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Open innovation joined to knowledge management in latin american public universities. Comparative case

Innovación abierta unida a la gestión del conocimiento en las universidades públicas latinoamericanas. Caso comparativo

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Contents

ABSTRACT:

The aim of this paper is to analyse the processes of open innovation and knowledge management in the Latin American public university through a comparative study between the University of Guanajuato in Mexico and the Pedagogical and Technological University of Boyacá in Colombia. The methodological approach was qualitative; 16 semi-structured interviews were applied. The findings evidenced relationship between open innovation and knowledge management, likewise, it was shown that research is the basis of university innovation and this is the mechanism of linkage with its environment.
Keywords: Knowledge management, Open innovation, Public university, Environmental linking.

RESUMEN:

El objetivo principal de este trabajo es analizar los procesos de innovación abierta y gestión del conocimiento en las universidades públicas latinoamericanas a través de un estudio comparado entre la Universidad de Guanajuato en México y la Universidad Pedagógica y Tecnológica de Boyacá en Colombia. La aproximación metodológica fue cualitativa; se aplicaron 16 entrevistas semiestructuradas. Los hallazgos evidenciaron la relación significativa entre gestión del conocimiento e innovación abierta, asimismo, se mostró que la investigación es la base de la innovación universitaria y ésta es el mecanismo de vinculación con su entorno
Palabras clave: Gestión de conocimiento, Innovación abierta, Universidad pública, Vinculación con el entorno.

1. Introduction

In recent decades, numerous studies have suggested the link between universities and their environment; Etzkowitz (2018) has called it the third essential function of Higher Education Institutions because the University recognizes its responsibility to contribute to the development of its environment through the social relevance of its educational offer and the exploitation of its research results. In this sense, the University is an organization that manages knowledge; this management refers to the process of searching, creating, using and transferring this knowledge.

In Latin America, university management models have evolved to try to respond to their social reality and to changes in educational models, generally inspired by those of other countries (Gros and Lara 2009, Rama 2007). The university knowledge management (KM) process involves strong challenges due to the number of daily academic functions of the members of the university community; some studies show that KM in universities is precarious and the interest of their community to manage knowledge with the productive or public environment is very low. This knowledge management in interaction with the environment is what Chesbrough (2006; 2017) refers as open innovation (OI); OI facilitates a community the generation of innovations from a dynamic flow of inputs and outputs of knowledge between the organization and its environment.

The objective of this research is to analyse the open innovation process and knowledge management in the Latin American public university, using a comparative case. The dimensions and categories coinciding between both variables are analysed in a comparative manner in two public universities of Mexico and Colombia. In the case of Mexico, University of Guanajuato (UGTO for Spanish initials) is the state public university in one of the emerging regions in the country. Guanajuato has developed a strong industrial vocation and has created the conditions of an innovative environment based on its privileged geographic location and the implementation of industrial public policies based on the promotion of innovation (Álvarez and Estrada 2017). In the case of Colombia, Pedagogical and Technological University of Colombia (UPTC for Spanish initials) is a state public university; it is the most important

university of the department of Boyacá and one of the most prestigious in the Colombian state. The traditional production environment of the UPTC is the primary sector and the emerging one is the tourism sector; Boyacá is a privileged region with natural resources and has very important history in the mining sector.

Based on a qualitative approach, semi-structured interviews were conducted with the main actors of the university ecosystem; the hermeneutic unit was analysed, and the dense description was systematized.

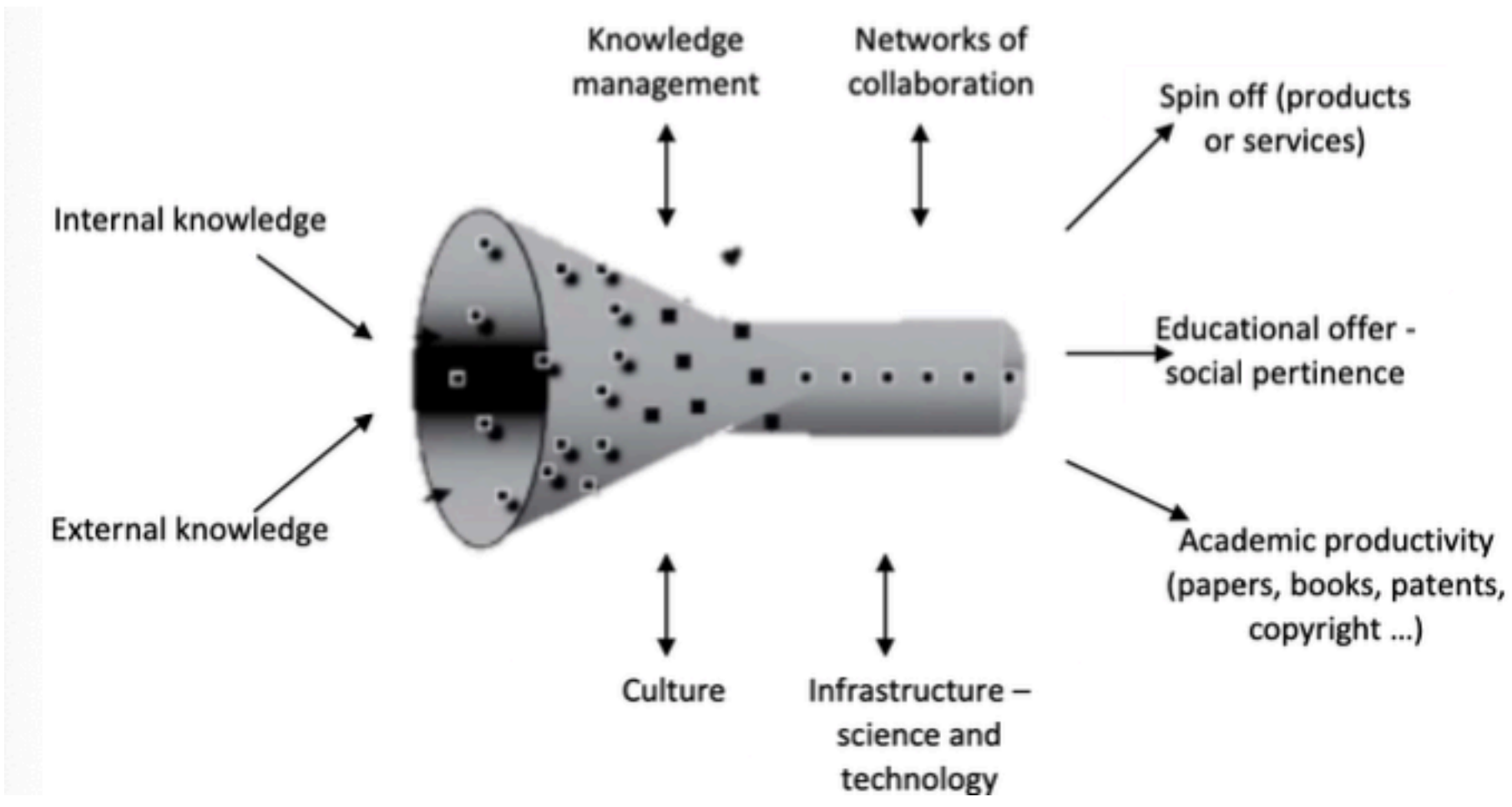
2. Analytical framework

Some studies such as Barnett (2001), Etzkowitz (2018), Gros and Lara (2009), Cifuentes (2012), Díaz and Silva (2013), Cabrera, Nieto and Giraldo (2014) discuss the transformation of the University. With coincidences and differences among the authors, four styles of university management have been identified: the "modern" university management that responded to the industrial development of the `50s and `60s of the 20th century; the "social change" university management that responded to realities and conflicts of the late `60s that urgently demanded social change; the university management of "excellence" that added the research activity as a primary function, in addition, it focused on academic productivity and accreditation processes as the axis of development; the university management "linked with the environment" that mixed its interest in the public with the innovation-based management that added the linkage and the systematic application of knowledge to the different productive, public and social sectors with the pretension to achieve that science, technology and innovation strengthen the well-being of the territories.

The current University is immersed in strong dynamics of globalization and internationalization, and faces wide challenges, from creating open innovation alliances to make science and develop technology, until coexisting in their teaching processes with new information technologies and virtualization schemes of education. Likewise, the public university incorporates the challenge of responding to broad vulnerable social sectors of the population based on the social relevance of its educational offer and on the transfer of knowledge for the resolution of the problems of the territory where it affects. Etzkowitz (2018) argues that the University has the responsibility to apply knowledge that generates development to improve the quality of life in their environment. Therefore, open university innovation is relevant because no organization has in its interior all the accumulation of knowledge or all the creative capacity to reach the highest levels of application of that knowledge (Vesga, 2016).

Open innovation is a construct that explains the mix of internal knowledge with external knowledge to the organization that generate innovations, strengthen interorganizational collaboration and increase knowledge stocks (Chesbrough, 2017). Chesbrough (2017) proposes that OI is multidirectional and is based on collaboration, since the various inputs and outputs of knowledge generated by innovation are multiple (Figure 1). Chesbrough (cited by Suárez and Hernández 2015) clarifies seven fundamental characteristics of OI: external and internal knowledge are weighted with the same importance; the levels of accessibility to knowledge and quality information are high; the management of intellectual property is proactive; the knowledge flows and "outgoing" technologies are the strategic connection of the organization with its environment; the number of intermediaries in innovation is dynamic; the business model gives value to the KM as a result of the investigation; the measurement of innovative capacity and its results is emerging and is defined for each organization.

Figure 1
Open innovation process



Source: elaborated by the authors inspired by Chesbrough (2006).

The review of the literature shows evidence of the theoretical relationship between OI and KM. Peña, Vega and Castellanos (2016), based on previous studies, point out that KM is a source of innovation linked to the development of new innovative capacity and potentializing the existing capacity in human capital. Nowacki and Bachnik (2016) relate KM to organizational effectiveness for innovation. Marulanda, López and Valencia (2016) and Wang and Yang (2016) describe KM as an organized and systematic process that explores and exploits knowledge to innovate in closed or open mode.

García and Ferrer (2012), Torugsa and O'Donohue (2016) and Alkhuraiji, Liu, Oderanti and Megicks (2016) expose

that KM has strongly evolved in recent decades. Since the ‘90s, the knowledge management process was recognized as an object of study and it gained strength in the 2000s due to the interaction between the University, companies and civil society organizations that share useful knowledge. Based on these authors, Table 1 shows the evolution of KM; first, it was interested on information processes and knowledge flows; then, it focused on the forms of knowledge transfer through human capital in the organization; subsequently, it was oriented towards management in knowledge organizations with complex structures of fuzzy logics; later, KM was linked to innovation, first, in closed schemes and then in shared schemes; finally, its current orientation is focused on the research design, on the development of competences that mix theory and practice, on explanations based on the theory of complexity and on abductive reasoning as a basis for theorizing, among others.

Table 1
Comparison between the periods of evolution of knowledge management

Period	Perspective	Operationalization
Before 1990s	Knowledge and recognition of KM	The KM construct is created. It proposes its importance and studies practical actions for its implementation. Associated concepts: existence and flow.
1990- 2000	KM linked to information technologies.	Knowledge processes managed with technology (email, intranet, contents and yellow pages). Knowledge is existence.
1995- 2000	KM linked to management of human resources / talent management.	The categories of employability, corporate universities, maturity levels of KM, teacher-student relations, knowledge return are incorporated. Knowledge is flow.
After 2000	KM of the organization	Knowledge organizations linked to constructs such as Fuzzy, hypertext and web structures, knowledge infrastructure, engineering, recentralization.
	KM linked to innovation	Shared schemes of innovation, collaborative aspects between academic and business institutions.
	KM linked to the management of technology	Network schemes in multi-organizational contexts to generate innovation-research projects.
After 2010	KM as a complex system	Ability to mix theory and practice. Applied knowledge for the benefit of the environment. Abductive reasoning as a basis for theorizing

Source: prepared by the authors based on García and Ferrer (2012), Torugsa and O'Donohue (2016) and Alkhuraiji, Liu, Oderanti and Megicks (2016).

According to Spithoven, Vanhaverbeke and Roijakkers (2013), internal knowledge is linked to external knowledge and external knowledge is linked to internal knowledge so these links generate and strengthen the innovative capacity of human talent in the community which facilitate a culture of open innovation. The league internal-external knowledge refers to the offer of innovations of the organization abroad (Bernal and Frost 2015). The league external-internal knowledge refers to the capacity of absorption of the organization to accelerate the generation of innovation based on research with social impact (Bogers, Foss and Lyngsie, 2018).

3. Methodology

The investigation was explanatory and transversal. The methodological design was based on a qualitative approach (Hurtado and Toro, 2008), to approach the social reality of Latin American public universities and explain the behaviour of OI and KM in two universities, one in Mexico and one in Colombia. Data triangulation was used for internal validation and analytical generalization for external validation (Yin, 2003).

In the research, it was studied how university knowledge management happens and its points of coincidence with OI in the Latin American public university; a university that seeks to be inclusive and be at everyone’s service, beyond the individual interests of its human capital. Therefore, KM was conceptualized as the process of identification, creation, transfer, use and reuse of the university knowledge that flows and is stored in the organization. OI was assumed as the process of collaboration with agents external to the Institution to generate knowledge during innovation processes (inter and extra university colleagues, and organizations with the capacity and willingness to innovate in the productive, public or social sectors).

The methodological process was integrated into two phases. In the first phase, the behaviour and characteristics of the two universities, their main actors and their environment were deeply studied. In the second phase, the semi-structured interview aimed at leaders of the university community in both higher education institutions was used as a data collection instrument to analyse the relevant aspects of OI and KM in the two public universities. The instrument was integrated with four axes for both variables:

1. The university structure and its functioning related to the university knowledge management and OI.
2. The stimulus to generate science and to develop technology with social impact.
3. The process of OI and KM within the schools, faculties or divisions.
4. Factors that inhibit or facilitate OI and KM within schools, faculties or divisions.

Table 2 shows the distribution of the interviews: nine in the UGTO and seven in the UPTC. The interview was applied to three groups of units of analysis: executive authorities, managers in the university ecosystem and researchers with a highly recognized academic background. The application of the 16 interviews was in a personal way in the two countries, in the four offices of the UPTC and the four UGTO campuses. The roles between both institutions were homologated by country-institution to ensure uniformity in the terms.

Table 2
Data triangulation through the distribution of interviews

Analysis units	Description	UPTC	UGTO
Executive authorities	Researcher who occupies a high position in the Institution; his academic acknowledgments guarantee his wide experience in research; his national system of recognition of research categorized him in the highest levels.	1	1
Managers	Researcher with experience and categorized in his national system of recognition of research that occupies a managerial position, generally, he has strong relationships in the university environment and interaction networks with the productive, public and social sectors.	4	5
Expert researcher	Researcher with extensive experience in research in his area of knowledge domain, categorized in his national system of recognition of research and has held positions of management or executive authority.	2	3
Total		**7**	**9**

Source: by the authors.

The dense description (Cliford, 2003) collected was systematized to analyse the hermeneutical unit in three moments with the support of Atlas TI v.7.0. In the first moment, the implication of the frequency of use of the key terms in the interviews of the UGTO was analysed by means of the word cloud counting technique; the procedure for the UPTC interviews was replicated; the global hermeneutic unit was analysed to conclude with a discursive comparative of the terms and phrases of the Latin American public university related to university knowledge management and OI. In the second moment, the codes associated to the most representative categories of the university model in the two institutions were analysed, through frequency tables and graphs. Finally, in the third moment, the global semantic network was generated based on the most representative elements found during the 16 interviews applied.

4. Findings and discussion

4.1 Characterization of the two public universities

Education, research and interaction with the environment are essential functions of the University of Guanajuato. During the last two decades, the UGTO has made important changes to adapt to the new dynamics of the environment; it went from being a decentralized organ of the state government to an autonomous organization; it has reconfigured its academic-administrative structure of schools and faculties to a departmental model organized on campuses. Its educational model is an innovation because it changed the traditional approach to education to put the student as the centre of the process. The UGTO has adopted a culture of quality and transparency. All these elements and other innovation processes are part of the gradual adaptation of the UGTO to changes in the environment.

As from 2019, the UGTO is governed by a new university legislation that seeks a disruptive structural modification oriented towards the linkage with the environment, research with social impact, development and application of knowledge. This coincides with Calvo, Navarro, Rey and Periañez (2016), who maintain that KM is related to the capacity of the organization to adapt to changes in the environment and to innovate based on the generation, use and transfer of knowledge.

The UGTO has systematically incorporated professors with a research profile and it currently has more than 500 members in the National System of Researchers (SNI for Spanish initials), which represents 55% of the teaching staff, in addition, 95% of the SNI members are full-time professors. The members of the SNI of the UGTO are distributed

by levels: 4% is level III, 13% is level II, 57% is level I and the rest are at the Candidate level (CONACYT 2018). This constitutes a robust research system, that, in relative terms, it positions the UGTO as one of the three best state universities in Mexico. This system has national and international leadership (level III) and independence (level II), although its greater relevance constitutes a young staff of researchers; this is a convenient feature for the acceptance of possible changes in the university's actions.

The distribution by knowledge areas is balanced with approximately 14% of SNI members in each of the seven areas, although the strength of their research system lies in the areas of natural sciences and engineering. The UGTO has 106 research groups attached to the different campuses, of which 17% are in formation process, 48% are in consolidation process and 35% are consolidated (SEP 2018). The UGTO offers 102 postgraduate educational programs, of which 58% belong to the National Register of Quality Postgraduate Programs (CONACYT 2018). Among the state public universities, the UGTO ranks second for the level of international competence of its graduate programs in the Register.

Research, pedagogy and extension are the missionary functions of the Pedagogical and Technological University of Colombia. The UPTC is the second national public university institution. Its research system places it in ninth place in scientific production among Colombian universities. In 2018, the Art. Sapiens ranking places the UPTC in 13th place nationwide. In the province of Boyacá, the UPTC is the public university that responds to the demand for quality education for all. The UPTC currently has more than 430 researchers attached to the Colciencias researcher's system (COLCIENCIAS, 2018) which represents 22% of the teaching staff. In addition, 50% of the researchers recognized by Colciencias are full-time professors (UPTC 2018).

The UPTC has 134 research groups categorized by COLCIENCIAS attached to the different offices of the Institution of which 1,5% are in category A1, 8,2% in category A, 15,7% in category B, 58,1% in category C, 13,5% in recognized and 3,0% registered (COLCIENCIAS, 2018). The UPTC offers 173 educational programs, of which 57,8% are postgraduate (UPTC 2018).

4.2. Analysis of the hermeneutic unit

In the first moment of this phase of the investigation, the nine interviews applied in the UGTO, in the cities of Guanajuato, León and Salamanca, which generated ten hours of recording, were transcribed and systematized to analyse the hermeneutic unit through Atlas TI. It was found in the university discourse that the primary function in the work of professors is teaching, followed by innovation as a binding process of research with the environment. Generally, the interviewed commented that innovation (linking mechanism) generates development, therefore, the University is redefining its processes and resources for research with social impact; the interviewed argued that universities should strengthen their research groups to make the university impact in the state.

Figure 2 shows the word cloud of the speech in the UGTO; the word cloud is displayed in Spanish so that the results are not distorted. The frequency of words in the cloud shows the relationships between the support for innovation and research processes and the categorization of researchers. A tendency is observed on the priority that the university grants to research and innovation through the allocation of material and human resources for the execution of these two fundamental activities. In the interviews, evidence was gathered to suppose that there is a regional culture of innovation that needs to strengthen the relationship between the university and the productive, public and social sectors of the state. The interviewed perceived that companies are an engine of development and that their interaction with the university could improve the welfare level of the university environment. In addition, they assured that this interaction should be led by the work of research groups to promote change in Mexican regional development. The interviewed said that research constitutes an eminent source of social legitimacy.

Figure 2
Word cloud at University of Guanajuato (Mexico)

Source: by the authors based on fieldwork

The seven interviews applied in the UPTC, in the cities of Tunja, Sogamoso and Duitama, which generated seven hours of recording, were transcribed and systematized to analyse the hermeneutical unit using Atlas TI. A high frequency of innovation based on research was found in the university discourse. Additionally, a high frequency was reflected in the support processes for the research groups that involve the human capital of the university. The interviewed reiterated in a significant way that more financial resources are required for research, more links with external institutions and more internal links, especially with the levels of university government (faculties and vice-rectories).

Figure 3 shows the word cloud of the speech in the UPTC; the word cloud is displayed in Spanish so that the results are not distorted. The frequency of the words in the cloud shows the research processes as support to the activities of OI. In the interviews, researchers showed a tendency to participate in local and national calls to achieve the recognition of science and technology entities, mainly Colciencias. It was identified that the contribution of university organizational capital to the development of the region is valued. It was evident that the researchers of the Institution consider the management of research as a key element in their work to generate quality knowledge. In addition, the achievement of impact indicators that generate knowledge networks and academic relational capital is highly pursued.

Figure 3
Word cloud at the Pedagogical and Technological University of Colombia

Source: by the authors based on fieldwork.

In this sense, Vesga (2016) proposes that the University is able to facilitate the construction of active networks, to build and to reconstruct knowledge during the OI process, to train human talent, to manage knowledge and to foster a culture of innovation in the territory. However, González (2009) assures that frequently the university human capital in Colombia focuses on teaching activities because its interest in research and the application of these research products was low.

According to the methodological process, the 17 hours of systematized recording were integrated to identify the most relevant categories. The frequency of the words in the cloud highlighted innovation as a transversal variable; it was highlighted the valuation of university human capital as a pressing demand towards the authorities of both universities. In the word cloud, the importance of recognition systems and incentives, and of the tangible and intangible resources necessary for research and innovation was emphasized.

Figure 4 shows the word cloud of public university discourse in both institutions; the word cloud is displayed in Spanish so that the results are not distorted. This analysis showed other elements not scrutinized in the individual analysis; the first was the concern for solving society and companies' problems that are linked to the essential function of linkage with the environment; the second was the university's demand for improving management and management processes in the public university; the third was the need to foster a research-innovation culture as a facilitator to achieve research results with academic and social impact.

Figure 4
Word cloud at Latin American public university

Source: by the authors based on fieldwork

These results coincide with Vesga (2016), who assures that the University can be a leading actor of OI not only because it is a knowledge generating organization but also because it generates innovative technical solutions that take advantage of the infrastructure of its laboratories and all the knowledge accumulated in the organization. In addition, it is coincident with Gros and Lara (2009), who argue that knowledge management is no longer a monopoly of universities because many companies have created their research, development and innovation centres; therefore, the mixture of internal and external knowledge to the university is increasingly relevant.

In the second moment of this phase of the investigation, the hermeneutic unit was analysed through the codes of co-occurrence in the interviews. In coding, 18 codes were identified that resulted in a total of 473 citations. Of these,

269 corresponded to the UGTO and 204 to the UPTC. In the consolidated interviews, the most significant codes were five: collaborative support that recorded 49 citations; culture with 48 citations; motivation with 44 citations; relational capital with 41 citations; university policies with 38 citations.

Table 3 shows the representative codes by institution and the consolidated data. In the analysis discriminated by institution regarding citations, the highest percentage corresponds to the University of Guanajuato with 56,9% of the total number of referenced codes and 43,1% of citations to the UPTC. At the University of Guanajuato, collaborative support is the first indicator, since it recorded 32 citations representing 6,8% of the total citations; it was followed by motivation with 31 citations, which means 6,6% of the total; culture appeared with 28 citations representing 5,9% of the total. In the Pedagogical and Technological University of Colombia, the most cited code was relational capital with a record of 29 citations representing 6,1% of the total; it was followed by university policies with 21 citations representing 4,4% of the total citations in the interviews; the third most significant code was culture with a record of 20 citations that represented 4,2% of the total.

Table 3
Code frequency table UPTC-UGTO

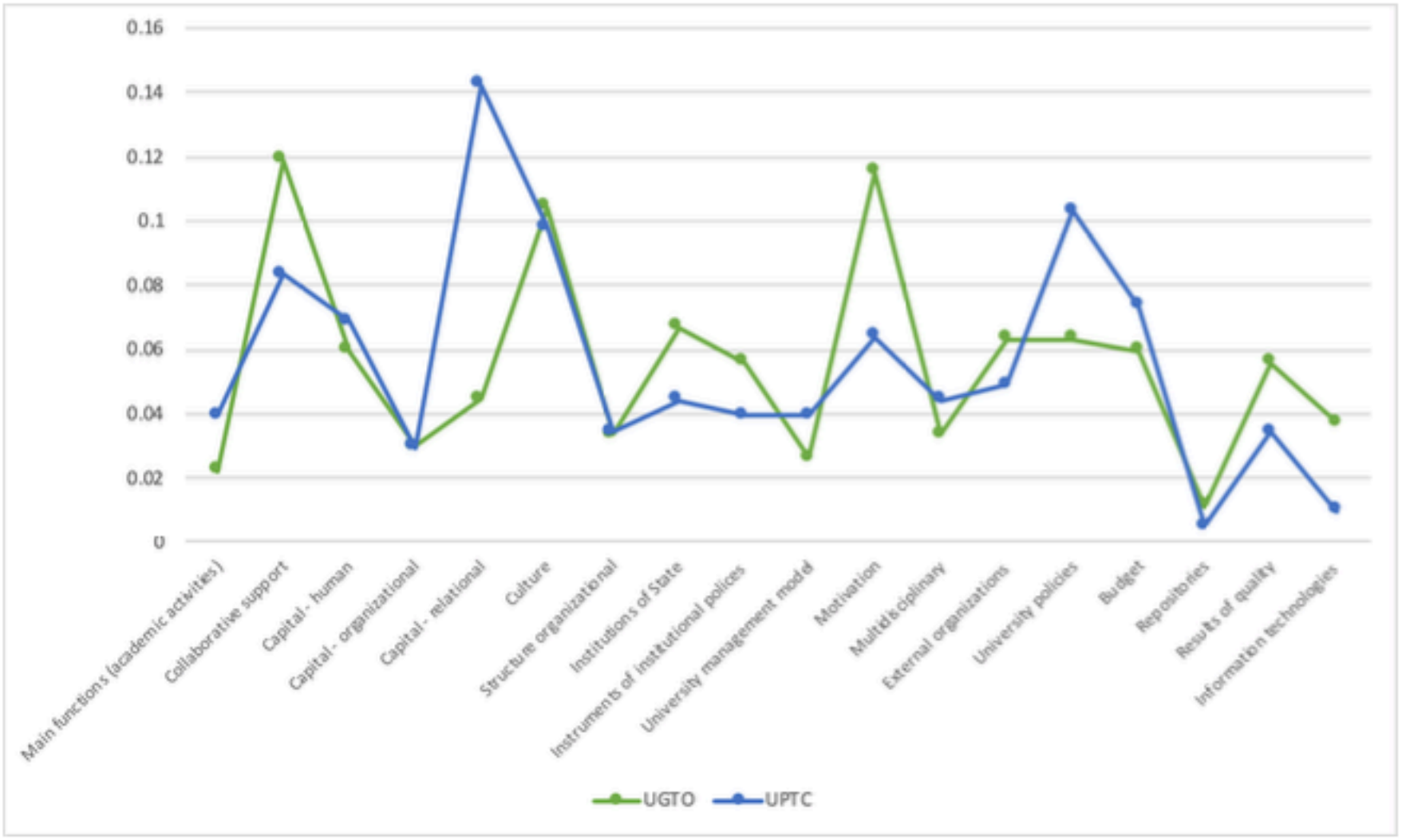
Codes	Institution: UGTO	% UGTO	Institution: UPTC	% UPTC	Total	% Total
Main functions (academic activities)	6	1,3	8,0	1,7	14,0	3,0
Collaborative support	32	6,8	17,0	3,6	49,0	10,4
Capital - human	16	3,4	14,0	3,0	30,0	6,3
Capital - organizational	8	1,7	6,0	1,3	14,0	3,0
Capital - relational	12	2,5	29,0	6,1	41,0	8,7
Culture	28	5,9	20,0	4,2	48,0	10,1
Structure organizational	9	1,9	7,0	1,5	16,0	3,4
Institutions of State	18	3,8	9,0	1,9	27,0	5,7
Instruments of institutional polices	15	3,2	8,0	1,7	23,0	4,9
University management model	7	1,5	8,0	1,7	15,0	3,2
Motivation	31	6,6	13,0	2,7	44,0	9,3
Multidisciplinary	9	1,9	9,0	1,9	18,0	3,8
External organizations	17	3,6	10,0	2,1	27,0	5,7
University policies	17	3,6	21,0	4,4	38,0	8,0
Budget	16	3,4	15,0	3,2	31,0	6,6
Repositories	3	0,6	1,0	0,2	4,0	0,8
Results of quality	15	3,2	7,0	1,5	22,0	4,7
Information	10	2,1	2,0	0,4	12,0	2,5

technologies						
Totals:	**269**	**56,9**	**204,0**	**43,1**	**473,0**	**100,0**

Source: by the authors based on fieldwork.

The most significant citation trend is shown in the UGTO. The interviewed in the UGTO showed a greater cultural predisposition to innovation that it is centred on collaborative support, teamwork and interdisciplinarity. The interviewed in the UPTC are clearer about the concept of relational capital. The consolidated analysis of the interviews highlighted that the motivational factor has a high influence on the processes of OI and KM. Figure 5 shows the comparison of frequencies between both institutions.

Figure 5
Comparison of code frequency UPTC- UGTO

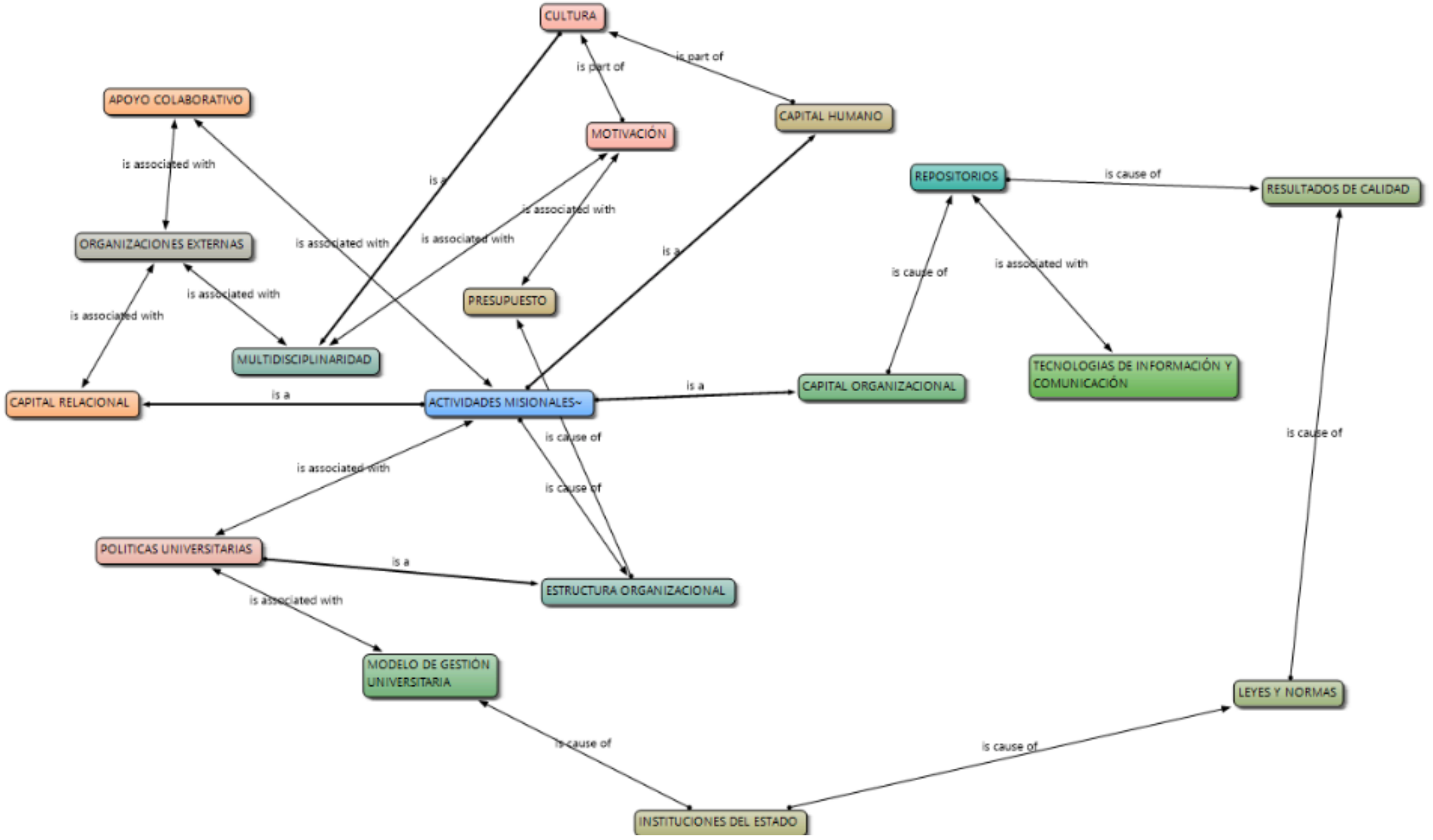


Source: by the authors based on fieldwork

In the third moment of this phase of the investigation, the consolidated semantic network of the hermeneutic unit was constructed to show the list of codes by roles of the interviewed. The basis of the semantic network was the influence of national and institutional innovation and research policies, and institutional capital. This capital is integrated by three axes: the human capital of its university community; the organizational capital that refers to the knowledge and academic production pool for the research and innovation of the Institution; the relational capital that is sustained in the university extension and relates the University to its productive, public and social environment.

Figure 6 shows the consolidated semantic network of UPTC-UGTO codes. The relations in the network are supported in the collaborative support through culture, information technologies, motivation and multi-discipline to carry out the processes of knowledge management and open innovation in the university; there is a strong link with academic products that reflect the results of the research such as articles, books, patents, spin off; this is a reflect of the priority in the research processes.

Figure 6
Consolidated semantic network of UPTC-UGTO codes



Source: by the authors based on fieldwork

This coincides with the review of the literature, which ensures that OI facilitates not only the mix of knowledge to improve or create products, processes, commercial activities or forms of organization, but the integration of the collective intelligence to strengthen innovation capabilities (Álvarez and Bernal, 2017; Albizuri and Rodríguez, 2012). Therefore, OI has a direct relationship with KM through four dimensions that relate them:

1. Networks or interorganizational relationships that dynamize the interactions of the university with its environment.
2. Organizational structure or internal networks that manage the capacity of absorption and dissemination of knowledge.
3. Feedback system or evaluation processes according to the level of openness of the organization that systematically detect available opportunities.
4. Management systems that mix the knowledge of the environment with the knowledge of the organization.

In addition, there are coincidences with López, Annibal, Hofmeister, Tavares and Roehe (2016), who maintain that KM is capable of generating sustainable innovation processes to strengthen the organization. They argue that innovative capacity based on KM plays a fundamental role in organizational, environmental, social and economic sustainability; however, the innovation they refer is open-ended because KM promotes innovation in the entire value chain of an organization, which requires opening its doors to the productive, public and social sectors.

5. Conclusions

Based on the results of this research, it is concluded that there is a significant relationship between open innovation and knowledge management in the university. It was evidenced that research is the basis of university innovation and this is its mechanism of connection with the productive, public and social environment.

The findings showed similarities in the processes of open university innovation and knowledge management in the two countries. Research is a priority in both institutions, and it is seen as the hotbed of innovation. There was high interest in the categorization of researchers at high levels. The codes related significantly as collaborative support, culture and motivation processes give evidence of this.

It was evidenced that the motivation of the university's community is the genesis of the processes of open innovation and knowledge management. This motivation is dynamic for three reasons: the main one is the concern of multi and interdisciplinary collaboration; the second is the development of university human capital through individual incentives; the third one is the demand for tangible and intangible resources necessary for research and innovation.

The discriminated analysis of the citations showed that in the UGTO there is a cultural predisposition centred on collaborative support, teamwork and interdisciplinarity. In the UPTC the relevance of the concept of relational capital was evidenced. Therefore, the incidence of the Latin American public university in its environment is potentially strong.

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