



Available online at www.jlls.org

JOURNAL OF LANGUAGE AND LINGUISTIC STUDIES

ISSN: 1305-578X

Journal of Language and Linguistic Studies, 18(2), 1026-1037; 2022

Triple Helix Model: An Analytical Framework For The Development Of The Ceramic Industry In Norte De Santander

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APA Citation:

Mendoza, J.A.G., Molina, J.S., García, M.C., (2022). , Triple Helix Model: An Analytical Framework For The Development Of The Ceramic Industry In Norte De Santander , *Journal of Language and Linguistic Studies*, 18(2), 1026-1037; 2022.

Submission Date: 20/02/2022

Acceptance Date: 10/04/2022

ABSTRACT

The ceramics industry is one of the most important in Norte de Santander, contributing approximately 13% of the Department's GDP, generating employment and boosting the economy throughout its value chain. Its natural market consisted of clients from Venezuela, whose sales disappeared in 2015, with the closing of the border due to political and economic differences between the two countries. Currently, the sector faces great challenges to reinvent itself and look for other markets, especially in countries with which there are trade agreements and where there may be export opportunities. The loss of the Venezuelan market generated many difficulties not only in the business order, but also in economic and social aspects such as unemployment, informality, and a decrease in income to the state treasury. Therefore, the responsibility to reconfigure is not only of the businessmen but also of the Government and the universities. In this context, this research aims to analyze the current state of the sector and propose strategic guidelines for its development. The triple helix theory, consisting of the strategic cooperation between the Company, the State and the University, is used as the center of discussion.

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The qualitative method was used for the research and in-depth interviews were conducted in the field. The productive sector under study is made up of 72 organizations located in Norte de Santander (Colombia). According to the findings, it can be affirmed that a common agenda between the company, the state and the university on promotion, research and development, financial leverage and human resources training can be decisive in the productive development of the sector.

Keywords: Triple Helix, University-Business-State, Ceramics Industry.

RESUMEN

La industria cerámica es una de las más importantes de Norte de Santander que aporta aproximadamente el 13% del PIB del Departamento, genera empleo y dinamiza la economía de toda su cadena de valor. Su mercado natural consistía en clientes de Venezuela, cuyas ventas desaparecieron en el 2015 con el cierre de frontera debido las diferencias políticas y económicas entre los dos países. Actualmente el sector afronta grandes retos para poder reinventarse y buscar otros mercados especialmente en países con los que se tienen tratados comerciales y en los que puede haber oportunidades de exportación. La pérdida del mercado venezolano generó muchas dificultades no solo del orden empresarial, sino también aspectos económicos y sociales como desempleo, informalidad, disminución de ingresos al fisco estatal, por lo tanto, la responsabilidad de reconfigurarse, no solo es de los empresarios sino también del Gobierno y de las universidades. En este contexto se plantea esta investigación que tiene como objetivo analizar el estado actual de del sector y proponer lineamientos estratégicos para su desarrollo. Como centro de discusión se utiliza la teoría triple hélice consistente en la cooperación estrategia entre la Empresa, el Estado y la Universidad. Para la investigación se utilizó método cualitativo y el trabajo de campo se realizaron entrevistas a profundidad. El sector productivo objeto de estudio está conformado por 72 organizaciones ubicadas en Norte de Santander (Colombia). De acuerdo a los hallazgos encontrados se puede afirmar que una agenda común entre la empresa, el estado y la universidad sobre promoción, investigación y desarrollo, apalancamiento financiero y capacitación de recursos humanos puede ser determinante en el desarrollo productivo del sector.

Palabras Clave: Triple Hélice, Universidad-Empresa-Estado, Industria cerámica

1. INTRODUCTION

The ceramics industry is one of the most important in the region as it contributes around 13% of Norte de Santander's GDP, generates direct and indirect employment and is a driving force for the entire production chain, making it key not only to business development but also to social and governmental development. Due to various difficulties such as the closing of the border between Colombia and Venezuela and the coronavirus pandemic in 2020, the industry has lost a large part of its market that originally went to the neighboring country (González et al., 2022; González-Mendoza et al., 2022; Salazar et al., 2022). In terms of an informant for this research, "The industry did not sell but was bought, so it had assured sales for several months of production". However, with the closing of the border, this market was lost, some companies had to close and others have been looking for productive reconversion and new markets in Colombia and abroad.

The objective of this work is to explain how the ceramic industry can find again its business dynamics, supported by the tripolar model or triple helix that consists of the articulated effort

between University-Business-State. The university provides its experience and qualified personnel in research, development and technology transfer; the company provides the financial capital, and the capacity to lead large projects; and the State establishes the design of policies and the governance required by the business ecosystem to facilitate investment, the development of innovation, the search for international markets and the entry of foreign capital.

The three spheres of power of the helixes generate common spaces where organizations are created that take advantage of the articulation and efforts of the University, the Company and the State, creating an environment conducive to innovation, the creation of spin-offs and the prevalence and growth of companies in the sector.

The article is a research work with qualitative methodology, with in-depth interviews of the main actors, using the triple helix model as the central axis of discussion.

2. THEORETICAL BACKGROUND

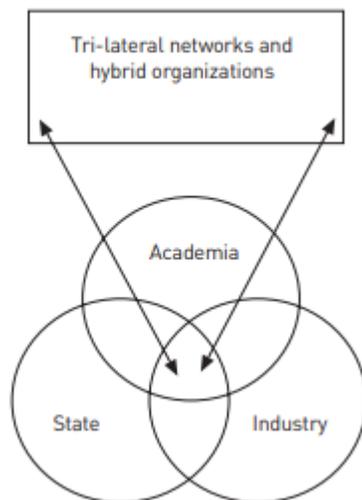
When it comes to the generation and dissemination of knowledge, there are three main sources of production: the educational sector, the economic sector and the governmental or political sector, and the relationship between these actors forms the basis for creating the Triple Helix (TH) system (Castillo et al., 2014). The TH model consists of carrying out joint and articulated actions between the University, the State and the Company, to strengthen the economic and social development of the regions (Etzkowitz and Leydesdorff, 1995). Each component of the system, called the helix, has its objectives, but when they cohere, they create the necessary conditions and synergy to favor innovation and the strengthening of industries.

Some antecedents of the model refer to the linear model, consisting of the relationship between the University and industry, characterized by being unidirectional, hierarchical and homogeneous, where the universities or research centers constitute the nucleus of knowledge generation, especially within academic confines, and the result is transmitted employing technology transfer to the productive sector (Villaveces, 2006). Initially, the model had the purpose of generating spaces to integrate the actions of universities, companies and the State to favor innovative processes and the competitive capacity of each of the entities.

In a second phase, Triple Helix is a spiral innovation model that captures the multiple and reciprocal interactions between the university as knowledge generator and first helix, the companies applying the new knowledge and converting it into innovation, as the second helix, and the administrations or government as the third helix, generating policies and promoting their application (Etzkowitz, 2002; Chang 2010; Rivera et al., 2015).

In the third version of TH, the three-helix spheres overlap, so that each takes on the role of the others. In the common or intersecting spaces between them, organizations called trilateral networks to emerge, composed of the strength and competence of the three helixes (Hernández et al., 2014). Currently, in most countries, efforts are being made to set up TH-type alliances, to form an innovative environment that promotes spin-offs, based on knowledge and that can prevail with the help of private enterprises and research groups (Chang, 2010).

Figura 1. Tomada de Etkowitz y Leydesdorff (2000).



Regarding industrial development, Malaret & Entrena (1989), Jaramillo (1993;), Echeverría (1990) and Saint Martin (2011) consider that for companies in the era of modernity and globalization, three key elements must be considered: (a) Innovation, which allows replacing the traditional manufacturing base with new knowledge; the adoption of more efficient organizational structures to take advantage of the opportunities that the new market and maintain a competitive advantage; (b) institutions since the capabilities of the industry depends largely on industrial development, fiscal and technological innovation policies that allow to strengthen competitive capabilities and close the gap with developed countries; and (c) the organization of productive systems through the formation of industrial networks and the strengthening of economies of scale.

2. METHOD

The research uses the phenomenological or qualitative method, which seeks to interpret reality in depth. For the collection of information, a procedure for the selection of informants was used, resorting to the non-probabilistic type, which some authors such as Goetz and Le Compte (1988) call "intentional or opinionated sampling" (n/p). For the selection of key informants, three businessmen or senior managers were considered; two researchers from the region's universities and one informant from the regional government (Table 1).

Table 1. Key Informants

Entity	Number of Informants
Private Company	3
University	2
Government	1

The information gathered is triangulated between the documentary findings, the theoretical background of the HT model and the informants' testimonies.

3.1 FINDINGS AND DISCUSSION

3.2 The ceramic industry

The companies of the ceramics sector in the department are located on the border axis with Venezuela in what is known as the metropolitan area of Cúcuta, which includes the municipalities of San Cayetano, El Zulia, Villa del Rosario, Los Patios and Cúcuta. Before the closure of the Colombian-Venezuelan border by the Venezuelan government in 2015, the industry contributed 38% of employment, 37% of total wages and 12.8% of GDP, making it by far the most important in the region (Sánchez et al., 2019; Sánchez et al., 2019; González et al., 2022).

Because it is located in a border zone, the companies that manufacture ceramics in the region have historically had their main market in Venezuela, not only because of its geostrategic location but also because of the commercial dynamics between the two countries, the quality of their products, the exchange rate and the proximity of large Venezuelan cities. For example, in 2005, the year of greatest commercial dynamics between Colombia and Venezuela, the industry exported around 5.45 million dollars (National Department of Statistics, 2006), which represented the second largest export of the department of Norte de Santander (Sarabia et al., 2022; Salazar et al., 2022; González-Mendoza et al., 2022).

After the frontier was closed, the ceramic industry's natural market was lost and since then the sector has faced serious difficulties in reinventing itself and finding new markets, especially because its geographic location is far from Colombia's large cities, the road infrastructure is deficient, and therefore the costs of locating the product are high. In addition, there are other organizational problems such as the deficient marketing system, since before the border closure everything that was produced was sold without much effort, and the precarious technological conditions (González et al., 2021).

However, the industry has been restructuring, to the point that it has conquered new markets and has managed to place its products in some regions of the country, such as the eastern llanos, where it has sold 10% of its production, 40% in the Atlantic zone and 30% in the center of the country (Cámara de Comercio de Cúcuta, 2018).

In these circumstances of crisis, aggravated by the pandemic presented in 2020, the sector has been taking initiatives of renovation, research and development and innovation in alliance with the Universidad Francisco de Paula Santander, especially so that these difficulties are becoming valuable experiences, which are expected to become a strength and increase confidence to recover the market and expand into Colombia and other regions of the world. The companies linked to the Norte de Santander Clay Association and the ceramic cluster have been renewing their portfolio of services, strengthening their production processes to internationalize their market, with the support of government institutions and the University.

2.1 The University and its Role in the Production and Transfer of Knowledge, first helix

Society has granted it the role of knowledge generator and through it the transformation and improvement of the living conditions and welfare of its population. Therefore, one of the key functions of the university is to contribute to economic and social development through the search for innovative ideas based on knowledge. Therefore, universities must be entrepreneurs that assume the creation or incubation of companies, giving rise to a new type of personnel called entrepreneurs or scientific entrepreneurs (Etzkowitz and Leydesdorff, 2000; González de la Fe, 2009).

In this way, this key function of the university not only remains in the generation of theoretical knowledge but through experience and articulation with private enterprise, it forms the DNA of the triple helix model, resulting in practical and codified knowledge, where students and teachers are seen as potential entrepreneurs. The permanent flow of this type of knowledge ensures change and continuity in the competitive advantage of the university, the business sector and society.

Therefore, in the TH model, it represents a reliable and coherent alternative to generate knowledge and social transformation from science, knowledge transfer and the generation of value to the productive sector and society.

In this sense, the Universidad Francisco de Paula Santander, through the Ceramic Materials Research Center (CIMAC) is the entity that has focused the most, together with entrepreneurs in the research and development of ceramics. The Universidad de Pamplona has supported the sector by promoting technical and technological careers in the field; and the Fundación de Estudios Superiores Comfanorte (FESC) is making inroads in research for the sector.

According to the information provided by the interviewed businessmen and experts in the sector, there is not always an effective company-university collaboration, since the university expects the businessman to take the initiative to request its help to solve some problem or to carry out research based on an idea. All these activities should be carried out in an articulated and joint manner with the research groups and centers of the regional and national universities since they are the ones who have the instruments and methodology for the search for new knowledge, which, oriented by the productive sector, will become effective innovation, generate added value to the products and strategic positioning in the market.

The accompaniment of the universities to the companies should be at the level of productive and organizational processes, and of rapprochement with other actors in the value chain such as the financial sector, economic associations and the government. The businessmen consider that the University is somewhat isolated from the economic and social reality of the region and is mainly dedicated to academia, leaving aside the search for solutions to society's problems and the improvement of the population's living conditions.

2.2 Entrepreneurial Ecosystem, Second Helix

A business ecosystem refers to the network of relationships that the company has with its stakeholders and complementary companies, so the key in this context is to understand how the system works and how to strengthen the processes of cooperation and competition (Willer & Neely, 2013). According to Garcia (1994), these processes should focus on cooperation and mutual aid since current business models do not seek the destruction of the rival but to integrate their skills and strengths. In the case of the business ecosystem, the ceramic industry refers to the set of its companies and the relationship with its stakeholders, but in this research, with the universities and the State.

The ceramic industry is made up of small and medium-sized companies with some degree of technological development and skilled labor that, as a whole, have a low level of competitiveness in local and national markets. The sector's greatest competitive advantage is the quality of the raw material, which allows for a product with the thermal, durability, and resistance characteristics desired by customers.

Based on the testimonies of the businessmen interviewed, the quality of the raw material is not enough to generate a competitive advantage, so research is needed in the search for new forms of

production and the generation of products that are lighter and easier to transport with the ability to maintain their temperature. In this sense, the industry does not have research and development departments, so it establishes strategic alliances with universities or the public sector to improve its products and processes.

Faced with this reality, 66.7% of ceramic companies have conducted research and development projects in alliance with universities, especially the Universidad Francisco de Paula Santander; 33.4% with the public sector, 20% with the private sector and there is a band of 13.4% that has not had the possibility of advancing research projects in alliance with other entities (Sánchez et al., 2019).

From the financial perspective, the sector's entrepreneurs believe that they do not find support and leverage from banks and the government and that due to the economic crisis their financial support does not allow them to demonstrate solvency, which is why banks reject their credit applications. The soft credit lines offered by the government also require pledges of collateral that they cannot back, therefore, the resources only go to a small number of companies with greater capacity and economic backing.

In this sense, in Colombia, 96.4% of the companies are MSMEs, which do not exceed 200 workers and have assets of less than 30,000 SMMLV but have a contribution of 40% of the GDP and 81% of the formal employment in the country. Barely 43% of the new micro, small and medium-sized enterprises, survive during the first five years, therefore, Asobancaria and the State require taking measures to mitigate the multiple risks to which MSMEs are exposed, including access to credit and financial education (Asobancaria, 2018).

According to the same source, more than 92% of the credit applications that reach the financial entities are approved and apparently, the rejection or lack of access to credit by entrepreneurs is due rather, to the low capacity to formulate business plans, evaluate the opportunity and benefits and know how and when to request it

At the trade union level, the informants interviewed mentioned some sector initiatives such as the Ceramics Cluster, Induarcillas, Arcilleros del Zulia and the Chamber of Commerce, which are the figures around which businessmen associate, discuss their problems and seek solutions in a consensual and collective manner; they are also used as a means of dialogue with the government.

Through these guilds, the ceramics industry seeks to solve collective problems, making decisions that favor all the companies in the sector more than one in particular, such as technological modernization, the opening of international markets, productive integration, research, development and innovation, and many other common issues that affect all the organizations.

The information gathered indicates that one of the objectives of the ceramic sector trade associations is to improve the issue of governance, which in terms of Finger et al. (2006) means collectively solving problems by making decisions that favor the stakeholders, through democratic actions of listening, learning and seeking solutions. This requires relationships of trust, respect and collaboration that facilitate addressing the complexity of problems in a collaborative and articulated way (Norman & Bakker, 2009; González, & Sierra, 2018).

2.3 The Governmental Perspective, Third Helix

The first author who spoke of the importance of the State in the promotion and growth of the economy was Schumpeter, who considered that it was necessary to create a series of political frameworks to facilitate the creation, diffusion and protection of knowledge. These measures, in

turn, would facilitate the innovation process by generating a multiplier effect, making the rapid diffusion and implementation of innovations more likely, committing and guaranteeing public budgets for research and development, limiting the adverse effects of creative destruction, and concentrating resources and efforts on strategies for economic growth (Sánchez-Ancochea, 2005).

Castell (1998) states that the State has the responsibility to provide the necessary infrastructure for the settlement of the business fabric, create training and qualification opportunities for the population, create the logistical infrastructure, ensure legal stability for doing business at a global level and attract international capital to promote the creation of national and regional companies. This series of measures helps the company and the University to play their roles so that the State becomes a key ally in the formulation of policies that help business growth and social development (Etzkowitz, 2003).

Because it transcends the particular interest in the creation and promotion of the business sector, since this generates employment, tax revenues, economic growth and social welfare, the role of the state in promoting entrepreneurship should be mandatory and provide the conditions for it to prevail and strengthen, especially in times of crisis such as border closures and pandemics (Malaret & Entrena, 1989).

In the case of the ceramic industry in Norte de Santander, the national and regional government has established a series of measures to boost the sector, such as product development policies, business creation, tax exemptions, creation of free zones, etc. However, businessmen consider that substantial results have not been achieved, especially because they do not have enough experience and knowledge to take advantage of these events.

Another government strategy implemented, through Decree 1818 of 2015, was the exemption of Value Added Tax (VAT) on all products generated in the region, which was intended to reactivate the economy and boost sectors affected by the border closure crisis. This initiative helped a little, but not enough, since the inputs are not produced in the region and therefore must be brought from other parts of the country and VAT must be paid.

Currently, the president of Colombia, Iván Duque, has proposed to create a Special Economic Zone in the region, to attract the settlement of new domestic and foreign companies, which would generate more employment and benefits for the population. The benefits would be granted to new companies that invest in the region and generate employment and would consist of tax exemptions on income and complementary taxes.

In terms of logistics infrastructure, the roads from Cúcuta to the Atlantic coast have been improved, the roads between Cúcuta and Pamplona are being developed, the Camilo Daza Airport has been modernized, and the region's hotel infrastructure has been significantly updated, which makes it likely to attract more investment to the region and the extraction of products to domestic and foreign markets.

Despite this, businessmen feel that the government urges them to generate quality employment under current legal regulations, but at the same time generates more onerous fiscal policies that prevent them from sustaining a stable payroll. Likewise, the businessmen interviewed believe that the State only takes them into account because of the utility they generate by creating employment, wealth, consumption and fiscal contributions.

In short, the necessary cohesion among the actors related to the triple helix has not been strong enough to find a strategy in which the regional productive sector finds a way to reconvert the

industry so that it can disappear its dependence on the Venezuelan market and become self-sustaining. Nor is there good governance among the actors in the value chain.

5. CONCLUSIONS

One of the main sectors of the economy in the region is the ceramics sector, which contributes about 13% of Norte de Santander's GDP, generates employment and boosts the entire production chain. Until before the political and economic confrontation between Colombia and Venezuela, and the border closure in 2015, almost all of the production of the ceramic industry went to the Venezuelan market, but after these events, many companies had to close and had to restructure to find other markets to prevail and even grow.

The bet for the development of the industry from the articulated effort between University-Business-State, supposes the fulfillment of the role of each one of these actors, articulating efforts and resources to create opportunities for the business sector. The University contributes its capacity to generate research and development, given its experience, infrastructure and trained researchers with extensive knowledge; the private company contributes with financial capital, human resources and experience in leading great challenges; and the State contributes with the regulatory framework that motivates the entry of foreign capital, guarantees innovation and entrepreneurship. However, despite being clear about the role of each one and the intention to work together, it has not been possible to achieve sufficient synergy for the industry to become again the main line of the economy and to fully conquer the markets of Colombia and other countries such as Central America and the Caribbean. Therefore, and according to the findings, work should be done on the issues mentioned below.

Guild Integration: strengthen the economic guilds so that they generate trust and allow for proper governance within the ceramic sector, especially through the Ceramics Cluster, Induarcillas, Arcilleros del Zulia and the Chamber of Commerce. Only if there is trust among the various actors can synergies be generated to ensure a common goal.

It is necessary to work on an effective productive integration in such a way that each producer specializes in a portfolio and the companies are not seen as competitors but rather as strategic allies. At the same time, specialization in production allows for raising quality standards, lowering production costs, seeking specific market niches and competing with products of international quality.

Concerning the market, the University and the State must train and accompany entrepreneurs to make the most of business rounds, fairs and virtual business platforms. At the same time, the company must specialize a sales force capable of taking its products to the national and international level and taking advantage of the country's free market vocation. It is necessary to change the sales model in which before there was a guaranteed market, but now it is necessary to find it. The same situation exists for financial leverage for the sector since the businessman perceives that there are no affordable sources of financing, while the Financial Superintendency considers that businessmen do not use its services and that when they do, the vast majority of them are approved. Therefore, there is a lack of financial education for the entrepreneur, which needs to be worked on, especially in the university and the company with the support of the financial authorities.

Another aspect to be worked on refers to highly competitive human resources, especially in research, development and technology transfer and in the training of managers with high managerial

competencies appropriate to the social purpose in the ceramic sector, with strategic thinking based on human resources, innovation and managerial decision-making.

REFERENCES

- Albors, J. & Hidalgo, A. (2011). Relaciones de gobernanza e innovación en la cadena de valor: nuevos paradigmas de competitividad. *Revista Europea de Dirección y Economía de la Empresa* 21(1), 205-214.
- Cámara de Comercio de Cúcuta. (2012). Arcillas Competitivas: Descripción del Clúster de Cerámica de Norte de Santander. Recuperado de: <http://www.datacucuta.com/index.php/cluster/arcillas-competitivas>
- Cámara de Comercio de Cúcuta. (2013). Arcillas Competitivas: Documento Estratégico Iniciativa Arcillas Competitivas. Recuperado de: <http://www.datacucuta.com/index.php/cluster/arcillas-competitivas>
- Camara de Comercio de Cúcuta. (2018). Informe de Gestión 2017. Recuperado de: http://www.cccucuta.org.co/media/transparencia_2017/informe_de_gestion_2017.pdf
- Castells, M. (1996) *La sociedad red*. Madrid: Alianza.
- Castillo, L., Lavín, J., & Pedraza, N. (2014). La gestión de la triple hélice: fortaleciendo las relaciones entre la universidad, empresa, gobierno. *Multiciencias*, 14(4), 438-446.
- Chang Castillo, H. G. (2010). El modelo de la triple hélice como un medio para la vinculación entre la Universidad y la Empresa. *Revista Nacional De Administración*, 1(1), 85-94
- Departamento Administrativo Nacional de Estadística. (2016). Encuesta anual manufacturera 2016. Recuperado de: https://formularios.dane.gov.co/Anda_4_1/index.php/catalog/493/related_materials
- Departamento Administrativo Nacional de Estadísticas. (2006). Informe de coyuntura económica regional departamento Norte de Santander, segundo semestre de 2005. Recuperado de: https://www.dane.gov.co/files/icer/2005/norte_santan/norte_santander_II05.pdf.
- Echeverría, J. (1990). Cambio técnico, reconversión y reestructuración industrial en Colombia. Estructura científica, desarrollo tecnológico y entorno social. En: Ministerio de Educación Nacional. (Ed.), *Misión de Ciencia y Tecnología*. Bogotá: MEN, DNP, FONADE
- Etzkowitz, H. & Leydesdorff, L. (1995). The Triple Helix of University-Industry-Government Relations: A Laboratory for Knowledge Based Economic Development. *EASST Review*. 14(1), 11-19.
- Etzkowitz, H. (2003a) *Innovation in Innovation: The Triple Helix of University-IndustryGovernment Relations*. *Social Science Information*. 42(3), 293-337.
- Finger M., Tamiotti L. & Allouch J. (2006) Introduction: conceptual elements. In: Finger, M., Tamiotti, L., Allouche, J. (Eds.), *The Multi-Governance of Water: Four Case Studies*. State University of New York Press, Albany. 1-42
- González, J. & Sierra, M. (2018). Frontera Colombia-Venezuela: Redes De Gobernanza Y Cooperación Transfronteriza. *Estudios Migratorios Latinoamericanos* (82).p5-30

- González, J., Cárdenas, M., & Fonseca, M. (2021). Incorporación del migrante venezolano al mercado laboral colombiano. Bogotá: Ecoe Ediciones Limitada.
- González, J., Sánchez, J., & Cárdenas, M. (2022). Pensamiento estratégico y reconversión productiva de la Industria cerámica de Norte de Santander. Bogotá: Ecoe Ediciones Limitada.
- González, J., Sarabia, A., & Sánchez, J. (2022). Gerencia prospectiva. Sector cerámico artesanal de Norte de Santander. Bogotá: Ecoe Ediciones S.A.S.
- González-Mendoza, J., Sánchez-Molina, J., & Cárdenas-García, M. (2022). Pensamiento estratégico y reestructuración industrial. *Desarrollo Gerencial*, 14(1), 1-20.
- González, T (2009). El Modelo de Triple Hélice de Relaciones Universidad, Industria Y Gobier.No: Un Análisis Crítico. *ARBOR Ciencia, Pensamiento y Cultura* CLXXXV 738 julio-agosto (2009) 739-755 ISSN: 0210-1963 doi: 10.3989/arbor.2009.738n1049
- Hernández, L.; Verástegui, J. & Melo, N. (2014). La gestión de la triple hélice: fortaleciendo las relaciones entre la universidad, empresa, gobierno. *Multiciencias*, 14(4), 438-446.
- Jaramillo, J. (1993). Reconversión industrial y pequeña y mediana empresa. *Revista Universidad EAFIT*, 29(89), 23–32
- Leydesdorff, L. & Etzkowitz, H. (2000) Le "Mode 2" et la globalisation des systèmes d'innovation "nationaux" : le modèle à Triple hélice des relations entre université, industrie et gouvernement. *Sociologie et sociétés*. 32(1), 135-156.
- Llinás A., Caicedo A. & Gómez D. (2015). Iniciativas clusters en Colombia: elemento central dentro de la agenda de política industrial moderna del país. *Coyuntura Pyme*
- Malaret, E. & Entrena, R. (1989). Régimen jurídico-administrativo de la reconversión industrial. Universidad de Barcelona. Recuperado de: <http://hdl.handle.net/2445/41530>.
- Marín, D. (2005). La enseñanza de las teorías de la Administración: limitantes epistémicas y posibilidades pedagógicas. *INNOVAR. Revista de Ciencias Administrativas y Sociales*, 15 (26), 43-58.
- Mogrovejo, J. (2015). Impacto económico del sector cerámico en San José de Cúcuta (Colombia). *Universidad & Empresa*, 17(29), 157-180.
- Mogrovejo, J. (2015). Impacto económico del sector cerámico en San José de Cúcuta (Colombia). *Universidad & Empresa*, 17(29), 157-180.
- Monroy, S. (2005). Enfoque y conceptos de una administración renovada. El aporte de Aktouf. *INNOVAR. Revista de Ciencias Administrativas y Sociales*, 15 (26), 134-137.
- Norman E. & Bakker K. (2009). Transgressing scales: water governance across the Canada–US borderland. *Annals of the Association of American Geographers*, 98(4), 1–19.
- Pineda, L., López, D. & Díaz, R. (2007). Primer Informe: Diseño del mapa de los componentes del clúster alrededor de su cadena productiva, Bogotá: Qubit Clúster Technology Based Consortium.
- Porta, F. (2007), “Integración productiva en el Mercosur: condiciones, problemas y perspectivas”, INT Policy, Note 04, Banco Interamericano de Desarrollo.

- Rodríguez, E. (2009). El Rol de las Universidades en la Sociedad del Conocimiento y en la Era de la Globalización: Evidencia desde Chile *Interciencia*, vol. 34, núm. 11, noviembre, 2009, pp. 822-829 Asociación Interciencia Caracas, Venezuela
- SaintMartin, M. (2011). Towards a dynamic approach to reconversions. *Social Science Information*, 50(3-4), 429–441.
- Sánchez, D. (2005) Capitalismo, desarrollo y estado. Una revisión crítica de la Teoría del Estado de Schumpeter. *Revista de Economía Institucional*. 7(13), 81-100.
- Salazar, L., González, J., & Mogrovejo, J. (2022). Competitividad y toma de decisiones la perspectiva de un agente tomador de precio del sector energético colombiano. Bogotá: Ecoe Ediciones S.A.S.
- Sánchez, J. & Ramírez, P. (2013). El Clúster de la cerámica del área metropolitana de Cúcuta (Trabajo de grado inédito). Universidad Francisco de Paula Santander. Cúcuta, Colombia.
- Sánchez, J.; González, J.; Avendaño, W. (2019). El Clúster Cerámico. Apuesta de desarrollo socioeconómico de Norte de Santander. Bogotá. Ecoe Ediciones.
- Sánchez, J., Ramírez, R., & González, J. (2019). La Industria de los chircales artesanales del Área Metropolitana de Cúcuta. Bogotá: Ecoe Ediciones Limitada.
- Sarabia, A., Sánchez, J., & González, J. (2022). Análisis estratégico del sector de las artesanías cerámicas del Norte de Santander. Bogotá: Ecoe Ediciones S.A.S.
- Villaveces, J. (2006). Nuevas políticas de ciencia y tecnología. Buenos Aires: CLACSO.
- Willer, C. & Neely, A (2013). *Business Model Design in an Ecosystem Context*. London. University of Cambridge