 1): this is the third stage of ambidexterity. At this stage, exploration and exploitation actions are (probably) institutionalized and occur organically;

Level IV- Developed (Group 4): at this level, there is a managerial maturity regarding innovation management. It is believed that at this stage, the incentive for exploration and exploitation actions is overly stimulated and occurs autonomously at all managerial levels.

Seeking to know the distribution of cases in the face of the new classification, it was noted that 3.80% of cases the HEI are in level I - embryonic, 16.46% are in level II - structured, 58.23% are allocated in the level III - semi-developed and, finally, 21.52% of HEI are in level IV- developed. Graph

3 represents this distribution.

Graph 3 - HEI frequency per cluster



Source: Own authorship (2018).

At this point, the topic of data presentation and analysis is concluded. In the sequence, the final research considerations are presented, gathering the research objective, main findings, limitations and indications for future research.

5 CONCLUDING REMARKS

The general goal of this research was born from the lack of knowledge of the degree of ambidexterity in private HEI and aimed to propose evolutionary stages of ambidexterity in these organizations. So, 79 directors and deans participated in the research – most of whom are men (63.3% of the total respondents). In 78.5% of cases, managers are between 36 and 54 years old. Regarding their education, 48.1% of the respondents have a Master's degree, and 40.5% have a Lato Sensu graduate degree. A significant portion of managers has a background in Human Sciences (38%) or Applied Social Sciences (32.9%). Most of them (54.4%) work in the higher education industry between 11 and 20 years old, and 54.4% of the respondents have worked at the company for less than 10 years.

Regarding the characteristics of the investigated HEI, there were 21 HEI from Regional CO, 11 from NN, 9 from SE, 11 from SP1, 18 from SP2 and 9 from SUL, finally totaling 79 HEI investigated. Cumulatively, these institutions cover 652,470 students, 1,214 higher education courses, 9,382 technical-administrative employees and 10,674 teachers.

The research revealed that no HEI was considered a non-innovative organization, only a single organization was classified as an institution strongly oriented towards exploration, 2 organizations were classified as companies strongly oriented towards exploitation and 76 cases were classified as ambidextrous organizations. It is noteworthy that the HEI are part of the same economic group and, even though 96% of the cases were classified as ambidextrous organizations, there was

a great dispersion among them, suggesting heterogeneity of the cases. With that, the proposition of the existence of different levels or stages of ambidexterity was raised; this phenomenon, in a preliminary way, was called the degree of ambidexterity maturity.

As a theoretical contribution, there is a deepening in the classification of ambidextrous organizations. Based on the degree of organizational ambidexterity, it is possible to classify companies according to their evolutionary stage in the phenomenon, being initially classified as follows: level I - embryonic (first stage of ambidexterity); level II - structured (second stage of ambidexterity); level III - semi-developed (third stage of ambidexterity) and level IV- developed (fourth stage of ambidexterity).

The following are the practical contributions of this research: a) conducting a managerial diagnosis of how much the innovation actions, whether incremental, radical or simultaneous, are on the agenda of the deans and/or general directors; b) reflection on the existence of alignment between corporate strategy and the opinion of tactical managers; and c) visualization of the managerial differences in innovation actions, with the background of Brazil's mesoregions.

As a limitation of the research, it is important to highlight that: a) the findings of this research cannot be generalized to other private HEI, as the sample was exclusive to HEI belonging to the same economic group; b) in the transversal cut, the period to which the companies were evaluated refers to 2013 until 2016); c) the data collected comes from the perception of the top manager of each HEI, whether they are directors or deans, thus, only one respondent was considered by HEI.

The main indication for future research refers to conducting qualitative in-depth studies, seeking to learn about a) characteristics, b) uniqueness, c) management practices, d) homogeneities and heterogeneities of companies at different levels of ambidexterity. This could lead to describe the behavior of these companies in a prescriptive manner, proving the existence of the maturity of organizational ambidexterity.

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2. Development of hypotheses or research questions (empirical studies)	√	√
3. Development of theoretical propositions (theoretical work)	√	
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	√
6. Data collection	√	
7. Statistical analysis	√	
8. Analysis and interpretation of data	√	√
9. Critical revision of the manuscript	√	√
10. Manuscript writing	√	√