THE IMPORTANCE OF BUILDING KNOWLEDGE NETWORKS IN HEIs

A IMPORTÂNCIA DA CONSTRUÇÃO DE REDES DE CONHECIMENTO EM IES

LA IMPORTANCIA DE CONSTRUIR REDES DE CONOCIMIENTO EN LAS IES

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ABSTRACT: Higher Education Institutions (HEIs) are inserted in environments with an unimaginable amount of information and knowledge. This provides for the construction of extremely dynamic information and knowledge networks. The research was carried out in an HEI in the state of São Paulo, using the case study method, allowing the construction of the HEI's knowledge network. The sources and flows of information and knowledge were mapped. The result provided the construction of the sociogram of the HEI, demonstrating the relations of access to knowledge and information between individuals of the institution and the external environment. It was demonstrated that the existing sources and flows of knowledge provide support for the construction of new intelligences and knowledge. It was also identified the centralization of these resources in individuals of the internal environment, as well as the little perception of the importance of external sources and flows. Recommendations were generated for the HEI to make better use of these resources in a structured way.

KEYWORDS: Knowledge Networks. Knowledge. Information. Intelligence. Higher Education Institutions.

RESUMO: *As Instituições de Ensino Superior (IES) estão inseridas em ambientes com um número inimaginável de informações e conhecimentos. Isso proporciona a construção de redes de informações e conhecimentos extremamente dinâmicas. A pesquisa foi realizada em uma IES do estado de São Paulo, dotando-se do método de estudo de caso, permitindo a construção da rede de conhecimento da IES. Realizou-se o mapeamento das fontes e fluxos de informações e conhecimentos. O resultado proporcionou a construção do sociograma da IES, demonstrando as relações de acesso de conhecimentos e informações entre indivíduos da instituição e ao ambiente externo. Demonstrou-se que as fontes e fluxos de conhecimento existentes proporcionam sustentação para a construção de novas inteligências e conhecimentos. Identificou-se também a centralização desses recursos em indivíduos do ambiente interno, bem como a pouca percepção da importância das fontes e fluxos externos. Gerou-se recomendações para a IES realizar melhor uso desses recursos de maneira estruturada.*

PALAVRAS-CHAVE: *Redes de Conhecimento. Conhecimento. Informação. Inteligência. Instituições de Ensino Superior.*

RESUMEN: *Las Instituciones de Educación Superior (IES) están insertas en entornos con una cantidad inimaginable de información y conocimientos. Esto permite la construcción de redes de información y conocimiento extremadamente dinámicas. La investigación se realizó en una IES del estado de São Paulo, utilizando el método de estudio de caso, permitiendo la construcción de la red de conocimiento de la IES. Se mapearon las fuentes y flujos de información y conocimiento. El resultado proporcionó la construcción del sociograma de la IES, demostrando las relaciones de acceso al conocimiento y a la información entre los individuos de la institución y el ambiente externo. Se demostró que las fuentes y flujos de conocimiento existentes brindan soporte para la construcción de nuevas inteligencias y conocimientos. También se identificó la centralización de estos recursos en individuos del entorno interno, así como la poca percepción de la importancia de las fuentes y flujos externos. Se generaron recomendaciones para que las IES hagan un mejor uso de estos recursos de manera estructurada.*

PALABRAS CLAVE: *Redes de Conocimiento. Conocimiento. Información. Inteligencia. Instituciones de Educación Superior.*

Introduction

Understanding information and knowledge as resources inserted indirectly in all organizational activities and processes, as well as, when the use and exchange of these resources occurs, in particular, the construction of knowledge (Choo, 2003), becomes fundamental for understanding this research. Therefore, it is of central importance to recognize the sources of knowledge and information, as well as their behaviors and dynamics in the context of organizations, which occur in transit between sources, that is, in flows.

Considering information and knowledge as resources, as well as their multiple relationships in the context of the organization's internal and external environment, is crucial in identifying information as a fundamental component in the generation of intelligence and new knowledge, in particular, aiming at innovations. Therefore, the importance of the process of mapping the sources and flows of information and knowledge is evident, and consequently, the visualization of the network, being essential components for enhancing the generation of new knowledge.

Mapping knowledge networks for Information and Knowledge Management processes has become extremely important in organizations (Jorge; Valentim, 2016) for better use of these resources in the management process. In this way, Jorge and Valentim (2016) question the impact of knowledge networks on organizations in the context of Information and Knowledge Management. It is observed that this network mapping process enables a significant increase in the *status* of knowledge and information as organizational resources and, when exploited appropriately, they become important inputs for the generation of innovations.

In this way, the research aims to highlight the relevance of the knowledge network mapping process in organizations that focus on education, especially in a Higher Education Institution (HEI). It is expected that HEIs can provide a different perspective on information and knowledge, and thus acquire a better perception of these aspects as resources that generate innovation.

The problem of this research questions the dynamics of the knowledge network of the HEI researched; identify sources and flows of information and knowledge from internal and external environments; and, finally, the consequence of the network on the activities of the HEI. We sought to present the HEI's knowledge network, its relationships and impacts in the context of innovations in a structured manner.

The construction process and knowledge management

Innovation actions use information and knowledge as resources. In this sense, it is essential to conceptualize them in order to understand their importance in the context of organizational innovations.

For this understanding, it is important to conceptually delimit information and knowledge as resources. In this way, the present research sought to delimit them, and thus identify how these resources relate, interact and undergo transformations in their relationships.

To understand the delimitations and characteristics of information and knowledge, it is important to understand 'data'. Data as resources in the management universe can be considered as simple observations about the state of the world, being made tangible in records that are supported, which, for the most part, make use of technologies. It is observed that data are resources for information, since this can be defined as data with purpose and relevance, which can be understood (attribution of meaning) and receive context by an individual. In this regard, current information as one of the main resources for knowledge, which can be conceptualized as the information that resides in the human mind, however, this is built on the relationship between this information and the individual's relationship with the world (the information that is available in this world) (Davenport; Prusak, 1998; Pérez-Montoro, 2004; Valentim, 2002). The systematization of these concepts is carried out by Davenport and Prusak (1998), who tabulated the main characteristics of each of the components mentioned, (table 1):

Table 1 – Data, information and knowledge

Data	**Information**	**Knowledge**
Simple observations about the state of the world	Data provided with relevance and purpose	Valuable insights into the human mind. Includes reflection, synthesis, context
▪ Easily structured; ▪ Easily obtained by machines; ▪ Often quantified; ▪ Easily transferable.	▪ Requires unit of analysis; ▪ It requires consensus regarding meaning; ▪ It necessarily requires human mediation.	▪ Difficult to structure; ▪ Difficult to capture on machines; ▪ Often tacit; ▪ Difficult to transfer.

Source: Davenport and Prusak (1998, p. 18)

We can understand that, unlike data, information and knowledge are needed by the subject for these resources to take on these formats. Jorge and Faléco (2016, p. 70, our translation) meet this point and relate information as a resource for knowledge, making knowledge

> [...]a resource and a strategic tool that can be used in the organizational context. To this end, information is considered input for the construction of

> knowledge, therefore, it is necessary to prospect, analyze, use and manage all information and data inside and outside the organization.

We can understand that the relationship between information and subject in the context of organizations is viewed as "[...] an activity inherent to the human being. All individuals, at the organizational level, have different informational needs to carry out their daily activities, as well as for decision making" (Valentim; Gelinski, 2007, p. 116, our translation).

Albagli (2004, p. 11, our translation) mentions and highlights the centralization of knowledge in individuals, "[...] in their roles as workers, consumers and citizens, in public and private organizations, in populations, communities and traditional peoples, among others groups and segments". Therefore, it is noteworthy that each subject builds their knowledge in a unique way, after all, each subject interprets the information within their moment, context and organizational environment (Valentim, 2004; Jorge, 2017). The interrelationship of dependence between the subject and information in the construction of new knowledge, and these act as important cognitive triggers, responsible for building innovations in organizations.

This entire movement generated the 'knowledge economy' and 'knowledge society', terms coined by Drucker (1969) and, as a result, made knowledge considered one of the main factors of production of the economy and developer of society. In this way, we observe subjects as intermediaries for the construction of new organizational knowledge, generating new social dynamics and innovations. Drucker (2000, p. 53, our translation) mentions that the knowledge revolution made it possible

> [...] carrying out the routine processes were not machines; the computer is just the trigger. Software is the reorganization of traditional work, based on centuries of experience, through the application of knowledge and, mainly, systematic and logical analysis. The secret is not electronics, but cognitive science. The secret to maintaining leadership in the new economy and new technology will be the social position of knowledge professionals.

Drucker (2000) notes numerous innovations arising from the application of knowledge as a resource. Takeuchi and Nonaka (2008, p. 37, our translation) reinforce this perspective by mentioning that organizations are in a dynamic of constant movement and, therefore, need a new management paradigm,

> [...] based on the creation of knowledge. He is better equipped to deal with turbulence, uncertainty, inconsistencies, contradictions and paradoxes. Knowledge is created by the synthesis of what appears to be opposites - that is, tacit and explicit knowledge. According to the knowledge-management paradigm, we are part of the environment and the environment is part of us (Takeuchi; Nonaka, 2008, p. 37, our translation).

The importance of knowledge as a resource responsible for generating support in the context of organizations is observed. To make better use of this resource, it is necessary to understand its movements inside and outside organizations and, in this way, identify its path and constructed network.

The construction of information and knowledge networks and their impact on organizational environments

Understanding that knowledge is a dynamic resource in the context of organizations is a crucial point for understanding the concept of network. Choo (2003, p. 27, our translation) draws attention to managers' lack of perception of the importance of information as a resource for building knowledge, after all, information is the intrinsic component of all organizational activities. Therefore, it is important to understand the "[...] organizational processes through which information is transformed into perception, knowledge and action".

This knowledge and action are built within networks of relationships between subjects in the internal and external environments of organizations. We can understand this network as a social artifice in which the relationships created build knowledge and share knowledge between the subjects in these relationships (Al-Hashem; Shaqrah, 2012).

According to Jorge, Valentim and Sutton (2020), by understanding the structure and importance of knowledge networks, it is possible to understand their impact on organizations. By understanding networks, it becomes possible to understand sharing between organizational levels and, also, it becomes possible to build strategies capable of enhancing knowledge construction (Sedighi *et al.,* 2018; Naude *et al.,* 2009).

To achieve this, it is essential to map organizational sources, since it is through these sources that connections are made, whether they are made in the internal or external environment. The relationships between sources are built by flows, both symbolizing the subject/device that has the information and/or knowledge, and the subject that requests these resources.

In this sense, Valentim (2002) points out that an organization has three levels of information flows:

- the flow of the physical structure (organization chart);
- the structure of human resources (intellectual capital) and;
- the informational structure (data, information and knowledge).

Complementing this idea, Jorge, Valentim and Sutton (2020, p. 4, our translation) mention that these flows build knowledge networks under two contexts in organizations, being the

> [...] networks built between the subjects that make up the internal environment and the relationships built between them with other organizations, governments and other subjects that are in some way related to the organization. With this, it is possible to understand that these networks are independent, but complementary in the context of building organizational knowledge.

Jorge, Valentim and Sutton (2020) complement by stating that the flows act in a synergistic way, which makes it impossible to identify their limits, after all, the flows are visualized in the organization's formal or informal communication processes. In this sense, it is important to mention that networks have a lot of information and knowledge circulating in informal flows, and this occurs due to the dynamic nature of the environments, thus creating enormous difficulty in recording them.

These difficulties are often related to subjects' lack of perception and understanding regarding the importance and value of information and knowledge as a resource, thus making it difficult to map organizational informational networks, impacting the enhancement of knowledge construction and the generation of innovations (Valentim, 2010; Jorge; Valentim, 2016).

Other important components also make up the networks, after all, the interrelationships of the individuals that make up the organizations and the components inserted in the external environment form the flows and these, when added together, generate the networks, which are made up of the sources and flows, already mentioned previously, but also by nodes and density (Jorge; Valentim; Sutton, 2020).

With this, we need to understand the function of nodes and density in networks. Nodes represent relationships between subjects and components in the internal and external environments. Density, in turn, is related to the frequency of access in relationships between subjects and components in the internal or external environment.

The development of strategies capable of increasing connection is the responsibility of the organization, and this, when worked on, exponentially generates the construction of new knowledge. These strategies can generate numerous positive consequences, including increasing network density, enabling the search for new knowledge beyond the boundaries of organizations (Hansen; Mors; Løvås 2005).

The greater the density (network nodes, that is, the relationship between subjects), the greater the construction of new knowledge, symbolizing trust and collaboration, fundamental behaviors for organizations (Nerkar; Paruchuri, 2005). These networks become important aspects in the context of innovation (Huggins; Johnston, 2010; Sammarra; Biggiero, 2008).

In this way, we can understand that knowledge networks, when mapped and enhanced, become important knowledge construction devices. This knowledge is then important resources for multiple innovation processes in different organizational contexts.

Methodological procedures

Aiming to provide greater consistency in the research, the 'Case Study' method was used. The choice of method occurred because the method "[...] contributes, in an unparalleled way, to our understanding of individual, organizational, social and political phenomena" (Yin, 2001, p. 21, our translation). In order to provide greater evidence for the research, data triangulation was applied, using three research instruments simultaneously.

Triangulation as a research strategy provides an amplified view of the phenomenon investigated and, as a result, there is greater value in the data and analyzes carried out. Direct observation was used, equipped with a structured observation guide. This process provides the identification of behaviors, patterns, actions, components and indicators that are part of organizations (Gil, 2002; Marconi; Lakatos, 2003).

After direct observation, the need to collect data and information at all levels of the organization was identified. In this way, a structured interview was carried out with the director of operations of the Higher Education Institution (HEI), after all, the interview is "[...] a data collection instrument, consisting of an ordered series of questions, which must be answered in writing [...]" (Marconi; Lakatos, 2003, p. 200, our translation).

The choice of the HEI operations director to carry out the structured interview was strategic, after all, this person is responsible for articulating all levels of the HEI. After carrying out the structured interview, it was possible to validate the various points found in direct observation and in the access, notes collected from the subjects that make up the HEIs.

To collect access data, a closed questionnaire was used. This tool was chosen due to its economy and speed in gathering research information (Marconi; Lakatos, 2003). The application of the closed questionnaire provided greater agility in the process of searching for information in the universe of the HEI, after all, there are different actors from different contexts operating in this universe.

Research Universe

The Higher Education Institution (HEI) of this research is located in the countryside of São Paulo state. It is a private and new HEI in the academic universe, after all, it has only been in existence for three years. The HEI offers 6 higher-level courses, that is, bachelor's and technologist degrees, and 5 in- person *lato sensu* postgraduate courses. It is important to understand that the

> [...] private institutions can be organized and function as universities, colleges, specialized professional schools, university centers, technical professional training institutes, among others permitted in each country (Ramiréz, 2011, p. 34, our translation).

Therefore, it is noteworthy that the HEI researched is structured with the aim of providing educational services to society, directing its entire structure towards higher education, whether for graduation at the baccalaureate level or for the higher technologist or, even, for the *lato sensu* postgraduate course. Ramiréz (2011) points out that organizations of this type need authorization from government bodies to operate. In the Brazilian context, the body responsible for certifying and accrediting these educational institutions is the Ministry of Education (MEC).

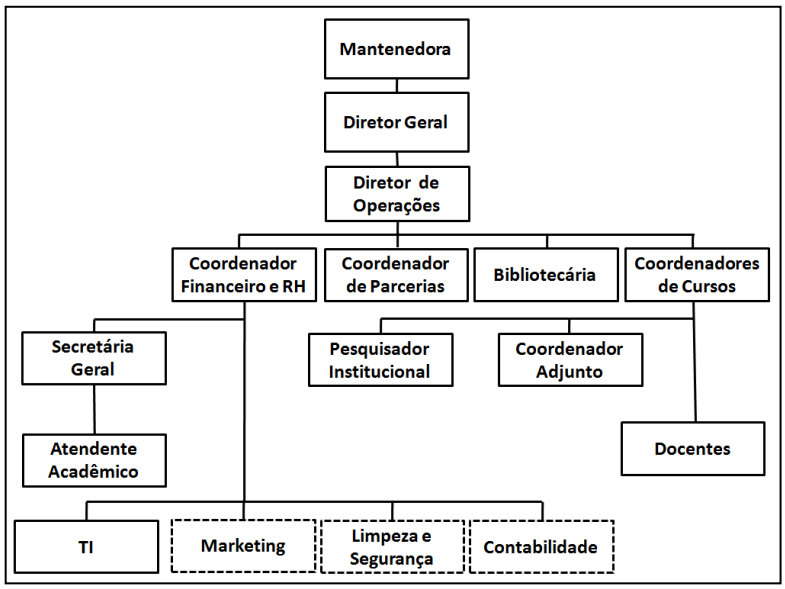
The HEI researched has 603 undergraduate students and 25 postgraduate students, totaling 628 students enrolled. The entire organizational structure of the HEI is focused on the academic area, after all, its core area is education, providing training for its students. In general terms, the Higher Education Institution of this research has 1 subject responsible for acting at the strategic level, 8 subjects working at the intermediate level, that is, tactical, and 34 subjects at the operational level, that is, the HEI has 43 subjects dedicated to carrying out educational activities.

Figure 1 shows the organizational structure of the HEI. The institution's guidelines are carried out by the HEI maintainer, as it works to identify the opportunities and needs of the regional context in which the institution is located. Sequentially, the maintainer directs the strategies for the organization, especially for the General Director. The General Director transforms the sponsor's demands into activities for the Operations Director, who, in turn, is responsible for coordinating these activities.

It is worth noting that the position of General Director is appointed by the sponsor, and is responsible for carrying out the Institution's management and strategy functions. In the HEI researched, the General Director also appears as a maintainer, as can be seen in table 2. In this sense, the HEI created the position of director of operations, and this individual is responsible

for all the support and development of viability for the subjects that make up the academic and administrative activities at the institution.

Figure 1 – HEI Organization Chart



Source: Prepared by the authors

In the administrative area, the individual is also responsible for providing support to the HEI' core area, that is, the educational area. The administrative area is made up of a coordinator, responsible for coordinating tasks, accounts receivable and payable, human resources, the information technology (IT) area, the secretariat, and carrying out the interface with outsourced areas in the HEIs, such as accounting and *marketing*.

It is observed that the general secretariat of the HEI responds to the Financial and human resources Coordination. Therefore, the general secretary and 2 assistants are part of the general secretariat. Meanwhile, the Information Technology area operates with 1 professional with technology skills. To facilitate commercial partnerships, the HEI established the role of partnership coordination, with this position being responsible for attracting students, building partnerships with companies and organizations, among other activities, with the aim of bringing the HEI closer to potential students.

The library department has dual subordination, since, when the matter is related to the acquisition of books and other administrative issues, the area reports to the Director of Operations. Meanwhile, the demands for materials, specifications of needs and other aspects related to the academic context are the responsibility of the course coordinators. This department is made up of 1 Library Science professional and 1 intern who acts as support.

Table 2 - Areas, organizational levels and positions of the HEI

Level	Grouping	Area	Function/Position	Qty.
Strategic	Academic / Administrative	Maintainer	Representative of the Maintainer / General Director	1
Tactical	Academic / Administrative	Direction	Director of Operations	1
Tactical	Administrative	Finance / Human Resources	Financial Coordinator/Human Resources	1
Tactical	Administrative	Partnerships	Partnership Coordinator	1
Tactical	Administrative	Secretary	General secretary	1
Operational	Administrative	Secretary	Academic Attendant	2
Tactical	Academic / Administrative	Library	Librarian	1
Operational	Academic / Administrative	Library	Librarian Intern	1
Operational	Administrative	IT	Computer Technician	1
Operational	Academic	Academic	Institutional Researcher	1
Tactical	Academic	Academic	Course Coordinator/Teacher	2
Operational	Academic	Academic	Deputy Coordinator/Teacher	1
Operational	Academic	Academic	Teachers	30
Total Employees				43

Source: Prepared by the authors

In the other group are the course coordinators, that is, individuals responsible for working directly in the academic context of the HEI. This area is made up of two individuals who are responsible for interpreting the demands of the Operations Department and coordinating all academic activities that are carried out in the HEI courses.

The coordination is supported by an individual who acts as an institutional researcher, responsible for monitoring and developing, together with teachers, all documentation relevant to the Ministry of Education. These documents range from the Institutional Development Plan (PDI) to the Pedagogical Course Projects (PPC).

For bureaucratic coordination activities, there is the figure of the deputy coordinator, this individual being responsible for assisting the coordinators in their activities. Currently, the HEI has only two assistant coordinators who work simultaneously as assistant coordinators and as teachers.

In the group of engineering courses, there is 1 Coordinator who works on the activities of the Building Construction (Higher Technologist) and Civil Engineering Courses. In courses within the scope of management and business, that is, Accounting Sciences, and Higher Technologists, Financial Management, Industrial Production Management (GPI) and *Marketing* are the responsibility of another subject who performs the role of Course Coordination.

The Management and Business Course Coordinator also coordinates 4 specialization courses focused on the business area. The 2 coordinators manage 30 teachers who work on the courses mentioned above. HEI professors work in the core area of the researched organization, after all, these individuals work directly in the teaching-learning process with students and, in this way, they were considered the main interface between the HEI and students.

Analysis and presentation of results

The research was guided by mapping information sources and flows, making it possible to identify the sources with the most access using the sociogram. The sociogram consists of the

> [...] description of a population in terms of relationships between pairs of people in that population. This relationship could be "like", "dislike", "choices as a workmate", or any of a number of others. This relationship can be "bivalent", present or absent", "positive or negative", or it can be multivalent, "likes a lot", "likes a little", "doesn't know", "dislikes" and "hates" of values that the relationship between A and B can be and be called the "interval" of the function (Rapoport; Horvath, 1961, p. 279, our translation)[4].

Complementing this idea, we can understand the sociogram as the "[...] technique that allows for an in-depth understanding of the relationships between individuals in a group or between groups" (Jorge; Valentim, 2016, p. 165, our translation). In this sense, with the application of the sociogram, it is possible to identify the research subjects, as well as who they turn to and access when they need information and knowledge in their demands (Jorge; Valentim; Sutton, 2020).

By adopting and applying this tool, it becomes possible to identify the subjects with the greatest access in multiple contexts of the HEI. Through these accesses, it becomes possible to understand the structure of the institution's knowledge network, taking into account the internal and external environments.

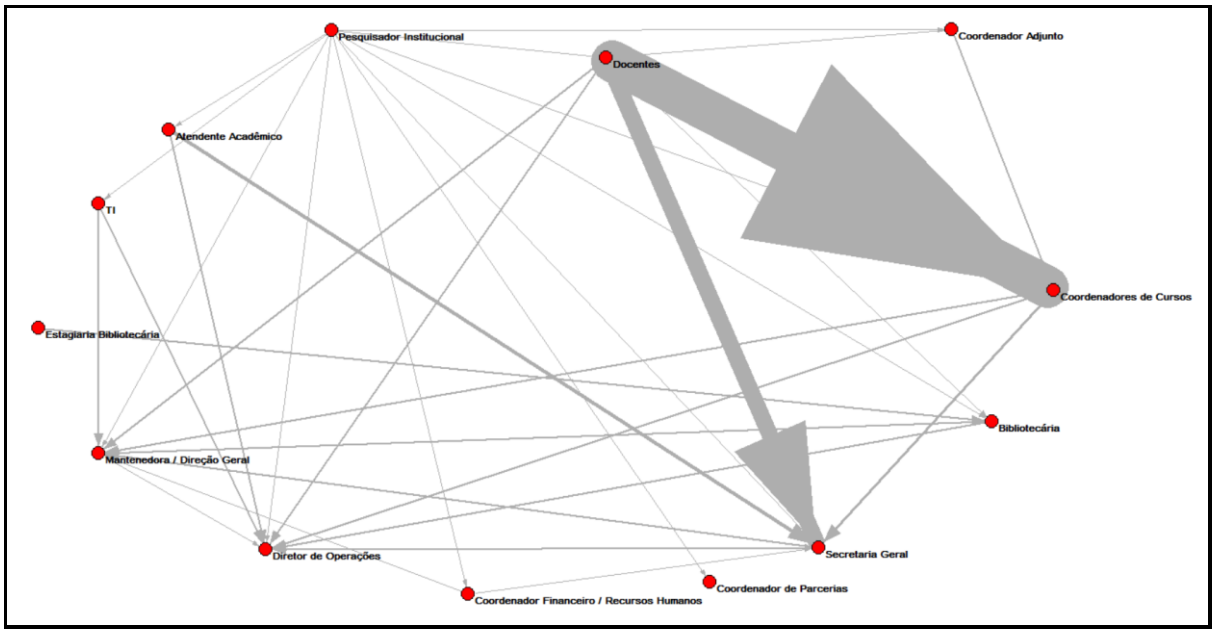
You can see in figure 2 the references to knowledge and intelligence, which are directly related to the speech of the operations manager, aligned with access to the internal environment, demonstrating a centralization of access in the course coordinators (54) and the general secretariat (30). This dynamic happens since the majority of HEI members carry out activities in which the aforementioned subjects provide support for their activities, with the general

[4]"[…] a description of a population in terms of relations between pairs of people in that population. This relation may be "likes" (used in this study), "dislikes," "chooses as work companion," or any of a number of others. This relation may be bivalent, eg, "present or absent" or "positive or negative", or it may be multivalent , eg, "likes very much," "likes a little," "doesn't know," "dislikes, " and hate." The set of values that the relation between A and B may take on is called the "range" of the function" (Rapoport; Horvath, 1961, p. 279).

secretariat and course coordinators being considered as bridges to the operations director or to the strategic level of the HEI.

Within the aforementioned dynamics, it is observed that (Table 1) of the fifty-four (54) accesses to course coordinators, forty-nine (49) come from HEI professors. The institution's researcher mentioned that he accesses the coordinators, followed by two (2) accesses from the deputy coordinators. At the strategic level, the maintainer, who also holds the position of general director, mentioned accessing the two coordinators (thus generating 2 accesses) on a constant basis when it comes to searching for information and knowledge.

Figure 2 – HEI sociogram



Source: Prepared by the authors

The general secretariat of the HEI presents a very similar situation, however, with a greater variety of access than the course coordinators. It is observed that of the thirty (30) accesses received, nineteen (19) were notes from teachers, three (3) from course coordinators and one (1) access from the institutional researcher.

In the administrative context, the general secretariat received four (4) visits from academic staff, that is, from collaborators who are directly linked to the core activities of the position in question. The coordination role of the general secretariat is visible when it is mentioned as a source of knowledge and information by the financial coordinator/human resources, the director of operations and the general director/maintainer of the HEI.

In this same diversity of access, still at the management level, there is the director of operations with fourteen (14) accesses. This subject is accessed from all organizational levels,

as it receives access from the general director/maintainer of the HEI, that is, the only subject in the strategic context. Meanwhile, the subject received access from course coordinators, the librarian and the general secretary, being mentioned two (2) times for each of these functions.

When considering the subjects at the operational level, it is observed that this subject was mentioned as a source of information and knowledge by two (2) teachers. He received the same amount of access from academic staff and from the person responsible for the Information Technology (IT) area of the HEI. Complementing the subjects at the operational level, it is noteworthy that the institutional researcher (IP) also mentioned accessing the institution's director of operations.

This information is in line with the subject's speech in the structured interview and the notes made by the collaborators. After all, when considering that the core activities of a higher education institution are processes that involve teaching, research and extension, the functions that involve the academic context are guided by the coordinators, supported by the secretary and it is up to the operations management to provide important guidelines for these subjects.

Furthermore, when considering the subjects that make up the tactical level of the HEI, we observed that the financial / human resources coordinator received one (1) access, the same amount received by the partnership coordinator. The HEI Librarian received four (4) accesses, two (2) from the librarianship interns, and one (1) from the institutional researcher and professors, as can be seen in table 1.

Table 1 – Total access to information and knowledge within the Institution's internal environment

Quem requer informação \ Quem Concede informação	Estagiaria Bibliotecária	TI	Atendente Acadêmico	Pesquisador Institucional	Docentes	Coordenador Adjunto	Coordenadores de Curso	Bibliotecária	Secretária Geral	Coordenador de Parcerias	Coordenador Financeiro / RH	Diretor de Operações	Mantenedora / Direção Geral
Estagiaria Bibliotecária								2					
TI												2	2
Atendente Acadêmico									4			2	
Pesquisador Institucional		1	1		1	1	1	1	1	1	1	1	1
Docentes						1	49	1	19			2	2
Coordenador Adjunto							2						
Coordenadores de Cursos									3			2	2
Bibliotecária												2	2
Secretaria Geral												2	2
Coordenador de Parcerias													
Coordenador Financeiro / RH									1				1
Diretor de Operações									1				1
Mantenedora / Direção Geral							2		1			1	
Total		1	1	0	1	2	54	4	30	1	1	14	13

Nível Operacional
Nível Tático
Nível Estratégico

Source: Prepared by the authors

The subjects at the tactical level act as intermediaries for the subjects that make up the operational and strategic levels. In this sense, the maintainer is part of the strategic level, who holds the position of general director of the HEI. This subject received thirteen (13) hits from eight (8) different positions at the operational and tactical levels. Considering the tactical level, this individual was requested for one (1) access by the director of operations and the financial/human resources coordinator. Meanwhile, it received two (2) hits from the subjects who occupy the position of course coordinator, the librarian and the general secretary. In the same quantity, that is, two (2) accesses, this subject is identified as access by teachers and the person responsible for the Information Technology (IT) area. Meanwhile, the institutional researcher mentioned one (1) access to the general director.

At the operational level, in turn, there was a low number of subjects who were considered sources of information/knowledge, after all, of the six (6) positions, only four (4) received access, and of these, only the deputy coordinators received two (2) access, from

professors and institutional researchers. The professors, the academic assistant and the person responsible for IT at the HEI received only one (1) access.

The centralization of access at the tactical level demonstrates the importance of these subjects as intermediaries between the plans carried out at the strategic level and the executions in the format of activities at the operational level. In addition to the accesses carried out in the internal environment, the research sought to cover sources of information and knowledge from sources in the external environment.

Table 2 shows the information and notes of each subject from external sources. It is important to highlight that, when pointing out external sources, there was no delimitation of sources, as occurs in the internal environment, since these sources vary according to the perception of each individual.

In this sense, responses were centralized in three (3) different sources with access numbers above ten (10). Thus, teachers from other institutions received twenty (20) accesses. Professionals in the area received sixteen (16) accesses, that is, important sources that help bring knowledge into the HEI.

The internet *sites* received eleven (11) hits, thus demonstrating that this source is responsible for providing new information for the institution, as can be seen in table 2. With eight hits, the subjects mentioned accessing advisors, these being advisors for their postgraduate degrees.

In this same universe, the subjects indicated the role of controllership analyst two (2) times, three (3) accesses for consultants and two (2) accesses for accountants, demonstrating that they turn to market professionals to search for information and knowledge. Other accesses demonstrate the difficulty in perceiving these subjects regarding the separation of internal and external environments.

Table 2 - Total access to information and knowledge by the subject in the Institution's external environment

Quem requer informação \ Fonte de Informação e conhecimento	Coordenador	Orientador	Professores	Analista Controladoria	Ninguém	Consultores	Pesquisadores	Secretaria	*Profissionais da área*	Sites/Internet	Diretoria	Presidente	Contador	Diretora Pedagógica	Estudantes
TI			1												
Atendente Acadêmico			1					1		1					
Pesquisador Institucional															
Docentes	9	8	17	2	9	2	1	6	12	8			1	1	3
Coordenador Adjunto					1										
Coordenadores de Cursos			1			1			1	2					
Bibliotecária											2				
Secretaria Geral											2				
Coordenador de Parcerias					1							1			
Coordenador Financeiro / Recursos Humanos									2						
Diretor de Operações					2										
Mantenedora / Direção Geral								1	1				1		
Total	9	8	20	2	13	3	1	8	16	11	4	1	2	1	3

Nível Operacional
Nível Tático
Nível Estratégico

Source: Prepared by the authors

In this way, the subjects considered coordinators, secretariat, pedagogical director, and students as part of the external environment. In this sense, the figure of the coordinator received nine (9) hits, from the secretary, eight (8), from the pedagogical director, one (1), from the director, four (4) and, finally, three (3) hits were highlighted for students.

Another point that deserves to be highlighted is that thirteen (13) subjects, that is, 30%, do not consider external access, after all, they mentioned not resorting to anyone, thus demonstrating their lack of knowledge regarding the use of intelligence and sources of information and knowledge as important inputs for its activities. This situation draws attention,

because of the thirteen (13) subjects, nine (9) are teachers, a situation contradictory to the role of research carried out by teachers in their duties.

In contrast to this information, the subjects indicated that they seek other professionals who work in the area, *internet/websites* and teachers who work in other institutions. This demonstrates the existence of intelligence activities being carried out in an unstructured manner, as there was enormous difficulty in identifying sources, in addition to disseminating and using information whose source was in the external environment.

The sociogram, together with direct observation, aligned with the interview carried out with the operations director identified the context of organizational leadership. In this section, a natural movement was identified for subordinates to follow their superiors, after all, they are present and involve everyone in their activities, which makes them references in carrying out their tasks. This movement can be observed in the sociogram of the internal environment, as well as in the table of access to the external environment, after all, subjects mention their leaders as references for information and knowledge.

Meanwhile, communications between superiors and employees occur in mixed ways, as a significant part of the educational guidelines occur by sending emails, which are reinforced in person, in contact with the employee. The subjects demonstrated that they believe that, in possession of information, it can be transformed into knowledge in the context of the organization, however, the operations manager shows that the transformation to intelligence is more complex, due to the lack of knowledge about the process. This phenomenon can be observed in the results regarding access to the external environment.

It is important to point out that organizational communications, in general, occur in an unstructured manner, a fact that is highlighted when observing that the HEI has systems that support information, but which operate on different bases, that is, they are disconnected. Still considering communication activities, there are frequent meetings aimed at disseminating knowledge and information to the subjects, but a structured process that supports the subjects' demands for intelligence and knowledge has not been identified.

The implementation of a strategy aimed at communication between subjects through cell phone applications stands out; In this way, it was observed that communication occurs more quickly, thus allowing all participants in the groups to share information regarding their tasks. These actions are observed by the organization in a positive way, after all, sharing this information is seen as strategic actions, reinforcing the culture of valuing intelligence, knowledge and information.

The lack of structured intelligence and knowledge management processes was observed. This significantly affects the externalization of knowledge, construction or application of knowledge, after all, there are no motivational factors that encourage this process. The formal and informal spaces of the HEI make it possible to share knowledge and information among the institution's subjects. According to the operational director, holding constant meetings allows individuals to present and share their good practices with other members of the institution.

However, the relevance of knowledge and its value is observed, even if its construction, sharing and other activities take place in an unstructured way. A similar situation was identified with intelligence, however, work to strengthen a culture that values external information is essential, aiming to make better use of sources from the external environment. The lack of formalization of processes that operate in the use of intelligence, information and knowledge is highlighted, due to the number of people who make up the HEI. In this way, individuals who join the organization can be guided by clear guidelines regarding the aspects mentioned and, as a result, will be able to contribute more assertively to the HEI.

Partial remarks

The research identified the sources of knowledge and information of the Higher Education Institution (HEI) analyzed. By identifying the sources, the most relevant flows of information and knowledge for individuals inserted in the HEI were understood.

The results of the instruments applied made it possible to understand the dynamics of the sources and flows existing in the institution. Therefore, it was possible to understand the need to build structured work whose focus consists of information, knowledge and intelligence as organizational resources, especially in their use in the context of innovation. By carrying out this structuring, the institution can build a greater number of innovations in the context of teaching, research and extension.

The individuals participating in this research presented a perception of the importance of sources from the internal environment, however, they have little perception of knowledge and information from the external environment. This fact is evidenced by the number of incorrect mentions of components of the internal environment as if they were from the external environment, as well as the fact that 30% of individuals mentioned not accessing any source.

When pointing out this low perception of individuals, the research is based on the countless sources in the external environment that they access at all times, however, these individuals do not recognize other individuals, organizations or *websites* that are outside the HEI environment as sources. It is noteworthy that these sources are important inputs that enable new knowledge and the innovation process.

This little perception occurs, after all, because many sources used in the academic context were not even cited, such as, for example, scientific journals, scientific knowledge bases, repositories of the Ministry of Education (MEC), among other bodies responsible for the entire structuring of higher education. These institutions are responsible for generating new demands for HEIs and, therefore, demanding the construction of new knowledge and innovations aimed at teaching, research, and extension.

The recording of information and knowledge that travels through flows requires attention. These records, being carried out on different bases, make it difficult to build new knowledge and, therefore, make it impossible to build innovations. In addition to the activities that are already registered in different bases, there are other activities that are carried out by individuals based on information, knowledge and intelligence, however, the construction, sharing and use of these resources occur in an unstructured manner.

This makes it impossible for these resources to be fully explored and, in this way, it demonstrates the need for the adoption, by the HEI, of a set of structured methods to deal with resources, aiming at the construction of innovations in the context of teaching, research and of the extension. These innovations can be made tangible, for example, in a new didactic in teaching activities, in the construction of new strategies aimed at bringing the HEI universe closer to the regional context, among other important constructions. It should be noted that these are just a few examples of innovations that information, knowledge and intelligence, when managed as resources, can provide for the HEI.

When considering these components as important resources, it is suggested that the HEI encourages the acquisition of a professional who has skills focused on information and knowledge management, the construction of methods and strategies for working with information, intelligence and knowledge contained in information sources and flows observed in the networks identified by this research. Therefore, it becomes possible to make all information and knowledge fully available. This professional must work to build/reinforce a culture that values information and knowledge, as well as reinforcing how these components are strategically important for generating innovation.

Other points that require attention, and would also be the responsibility of this professional, consist of developing information skills in the individuals who make up the institution, as well as the construction of strategies aimed at making better use of these resources. In this way, the entire structured process of information management (access, storage, processing, organization, management, and dissemination) becomes better executed and, as a result, the construction of knowledge and intelligence aimed at generating innovation is enhanced.

To carry out the recommendations highlighted by this research, a more in-depth analysis of activities and processes carried out in the institution and which refer to information management, knowledge management and the intelligence process is essential. That said, the development of other research focusing on higher education institutions is recommended. These researches will need to address questions about information management, knowledge management and organizational/competitive intelligence in the context of this type of organizations, focusing on the process and management of innovations in teaching, research, and extension.

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