Methodology of the Fifth Helix Systemic, A Decade of Sectorial Investigations 2010-2020

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Abstract. As a result of a Doctoral Thesis Research in 2010 at the Universidad Autonoma de Baja California, Tijuana Campus, Mexico, and within the PhD Global Development Studies - High Level Human Resources Training Program of CONACYT, a methodological proposal called Fifth Helix Systemic (in spanish Quinta Helice Sistemica QHS) was generated, for the aim of the widespread policy analysis and as a methodological instrument, to be a research applicable in different sectors in the State of Baja California community. This documentary article aims to analyze, the productivity and traceability, of the QHS methodology (business, education, government, business chambers and consultants) and its applications identified in the decade 2010 to 2020 at regional, national and international level, through traceability in network platforms of academic and scientific research journals on the Internet.

1. Introduction
Within the academic context, teachers and researchers who develop a career in the education sector obtain productivity indicators related to their publications and research in high-impact academic journals and portals, which is why this article proposes an exercise of the actions linked in the process of analyzing the productivity and traceability of articles over time, in the electronic media and specialized networks of article publications, journals and conference proceedings registered and published in research portals.

This article is aimed at showing the traceability of publications over a decade (2010-2020), since the first published product of a doctoral thesis research was generated at the Universidad Autonoma de Baja California Campus Tijuana, within the Faculty of Economics and International Relations and under the National Quality Postgraduate Program (PNPC), Doctorate in Global Development Studies, recognized in international category by the National Council of Science and Technology (CONACYT) of Mexico.

2. Methods and Materials
In order to systematize the chronology of the productivity of publications in Graph 1, the records of productivity generated and linked in the management of academic professional performance and research between 2010 and 2012 are presented, 4 articles were generated, as an initial phase of replicate the methodological structure of the doctoral thesis research "Factors that determine the systemic competitiveness of the electronic sector industry in Tijuana, Baja California", being the basis for the design and development of the methodological and instrumental contribution of the Fifth Systemic Helix, also identified by the acronym in internet search engines as QHS.
During 2012, as a result of the Postdoctoral Stay and the collaboration as Research Professor and Consultant at the Center for Research and Training in Public Administration (CICAP) of the Universidad de Costa Rica (UCR), the number of projects and initiatives is activated research and international links, especially with Universities in Mexico, Colombia, Chile, Panama, Peru, Uruguay, Argentina and Spain, as well as links with the universities of Costa Rica. Graph 2 shows the records of publications at the international level on topics related to the QHS methodology. The number of publications developed in Costa Rica as a result of the Postdoctoral stay and the work stay during the period from 2012 to 2016 and a very close relationship during 2010 to 2020 stands out.

The academic traceability of publications begins with the Red-E-Mun International Congress of 2010 called: "New Paradigms, Better Local Governments. The municipality facing the financial economic crisis and international integration. Benemerita Universidad Autonoma de Puebla, Red-E-Mun. Universidad de Costa Rica (UCR), Universidad Autonoma de Tamaulipas, Mexico ", in that academic event the progress and contribution of the doctoral thesis that generated in 2012 the methodological proposal of the Systemic Fifth Helix was presented for the first time and with it the link with the Center for Research and Training in Public Administration (CICAP) of the Universidad de Costa Rica.
For the year 2011, 2 publications were made; one in Costa Rica and the other in Mexico. The first international stay was made as Visiting Professor at the UCR, participating in talks, conferences and in linking and research activities of CICAP, School of Public Administration (EAP) and School of Chemical Engineering (EIQ).

3. Results
In 2012, 4 publications were made [1-5], together with the beginning of the Postdoctoral Stay at CICAP, focusing the main activities on collaboration in research projects to promote a National System of Labor Competencies in the Costa Rican Public Sector, starting from international linkage activities and sectoral linkage with different Costa Rican institutions to form Grupo Semilla, as Instructors, Evaluators and Methodologists in labor competencies.

In 2013, 7 outreach and linkage publications were generated, as well as international collaboration and linkage activities with the National Council for Standardization and Certification (CONOCER) dependent on the Secretary of Public Education of Mexico, as well as with the Technological University of Tijuana, Universidad de Guadalajara, Instituto Politecnico Nacional, Universidad Cooperativa de Colombia, Universidad de Valencia, Spain, in the actions of the RULESCOOP Network, collaboration with the activities of Red-E-Mun with the Benemérita Universidad Autonoma de Puebla. Links with institutions of the Costa Rican public sector such as the General Directorate of Civil Service, Ministry of Culture, as well as international links with the Universidad de Panama.

For 2014, [6], 12 publications of international outreach and outreach were generated and 8 articles in Costa Rica; of which 4 were presentations at the Red-E-Mun Congress organized in Costa Rica, 2 journalistic notes on the portal of the University of Costa Rica, 2 journalistic notes from the General Directorate of Civil Service (DGSC), in Mexico 2 outreach activities are generated; an international conference activity the event organized by CONOCER at the WTC in Mexico City and a presentation at the International Congress of Researchers in Competitiveness, organized by the Universidad de Guadalajara in the City of Puerto Vallarta.

In the United States of America an article in English Methodology of the fifth systemic helix for the development of public sector policies is published in the Journal Competitiveness studies (JSC), in the case of Chile it participates as Guest Professor at the University of La Serena, giving various conferences and experiences around the research projects promoted in CICAP and the projects aimed at the systematization of knowledge, skills and attitudes about the different knowledge that make up labor, professional and research competencies to promote and strengthen performance and competitiveness sectorial. This year is intense in international outreach activities, research projects before the Vice-rectory for Research and training events before the Vice-rectory for Social Action, generating a precedent of training and certification projects in labor competencies, until achieving the CICAP-UCR certification as a Certification and Evaluation Entity through CONOCER Mexico.

For 2015, [7,8], 9 publications were generated, of which 4 were in Costa Rica, 3 in Mexico, 1 in Panama and 1 in Spain. Those with the greatest impact on international research in this period are the design and development of an initiative for the Standard of Competencies for Teleworking within the framework of the activities of the ELAC Group of ECLAC, a project led by the UCR through CICAP linked to universities of Mexico, such as the Universidad de Guadalajara, CESUN Universidad, FUNDESCO of Argentina, Universidad Autonoma de Republica Dominicana, Universidad de la Serena, Chile and CONOCER of Mexico.

An article is also developed in the Inf5G SEGO-BIT Magazine of the Universidad de Segovia, Spain. In Mexico, they participate in the development of a Book Chapter with an Academic Body of the Instituto Politecnico Nacional of Mexico. Conferences are held at the Universidad de Panama on the research project and international linkage on labor competencies and the development of an Evaluation Center linked to the CICAP of the UCR and the School of Public Administration of the Universidad de Panama. The development and approval of the first standard of competencies for Customs is also promoted and generated as a milestone in Costa Rica and the start of another for Theater Management.
In 2016 3 publications were developed; 2 in Colombia and 1 in Mexico. This year is the final phase of the Postdoctoral Stay at the CICAP of the UCR where the bases for a CICAP Research Journal (RI-CICAP) are promoted, and a stage of Invitation as International Professor of the Doctorate in Business Administration begins at the Technological Institute of Costa Rica, contributing to the training of high-level human resources through the Direction of 2 Doctoral Theses, orientation to scientific writing from thesis projects to be published in indexed journals.

In 2017, the return to work academically in Mexico was recorded, at the Universidad Tecnologica de Tijuana as Coordinator of Academic Mobility and Work Situation Analysis (AST) and at the Tecnológico Nacional de México Campus Tijuana, as Coordinator of Postgraduate Masters in Administration. 5 publications are generated; a book chapter and article in the International Congress of Competitiveness Researchers at the Universidad de Guadalajara, 2 articles in journals from the United States of North America, and an article in a journal indexed in Colombia.

During 2018, 6 publications were developed; a book chapter and two articles in the International Congress of Competitiveness Researchers at the Universidad de Guadalajara, 2 articles in journals from the United States of America and a scientific article in a journal indexed in Colombia.

In 2019, 10 publications were developed; a book chapter and two articles in the International Congress of Competitiveness Researchers at the Universidad de Guadalajara, 2 articles in journals from the United States of America and a scientific article in a journal indexed in Colombia.

As a result of the academic advances and the trajectory of national and international research management [11,12], at the end of 2019 the academic certification at the national level is achieved in Mexico by ANFECA, the National Association of Faculties and Schools of Accounting and Administration, promoted by UNAM, also the PRODEP National Recognition, Desirable Profile as an Academic at the National Level, a distinction granted by the Secretary of Public Education of the Government of Mexico. For the year 2020, the conditions are generated to constitute and register as Leader an Academic Body, called Competitiveness and Innovation for Sustainable Regional Development, officially establishing national and international links with researchers and specialists in the topics axes of the Academic Body (CA) or Research Group, having as lines of research the following thematic axes: 1. Systemic, sectoral and global competitiveness, 2. Models of innovation, ICTs and organizational management, and 3. Capacities of chains and clusters sectoral.

4. Conclusions
As a phase of the academic development trajectory [13-18], it ventures into the training of high-level human resources under Doctoral Theses, achieving in 2020, 3 out of 4 with Honorific Mention from the students of the Pacific Business School Campus Tijuana, without a doubt, a great satisfaction to contribute to the development of new generations of professionals, likewise, a very special distinction was received for the professional and academic career, an Honoris Causa Doctorate by the Mexican Institute of Leaders of Excellence (IMLE) in the AAPA Hall of UNAM, representative body of university academics UNAM, received in the highest house of studies in Mexico, UNAM.

Currently, new professional and academic challenges are being assumed, developing the management as Coordinator of the Doctorate in Administration project, an appointment received at the National Technological Institute of Mexico, after having covered the responsibility of the appointment of Coordinator of Master in Administration for the period 2017-2020, promoting Initial enrollment of 24 to 98 students until August 2020. Along with the new academic projects, other responsibilities and institutional challenges are aligned, such as the position of Honorary President of the Commission for the Promotion of the Social Economy of the City of Tijuana, regional representative of NODESS Metropolitan of Social Economy for the Tijuana and Rosarito Baja California area and, the Vice Presidency of CIRIEC Mexico for the North Region.
Undoubtedly, the year 2020 represents the crystallization of many efforts in work, professional and research development in the different areas of the career as an academic, researcher and business consultant and therefore, this article aims to share the sheet with academics route to cement productivity and development in the academic field.

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