Indicators To Evaluate Research Efficiency in Higher Education Institutions

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Abstract

The comparison of efficiency between Higher Education Institutions (HEIs) based on quantitative and absolute data, is it may not be the most honest way to establish efficiency levels. This study aims to propose indicators for evaluating efficiency in research to compose the management report of intangible assets in HEI. A search was performed in the SCOPUS bibliographic base to identify the intellectual production of the Federal University of Sergipe in the period from 1977 to 2019. The results demonstrate a positive trend in the growth of the volume of publications and that the intellectual production of the university is the result of its integration in national and international networks of scientific collaboration. A management report that aims to demonstrate the value of the university should accurately contemplate the intangible assets produced by it, which could be used as indicators of research efficiency. The disclosure of the value of intangible assets is a strategy to increase the value and credibility of the brand, but also a form of positive accountability to its maintainer and to society.

Keywords: Intellectual Capital, Collaboration Networks, Universities, Research.

Introduction

In recent interview in Brazilian national media, a minister of state suggested that there is lack of quality in Higher Education Institutions (HEIs) in Brazil (Araújo, 2019). His argument is based in comparison of efficiency between public and private universities. This statement triggered several protests in the political environment and on the country's streets. The population and several representatives of the people protested with arguments of 'defending education' (El País, 2019).

Scientific research in Brazil is developed, in most cases, by public universities (Soares, 2018), which despite the structural and financial limitations, are responsible for approximately 90% of national research. However, the current political and economic scenario, marked by budget cuts, has been compromising its research capacity (Massarani & Araripe, 2019).

The university's level of efficiency or performance is defined based on evaluation programs that aim only at the quantitative aspect of production, disregarding qualitative aspects (Agapito, 2016), such as the alignment of intellectual production with the institutional mission or lines of action. The comparison of

efficiency between HEIs based on quantitative and absolute data is it may not be the most honest way to establish efficiency levels, nor to compare performance.

The evaluation of the quality or efficiency of the university needs to consider the formal dimension, which includes the scientific, logical, technical and analytical nature of the assets generated; and the political dimension, referring to the human, technical and conceptual skills of the trained human capital (Soares & Cunha, 2017). Thus, the performance of HEIs should not be limited only to the indicators available in administrative reports. For Klann et al. (2012) it is also necessary to consider academic performance, such as the quality of teaching, research, and the aplication of graduates in the labor market.

The University is the house of the construction of knowledge, an immaterial object that is not measured in size or monetary value. This value is intangible and is not normally considered in performance reports (Jarrett, 2019). Gonçalves & Moreira (2018) explain that the qualification of the teaching staff, graduate courses, quality of the courses offered, general index of courses and the concept received by the Coordination for the Improvement of Higher Education Personnel (CAPES) are important evaluation indicators performance of HEIs. These indicators are related to intangible assets and directly influence the value of the institutional brand.

Universities, centers of scientific and technological development (Pereira et al. 2016), concentrate high levels of human and intellectual capital. Institutions with a high level of human capital for research and development, integrated in diverse networks of relationships are better positioned to extract value from strategic partners (Martinez et al., 2019). For Arranz et al. (2020) when developing collaborative projects, institutions integrate and form networks, generating social or relational capital. The context influences in creation and use of intangible capital (Edelman et al., 2004). In the academic environment, for example, these assets are the result of teaching, research and extension processes and represent the central elements of value creation and delivery.

The term intellectual capital has been used commonly to refer to intangible assets. However, the concept of an intangible asset is broader. It is legitimate to categorize as intangible assets all intangible rights that have economic value for the institution, thus being able to extrapolate the items presented in the concept of intellectual capital (Silva et al., 2018; Nunes-Silva et al., 2019).

It is also possible to identify several classifications for intangible assets. Dias (2015) presented a robust model for the evaluation of intellectual capital in public administration, composed of the components: human, organizational, technological, business, social, entrepreneurship and innovation. Specifically, in the context of universities, these assets were classified into human, structural and relational capital, according to the Report on intellectual capital in Austrian universities and the PCI Program: Comunidad de Madrid (Sangiorgi & Siboni, 2017).

When proposing a procedure to identify intangible assets that generate value in universities, Martínez-Torres (2014) used the widespread classification of intellectual capital: human, structural and relational. However, considering that the intangible assets generated in universities are the result of teaching, research and extension processes, this research proposes the use of a modified taxonomy, adjustable to the demands of universities, composed of: Human Capital (qualification and know-how of staff) , Intellectual Capital (scientific and technological productions) and Integrative Capital (Collaboration networks and fundraising).

Public institutions disburse resources or assume obligations with the acquisition, development, maintenance or improvement of intangible assets (CFC, 2017). The identification and valuation of these assets can contribute to the construction of arguments for allocating budgets and generate instruments for monitoring and evaluating performance (Salgado, 2016). Information on the generation of intangibles could also feed the communication systems and increase the university's transparency. The disclosure of intangible assets through Reports may improve information related to intellectual values and assist managers in the effective management of intellectual capital (Córcoles & Ponce, 2013).

The university's intellectual production is increased through collaboration networks. Thus, the report of intangible assets must contain information about integrative capital, representing relationships with strategic publics, such as internationalization and external relations (Cunha, 2018). These relationships could be expressed in actions of extension (Júnior & da Silveira, 2016), sharing of equipment, scientific collaboration (Leite et al., 2018) or participation in external academic actions. In the academic environment, the integrative capital perceived in the relationship networks denotes the capillarity of the HEIs in the construction and diffusion of knowledge.

Although this commercial bias is not admitted from an educational and pedagogical point of view, when analyzed from an administrative perspective, HEIs offers academic service, recognized how teaching-learning process (Ligozat et al., 2018). Services have values that are centered on the subjective perception of those involved. These values are intangible, needing something concrete to evidence it.

In this context, the Brand represents the intangible asset that influences consumer perception and the definition of service quality. The Brand is the service's sensory identity, and its value can be regulated by the management of the service's intangibility (Merz et al., 2018). The relationships between HEIs could be considered quality indicators to define their capacity for generating knowledge in collaboration with other institutions.

Public HEIs are institutions financed by society, which make them dependent on publics education policies (Chaves et al., 2018). This financial dependency may represent a restriction on freedom of growth, but it can also be a driver of resource allocation. It seems consistent that, when public resources are received, HEIs have an obligation to disclose information about the application and the results achieved (Craveiro, 2018). The results consolidate the value relationship generated by the HEI, which is not always expressed considering intangible assets.

Some HEIs use scientific and technological productions to value their Intellectual Capital. Others quantify the degree of professors to demonstrate the value of Human Capital. However, the disclosure of the value inserted in institutional relations is restricted. This would characterize Integrative or relational Capital. The identification and disclosure of institutional capillarity at the national and international levels demonstrate, in addition to the productivity of human capital, the reach and impact of the generated intellectual capital.

Martinez-Torres (2014) argues that the reports focus on the identification of intangible assets and try to link them to the university's objectives, needing the definition of specific indicators to facilitate comparability and performance measurements. Specifically, data was identified based on the production of intellectual capital and integrative capital to propose representative indicators to measure the efficiency of the university in research. Thus, this study aims to propose indicators of evaluation of efficiency in research to compose the management report of intangible assets in the HEI.

Method

Search Type

This research is based on infometry. A quantitative analysis methodology, which, through its tools and procedures, supports the interpretation of quantitative data and allows the analysis of results to be carried out in different ways, depending on the objective (Coelho Neves et al., 2015; Teixeira et al., 2017). It also assumes characteristics of cross-sectional study. Publication records have been analyzed since 1977, however the analysis is not based on the temporal evolution of the results, but on the apparent picture on the date of collection. As for the method, the inductive was used because it is indicated for studies based on evidence.

Data Collection and Procedures

The intellectual production of the Federal University of Sergipe (UFS) was analyzed. This public institution, selected intentionally, was the target of the speech of a Brazilian Minister of State, who publicly questioned the efficiency of the university in the process of producing Intellectual Capital.

Founded in 1968, UFS currently has six campuses throughout the state of Sergipe. The Institution offers 82 different undergraduate courses, 7 latu sensu specialization courses and 60 stricto sense postgraduate programs (UFS, 2019).

The identification of the university's intellectual production was fulfilled on the SCOPUS bibliographic base. The date of data collection was May 2019. Thus, the results for 2019, the current year of the survey, are partial. The data resulted from the expression 'Sergipe', inserted in the search field with a filter directed to 'affiliation'. Subsequently, the data refinement criterion was applied, again using the 'Affiliation' filter limited to results containing 'Federal University of Sergipe'.

The proposal of indicators to measure the efficiency of the university in research, in this study, is based on data on:

a. The behavior of the volume of intellectual production. The objective was to understand the variation in publication volume over the period.

b. The volume of intellectual production developed from financing, seeking to verify the percentage of research resulting from internal (from the institution) or external (financing agencies) investments.

c. The volume of intellectual production of human capital. The objective was to identify the behavior of the production volume according to the level of qualification.

d. The area of knowledge of intellectual production, seeking to identify the alignment of production with the mission or lines of action of the university.

e. Integration networks. The objective was to identify institutional capillarity.

Data analysis

The data are presented in the form of graphs of frequency of publication volume per year, funding agencies for the intellectual production process and integration networks. Based on information collected on the university's Portal, added to the information collected on the SCOPUS bibliographic base, the relationships

are presented between: the number of publications by teachers; and the number of publications by professors with doctoral degrees. Among these data, Pearson's correlation coefficient was established. Finally, groups of qualitative and quantitative indicators of research efficiency are suggested.

Results

Considering all types of publications, 6,239 results were identified. Of this total, 83.8% (5,231) are articles published in peer-reviewed journals. The results were grouped by year of publication. Figure 1 shows the volumes of publications per year, since the first registration in the database, in 1977. Two factors stand out: the annual growth in the volume of publications since 2002, causing an abrupt change in the trend line; and the behavior of the trend line of the annual volume of publications.

Visually, it is possible to identify three growth trend lines, which coincide with political periods of Brazil. From the first publication until 2002, there is an almost continuous line with few publications. From 2002 to 2010, the first positive inclination in the volume of publications is noted; after this period, it is possible to observe another positive change in the trend line. 2019, the current year of this study, does not yet contain all publications, which negatively influences the trend line.

Figure 1

Number of publications per year

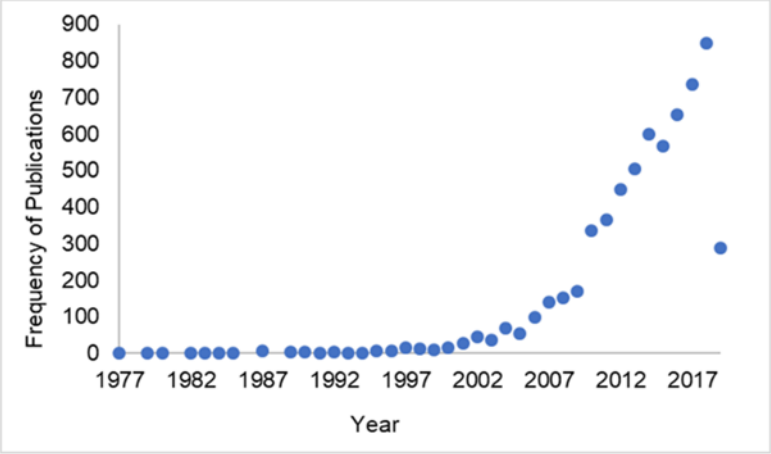


Figure 2 shows the percentages related to research funding. Of the total selected surveys (6,239), 4,408 (70.7%) did not indicate sources of funding. Thus, it is considered that 1,831 (29.3%) surveys indicated the receipt of financial subsidy.

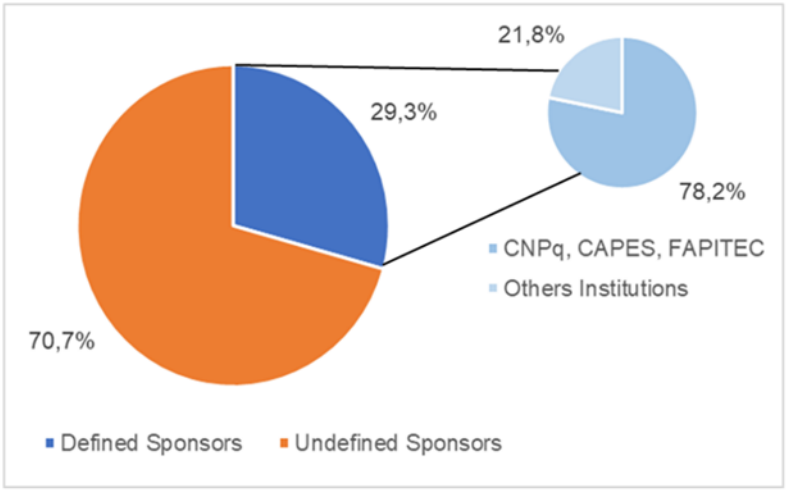
156 funding agencies were identified. Of this total, 10.9% (17) are Brazilian and 89.1% (139) are international. Of the total surveys that indicated sources of funding, Brazilian agencies were declared as financiers by 57.5% and international agencies by 42.5%.

It was possible to verify that some researches, especially those developed in co-authorship, indicated more than one source of financing, which could be from national or international institutions. Considering the number of times the national development agencies were appointed as financiers, the National Council for Scientific and Technological Development (CNPq), CAPES and the State Foundation of Sergipe

(FAPITEC), together, were listed 2,502 times, the equivalent to 78.2% participation. Other institutions, including universities and national research institutions, were cited 697 times, corresponding to 22%.

Figure 2

Percentage of surveys that indicated or did not indicate sources of financing and the participation of Brazilian agencies



Another important indicator to be analyzed is the number of publications by professors over the years. Figure 3 shows the indices related to the number of publications resulting from the research, divided by the total number of professors at the institution and by the total number of professors with doctoral degrees. The values refer to the most recent decade, starting in 2010. The volume of publications in 2019 was disregarded, as it is the current year of this study. It is observed that there is an increase in the index of publications for both types of analysis, according to the linear regression trend line. Applying Pearson's correlation coefficient, an almost perfect correlation of 0.998 is observed.

Figure 3

Indexes regarding the number of publications per year

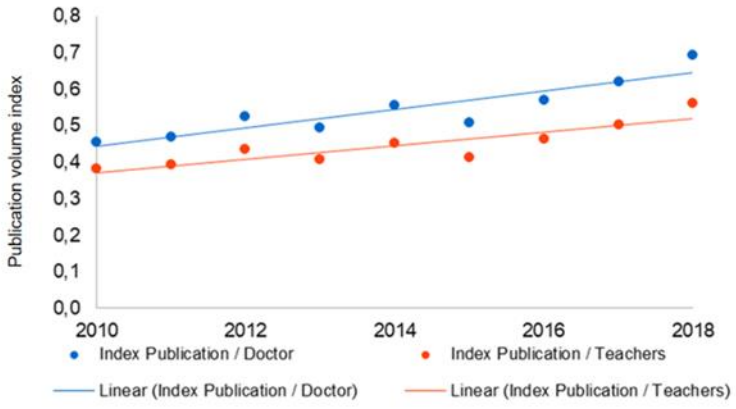


Figure 4 shows the areas of knowledge of the journals in which the researchers published the researchs. Approximately 70% of publications are directed to the larges areas of Health Sciences, Engineering, Agricultural Sciences and Biological Sciences. In percentage terms, the results show that the Health Sciences area (22.59%) is the most frequent and that the Applied Social Sciences area has the lowest number of publications (1.0%)

Figure 4

Areas of knowledge of publications' journals

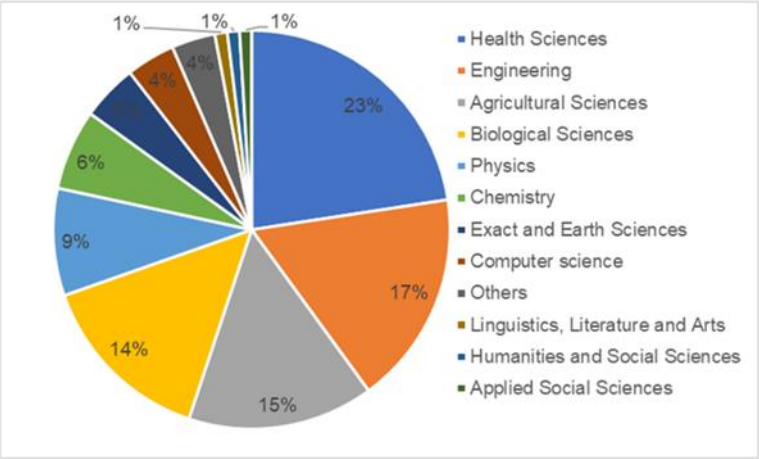


Figure 5 shows the integration network between UFS and other institutions, formed from the researchers' institutional link. The configuration of the network demonstrates two specific situations: (5a) the international institutions that make up the university's relationship network; and (5b) the Brazilian institutions that relate to the university. Of the total of 27 Federative Units in Brazil, the analyzed university is related to institutions spread across 23 states. It is also possible to observe the more intense participation of Brazilian public universities in the network.

Figure 5

Integration network between the Federal University of Sergipe and international and national institutions

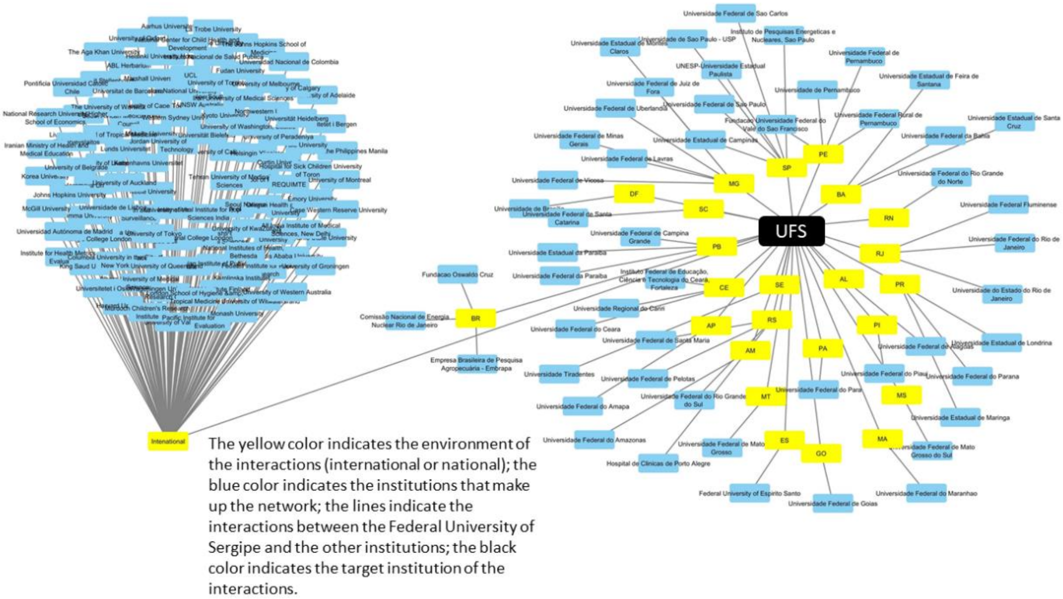
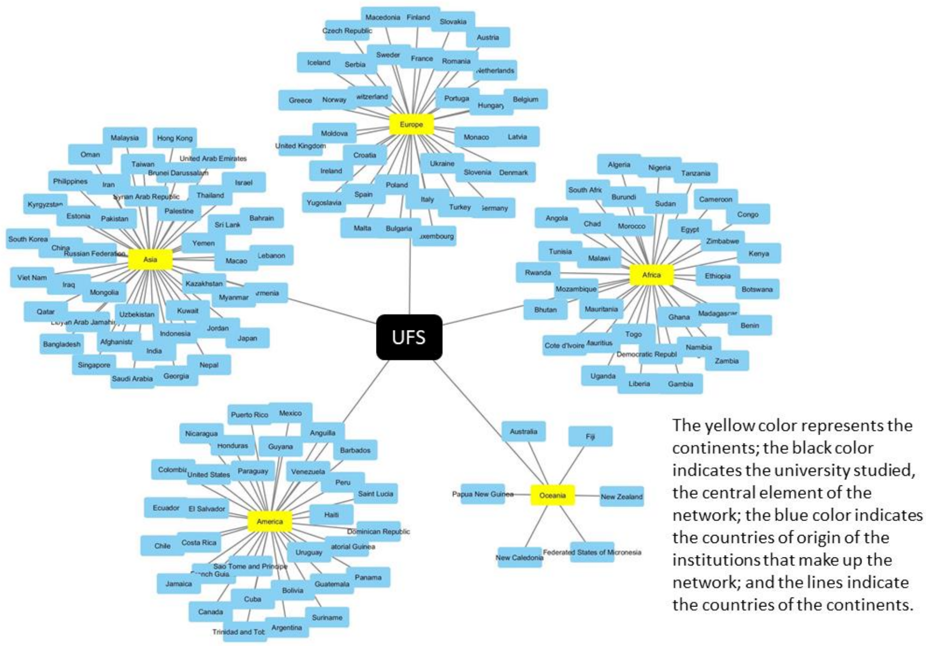


Figure 6 shows the integration networks between UFS and other international institutions distributed across continents, formed from the researchers' institutional link. It is observed that UFS is integrated with institutions from the five continents. It is possible to see that the university is more integrated with institutions from countries on the Asian, European, African and American continents, in that order, and that the network of integration with institutions from countries in Oceania is smaller in number of relations.

Figure 6

Integration network between the Federal University of Sergipe and international institutions distributed across continents



Discussion

When interpreting the lines of evolution of intellectual production, it was possible to observe a relationship between the number of publications and the Brazilian public policies for higher education management. The perceived effects correspond to those recommended by the Ministry of Education, showing alignment with the government expectations implemented in 2003 and with expected effects until 2012 (MEC, 2010). Apparently, these policies caused stable changes in academic behavior, evidenced by the continued evolution of the quantitative of intellectual production. The increase in the number of publications may reflect the University Reform promoted by the federal government, such as the Federal Government Program to Support Plans for Restructuring and Expansion of Brazilian Federal Universities (REUNI), which increased the number of places in public universities and made it more attractive the academic career for researchers (Araújo, 2012). REUNI was one of the actions that integrated the Education Development Plan (Brasil, 2007).

The program enabled the articulation between undergraduate and graduate courses, through the granting of scholarships called REUNI Teaching Assistance Scholarships (Brasil, 2008). In addition to developing academic activities, graduate students are dedicated to research activities and the publication of intellectual production (Valverde et al., 2017). Other national initiatives may also have positively influenced the increase in intellectual production at UFS, such as the CAPES Thesis Premium, created in 2005; the Science Without Borders Program, established in 2011; the National Knowledge Platforms Program, started in 2014; and other CNPq initiatives, such as research notices: Chamada Pública, Pronex and Edital Universal.

Financing in research infrastructure influences the scientific and academic production of researchers. For Monteiro (2018) the impacts of financing can be seen in intellectual production, as well as in the results of evaluations of graduate programs. To stimulate the development of scientific and technological research, there are several types of financing (Porto & Memória, 2019), such as postgraduate scholarships and research notices.

The indication of funding sources is an unconditional commitment by the researcher. It is essential to disclose any financial relationships with institutions or sponsoring agencies that may unduly interfere in search. Of the total surveys identified, approximately 70% did not indicate sources of funding. Thus, it is understood that the financing institution was the HEI itself, the researcher's employer. However, considering the possibility of the researcher's neglect in relation to the identification of the funding source, it is possible that the percentage of research developed from subsidies is higher. In view of this possibility, Ordinance No. 206/2018 was published, which dispose for the mandatory citation of CAPES in works produced or published, in any media, arising from activities financed, in whole or in part, by the agency (CAPES, 2018).

In the case of UFS, data presented by Araújo et al. (2018) indicate that 11.33% of the resources invested in research are the result of internal investments. This percentage places the institution in the 41st position in the ranking among the Federal Universities of Brazil. Considering that the official funding for research is preferentially aimed at researchers with a doctorate degree, these data allow us to suggest that many researchers without a doctorate degree are participating in research produced at the university.

It was possible to verify the active participation of Brazilian and international institutions in promoting research carried out in collaboration with UFS. At the national level, the main research promoting bodies are CNPq and CAPES, and at the state level, FAPITEC, the research management agency in the state where the analyzed institution is located. Despite appearing in a smaller number of the total surveys that indicated funding, Brazilian agencies were declared at 57.5%. With regard to international financing, Ramos (2018) explains that this represents an important strategy for the internationalization of higher education and scientific research.

Public universities depend exclusively on public resources and partnerships in the development of research. Moura & Camargo Júnior (2017) point out that funding agencies are fundamental elements in the scholarship payment processes in graduate programs and the financing of research projects. Leite & Rocha Neto (2017) emphasize the function of CNPq in the financing processes of Brazilian science and in the constitution of a national elite of researchers, mainly in public universities.

The intellectual production of universities is the result of research carried out in single authorship, co-authorship, or in research groups (Domingues et al., 2017). In the academic and scientific environment, researchers with high degrees are highly valued, which suggests the capacity and qualification to perform teaching and research activities (Barreira & Conde, 2016). Following the line of reasoning that researchers with a doctorate degree are responsible for research at the university, it would be expected that the increase in intellectual production would be associated with the increase of doctors in the faculty of the HEI.

Analyzing the official data from UFS, it was found that the percentage of professors with doctoral degrees did not increase, remaining at 83.0%. When the annual publications index was generated, by dividing the number of publications by the number of professors with a doctorate and, subsequently, by the total number of professors at the institution, the values follow an upward trend line in both situations, contrary to the studies by Dias & Moita (2018).

Pearson's Correlation Coefficient was applied and an almost perfect correlation of 0.998 was found. This suggests that there are no differences in the capacity to produce Intellectual Capital from the titling of Human Capital. The almost perfect correlation confirms Soares' (2018) interpretation, when he says that the search for a degree is a consequence of the valorization of the title of doctor in the academic career, independent of competence, profile or specialty.

The possibilities for the university to have high levels of intellectual capital are directly related to the profile of human capital, however this relationship is not conditioned exclusively to the academic degree factor, but to others, such as engagement in collaboration networks. Researchers without a doctorate degree can be integrated into internal research groups and scientific collaboration networks, which favors the development of research and the utilization of internal and external resources. Neiva et al. (2016) highlight that collaboration with high-productivity researchers, positioning in collaboration networks, number and quality of relationships and efficiency of contacts are factors that influence productivity.

The targeting of intellectual production to certain areas of knowledge denotes the current alignment of the HEI. Health Sciences, Engineering, Agrarian Sciences and Biological Sciences make up most of the areas of concentration of the journals in which the research was published. In a direct analysis, it is possible to see a profile of performance within biological areas. The university studied has a Campus oriented at the

Health Sciences area, therefore, the profile of intellectual production seems to be aligned with the academic offer.

However, the Intellectual Capital generated by the HEI should demonstrate alignment with the mission. According to official documents, the UFS Mission is to contribute to the progress of society through the generation of knowledge and the formation of critical, ethical and committed citizens to sustainable development (Santos et al., 2018). Among the objectives, what comes closest to the biological areas is perhaps to investigate and offer solutions to the problems related to the socioeconomic and cultural development of the State, the Northeast Region and the Country.

The publication areas other than those foreseen to fulfill the institutional Mission and the objectives, suggest disproportionality between the alignment of the Intellectual Capital produced and the composition of the official documents. This could be an indication of the need for a revision of the IES Mission, mainly because the criteria for the selection and formation of Human Capital follow, or should follow, the specificities of the areas of excellence perceived internally.

Scientific collaboration networks represent one of the main relationship tools in the scientific community. They indicate the flows of knowledge generation and circulation and stimulate new research (Haddad et al., 2017). This integration of researchers or universities corresponds to Integrative Capital, a consequence of the interest in sharing resources, knowledge and generating Intellectual Capital. The integration and transversality of knowledge and cultures is the mainstay of the success of the collaboration, evidenced in the results achieved by the networks.

The intellectual production developed in collaboration shows that some values of the Human Capital of the university are perceived by the research partners. It seems clear that the partnerships are initiated based on the researchers' particular intentions, but all are certified by the HEIs of origin in the form of scientific collaboration or agreements. The structure of networks with special dedication to social relations, contributes positively to the success of research groups (García-Sánchez et al., 2019). In this specific case, the existence of collaboration networks with HEIs from almost all Brazilian states is perceived, therefore an indicator to estimate the value of the university.

The relationship with researchers from institutions in 150 countries, from all continents, demonstrates the university's capillarity. These data could be considered indicators to value the IES brand, as this signals the ability to integrate into networks, as well as the international interest in research developed at the university. According to Sidone (2013), international collaboration is an indicator in the formulation of Science, Technology and Innovation policies, since it provides an opportunity to increase the quality of national science and promotes access to knowledge generated from international investments.

Conclusion

A university management report that aims to demonstrate the value of the institution needs to accurately contemplate the intangible assets produced by it. Intangible assets that could be used as indicators of efficiency in research can be classified into:

•Quantitative: volume of productions. Viewed in the annual number of scientific publications and its growth over time.

•Qualitative: ability to raise funds for investment in research; the percentage of intellectual production from internal investments; annual index of publications per teacher and its growth curve; ability to integrate into national and international research networks.

•Quality: alignment of intellectual production with the mission and objectives of the HEI. Process carried out by comparing the areas of the journals in which the research is published with the Mission and objectives, as explained in the official documents. This analysis identifies the extent to which the HEI fulfills its social role provided for in the official document of commitment to society and endorsed by educational regulatory organisms.

The disclosure of the value of the intangible assets generated by the institution is an effective strategy to increase the value and credibility of the brand, but also a way of positive accountability to its maintainer and to society. The performance evaluation of the HEIs needs to be carried out in an integrated perspective, incorporating the results of the teaching, research and extension processes. The profile of Human Capital can be directed at the moment of funding, but Intellectual Capital and Integrative Capital are consequences of the directions given by IES in its management. This management should consider the integration of academic and intellectual production with the Mission and the objectives, since this directly influences the perception of the brand value.

In this research, groups of indicators were presented to evaluate research efficiency. Considering that the intangible assets produced in universities are the result of teaching, research and extension processes, it is suggested for future studies to identify indicators to assess the efficiency of teaching and extension

References

Agapito, A. P. F. (2016). Ensino Superior no Brasil: expansão e mercantilização na contemporaneidade. Temporalis, 16(32), 123-140.

Araújo, E. C. F., Siena, O., & Rodriguez, T. D. M. (2018). Receita própria no financiamento das universidades federais brasileiras. Anais dos Colóquios Internacionais sobre Gestão Universitária, Loja, Equador.

Araújo, B. C. (2012). Políticas de apoio à inovação no Brasil: uma análise de sua evolução recente. Instituto de Pesquisa Econômica Aplicada – IPEA, Rio de Janeiro.

Araujo, F. Onyx Lorenzoni é criticado por declarações sobre UFS, publicado em 03/05/2019. Available in: f5news.com.br/politica/onyx-lorenzoni-e-criticado-por-declaracoes-sobre-ufs_55349/. Access on: 22 jun. 2019.

Arranz, N. M. F., Arroyabe, J. C., & Fernandez de Arroyabe. (2020). Network Embeddedness in Exploration and Exploitation of Joint R&D Projects: A Structural Approach. British Journal of Management, 31, 421-437.

Barreira, C. R. A., & Conde, E. (2016). A psicologia do esporte na ANPEPP: um inédito grupo de trabalho inaugura sua participação. Revista Brasileira de Psicologia do Esporte, 6(2), 1-12.

Brasil. (2007). Decreto nº 6.096, de 24 de abril de 2007. Institui o Programa de Apoio a Planos de Reestruturação e Expansão das Universidades Federais-REUNI. Brasília, Diário Oficial da União.

Brasil. (2008). Portaria n°582, de 14 de maio de 2008. Brasília, Diário Oficial da União, seção 1, 19. Available in: https://ufsj.edu.br/portal-repositorio/File/PPGENF/Concessao_das_bolsas_de_Pos-Graduacao_do_Programa_REUNI.pdf. Access on: 12 out. 2019.

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). (2018). Portaria nº 206, de 4 de setembro de 2018. Dispõe sobre obrigatoriedade de citação da CAPES. Available in: http://capes.gov.br/CECOL/Portaria_CAPES_DOU_206_de_2018.pdf. Access on: 12 abr. 2020. Acesso em: 12 de out. 2019

Conselho Federal de Contabilidade (CFC). (2017). Norma Brasileira de Contabilidade, NBC, TSP 08 - ativo intangível. Available in: http://www1.cfc.org.br/sisweb/SRE/docs/NBCTSP08.pdf. Access on: 10 abr. 2020.

Córcoles, Y. R., & Ponce, A. T. (2013). Cost–benefit analysis of intellectual capital disclosure: University stakeholders'view. Revista de Contabilidad - Spanish Accounting Review, 16(2), 106–117.

Chaves, V. L. J., Reis, L. F., & Guimarães, A. R. (2018). Dívida pública e financiamento da educação superior no Brasil. Acta Scientiarum Education, 40(1), 1-12.

Coelho Neves, B., Souza Couto, E., & Couto Cunha, M. (2015). Fundamentos e agenda da inclusão digital no Brasil: pesquisas em Educação. Educação, 38(3), 379-386.

Craveiro, F. M. L. (2018). Acreditação no Ensino Superior: um estudo sobre a Universidade de Coimbra. Dissertação (Mestrado em Administração Público-Privada apresentado à Faculdade de Direito). Universidade de Coimbra, Coimbra.

Cunha, J. L. V. (2018). Proposição de uma estrutura de indicadores para apoiar a gestão dos ativos intangíveis de capital intelectual em IFES. Dissertação (Mestrado em Engenharia de Produção) - Universidade Federal do Rio Grande do Sul - Escola de Engenharia. Rio Grande do Sul, 2018.

Dias, T. M. R., & Moita, G. F. (2018). Um retrato da produção científica brasileira baseado em dados da plataforma lattes. Brazilian Journal of Information Science: research trends, 12(4), 62-74.

Dias, M. A. H. (2015). Proposta de Modelo para Avaliação do Capital Intelectual na Administração Pública: O Caso no PROANTAR. Tese de Doutorado em Engenharia e Gestão do Conhecimento. UFSC. Florianópolis, 2015.

Domingues, A. N., Machado de Jesus, I. T., & Zem-Mascarenhas, S. H. (2017). Informática na Educação em Saúde e Enfermagem: análise dos grupos de pesquisa. J. Health Inform., 9(1), 19-24.

Edelman, L. F., Bresnen, M., Newell, S., Scarbroughw, H., & Swan, J. (2004). The Benefits and Pitfalls of Social Capital: Empirical Evidence from Two Organizations in the United Kingdom. British Journal of Management, 15, S59-S69.

El País. Protestos contra cortes na educação: "O que o presidente diz é uma ofensa a nós que viemos às ruas", publicado em 16/05/2019. Available in: brasil.elpais.com/brasil/2019/05/15/politica/1557925930_773928.html. Access on: 22 jun. 2019.

García-Sánchez, P., Díaz-Díaz, N. L., & De Saá-Pérez, P. (2019). Social capital and knowledge sharing in academic research teams. International Review of Administrative Sciences, 85(1), 191-207.

Gonçalves, A. R. A., & Moreira, N. P. (2018). Desempenho das Universidades Federais Brasileiras no contexto da Política Pública REUNI. Revista Brasileira de Educação e Cultura, 18, 81-100.

Haddad, E. A., Mena-Chalco, J. P., & Sidone, O. (2017). Produção científica e redes de colaboração dos docentes vinculados aos programas de pós-graduação em Economia no Brasil. Estudos Econômicos, 47(4), 617-679.

Jarrett, J. E. (2019). Methods for Evaluating the Value of Intangible Assets. International Journal of Business and Data Analytics, 1(2), 2019.

Júnior, N. T., & Da Silveira, R. I. M. (2016). Reflexões acerca do melhoramento contínuo da qualidade em serviços de extensão universitária: um estudo de caso em um programa educativo de rádio universitário. Revista Eletrônica Gestão e Serviços, 7(1), 1466-1491.

Klann, R. C., Cunha, P. R., Rengel, S., & Scarpin, J. E. (2012). Avaliação de Desempenho das Instituições de Ensino Superior pertencentes à Associação Catarinense das Fundações Educacionais (Acafe). Contabilidade, Gestão e Governança, 15(3), 71-87.

Leite, D. B. C., Caregnato, C. E., & Miorando, B. S. (2018). Efeitos multiplicadores das redes de colaboração em pesquisa. Um estudo internacional. Avaliação: Revista da Avaliação da Educação Superior, 23(1), 263-286.

Leite, A. C. F., & Rocha Neto, I. (2017). Perfil dos bolsistas de produtividade em pesquisa do CNPq em Educação. Revista Brasileira de Ensino Superior, 3(4), 97-112.

Ligozat, F., Lundqvist, E., & Amade-Escot, C. (2018). Analysing the continuity of teaching and learning in classroom actions: When the joint action framework in didactics meets the pragmatist approach to classroom discourses. European Educational Research Journal, 17(1), 147-169.

Martínez-Torres M. R. (2014). Identification of intangible assets in knowledge based organizations using concept mapping techniques. R & D Management, 44(1), 42–52.

Martinez, M. G., Zouaghi, F., & Garcia, M. S. (2019). Casting a Wide Net for Innovation: Mediating Effect of R&D Human and Social Capital to Unlock the Value from Alliance Portfolio Diversity. British Journal of Management, 30, 769-790.

Massarani, L.; & Araripe, C. (2019). Aumentar o diálogo com a sociedade é uma questão de sobrevivência para a ciência brasileira. Cadernos de saúde pública, 35(6), 1-3.

MEC [Ministério da Educação]. O que é o REUNI? Publicada em 25.03.2010. Available in: http://reuni.mec.gov.br/o-que-e-o-reuni. Access on: 11 out. 2019.

Merz, M. A., Zarantonello, L., & Grappi, S. (2018). How valuable are your customers in the brand value co-creation process? The development of a Customer Co-Creation Value (CCCV) scale. Journal of Business Research, 82, 79-89.

Moura, E. G., & Camargo Júnior, K. R. (2017). A crise no financiamento da pesquisa e pós-graduação no Brasil. Cadernos de Saúde Pública, 33(4), 1-3.

Monteiro, J. Z. O. (2018). O financiamento à infraestrutura de pesquisa e sua relação com a produção científico-acadêmica e a qualificação dos cursos de pós-graduação stricto sensu. Dissertação (Mestrado em Administração Pública apresentado à Escola Brasileira de Administração Pública e de Empresas). Fundação Getúlio Vargas, Rio de Janeiro.

Neiva, E. R., Fussi, C. C., & Corradi, A. A. (2016). Relações entre produtividade acadêmica e redes sociais entre pesquisadores da Ciência Psicológica. Estudos de psicologia (Campinas), 33(1), 83-94.

Nunes-Silva, L.; Malacarne, A.; Macedo, R. F.; & De-Bortoli, R. (2019). Generation of intangible assets in higher education institutions. Scientometrics, 121, 957–975.

Pereira, J. M. C., Castro, F. N., Lanza, L. N. M., & Lanza, D. C. F. (2016). Panorama de oportunidades para egressos do ensino superior no Brasil: o papel da inovação na criação de novos mercados de trabalho. Ensaio: aval. Pol. Públ. Educ., 24(90), 179-198.

Porto, G. S., & Memória, C. V. (2019). Incentivos para inovação tecnológica: um estudo da política pública de renúncia fiscal no Brasil. Revista de Administração Pública, 53(3), 520-541.

Ramos, M. Y. (2018). Internacionalização da pós-graduação no Brasil: lógica e mecanismos. Educação e Pesquisa, 44(e161579), 1-22.

Salgado, P. M. (2016). Validez inicial de una escala de medición del capital intelectual en universidades. Univ. Psychol., 15(2), 109-120.

Santos, R. F., Oliveira, K. F. D., Silva, A. P. D., & Jorge, M. A. (2018). Plano de Desenvolvimento Institucional (PDI) 2016-2020. Available in: https://ri.ufs.br/bitstream/riufs/7901/2/PDI-UFS%202016-2020.pdf. Access on: 23 abr. 2020.

Sangiorgi, D., & Siboni, B. (2017). The disclosure of intellectual capital in Italian universities: What has been done and what should be done. Journal of Intellectual Capital, 18(2), 354-372.

Sidone, O. J. G. (2013). Análise espacial da produção e das redes de colaboração científica no Brasil: 1990-2010. Dissertação (Mestrado Faculdade de Economia, Administração e Contabilidade), Universidade de São Paulo, 166p.

Silva, M. P. P., Silva, A. H. C., & Sancovschi, M. (2018). Ativo intangível das empresas brasileiras listadas no mercado de capitais: um estudo comparativo com Estados Unidos, Europa, Austrália e Japão. Revista de Contabilidade do Mestrado em Ciências Contábeis da UERJ, 23(2), 53-75.

Soares, P. C. (2018). Contradições na pesquisa e pós-graduação no Brasil. Estudos Avançados, 32(92), 289-313. Available.

Soares, S. R.; & Cunha, M. I. (2017). Qualidade do ensino de graduação: concepções de docentes pesquisadores. Avaliação: Revista da avaliação da educação superior (Campinas), 22(2), 316-331.

Teixeira, A. V., Ribeiro, S. S., Araujo, R. C., & Rezende, D. A. (2017). Evaluation of thematic session state planning and Politics of xvi enanpur. Revista Brasileira de Desenvolvimento Regional, 5(1), 183-199.

Universidade Federal de Sergipe [UFS]. (2019). Sistema integrado de gestão de atividades acadêmicas. Available in: https://www.sigaa.ufs.br/sigaa/public/home.jsf;jsessionid=D549DC814D6AA6FA4A6C643D231AB1F3.cardeal1. Access on: 23 set. 2019.

Valverde, M. T., Silva, A. N., Perez, D. A., Campolina-Silva, G. H., Medeiros, Z., & Oliveira, C. A. (2017). Enfrentando desafios da formação docente na pós-graduação: descrição de uma experiência. Revista Brasileira de Pesquisa sobre Formação Docente, 9(17), 67-84.