

Organizational Performance of a Public Higher Education Institution: An Analysis from the Perspective of Absorptive Capacity and Innovation

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Abstract

This article aims to identify the perception of students of Administration and Accounting Sciences about Perceived Organizational Performance from the perspective of Absorptive Capacity and Innovation within the UFCG. To this end, a quantitative, exploratory-descriptive approach was used, using the survey technique, together with the students of the UFCG Administration and Accounting Science courses. Out of 362 students (172 in the Administration course and 190 in the Accounting Science course), a sample of 223 responses was obtained. For data collection, the model of Oliveira et al. was adapted (2018). The questionnaire was applied from September to November 2019. For the construct, a Likert scale from 1 to 5 points was used. Factor analysis was applied. The results indicate that the Perceived Organizational Performance of the UFCG exerts positive influences on both Perceived Absorptive Capacity and Innovation, unlike what was found in the study of Oliveira *et al.* (2018). The results found demonstrate that the Organizational Performance perceived by students within the UFCG may be positively impacted by Perceived Innovation and Absorptive Capacity, reflecting the institution's abilities to identify and acquire knowledge in the external environment, assimilate it, internalize it, transform it and apply it, resulting in valuable products and services as advocated by Cohen and Levinthal (1990), Zahra & George (2002).

Keywords: organizational performance, absorptive capacity and innovation, public higher education institution

1. Introduction

The pioneering scholars of *Absorptive Capacity* (ACAP) or simply AC were Cohen and Levinthal (1989, 1990). They proposed that AC is an important part of the ability of a company, institution or entity to create new knowledge. Absorptive Capacity was initially defined as the ability of an organization to identify technical and scientific knowledge, available in the external environment in which it is inserted, internalize and assimilate this knowledge to apply it in order to improve its products and services (Cohen & Levinthal, 1990).

This process of Absorptive Capacity aims to use the new knowledge, and consequently bring financial and/or social return to the organization (Fávero et al., 2020). An organization's ability to innovate is recognized as the main factor of its survival and success, since it provides additional value to the product and the customer. At the same time, competition, economic uncertainties and new technologies are the main drivers of innovation, along with the pursuit of superior performance (Cassol *et al.*, 2016; Valladares, Brito & Vasconcellos, 2012).

In the organizational management area there is a considerable concern in the capacity to acquire, assimilate, transform and explore new external knowledge for economic purposes, benefiting the organizations to increase their innovation capabilities and, consequently, helping them to achieve a better performance in innovation. (Hurtado-Palomino, Gala-Velásquez & Ccorisapra-Quintana, 2022).

Most studies on Absorptive Capacity were developed in industries (Cohen & Levinthal, 1990). Vega-Juro, Gutiérrez- Gracia and Fernández-De-Lucio (2008) used a construct focused on the academic environment, the capacity for scientific absorption, which can be understood as the ability of the organization to absorb knowledge from HEIs, Institutes of Science and Technology (ISTs) and scientific congresses. In the study Vega-Juro,

Gutiérrez-Gracia and Fernández-De- Lucio (2008) make clear the need for HEIs to seek appropriate solutions for absorptive capacity, which involve acquisition, assimilation, creation and sharing, a necessary condition for the success and superior performance of HEIs.

The idea of Absorptive Capacity is conceptualized as the way that the institution adapts and recognizes the amount of new knowledge and then adopts in its activities with the intention of motivating other transactions. It is alleged that the institution needs the accumulation of knowledge to obtain the increase of its ability to propose itself on the current learning, that is, knowledge is cumulative and the dynamism of learning is superior when the study tool is related to what it is already known as argued by Cohen and Levinthal (1990), Zahra and George (2002), Jansen, Van Den Bosch and Volberda (2005). According to Zahra and George (2002) and Cohen and Levinthal (1990), the Perceived Potential Absorptive Capacity is an instrument that supports the Perceived Potential Innovation, because of the help that the accumulation of knowledge will produce regarding creative practices.

In this sense, it is understood that studies that identify knowledge absorption practices in HEIs are extremely relevant to fill some of the existing theoretical gap, as well as the need to adapt to the environment and participate in the clinical view of those who should benefit from the essential activity of an educational institution, the knowledge offered to students through management transparency activities and activities promoting the development of new learning policies as argued by Oliveira and Balestrin (2015), Oliveira *et al.* (2018).

García-Sánchez, García-Morales and Martín-Rojas (2018), Hurtado-Palomino, Gala-Velásquez & Ccorisapra-Quintana (2022) suggest deepening the interactions between the organizational capacities and the innovation performance in countries with cultural differences and diverse economic environment. It is still considered the argument that there are relatively few empirical studies about the determinants of the absorptive capacity highlighting the gap in existing research (Audretsch *et al.*, 2021).

Add to this the argument defended by Chauvet (2014) and Ciotti and Favretto (2017) when they point out the need for studies to identify practices of absorption and knowledge management in HEIs, which provide the acquisition, creation and sharing this, assisting in the success and performance of the institution are configured as aspects of extreme relevance to answer this theoretical and empirical gap.

In view of the above, this article proposes to answer the following question: What is the perception of the students of Administration and Accounting Sciences about the Perceived Organizational Performance from the perspective of Absorptive Capacity and Innovation within the UFCG?

For this purpose, this article aims to identify the perception of the students of Administration and Accounting Sciences about the Perceived Organizational Performance from the perspective of Absorptive Capacity and Innovation within the UFCG.

2. Theoretical Framework

2.1 Absorptive Capacity

The study of Absorptive Capacity is important to the extent that research discovers its potential to explain innovative organizational performance. The advances arranged in the literature deal with two basic aspects according to Filenga (2015), the first under the strand of Cohen and Levinthal (1990) and the other by Zahra and George (2002). In both cases, there seems to be no doubt about the potential application of this field of knowledge in information management and, mainly, about the potential to obtain organizational results. However, there is a dichotomy about the understanding of the construct. In this division, the main characteristic is to consider Absorptive Capacity as management potential of a knowledge reserve or as the ability to process information dynamically to generate this reserve (Filenga, 2015).

Also according to Zahra and George (2002) and Cohen and Levinthal (1990), another proof that highlights the conflict of the Potential Perceived Absorptive Capacity in Innovation is the use of the knowledge of the participants of an institution. The degree of knowledge of employees contributes to architecting a more explained way of collecting information for the institution. In this way, it contributes to the creation of new conceptions, considering that employees are indoctrinated for constant learning. In view of this, the Potential Absorptive Capacity through investment in the qualification of individuals can affect the innovative performance of institutions. The ability to handle information modifies the organizational character of an innovative object, inducing it to endure operations of macro-environment variables (Cohen & Levinthal, 1990).

For Puffal, Puffal & Souza (2019), Absorptive Capacity can be considered a skill for the organizations that develop innovations, as long as the knowledge acquired is assimilated, transformed and exploited, it contributes

to competitive advantage.

Zahra and George (2002) define absorptive capacity as a set of organizational routines and processes by which organizations acquire, assimilate, transform and apply knowledge to produce a dynamic organizational capacity. It can be said that the acquisition is related to the search for knowledge, that is, what is done to verify and acquire the knowledge appreciated for the organizational performance that is generated externally. Assimilation, on the other hand, concerns “the routines and processes of the organization that allow it to analyze, process, interpret and understand the information obtained from external sources (Zahra & George, 2002).

The current knowledge acquired and assimilated is united and agreed to the effective knowledge in the organization, in the dimension of transformation. This occurs by the addition or exclusion of knowledge or simply by interpreting the same knowledge in a different way (Zahra & George, 2002). Cruz-Ros *et al.* (2021) argue that the dimensions of AC have positive effects in innovation processes. They also emphasize the importance of the assimilation and transformation of knowledge in the creation of a competitive advantage. It strengthens the innovation capacity of an organization (Lim & Ok, 2021).

In this sense, it is observed that for an organization to be equal with the competitive market, it is necessary that it develops the absorptive capacity in view of its needs and objectives, while analyzing external and internal competencies, thus becoming an organization capable of adding value. As noted, the absorptive capacity has the function of capturing the organization's internal and external knowledge and transforming it, providing the development of innovations, that is, the creation of new products and services that satisfy customers and are able to build a competitive differential (Cassol *et al.*, 2016).

Within a higher education institution, these concepts and arguments also apply since the innovation activity of a higher education institution is born through the way they absorb knowledge in the external environment and internalize it in its internal context, causing changes in routines and culture, thus contributing to the activity of innovating, whether in teaching, research or extension, as advocated by Jacomossi and Feldmann (2020).

2.2 Models to Assess Absorptive Capacity

There are several initiatives to evaluate the Organizational Absorptive Capacity. Cruz-Ros, Guerrero-Sánchez and Miquel-Romero (2021) used the four absorptive capacity dimensions to observe the impact of Absorptive Capacity in innovation in the service delivery processes. They realized that this innovation influences business performance. Audretsch *et al.* (2021) studied how AC from the perspective of the operationalization and fundamental for the intrapreneurial capacities, permit companies to understand and exploit the existing internal and external knowledge, creating and implementing new ideas to increase competitiveness.

Lim & Ok (2021) investigated the mechanism behind the relation between empowered leadership and innovation, particularly regarding the capacity of absorption, in order to analyze how the organizations with high absorptive capacity become more innovative making fast and rational decisions about their business strategies.

Bhupendra and Sangle (2022) did an empirical test to analyze a structural process model based on the AC constructs considering aspects of sustainability. The results of the study can help the organizations to renew the business processes related to AC and improve the decision making considering attributes of sustainability.

As observed, there are several relevant studies about this theme that support this research. Next, some characteristics are highlighted in the model of Cohen & Levinthal (1990), Zahra and George (2002) and Oliveira, Rabêlo Neto, Nascimento and Melo (2018).

The model of Cohen and Levinthal (1990) of three dimensions, Zahra and George (2002) with four dimensions, considered as seminal studies that proposed constructs used in most of the works about this theme. Then, Oliveira *et al.* (2018) work presented the issues related to a model applied in a HEI and it was adapted to this research.

Absorptive Capacity (AC) has been achieving a certain degree of integration with regard to the concepts of a theoretical framework susceptible to research. The following are the models of Cohen and Levinthal (1990) of three dimensions, Zahra and George (2002) with four dimensions, as they are the most important studies that proposed constructs that are cited in most of the works in this theme. Then, the study of Oliveira *et al.* (2018) is presented, which addresses issues related to a model that was applied in a higher education institution and that was adapted for this research.

2.2.1 Cohen and Levinthal Model (1990)

The first authors to present the concept of ACAP were Cohen and Levinthal (1990), as the ability that organizations have to identify, assimilate and explore knowledge that is transformed into useful information for

them. Therefore, the authors define it as the ability of organizations to capture information from external sources to transform it into a new source of knowledge with specific purposes and an innovation strategy for the environment. They propose a model presented in three dimensions, in which each step is structured in a subsequent way, so that the previous step establishes conditions for the development of the next step, as can be seen in Figure 1.

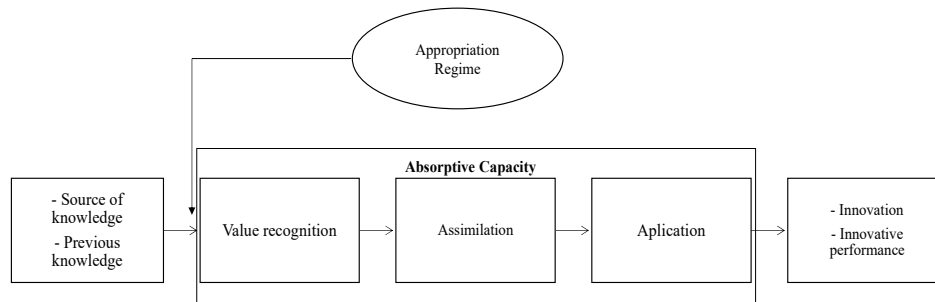


Figure 1. Absorptive capacity according to Cohen and Levinthal

Source. Cohen and Levinthal (1990).

The ability to absorb new information depends on the level of previously related knowledge, which concerns basic skills and learning experiences. For the absorption of knowledge to exist, it is necessary to recognize the new information as relevant. Thus, the more diverse the organizational background, the more robust the basis of absorption and the contribution to innovation and better performance (Cohen & Levinthal, 1990; Engelman *et al.* 2016). Prior knowledge includes research and development (R&D) activities, human capital and individual capabilities, organizational structure and administrative practices, as well as types of interactions and cooperation with external partners (Engelman *et al.*, 2016).

2.2.2 Zahra and George Model (2002)

New approaches emerged after the model of Cohen and Levinthal (1990) in an attempt to improve studies on this subject. One of them was the study proposed by Zahra and George (2002) that defines the AC as a multidimensional construct formed by a set of routines and organizational processes in which organizations transform and apply knowledge to produce a dynamic organizational capacity. For Filenga (2015), this new proposal presented by Zahra and George (2002) is not only about peripheral changes in the internal quantity of the dimensions of the construct, but a conceptual review that directly affects organizations, which need managerial information that can be reversed in an innovative performance. In this context, AC is presented in four dimensions, which allow organizations to develop knowledge to obtain organizational capabilities, which are the basis for a competitive advantage.

According to this author, the three dimensions proposed by Cohen and Levinthal (1990) become four with the inclusion of the Transformation dimension. In addition, these four dimensions were separated into two distinct groups, called Potential Absorptive Capacity and Accomplished Absorptive Capacity. Such emphases give the concept of Absorptive Capacity a conceptual redefinition since it is configured as a set of routines and organizational processes through which the company acquires, assimilates, transforms and explores knowledge to produce dynamic organizational capacity (Filenga, 2015), as shown in figure 2.

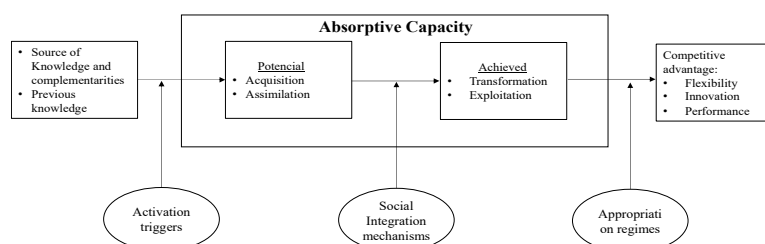


Figure 2. Absorptive capacity of Zahra and George model

Source. Zahra and George (2002).

Taking as reference the conceptual model of Figure 2, proposed by Zahra and George (2002), two dimensions can be observed: Potential Absorptive Capacity (PACAP) and Accomplished Absorptive Capacity (AACAP). According to Cruz (2011), these dimensions of AC are divided by the components of acquisition, assimilation, transformation and exploitation, which is in line with the Flatten *et al.* (2011) model, which presents four subdivisions of AC, which allow organizations to develop technologies that enable new products and processes based on new knowledge, as well as providing intangible capabilities in competitive advantage. Table 1 shows the dimensions and components of the Zahra and George model (2002).

Table 1. Dimensions of absorptive capacity

Dimension	Components	Definition
Potential absorptive capacity (PACAP)	Acquisition	It is the company's ability to locate, identify, value and acquire external knowledge.
	Assimilation	It is the processes and routines that allow the new information or acquired knowledge is analyzed, processed, interpreted, understood, internalized and classified.
Accomplished Absorptive Capacity ((AACAP))	Transformation	Refers to the refinement of externally acquired knowledge to adapt it to internal routines, in order to facilitate the transference and combination of prior knowledge with the new knowledge acquired or assimilated.
	Application	Routines and processes that create new operations, knowledge, competences, goods and products.

Source. Adapted from Holanda et al. (2019).

Filenga (2015) understands that the differentiation of these two models, in addition to implying a different understanding of what the Absorptive Capacity consists of, results in two strands of analysis throughout subsequent research, arising from these findings. The research that investigates the theme from this construct sometimes points to the seminal work, sometimes to the new connotation. The developments of each of these interpretations, in general, reinforce each in their own way, the concepts on which they are based, but do not nullify the other.

Of course, other models were developed and adapted to the most varied organizational contexts possible and that are not the object of this work. However, the work of Oliveira *et al.* (2018) is presented below, which served as the basis for this research due to the fact that it addresses the context of higher education institutions.

2.2.3 Oliveira, Rabêlo Neto, Nascimento and Melo Model (2018)

The model by Oliveira *et al.* (2018) proposes a framework with integration of the analyzed constructs, testing the eventual mediator function of Perceived Innovation in the relationship between Perceived Potential Absorptive Capacity and Perceived Organizational Performance. As contributions offered by this study, there is the suggestion of this framework integrating the constructs analyzed, seeking Perceived Innovation as a mediating variable of the relationship between Potential Absorptive Capacity and Organizational Performance.

The authors tested the model in a HEI in order to identify practices of knowledge absorption in the HEI because they understand that there is a theoretical gap in the scope of learning policies.

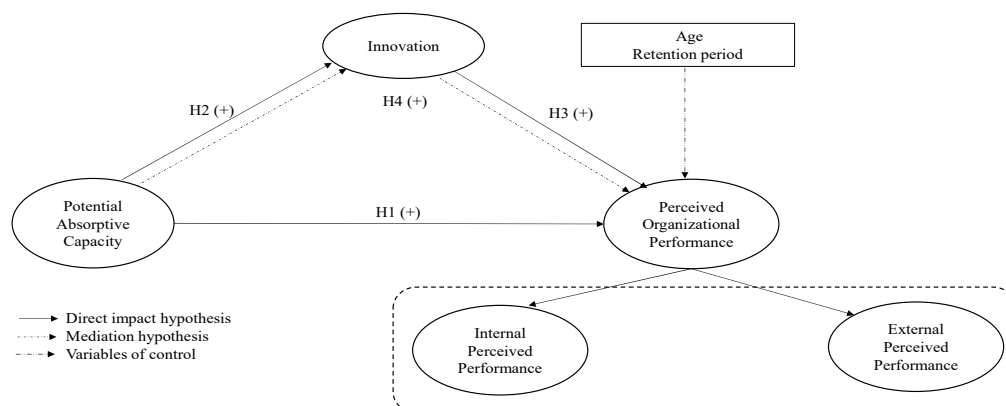


Figure 3. Structural model of Oliveira, Rabêlo Neto, Nascimento and Melo

Source. Oliveira et al. (2018).

As the main findings of the research, it was noted that the Perceived Potential Absorptive Capacity positively impacts Perceived Innovation and Perceived Internal and External Organizational Performance. Perceived Innovation partially mediated the relationship between Perceived Potential Absorptive Capacity and Perceived Internal and External Organizational Performance. The suggestion of a framework with integration of the analyzed constructs, it seeks Perceived Innovation as a mediating variable of the relationship between Perceived Potential Absorptive Capacity and Perceived Organizational Performance can be seen as a contribution of this study, as well as the validation of a scale of organizational performance measure aimed at higher education institutions.

In view of the above and considering the peculiarity of the construct within the scope of this study (HEIs – UFCG), it was decided to adopt this model in order to verify its applicability to the context of Administration and Accounting Science courses.

3. Methodological Procedures

To achieve the objective of this study, a quantitative, exploratory-descriptive approach was used, applying the survey technique.

The choice for the theme and object of study was due to the researchers' interest in understanding how students of Administration and Accounting Science courses of the Academic Unit of Accounting Sciences (UACC) of the Federal University of Campina Grande (UFCG) perceive Organizational Performance from the perspective of Absorptive Capacity and Innovation.

The definition of the research universe initially occurred from the identification of the total number of students enrolled in the semester of 2019. Two in the respective courses in the Campus of Sousa, Paraíba (PB). The sample adopted was the convenience type, in which the students were invited to answer the research questionnaire, after visiting each of the classrooms with due authorization from the teacher and student. The objective of the research was explained and presented in the Informed Consent Form (ICF) in which the student demonstrated his interest in participating in the research.

Out of 362 students (172 in the Administration course and 190 in the Accounting Science course), a sample of 223 responses was obtained, corresponding to 61.60% of the total participants of the research. For data collection, the model by Oliveira *et al.* (2018) was adapted, which studied these three constructs at a Federal University in the Northeast region. The instrument was structured in four stages: the first composed of the respondent's profile; the second by the characteristics of Absorptive Capacity, Innovation and Organizational Performance. The Absorptive Capacity Scale was composed of five variables defined as the act of acquiring and understanding new organizational knowledge. The Innovation Scale is formed by six variables that acts as a kind of bridge that unites the tools of knowledge absorption through learning in favor of new creation techniques, benefiting organizational performance with the eventual positive returns that these instruments can provide. The Organizational Performance Scale was composed of seven variables that seek to evaluate the performance of the higher education institution in relation to other HEIs.

The questionnaire was applied from September till November 2019 and was structured by a characterization group of the respondents and another by the construct variables. For the construct, a scale of *Likert* from 1 to 5 points was used, with 1 corresponding to totally disagree, 2 = partially disagree, 3 = neither agree nor disagree and 5 = totally agree.

For the analysis of the data obtained, a descriptive analysis of the data referring to the characterization questions was initially carried out. For the assertions of the construct, the factor analysis (FA) was used considering the eighteen variables. Cronbach's alpha test was applied to verify the internal consistency of the questionnaire, according to the management of Hair *et al.* (2009). The software used were SPSS and Microsoft Excel for tabulation and formatting of the tables.

4. Presentation and Discussion of Results

4.1 Characterization of Research Participants

The participants of the study, in the data collection period, 60.09% (134) are male and 38.91% (89) are female. The majority (78.48%) 175 respondents were up to 25 years old, 15.7% (35) between 26 and 35 years old and only 5.83% (13) were over 35 years old. In total, 40.5% (34) were women and 59.6% (50) were men. With regard to the course, 43.05% (96) are attending the undergraduate course in Administration and 56.95% (127) in Accounting Sciences. Regarding the period, they were attending, the majority of the answers were from students of the 2nd period 33.63% (75) and the 4th period 26.46% (59), as shown in table 2.

Table 2. Period that is being studied

	Frequency	%
1st	1	0,45
2nd	75	33,63
4th	59	26,46
5th	24	10,76
6th	15	6,73
7th	24	10,76
8th	18	8,07
9th	7	3,14
Total	223	100

Source. Research data.

Most participants reside in the city of Sousa, Paraíba State 68.16% (152), followed by Pombal 6.73% (15 participants), Cajazeiras 4.93% (11) and Aparecida 3.59% (8 participants). This reality is portrayed in this way due to the fact that Sousa, PB, the place where the courses work, is a city that supports these neighboring cities and presents students who attend Administration and Accounting Science courses (table 3).

Table 3. City of participants

City	Frequency	%
Aparecida	8	3,59
Aurora	1	0,45
Cajazeiras	11	4,93
Catolé do Rocha	4	1,79
Jericó	4	1,79
Lastro	3	1,35
Marizópolis	5	2,24
Mato Grosso	1	0,45
Nazarezinho	2	0,90
Patos	1	0,45
Paulista	1	0,45
Pombal	15	6,73
Santa Cruz	3	1,35
São Francisco	4	1,79
São José da Lagoa Tapada	1	0,45
São José de Piranhas	2	0,90
Sousa	152	68,16
Vieirópolis	5	2,24
Total	223	100

Source. Research data.

4.2 Application of Factor Analysis

Students were asked about the performance of the UFCG in relation to other higher education institutions (table 4). The majority 56.95% (127) considered on average, followed by 30.94% (69) above average. As observed, most opinions show that the institution is at a level that points to a situation of comfort in relation to other HEIs. This type of perception is important because organizational performance is configured as a possibility for management to establish goals and strategies for success, perform activities that reflect on the results, monitor the results and point out improvements to be made, as suggested by Araújo *et al.* (2019).

Table 4. How students rate the performance of HEIs (UFCG) in relation to other HEIs

	Frequency	%
Above average	69	30,94
On average	127	56,95
Below Average	12	5,38
I don't know	15	6,73
Total	223	100

Source. Research data.

The following are the results obtained with the application of Factor Analysis (FA) to group the variables studied. In the case of the study, 223 responses were obtained. Initially, as a way to verify the adequacy of the data for the application of FA, we sought to identify the internal consistency of the three scales: Perceived Absorptive Capacity Scale (5 variables), Perceived Innovation Scale (6 variables) and Organizational Performance Scale (7 variables) – 18 variables (see questionnaire) – through Cronbach's Alpha Coefficient. This model measures internal consistency based on the average correlation between variables, it's considered the most common method for data reliability analysis, whose main idea is that individual values should measure the same construct and be interrelated (Hair *et al.*, 2009).

According to Hair *et al.* (2007), in order for the variable (in the case of the dimension study) to be properly measured by two or more questions, it is necessary that the *Alpha of Cronbach* (α) is greater than 0.70, that is, the value assumed by *Alpha* must be between 0 and 1, and the closer to 1 is its value, the greater the reliability of the dimensions of the construct. Thus, with the use of the *software* SPSS, the test was proceeded and the standardized coefficient of the acceptable test was obtained for the Perceived Absorptive Capacity dimension $\alpha = 0.735$, Perceived Innovation $\alpha = 0.816$ and Perceived Organizational Performance $\alpha = 0.833$. Combining all three dimensions $\alpha = 0.88$, denoting that the variables have good internal consistency and are therefore satisfactory for the study (table 5).

Table 5. Application of the Cronbach's Alpha

Reliability Statistics		
Dimension	Cronbach's alpha	Number of questions
Perceived Absorptive Capacity	0,735	6
Perceived Innovation	0,816	5
Perceived Organizational Performance	0,833	7
3 dimensions	0,888	18

Source. Research data.

Then, two statistical tests were performed to verify the adequacy of the data to the FA method: the first was the *Kaiser-Meyer-Olkin* – KMO or *Measure of Sampling Adequacy* – MSA, which in the understanding of Hair *et al.* (2007) is a test that allows assessing how adequate is the application of FA, observing the values between 0.5 and 1.0 for the matrix or for an individual variable that may indicate such adequacy.

The second test applied was the Sphericity test of *Bartlett*, which according to Rodrigues and Paulo (2007), the closer to zero (0.000) is the significance level (*Sig.*) of the test, the greater will be the suitability of the FA for a data set, and if the significance value exceeds 0.05, makes its application unfeasible.

In the first test, a KMO of 0.88 was obtained, which translates into a reasonable fit (>0.60) (Hair *et al.* 2007). The *Sig.* (Significance Test) also demonstrates the adequacy of the technique since it was below the acceptable limit 0.05. As shown in table 6.

Table 6. KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,88
Bartlett's Test of Sphericity	Approx. Chi-Square	1452,30
	df	153
	Sig.	0,00

Source. Research data.

The choice of the number of factors is a fundamental point in the execution of FA, to condense all the variables into a smaller number of data (factors), in order to facilitate the observations, three factors were adopted in order to elucidate the data, based on the result presented by the criterion of the *Scree Plot* graph (graph 1).

This graphic is intended to help the researcher define the number of factors that will compose the analysis. Bezerra (2007, p. 86) comments that the “[...] definition of factors follows the reasoning that a large portion of the variance will be explained by the first factors and that there will always be a significant difference between them. When this difference becomes small, this point determines the number of factors to be considered”. Note that from the fourth point on, in the graph (from top to bottom) there was a smoothing of the slope (curve), decreasing the difference between the points. In this case, it is understood that, from the fourth point, the factors assume a low power of explanation in relation to the total variance of the data.

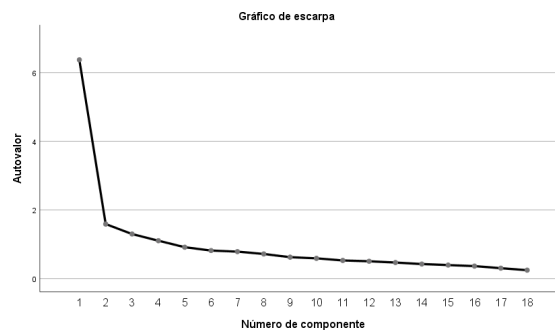


Figure 1. Scree plot

Source. Research data.

In the conception of Bezerra and Corrar (2006), an analysis that can be done before other tests is the degree of explanation achieved by the factors that were calculated in FA. Thus, the three factors presented in the Table (component matrix and total variance explained) can explain 51.41% of the total variance in relation to the original data, which can be considered as a good value, since it is close to 100%. The higher percentage variance values indicate that one factor explains more of the variability. Therefore, the researcher can use the percentage variance values to determine which factors are most important (Hair *et al.* 2009).

Table 7 (component matrix and total variance explained) indicates the composition of each variable, based on the three factors identified, with the rotation *Varimax*, which allows to verify which of the factors best explains each of the values considered.

Note that seven variables were located in factor 1, named Perceived Organizational Performance, which according to the perception of the students participating in the research receives from positive innovative influences, which is justified by the use of information for practical application for the benefit of the institution. Information is used by innovation as a creative source in the development of procedures and products, thus, the attitude of appreciating and applying external knowledge to organizations with economic purposes forms a process that differentiates organizations in relation to the market environment of competition and, in the case of HEIs, is capable of generating organizational development (Oliveira *et al.* 2018). This factor, considered for this study as the most important since it presented 19.35% of total variance explained.

Perhaps one of the reasons behind these findings is the fact that the Organizational Performance construct is recurrently used in organizational studies. The evaluation of the performance achieved helps managers to develop, structure and reinvent the usefulness of their resources (uniqueness), since the evaluated performances provide subsidies for the constant evaluation and improvement of actions (Costa, 2018). Or the fact that organizations with better past performance could influence the adoption of investing more in innovation than organizations with worse performance and consequently more conditions to develop strategies aligned with AC.

Another conception is that pointed out by Garrido *et al.* (2017) when they argue that the positive and significant result is in accordance with the idea of a mutual reinforcement between innovation and performance. Past performance is an important condition for a company to remain innovative. This could mean new or larger investments. Thus, innovative capacity is important to obtain a competitive advantage. However, past performance is crucial to improve the innovation of companies. This result indicates that higher performing

organizations are likely to reinvest their results to remain innovative and profitable. Note that the factor is more important, followed by factor 2, as described below.

In the second factor, the five variables related to Innovation or Perceived Innovation are aligned, that is, innovation builds an important link between the creative potential provided by Absorptive Capacity and Organizational Performance, since on the one hand there is the knowledge provided by absorption capacities through learning, and on the other, it is seen that innovative actions offer development in relation to obsolete teaching techniques. Consequently, innovation makes a kind of bridge that unites the tools of knowledge absorption through learning in favor of new creation techniques, benefiting organizational performance with the eventual positive returns that these instruments can provide. This factor presented 17.19% of variance.

In the third factor, the variables (6 in total) are concentrated, which are called Absorptive Capacity, that is, at this point, these capacities collaborated, providing the internalization of the organizational objectives previously outlined in the elaboration of strategic tools, that is, Absorptive Capacity enables the learning of new knowledge that favors the updating of organizational processes, in addition to promoting devices that allow the improvement of structural flexibility, destroying any external and internal growth barriers. The total variance explained by this factor was 14.87%.

The findings of the study indicate that the construct of Perceived Organizational Performance of the UFCG exerts positive influences on both Perceived Absorptive Capacity as in Innovation, unlike what was found in the study by Oliveira *et al.* (2018). This result is presented in this way due to the fact that the students of the Administration and Accounting Science courses in UFCG attach greater importance to the perceived organizational performance, either comparing with the average of the competitors in the current or past context with regard to the institution's objectives both internally and externally in the university environment. The investigation of the relationships of the constructs studied by the students' perception is important for managers of Higher Education Institutions to be aware of other points of view, contributing to the strengthening of collective work among the university, students and the community, as Oliveira and Balestrin (2015) argue.

This reality is also supported by the fact that the acquisition of external knowledge and its subsequent incorporation into the internal environment are determining factors for the performance of the organizations (Levinthal, 1990; Zhara & George, 2002). According to Cassol *et al.* (2016), the best performances in the global market originate from companies that can demonstrate timely and rapid response to the environment, a flexible capacity for product/service innovation, in addition to the development of management potential to coordinate and redeploy internal/external organizational skills. In this context, the rapid changes observed in the context in which organizations operate make the innovation process an essential skill in generating a competitive advantage and the absorptive capacity has a strong relationship with the organization's ability to innovate (Zahra & George, 2002).

Although the sequence of dimensions changed its order, according to the study by Oliveira *et al.* (2018), the variables of each construct did not change, that is, they were not categorized in different dimensions than those contemplated in the adopted scale, which reinforces the internal consistency of the model. A supposed answer to this empirical finding may be in the argument raised by Zahra and George (2002) when they say that it is not clear whether the measures converge to capture similar attributes of the same construction, indicating a much needed dialogue about the definition and dimensions of the AC.

Table 7. Component Matrix with 3 factors by varimax method

VARIABLES	FACTORS		
	1	2	3
<i>Perceived Organizational Performance</i>			
DO1. Compared to the average of competitors, your university has better growth	0,72		
DO3. Overall, nowadays your university performs better than it did 5 years ago.	0,72		
DO4. Over the past 12 months, your university has achieved its performance goals.	0,70		
DO5. Over the past 5 years, your university has achieved its performance goals	0,70		
DO7. Compared to the average of competitors, your university has better participation in society.	0,61		
DO2. Overall, nowadays your university performs better than it did 12 months ago	0,57		
DO6. Compared to the average of competitors, your university is the one that receives the most students.	0,57		
<i>Perceived Innovation</i>			
INOV4. The university is able to allocate professionals from different functional groups in the innovation process.	0,74		
INOV3. The university is able to share lessons learned in Research and Development and Innovation projects.	0,73		
INOV5. The university is able to integrate different functional groups involved in the innovation process.	0,73		
INOV2. The university is able to assimilate knowledge acquired in Research and Development and Innovation projects.	0,68		
INOV1. The university is able to identify opportunities for improvement with a view to innovation.	0,60		
<i>Perceived Absorptive Capacity</i>			
CAP4. In the university, ideas and concepts are communicated in an interdepartmental way.		0,70	
CAP5. The university encourages interdepartmental support to solve problems.		0,70	
CAP6. In the university there is a rapid flow of information, for example, if a unit obtains important information it immediately communicates to all other units or departments.		0,66	
CAP3. Teachers expect students to handle information from a variety of different content.		0,56	
CAP2. Teachers motivate students to use external sources of information related to new forms of learning (e.g., reports from elsewhere, feedback, partners, government institutions, specialized journals, other sources).		0,54	
CaP1. The search for relevant information about teaching tools is an activity carried out daily at the university.		0,42	
Total Variance Explained = 51.41%	19,35%	17,19%	14,87%

Source. Research data.

5. Final Considerations

Studies on Absorptive Capacity have been increasingly relevant, especially with regard to the test of measurement models that have already been developed, that is, validation through empirical research. According to Versiani et al. (2010), Oliveira et al. (2018) its measurement is still a debate far from the end, especially because it contains a series of factors and constructs that influence the execution of this intangible artifact.

This study sought to identify the perception of students of Administration and Accounting Sciences about Perceived Organizational Performance from the perspective of Absorptive Capacity and Innovation within the UFCG. The organizational performance factor was more important according to the perception of the participants of the study, followed by the innovation and absorptive capacity factor. Only one variable (CAP1 = The search for relevant information about teaching tools is an activity performed daily at the university), presented a factor load below 0.50. The others presented reasonable power of explanation in relation to the variance of the data.

The results found demonstrate that the Organizational Performance perceived by students within the UFCG may be positively impacted by the Perceived Innovation and Absorptive Capacity, reflecting the institution's abilities to identify and acquire knowledge in the external environment, assimilate it, internalize it, transform it and apply it, resulting in valuable products and services (Cohen & Levinthal, 1990; Zahra & George, 2002).

One contribution is the fact that it validates an Organizational Performance model for Higher Education Institutions that was developed (Oliveira *et al.*, 2018) and applied in both the Administration and Accounting Science courses and that can bring interesting managerial reflections and inferences to the institution's management to the extent that it is noticed that the effort practiced to identify, acquire and transform external knowledge can become an important organizational investment that can contribute to the generation of innovation, thus confirming the relationship among Organizational Performance, Absorptive Capacity and Innovation, as advocated by Souza, Silva and Abreu (2019).

The divergences found by the results demonstrate only a change in importance in the order of the dimensions of Organizational Performance and Absorptive Capacity, without disregarding any of the variables of the model. The main limitations found in the study were mainly from the sample that could have a larger number of participants, although for the assumptions of FA it was feasible.

References

- Araújo, U. V., Baldam, R. L., Coelho Junior, T. P., & Costa, L. (2019). Perception of Fulfillment of Organizational Mission and Individual Performance in a Brazilian Public Company. *RACE: Revista de Administração. Contabilidade e Economia*, 18(2), 321-344. <https://doi.org/10.18593/race.19735>
- Audretsch, D. B., Lehmann, E. E., Menter, M., & Wirsching, K. (2021). Intrapreneurship and absorptive capacities: the dynamic effect of labor mobility. *Technovation*, 99. <https://doi.org/10.1016/j.technovation.2020.102129>
- Bezerra, F. A. (2007). Análise Fatorial. In: Corrar, Luiz J. Paulo, Edilson; Dias-Filho, J. Maria (Eds.), *Análise multivariada: para os cursos de administração, ciências contábeis e economia* (pp. 73-130). São Paulo: Atlas.
- Bezerra, F. A., & Corrar, L. J. (2006). Utilização da análise fatorial na identificação dos principais indicadores para avaliação do desempenho financeiro: uma aplicação nas empresas de seguros. *Revista de Contabilidade e Finanças – USP*. São Paulo. <https://doi.org/10.1590/S1519-70772006000300005>
- Bhupendra, K. V., & Sangle, S. (2022). Structural process model of absorptive capacity for stakeholder's integration in decision-making: dynamic capability perspective. *Society and Business Review*, 17(3), 421-440. <https://doi.org/10.1108/SBR-05-2021-0067>
- Cassol, A., Cintra, R. F., Ruas, R. L., & Oldoni, L. E. O. (2016). Desenvolvimento da Capacidade Absortiva em Empresas Incubadas e Graduadas de Santa Catarina, Brasil. *Desenvolvimento em Questão*, 14(37), 168-201. <https://doi.org/10.21527/2237-6453.2016.37.168-201>
- Cassol, A., Gonçalo, C. R., Santos, A., & Ruas, R. L. (2016). A Administração Estratégica do Capital Intelectual: Um Modelo Baseado na Capacidade Absortiva para Potencializar Inovação. *Revista Ibero-Americana de Estratégia*, 15(1), 27-43. <https://doi.org/10.5585/riae.v15i1.2161>
- Chauvet, V. (2014). Absorptive Capacity: Scale Development and Implications for Future Research. *Capacidad de Absorción: Propuesta de Medida Y Contribuciones a Futuras Investigaciones*. <https://doi.org/10.7202/1028493ar>
- Ciotti, R., & Favretto, J. (2017). Capacidade Absortiva em Instituições de Ensino Superior: Uma Sistematização da Literatura. *Contextus - Revista Contemporânea de Economia e Gestão*, 15(3), 203-229. <https://doi.org/10.19094/contextus.v15i3.898>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128-152. <https://doi.org/10.2307/2393553>
- Cohen, W., Levinthal, D. (1989). Innovation and Learning: The Two Faces of R&D. *Economic Journal*, 99, 569-596. <https://doi.org/10.2307/2233763>
- Costa, J. C. N. (2018). Capacidade absortiva e desempenho organizacional: a influência mediadora das capacidades de marketing e dos desempenhos operacionais. Doctoral Thesis Programa de Pós Graduação em Administração de Empresas, Universidade Federal do Paraná.
- Cruz-Ros, S., Guerrero-Sánchez, D. L., & Miquel-Romero, M. J. (2021). Absorptive capacity and its impact on innovation and performance: Findings from SEM and fsQCA. *Review of Managerial Science*, 15(2), 235-249, <https://doi.org/10.1007/s11846-018-0319-7>
- Engelman, R., Failure, E. M., Schmidt, S., & Muller, H. F. (2016). Capacidade Absortiva: Adaptação e Validação de uma Escala em Empresas Sul-Brasileiras. *BASE - Revista de Administração e Contabilidade da UNISINOS*, 13(3), 235-247. <https://doi.org/10.4013/base.2016.133.04>
- Fávero, J. D., Pereira, P. E. J., Gomes, G., & Carvalho, L. C. (2020). Gestão do Capital Intelectual e da Capacidade Absortiva como Fundamentos do Desempenho Inovador. *Revista Gestão Organizacional*, 13(2), 85-103. <https://doi.org/10.20401/rasi.7.2.475>
- Filenga, D. (2015). Detalhando o reconhecimento de valor na capacidade absortiva: antecedentes, consequentes e proposta de operacionalização em modelo de variância. Doctoral Thesis Universidade de São Paulo.

- García-Sánchez, E., García-Morales, V. J., & Martín-Rojas, R. (2018). Influence of Technological Assets on Organizational Performance through Absorptive Capacity, Organizational Innovation and Internal Labour Flexibility. *Sustainability*, 10(3), 1-5. <https://doi.org/10.3390/su10030770>
- Garrido, I. L., Parente, R. C., Gonçalo, C. R., & Vasconcellos, S. L. (2017). Mantendo-se Inovadoras: O papel do Desempenho Passado, da Capacidade Absortiva e da Internacionalização. *Brazilian Business Review*, 14(6), 559-574. <https://doi.org/10.15728/bbr.2017.14.6.1>
- Hair, J. J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise Multivariada de dados*. (6th ed.). Porto Alegre, Bookman.
- Holanda, F. M. A., Azevedo Filho, L. G., Carvalho, J. R. M., & Chim-Miki, A. F. (2019). Modelo de capacidade absorptiva dos produtores rurais. Custos e gronegócio on line.
- Hurtado-Palomino, A., Gala-Velásquez, B. D. L., & Ccorisapra-Quintana, J. (2022). The interactive effect of innovation capability and potential absorptive capacity on innovation performance. *Journal of Innovation & Knowledge*, 7. <https://doi.org/10.1016/j.jik.2022.100259>
- Jacomossi, R. R., & Feldmann, P. R. (2020). Boas Práticas de Gestão e Capacidade Absortiva: Impactos na Produtividade das Firmas. *Revista de Administração Contemporânea*, 24(5), 432-447. <https://doi.org/10.1590/1982-7849rac2020190140>
- Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2005). Managing potential and realized absorptive capacity: how do organizational antecedents matter? *Academy of Management Journal*, 48(6), 999-1015. <https://doi.org/10.5465/amj.2005.19573106>
- Lim, S. G. E., & Ok, C. M. (2021). Fostering absorptive capacity and facilitating innovation in hospitality organizations through empowering leadership. *International Journal of Hospitality Management*, 94. <https://doi.org/10.1016/j.ijhm.2020.102780>
- Oliveira, R. S., Rabelo Neto, A., Hipólito, J. C., Nascimento, B., & Melo, R. S. (2018). O Desempenho Organizacional de uma Instituição de Ensino Superior: Uma Análise da Capacidade Absortiva Potencial e da Inovação. *BASE – Revista de Administração e Contabilidade da Unisinos* 15(4), 292-306. <https://doi.org/10.4013/base.2018.154.04>
- Oliveira, S. R., & Balestrin, A. (2015). Cooperação universidade-empresa: um estudo do projeto Unisinos – HT Micron para o desenvolvimento de capacidade absorptiva na área de semicondutores. *Gestão & Produção*, 25(3), 595-609. <https://doi.org/10.1590/0104-530X1018-13>
- Vega-Jurado, J., Gutiérrez-Gracia, A., & Fernández-De-Lucio, I. (2008). Analyzing the determinants of Firm's absorptive capacity: beyond R&D. *R&D Management*, 38(4), 392-405, <https://doi.org/10.1111/j.1467-9310.2008.00525.x>
- Zahra, S. A., & George, G. (2002). Absorptive Capacity: A Review, Reconceptualization and Extension. *Academy of Management Review*, 27(2), 707-715. <https://doi.org/10.2307/4134351>

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