INTRODUCTION TO SCIENTOMETRICS, INNOVATION AND SCIENTIFIC ACTIVITY

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Gratitude

The authors say thank you to God, as the only source of everything in the world; to our families for all their support and because they were our motivation and inspiration to persist, to all our colleagues, friends and people around that in certain moment helped us to carry out this book

The authors

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Prologue

Science requires complementary aspects of development, where each one of the participants of the great scientific ecosystem can present their tools to recognize their own investigative skills, there are experiences in the world about the Basic scientific mentoring, this principle of co- helping others to consolidate their life service project through the generation of a new knowledge, how to contribute from the technological development, which is the appropriate route for the strengthening of the competencies of the human resource for science, technology and CT&I innovation, how to achieve the interaction of the social appropriation of knowledge in scientific and non-scientific communities, according to Arencibia Jorge, R., & de Moya Anegón, F. (2008), approximations can be given to The techno-scientific activities from the scientometric analyses, offering concrete and action plans with improvement applied in the strengthening and dissemination of scientific advances of the universities, research centers or institutes.

Nevertheless, these scientific criteria, which are presented in indexed journals, visible in the world ranking of universities and countries, which are deceives in the synthetic indexes which are in each international measurement year by year, they recognize the way of classifying and To establish the tendencies of the production generated in each Latin American ecosystem, this represents a great challenge against the impact indicators in science with all its possible derivate products, the communication of the good practices of scientometrics in the Web can identify routes and information of the work carried out and the times for their results, in the studies of Peralta González, M. J., Frías Guzmán, M., & Gregorio Chaviano, O. (2015), orients how it can generate pertinent and relevant diagnostic pathways to improve Gradually results.

This document invites the researchers in training process as well as the experienced ones to generate new initiatives for researchers, who have as a concern the strengthening of communities, people which need to solve common problems, each chapter of this Book provides relevant information which is consolidated with a single purpose to strengthen science, technology and innovation, in it is described from the tools Cienciometricas or

Scientometrics, Webometrics, Cibermetrics, Altmetrics, Bibliometrics that They help the understanding of academic actions, which reflect on the research.

This book is a contribution to the researcher's knowledge and it is expected to achieve a greatest diffusion in the scientific and academic communities, it provides the experience of the researchers who contributed in each line. Here it is invited to support the consolidation of networks and communities around such initiatives like this.

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Introduction

These Days, the Scientometrics, BIBLIOMETRICS, INFORMETRIA, ALTIMETRY AND WEBOMETRÍA, is applied by different institutions, companies and people, it is the opportunity to offer a path to support the work of researchers in training and consolidation ones as well, this document provides the work of the life of professional experts who seek thoroughly key aspects for the development of science, technology and innovation.

In the relationship of the simple, it is possible to find the complexity of life, this argument with which we begin our rack for a journey of understanding the world scientific dialect, it allows a link door to knowledge, favoring and delivering the labor of High-level researchers, as a document derived from research on Scientometrics and researching applied to Latin America, this permit to build an opportune way for this knowledge field, new knowledge products generated are able to read The territory, as well as the understanding of how researchers from South America work, who are concerned about the space of construction of social communities that achieve direct communication with the context they interact.

In the first chapter is strategically and didactically structured is found a knowledge that is given to the researcher, definitions and actions on scientometrics, which it is possible to search information, the platforms available on the web for the recognition of knowledge, its thematic denomination " Conceptual Foundations of Cienciometría and Scientific Research", this document pretends invite the community to delve into the tools, ranking and global developed potential to strengthen public and private services for science and technology agencies.

The second chapter called " A tour of the scientometrics platforms in Latin America", provides a tour on the technology and science platforms in Latin America, which offers information about which countries are joined, from the work in the ministries as articulated platforms, like the use and technological application delivers the parameters of visibility and spreading of science.

The third chapter establishes the concept of innovation and its relationship with productivity, its name " Concepts of innovation, entrepreneurship and global technology", which identifies important factors from the global indexes of innovation, when it is read people can have a better understanding of which of them have an important value in establishing the final results of each country.

In the fourth chapter, it is recognized the concepts that make clear which are the concepts of " Signs, trademarks, patents, industrial designs, science developments and other products" derived from science, this part pretend to invite understand because of science, its nature and how these registries and assurances give special attention on the promotion of intellectual copyright reserve.

To finish chapter fifth, he it is argued that education is the pillar of previous developments, because of this, the argument of " Conceptualization and influence of educational policy in access to science", summarizes and conceptualizes which ones are derivative of science.

Capítulo

1

Scientometrics e Researching: Cienciometria and Research

Chapter 1
Conceptual Foundations of Cienciometría and Scientific Research

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The scientometrics and the concept of (e)-research, it is an exercise of reflection that presents the articulation of the aspects related to the development and innovation and the visibility of the research carried out in the online scenarios (on-line), it is thought in the Encouraging of good practices in the use and appropriation of the Internet as a favorable way, how to help to mitigate the impact of the problems of third world countries (the case of South America), where their progress is not significant and their visibility in production and development in each country is non-existence , compared to cognosespaciales levels.

The document does not refer to the use of the Internet as the main means of dissemination, but it teaches how this communication channel facilitates the use in networks and databases, generating an organic traffic (consultation of bases by the universities channels, bulletins and Research centers) and a direct traffic (consultation process that obey

to purposes of consultation with the URL of the article, without leaving register to the region or to the university) of the consultations by university, country, region, and that do not favor the updating and visibility in Communities of interest.

The goal is not to publish in the databases; This is not the end, as it is not only to generate "papers" that are not visible in the communities that really need these advances and results, the purpose is to help with the scientific developments and the meaningful results to the lower class communities.

Scientometrics e-Researching, look for the How do visualize the results in order to communities can appropriate and share common knowledge?, the answer we will be given with concepts that allow a better understanding and consolidation of strong academic networks , learning communities, professional community learning-PLC, this interaction will allow a constant dialogue between peers, facilitating the validated procedures for the scaling of information, turning this to a dynamic process into the use of good Investigative practices.

According to Miguel, S. (2011), there are magazines associated to the Latin American and Caribbean context, databases such as the scientific Electronic Library online SCIELO, the network of scientific journals of Latin America and the Caribbean, Spain and Portugal REDALYC and the database Bibliography of abstracts and quotations of articles of scientific journals SCOPUS, which facilitate the transit of the knowledge, but they are not applied in this region and underestimated the science in the continent, in some scenarios, they are considered like third science.

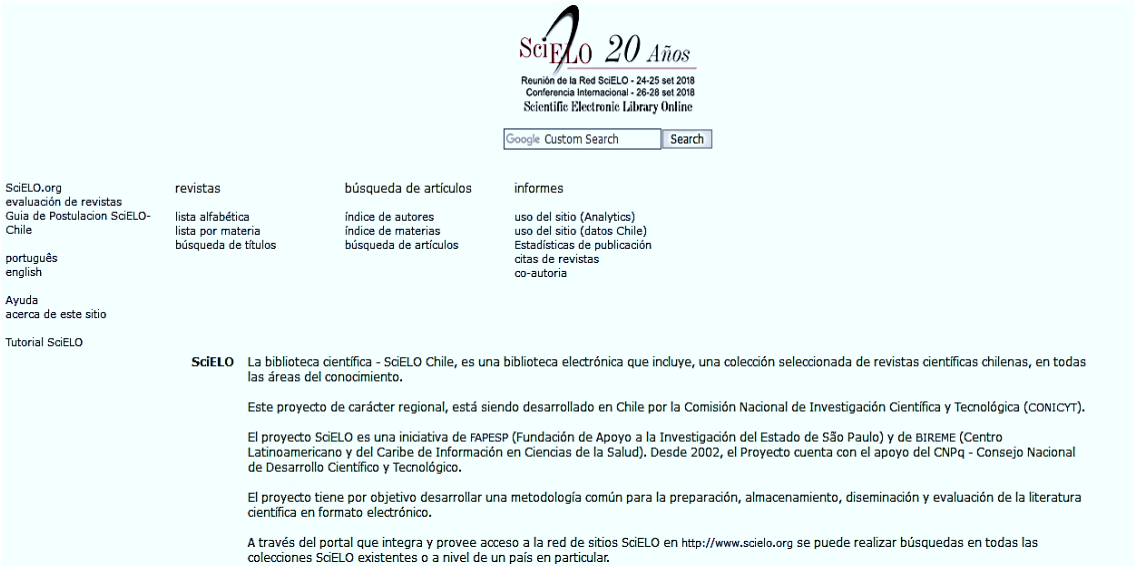

Figura No. 1. Specialized databases, Source: recovered from https://scielo.conicyt.cl/

In the comparison and coverage exercise of the papers generated by each country, they are established in the deadlines defined by the databases called journal (Time for measurement of research results, paper, books, lectures and Articulated seminars).

These observation windows relate the academic terms that establish the condensation of the scientific production, however, these applications are compared by the researchers Union of the continent, an exercise related to the lack of Understanding of this disclosure is presented by Aguja F. A. P. (2017), in his study establishes the researcher-teacher in relation to development for each stage, he refers to ignorance of the practices of science in online databases and its Ignorance on the part of the authors of their use in specific communities, facilitating the consolidation of networks that encourage the application of their discoveries and meaningful advances in the boarder of knowledge.

Figura No. 2. Specialized Databases, Source: recovered from http://www.redalyc.org/home.oa

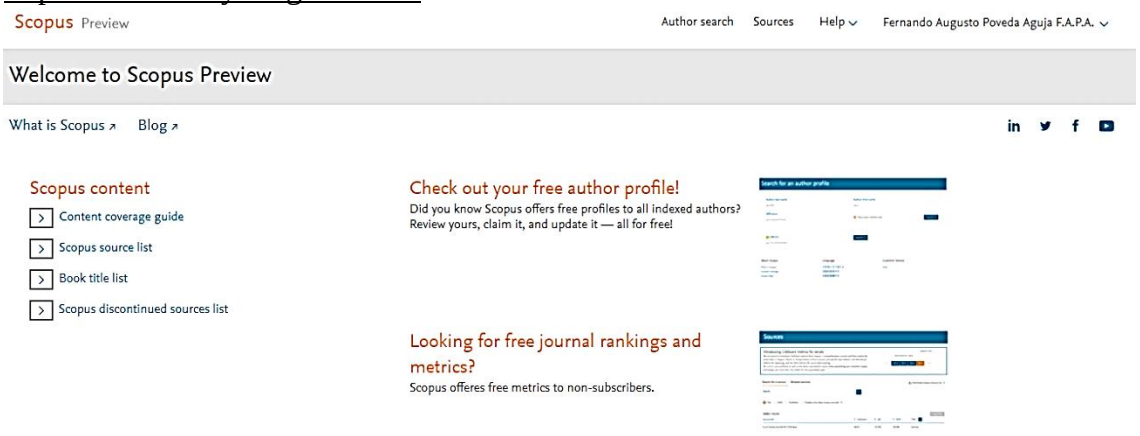

Figura No. 3. Specialized Databases, Source: recovered from https://www.scopus.com/

The counsels dedicated to the Scientometrics, who dedicate their professional trajectory in presenting the key aspects for the search of journals according to the area and sub-area of knowledge of the paper from an investigation, looking for strategies for to facilitate access to specialized, professional and scientific bases, SCOPUS, they are the basis of scientific content par excellence.

Its strictness and scientific of the joined journals, guarantee to have a dialogue validated by scientific communities organized by related topics. The SCOPUS database looks for the greatest impact of those who read the results, the invitation of this great knowledge base refers to the commitment of the authors to compromise, both with the results and with

access to direct consultation, allowing each Author has his/her analysis by: institutional affiliation, zone or region.

This is reflected in the rise of the science and technology indicators of each country, relating to the author or authors that are identified in each publication; Relating the area of knowledge which the document or documents belongs to, achieving the understanding in the management of the structuring of science.

A study by the Xie investigators, Z., Xie, Z., Li, J., & Yang, Q. (2018), who explore the influence of social activities in the scientific career, how do social aspects of dissemination influence the scientific career? who are considered Scientists? And what is the mechanism to be constituted as a researcher? Because of his, the results are conglomerated by a set of representative journals and their correlations with the indices of exposure, they are articulated according to the hypothesis on the extraction of data, relating their levels of cohesion, and how it is achieved the promotion of publications and the number of citations for authors between social patterns and the non-sociable pattern.

A revision or study from the Scientometrics applied, delivers as a result the edges in the specific change of science, determining which are the most relevant topics designed worldwide like common problems, which are presented from the needs of the context, continent or region.

This is why, a theme such as sustainable development is a benchmark that needs to be taken into account. An example is established by researchers who talk about how globality emphasizes strengthening research on sustainable and sustained development, relating the studies referred to in the databases with the theme of sustainability.

Considering the mapping as a concept of geo-reference of science (degrees, coordinates according to the Global Positioning System), it allows to deliver the indicators by regions, countries, universities, levels of development and how is the level of use of scientometrics data, which are the techniques of science promotion, the concept of co-author,

co-word, co-quotes, clusters and geo-spatial analyses that imply the tracking in the increase of the scientific visibility for each member.

The application of scientometrics refers to the analysis of the records that will support scientific take consult. In the related study of Olawumi, T. O., & Chan, D. W (2018), 2094 bibliographic records were taken, compared from the WEB OF SCIENCE (WOS) database, which is platform based in the web that collects the references of the main scientific publications of any discipline of knowledge, both scientific and technological, humanistic and sociological.

WEB OF SCIENCE ™ of the firm THOMSON REUTERS, which relates the concept of data analysis (DATA ANALITYC) resulting from the information, generating variables, identifying their relationships, key factors to associate, etc., which are referenced in the WEB OF SCIENCE - CLARIVATE, from a quantitative view relate the knowledge managessuch as MENDELEY, SCIENCE DIRECT that are presented as information solutions.

ELSEVIER's case, being a scientific information manager for researchers, professors, students, health professionals and information professionals, combine scientific publications, applying knowledge management, and mining Data MINNING, relating the interaction of data, its strength and scope of research, the consolidation of networks and geospatial maps.

ELSEVIER enabled through the data to identify countries that provide laudable and meaningful solutions for the world, such as the United States, China, the United Kingdom and Canada, with sustainability research being the central axis mainly in categories of topics of Environmental sciences, Green and sustainable Technology of natural sciences, civil engineering, and construction technology.

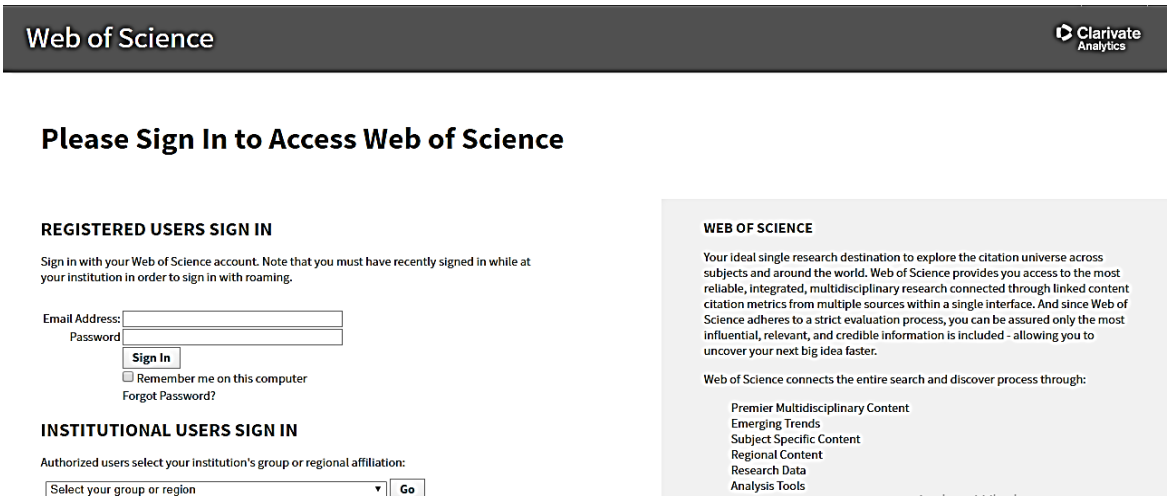

Figura No. 4. Web of Science Fuente: recuperado de http://login.webofknowledge.com/error/Error?Error=IPError&PathInfo=%2F&RouterURL=http%3A%2F%2Fwww.webofknowledge.com%2F&Domain=.webofknowledge.com&Src=IP&Alias=WOK5

This visibility in the study allowed generation and articulation as emerging trends in research into sustainability, sustainable urban development, sustainability indicators, water management, environment, evaluation, public policy, Where the results obtained from the scientometrics allowed the generation of 21 Co-citations, called cluster, relating the number of research papers they read about this exercise.

This leads to the data analytics generating new knowledge-related products associated with the metadata that arises from the continuous search.

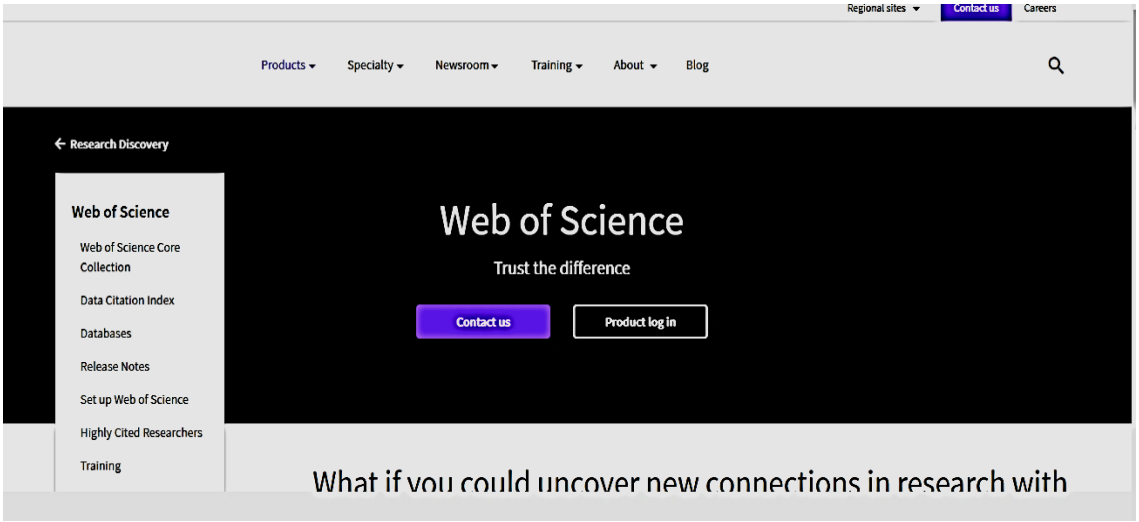

Figura No. 5. Data análisis de investigaciones publicadas. Fuente: recuperado de https://clarivate.com/products/web-of-science

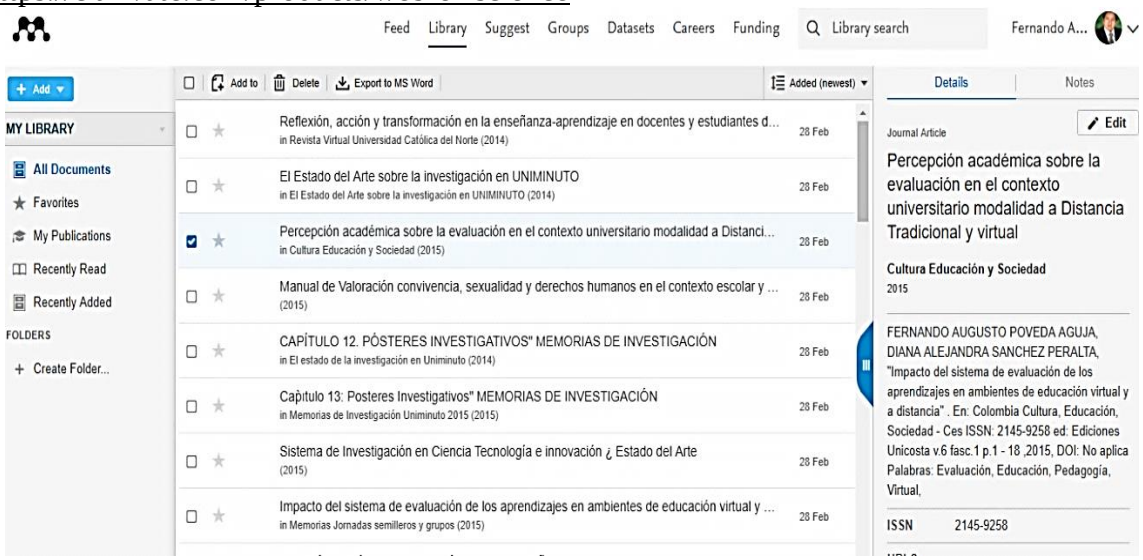

Figura No. 6. Gestores de datos Fuente: recuperado de https://www.mendeley.com/library/

Mendeley, is a free Bibliometrics manager, it can organize the information by categories in a large virtual library, generate communities or groups of interest. It behaves like the academic social network for researchers, where its management of the information of the advances and final results are treated by packages that articulate the institutional subsidiaries. It allows the consolidation of information and the search for external financing, relates a number of collaborators in the world, rediscovers the latest related research in the field of knowledge where the paper is and in which journal we can find it, Mendeley ®.

Figura No. 7. Búsqueda de meta buscadores Fuente: recuperado de https://www.sciencedirect.com

ScienceDirect, Elsevier's leader for researchers, manages information for research, relating to areas of knowledge and conforming exploratory networks that allow to suggest research adapted to the needs of the project. At each scientific stage, they find terms and

concepts, which help to improve research by allowing the different areas of knowledge to connect and form a link, achieving an optimal environment of research from an intuitive learning, the goal Search generates key vital topics for understanding and suggesting critical contextual sources.

Application of Scientometrics from statistical modalities

An important aspect, according to Vîiu, G. A. (2018), for Scientometrics, is that statistical measures are applied that reflect the degree of acceptance of articles, papers, research in the world, etc. An example is given from the statistical distribution of normal log, which explains the notable pattern documented by the scores and the characteristic scales in scientometrics, the scores and scales characteristic CSS (cascading Style sheets), which means ' Cascading style sheets '.

It is a language used to describe the appearance and format of a Web site written in markup language (such as HTML), CSS is a well-established scientometrics tool for the study of citation counts-they have been used to document a phenomenon Surprising that characterizes distributions of citations at high levels of aggregation, regardless of the scientific field and citation window.

Empirical studies find a persistent pattern in the use of this measurement: according to the results presented by Vîiu, G. A. (2018), about 70% of the scientific articles or papers belong to the class of papers badly quoted; About 21% belong to the kind of papers quite quoted; 6% belong to the class of remarkably quoted papers and 3% to the kind of papers quoted outstandingly (also exceptionally called, extraordinarily quoted).

The application of the CSS method to the NORMAL LOG distributions provides a very good fit to 70-21-6-3% of the empirical pattern. Whenever these distributions are characterized by a standard deviation parameter, the CSS pattern is essentially explainable as an epiphenomenon of the NORMAL LOG functional form and, more generally, as a result of the inclination of science that is Manifests in the distributions of the heavy tail citation, which is determined by the level of acceptance and its relationship with the adaptability in the databases, allowing its location in INDEX H.

The parameters for improving applications and the dissemination of researchers from any country or region are presented in the application of applied Scientometrics models, identifying the specific area. The multidisciplinary of the knowledge to be recognized is important to recognize that the articles with the most efficiency in their publication are those that the Scientometrics calls original articles, especially when the level of citation in studies is increased Exponentially referrals, making an adequate impact.

According to Damar, H. T., Bilik, O., Ozdagoglu, G., Ozdagoglu, A., & Damar, M. (2018), the suffix ' metria ' (of the Greek Metrón), which is added to these roots means, both ' measure ' and ' metric. Therefore, SCIENTOMETRICS, related to the concepts of WEBOMETRICS, INFORMETRICS, ALTMETRICS, CIBERMETRICS, BIBLIOMETRICS.

Nevertheless, the scientometrics of the original articles has greater capacity of access to databases and communities interested, allowing a greater probability of acceptance in closed scientific communities. The use of the Bibliometrics or BIBLIOMETRICS that studies the scientific production published in the books through statistical methods, linking university databases, repositories that are in open JOURNAL SYSTEM OJS or in open Acces mode (or access Open) for online consultation.

Also the use of WEBOMETRICS, as the measurement of educational institutions, generate the ranking of the best universities in the world taking into account several factors based on the visibility and presence online, the number of documents, papers published and Serial online Publications, e-book books and citations from authors with institutional subsidiaries, with a broad leadership index also online, developments presented in databases that achieve the research production relationship that positions the University or Academic

center.

Figura No. 8. Plataforma de WEBOMETRICS Fuente: recuperado de http://www.webometrics.info/es

The INFORMETRIC or the Informetria, refers to rigorous studies of high quality research, on quantitative aspects of the information science, quantitative studies of the documentation, the statistical analyses of a field of investigation in Particular that summarizes the information related to the topics covered over a given period of time; The authors, citations and their demographic characteristics; Network relations between the authors, what is the positioning, level and use, determined in the query of information related to a common topic.

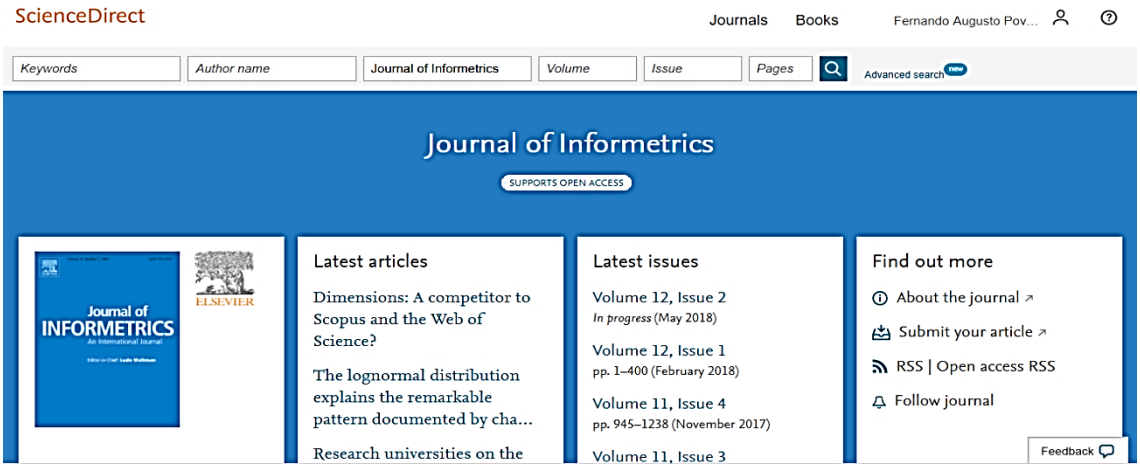

Figura No. 9. Plataforma de data análisis Fuente: recuperado de https://www.sciencedirect.com/journal/journal-of-informetrics

The Altmetrics, is the set of metrics used to measure the different impacts of research beyond the traditional metrics of online scientific production, tracks a number of sources to capture and collect information, monitor and report On research stakeholders, editors help to monitor, navigate, search, filter and measure all conversations surrounding published research, to institutions, provide detailed information on faculty attendance, Staff and students, for researchers relates who their research and provides the information of their peers.

Figura No. 10. Plataforma de análisis, Fuente: recuperado de https://www.altmetric.com

He application of the WEBOMETRICS method compared to data mining is considered an important strategy for organizations. If a direct dialogue is achieved in the management of quantitative information, resulting from the application of ALTMETRICS on the use of the Internet from the social approach, as reaffirmed by Vanti, N., & Sanz-Casado, E. (2016), which recognizes the ALTMETRICS as the search Social that allows the democratization of science, which relates the use of blogs, forums, social networks, generating positive trends for researchers cited by these channels of communication.

However, the Lorentzen study, D. G. (2014), on the role of WEBOMETRICS and web mining as direct fields of scientometrics, the two methodologies focus their analysis on the use of the Internet, measure the level of access and their contributions of presentation of the In Training, measures the direct traffic and organic traffic, as a result recognizes the possibilities of collaboration between subsidiaries identifying the fields of knowledge to

which they contribute the papers published in the journals of different scientific databases or professionals.

The WEBOMETRICS focuses on exploratory studies, while web mining has been dominated by studies focused on the development of methods and algorithms, from the use of a relevant descriptive statistic, or how to analyze contents from the Structure of the Web. The results reflect how the visibility of the institutional affiliations necessary for the development of institutional images in the world rankings and the positioning of the researchers attached to the measurements of the Scientific platforms (categories, Índex h).

The concept CIBERMETRICO or CYBERMETRICS, is defined as the study and analysis of all kinds of information and media that exist in cyberspace and employing techniques bibliometric, scientometric and Infométricas for the positioning of the Information.

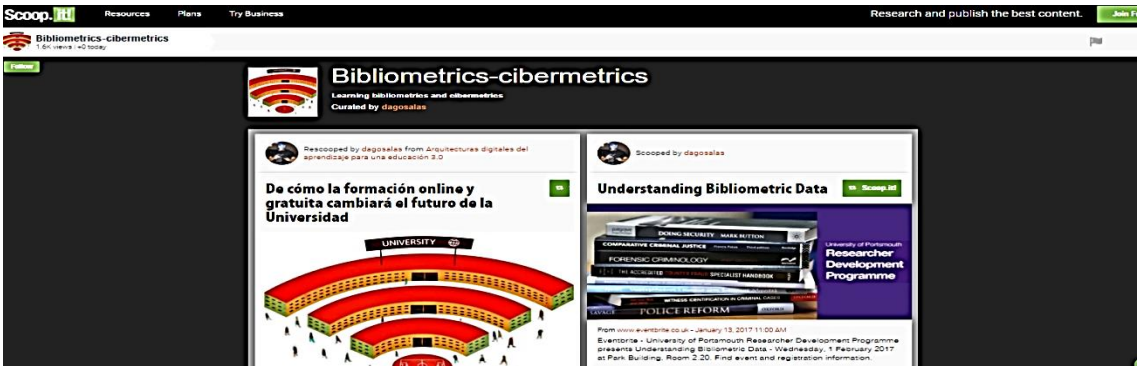

Figura No. 11. Data análisis, Fuente: recuperado de https://www.scoop.it/t/bibliometrics-cibermetrics

When BIBLIOMETRICS is applied, as the study of references in scientific, academic and professional databases, results close to the applied scientometrics are identified, like the WEBOMETRICS method, they establish a goal, That is articulated in time and space, an example of scientometrics is the academic study developed in a country like turkey through analysis of basic and advanced data, aspects applied in its publications, original articles on the WEB OF SCIENCE, the population Focused in the area of nursing, it allowed to establish

raw data, as these data include in the publications, the affiliations of the authors, their level of leadership.

For the compilation of data concrete tables are established to show the summary of the academic and demographic distributions of the publications.

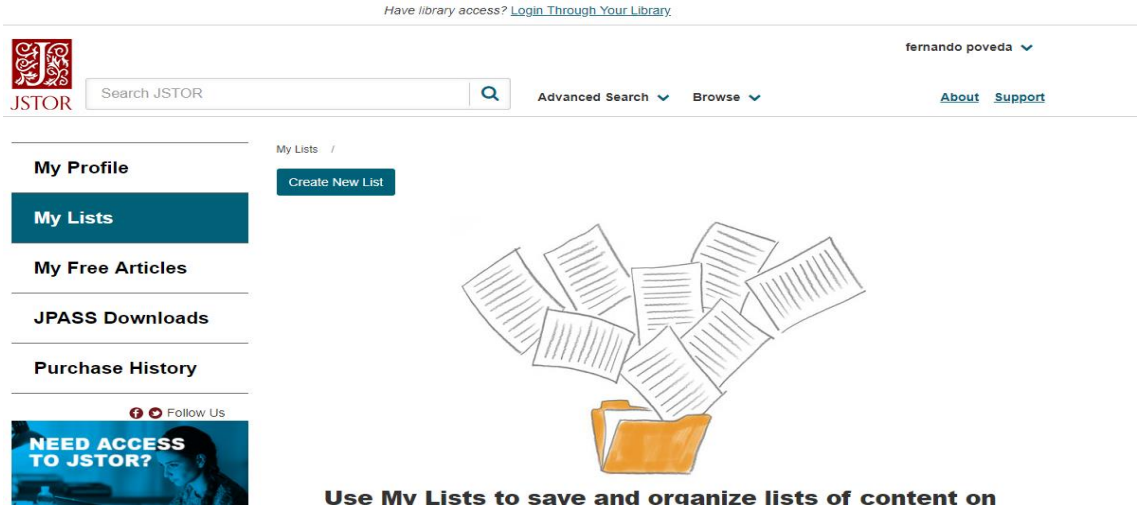

Figura No. 12. Plataforma de búsqueda avanzada Fuente: recuperado de https://www.jstor.org/

Do not forget the importance of the use of these strategies enunciated, according to Thijs, B., & Glänzel, W. (2018), talks about the role of scientometrics and how it contributes to development, becoming the standardization of a specific lexicon. In his four (4)-decade study, he achieves textual analysis and the use of lexical similarities, which prove to be an important asset in scientific cartography, mapping application sectors, where the results can consolidate financing strategies.

As previous research showed the added value of hybrid document networks on those based on links through the reduction of extreme dispersion, however, only after the application of natural language processing and Extracting phrases, networks based purely on lexical similarities could be used as inputs for the detection of topics in quantitative science studies.

This study shows the contribution of the scientific lexicon component as the hybrid cluster on a set of published articles. The displacement of the weight of the lexical

components generates changes in the structure of the underlying hybrid network, which can be detected by clustering techniques. The study showed that these changes are not moving documents at random, but in fact they identify small groups of roles, either at the frontier of knowledge between different subjects or combine them.

The analysis corroborates that the lexical component adopts the network structure rather than amplifying the hidden structures of the link-based network, allowing the interaction between peers and common subsidiaries.

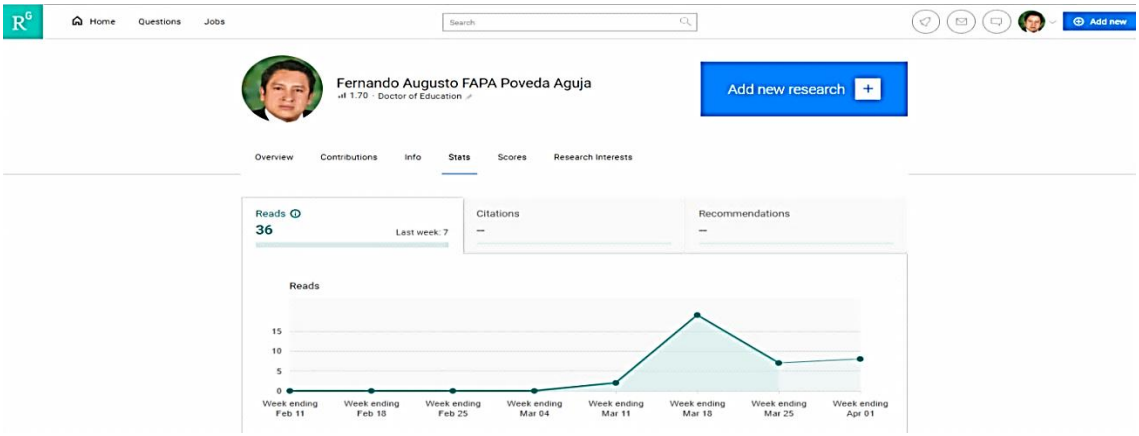

Figura No. 13. Gestor de investigación , fuente: recuperado de https://www.RESEARCHGATE.net

An example of the argument in the preceding paragraph is given in the use of RESEARCHGATE, becoming a simple use metric, which shows the frequency of access to the data, projects, related research, applied production, allows to show the metric of Access to reading and citation of work, its influence on other people on a platform that generates real-time results.

There are counters for each aspect recorded, the platform links questions about the project theme and generates discussion forums that adhere to the data recorded on the platform, which, in turn, relates the progress, identifies what is the country that Query, calculates the readings for each publication.

The concept of "reading" relates it every time someone sees the publication summary (such as the title, the summary and the list of authors), relates to clicking a publication-linked figure (either directly on the publication page or through the Alime Ntación, or views or downloads of the full text, if one or more is attached to the information metric reported.

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RESEARCHGATE, is an example of application of scientometric where the statistics of the author is reduced to the index of query, because it eliminates the traffic of artificial sources of the statistics. This means that the visits of automated programs like crawlers and bots, that load remotely pages and download content to retrieve information, are not counted, the readings are not counted when the author or one of his co-authors accesses one of Your own publications, when you consult your own question, answer or update of the project, or the author or a collaborator looks at one of his own projects.

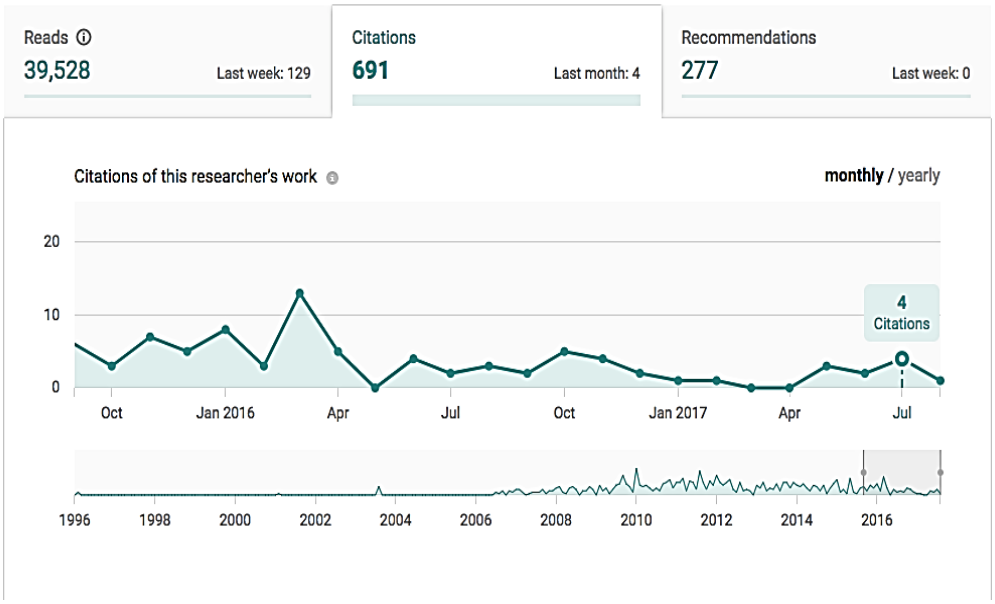


Figura No. 14. Estadísticas y métricas gestor de investigación, fuente: https://www.RESEARCHGATE.net

How to strengthen the H-index or the quotations of the scientific author?

An author is always confronted with concepts that are of scientific dominion, but which, for researchers in training, are difficult to understand. The question is always generated: What dating information can I find in my profile as a scientific researcher? how are they consulted? how can I make scientific research visible from my findings?

In the platforms that were previously shown, these consultations are specific metric, but the citation argues for the correct incorporation of the publications of authors in investigations, books, articles, states of the art, states of the question, etc., There in the databases the development of knowledge is related by area, subsidiary, region allowing that each time the work goes out in a first search in meta-search engines like GOOGLE SCHOLAR.

Then, there are citations in journal databases indexed as scientific, specialized or professional, but these concepts can be applied in networks of researchers, some of them like that of RESEARCHGATE, which relates the quoted articles, and by Who have been quoted, as well as arguments and repercussions for the writing. See the citation in context in the

publication where cited, this information can be found on the Statistics tab, under Subpoenas, or on your contributions form, under subpoenas. In the case of SCHOLAR, this reference how many jobs are quoted, in which publication, year and reference where it is related.

These aspects are fundamental to understand them, a common question how do you extract quotations from documents? for the databases or journal that are categorized by their rigorousness, called scientists, their structuring is a condition of publication End.

In this phase of review and publishing, it is possible to consolidate texts in PDF formats, which easily make traces of the references in the document, it can be generated that, if the texts are not achieved visualize the whole of the publication (especially in networks and bases of management of So you generate questions like why don't you show some of my quotes? do all databases on the web increase my H index?

While in fact, citations using standard citation styles are usually extracted accurately in SCHOLAR, platforms such as RESEARCHGATE, presents some cases where they cannot be removed, for example, for full-text PDF files Created from hard copies scanned.

When the writing is an image, which becomes PDF as a format, it is not particularly standard, and therefore the creation of algorithms to extract this information is an ongoing process, with different levels of success. Therefore, the investigator should take into account that citations that do not have complete metadata (publication date, Journal, summary) cannot be included in their citation counts, as this is important information when it comes to matching appointments with the publications correctly.

There are two possible reasons why your citation counts or H index decreased. It is possible that you have been quoted by a publication that was duplicated in the same system, then merge the duplicates that resulted in the loss of a citation, alternatively, an author of a publication that quoted the author may have removed his publication of the databases entirely, discharged because it was submitted or deleted at the request of the publisher, or by a letter to the editor requesting its non-application.

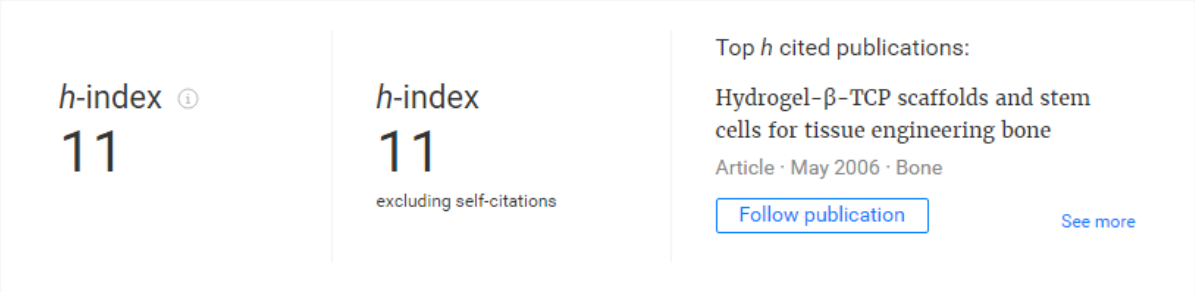


Figura No. 15. Métricas, índice H - gestor de investigación, fuente: recuperado de https://www.RESEARCHGATE.net

The H index is an easy way to measure the impact of research and results that are published in scientific sources, as well as research and interaction with the social networks of researchers, OPEN ACCESS media, with Categories that contribute to the location in areas.

This measurement is made by observing the number of highly shocking publications published by an investigator, the greater the number of publications cited, the higher the H index, regardless of the journal in which the work is posted. It can occur in different media, but is conceived when this index is detected by meta-seekers in indexes of consultation and reference, the scientometrics of this relationship h is 4-12 (index h for every 12 citations in less than 4 years).

How is the H index calculated on research bases or networks? The answer is simple, the H-index is calculated based on two bits of information: The total number of published documents (NP) and the number of citations (NC) for each document. This formula is applied to the relationship with the space in years, derived from the scientometrics of the publications (references). Then, the H index is defined by how many h of the publications of a researcher (NP) have at least in n citations h each, this means, that, if the author has a publication with at least one citation, its H-index is 1; If you have two publications with at least two citations each, your H-index would be 2; And so on.

If you want to increase the query index, the index by databases, you can have an H index in broad RESEARCHGATE, but it is not necessarily the same of the SCHOLAR, because it depends on the databases associated with this relationship of knowledge. If it is in robust databases such as SCOPUS, ELSEVIER, Thomson Reuters, MENDELEY, the H

index does not depend on non-scientific databases, so different metrics can be given depending on the measurement model.

Some H index statistics for GOOGLE scholar or DATA analytics, and for search engines like scholar, show that there are documents called Classic papers, which are very cited papers in their area of research, and that have withstood the test of time.

They are evident in the meta-seeker for the ten most quoted articles that were published ten years earlier. This version of the classic works consists of articles that were published in 2006 and is based on our index as it was in May 2017, periods of measurement of the data bases. These large areas help to define a positioning of these documents, if compared with management platforms like RESEARCHGATE, you will see two separate H-indexes that are shown for each author.

The first metric is an H index that includes self-appointments, the second H-index shown, excludes self-appointments so that anyone who looks at the numbers can be compared and determined quickly, if other authors are paying attention to the work of a Researcher. This tendency helps to choose the results of the paper, and achieves the attention of the same to contemplate as an opportunity of follow-up, the H-index takes into account only the quotations of its work of the scientific literature, reflecting the impact in the community Scientific. In addition, it is calculated based on the publications of the author's profile.

So the question that is asked the researcher in training is how can I improve my index h? it is not solved directly, if it is clear the concept, depends on the databases and their measurement. Google Scholar's case is given according to Google Scholar's statistics and its available metrics.

The H-Index of a publication is the largest h number, which at least H articles in that publication were quoted, in at least H times each. For example, a publication with five articles quoted by, respectively, 17, 9, 6, 3 and 2, has the index H of 3, since its measurement is given

by the relation of references used and prioritization. The H-core of a publication, is a set of articles quoted h of the publication, these are the articles on which the H-index is based.

For example, the previous publication has the H-core with three articles, those quoted by 17, 9 and 6, the H-midpoint of a publication, is the median of the citation accounts in its H-core. For example, the median h in the previous publication is 9. The H-median is a measure of the distribution of citations to the articles in the H-core.

Finally, the H5, H5-Core and H5-median index of a publication are, respectively, the H-index, H-core and H-median of only those of its articles that were published in the last five full calendar years (the 5 represents the measure in time).

If we respond from RESEARCHGATE, the H5 index and the median h5 for each publication included, it exhibits an entire H5 kernel of its articles, along with its citation counts, so you can see which items contribute to the H5 index.

According to the information of who I quote, on this platform you can make sure that you have the highest possible H-index for your enquiry, verifying that you add all your work in RESEARCHGATE. It is very important to make sure that all the publications that have been quoted are in the author's profile, to help improve their H index, however, to add another work that has not yet been quoted or that has only been quoted infrequently, is a great way to create the exhibition that leads to more citations.

All the arguments raised revolve around recognizing how we make adequate visibility. According to Guan, J., & Pang, L. (2018), there is a bidirectional relationship between the position of the network and the creation of knowledge in Scientometrics, based on the 3100 documents published in the International journal Scientometrics, data obtained from the database of Web of Science, during the period 1996 – 2015.

This study refers to how the three-stage minimum squares (3SLS) method was used. To investigate the bi-directional relationship between the authors ' network, position and

knowledge creation, allowing an understanding of how to increase their citation index. It allowed the best understanding of the interaction of knowledge networks and collaboration in the creation of knowledge.

The empirical results confirm that, the prolific co-authorship and the Coauthorship International, have positive and very significant effects in the creation of the knowledge, this leads us to the conclusion that the relational databases incorporate tendencies and Key aspects to generate conclusions in the research.

Figura No. 16. Google SCHOLAR, meta base de datos, fuente: recuperado de https://scholar.google.es/

The results of the 3SLS estimation models use the number of publications and citations as dependent variables. This study also shows that the structural holes of an author in the collaborative networks and their knowledge elements in the knowledge networks have a positive effect on their knowledge creation.

These findings suggest that the structural capital of an author and his knowledge elements are important factors influencing the quantity and quality of the research production. The results of the scientometrics models in this paper suggest that authors with better performance in the creation of knowledge are more likely to attract collaborators and occupy structural holes, using knowledge managers such as RESEARCHGATE.

In summary, we complete the research gap in exploring the bi-directional relationship between the positions of the authors ' network (in terms of grade centrality and structural holes) and research production.

DATA analytics platforms and challenges for science and technology

To discuss the data analysis from the scientometrics available to researchers around the world, a segmentation can be done for intentionality. In the case of innovation and development, there are platforms such as Clarivate Analytics, which can serve as a bridge for the positioning of brands and signs, which allow the recognition of universities and corporations.

The role that innovation fulfils in relation to competitiveness is rescued, as these platforms provide innovators, ideas in which they can rely from the innovation cycle (idea, packaging, prototyping), improve solutions Existing, and develop new ones. It is articulated with the bases Web of Science, Cotellis, Derwent, CompuMark, MarkMonitor and Techstreet, among others relevant for its development.

Clarivate Analytics, consolidates a high-level innovation network, providing the impetus to bring new ideas to life. Examples of advances are given in proposals such as the development of new sources of energy, or even a cure for cancer. The use of the global reach is supported by the best technology in its class, allowing to generate sustainable businesses.

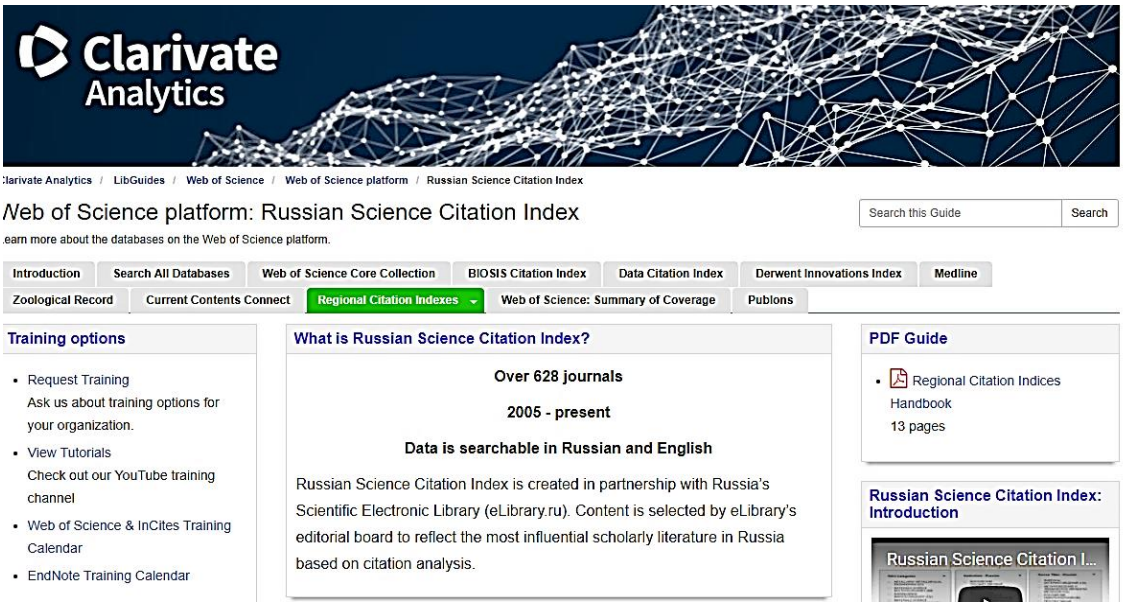


Figura No. 17. Clarivate Analytics, fuente: recuperado de https://elibrary.ru/project_rsci.asp

So, how does scientometrics apply to innovation platforms? What is the real purpose? Its application manages to consolidate a confidence on the perceptions of the market, this is achieved with the analysis of metadata, that not only connect platforms of Altmetrics, Bibliometrics, but also relating the social networks.

From the connection of the points and key aspects, through the most reliable and analytically based content, is by Clarivate, a platform of reliable use to foster the final phases of innovation, science and Development, which focuses and prioritizes, responding to the needs of researchers such as: where to invest and how to focus resources, how can we make sense of large data and improve research decision making?

Clarivate Analytics, manages to connect with communities of experts and networks to maximize the returns of their investments in innovation, establishing the best strategy to obtain the registration or licensing of their developments, identifying the market where Apply this development. The application of the scientometrics allows the investigator to establish what are the most important alliances for its implementation, determining the benefits and types of contracts to be presented according to the World regulations.

Clarivate Analytics, allows the association from the Transformation of developing economies, supporting countries and their governments. Example of this contribution is being traced in Australia, Algeria, China, throughout the European Union, Kazakhstan, Russia, Saudi Arabia and elsewhere, ensuring the construction of a framework of innovation in Latin America.

However, Sassmannshausen, S. P., & Volkmann, C. (2018), in his studies on the application of scientometrics, relates that the contribution of this information is not only given in the generation of new knowledge, but is applied with its results in solutions Appropriate for the communities that need it.

The scientometrics of social entrepreneurship and its establishment as an academic field, relates the transition from basic research to applied research, and as transit could occur in experimental research, this work provides an overview of the State of the art of research on social entrepreneurship and the establishment of this topic in the academic world.

The development of science and the use of information uses scientometric methods to measure the maturity of research in social entrepreneurship. The data reveal the growing number of papers, as well as the institutionalization of the social entrepreneurship in seven dimensions, the emergence of thematic clusters and forums on methodologies, and the registration and marketing of innovation.

The study makes concrete suggestions on how to overcome the methodological challenges, and also offers a ranking of the 22 most cited academic contributions in social entrepreneurship. Surprisingly, almost half of the most cited works have not been published in magazines, but in books, raising doubts about the current (over-) qualification of journal publications in indexed databases, taking part in the journal with approaches Business (see Figure 18), on the application of sectoral business platforms.

Figura No. 18. Plataforma de data Analytics para fomentar la innovación, fuente: recuperado de https://medlineplus.gov/spanish/

Zhao, S. x, Lou, W., Tan, A. M., & Yu, S. (2018), in the study on funded papers that attract more use, relate what is the great role of research that has direct links with the business, industrial, and organizational sectors. Research funding has been seen as one of the most important resources in the science rewards system, its contributions are well accepted in non-scientific communities.

The use of the publications denotes an interesting perspective of the behavior of the user in the scientific communication, since they are related as increments of the H indices and foments the co-citations, but their exploitation in the field work is of little Acceptance.

When analyzing this aspect (related in the study), we find the purpose of addressing the relationship between the financing and the counting of use, which is a new metric element established in the platform of the web of Science or web of science. The full records of 300,010 articles published in 2013 were downloaded in October 2015, and were divided into six disciplines, including, BIBLIOMETRICS, ALTMETRICS, SCIENCIOMETRICS, CYBERMETRICS in aspects such as information sciences, research Educational in education, economics, informatics, materials science and chemistry. The results of your application allow you to define the key indicators as indicators to measure the impact, including the financing rate, the citation for paper, the usage rate, the use by paper, the

citation difference, the use difference and the rate of Conversion. It was concluded that funding has an impact on use and citation, and funded documents attract more use, but vary in different disciplines.

For the application of the scientometrics, it is recognized that the account of the use can be used in the extension of the metrics of the citation (but with limits), allowing the delivery of accurate information for the investigators and the relation with their papers, dedicating to the Usage metrics and detecting that there is a positive correlation between use and financing.

The scientometrics of the research allows the structural recognition of the interaction of technological platforms in the implementation of science, technology and innovation, where the visibility of researchers is potentially increased Scientists in Latin America and the Caribbean.

The phenomenological interaction of this coupled purpose articulates global databases: SCOPUS, ISI, REDALYC, SCIELO, EBSCO, ProQuest, DIRECTCIENCE and information management platforms such as SCIMAGO; Where primary, secondary and tertiary science articles are codified, with relevant relationships in the relationship of researchers around the orb.

The Problémico axis is reflected by the little interaction of the researchers with the National Platform of Science ready for its visibility, it is recognized as the collateral effects of its recognition. All this, leads to an application development in regions, where the georeferencing of key concepts, integrates the applied scientometrics and obliges to present documents that give reference in their implementation.

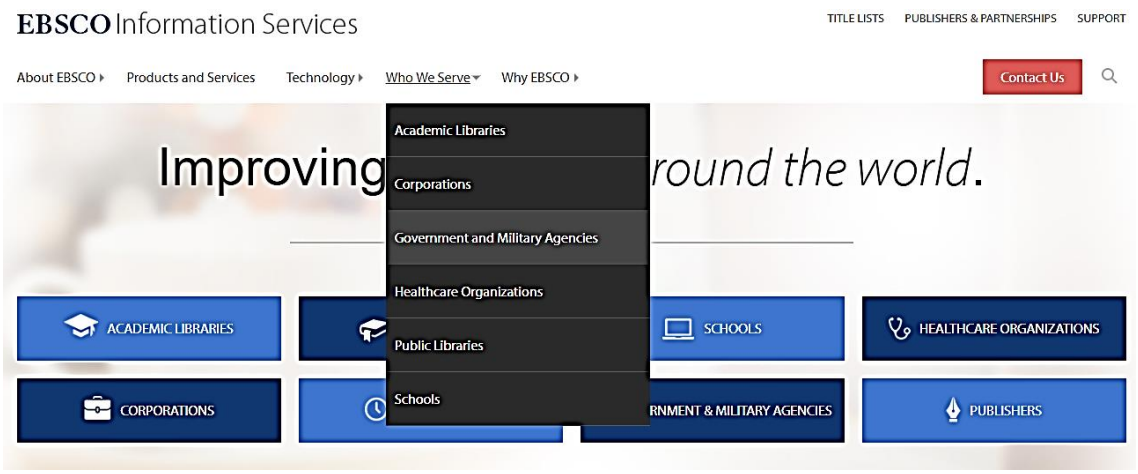


Figura No. 19.Plataformas de cienciometría con aplicación en diferentes sectores ,fuente: recuperado de https://www.ebsco.com/

Según Li, K., Rollins, J., & Yan, E. el uso de la **Web de la ciencia** en los documentos de investigación y revisión publicados 1997 – 2017, entregaron resultados desde un análisis selectivo, dinámico, entre dominios y basado en el contenido de *web of Science* de **Clarivate Analytics** (OT), su aplicación y diálogo de la plataforma científica líder en el mundo para la búsqueda de citas y la información analítica. Se utiliza como una herramienta de investigación que apoya una amplia gama de tareas científicas a través de diversos dominios

of knowledge, as well as a set of data for large-scale studies of intensive information.

As Clarivate Analytics (OT) applies to scientometrics, its implementation is used in thousands of academic studies published in the last 20 years. Eugene Garfield's most lasting commercial legacy, the quantitative impact of the (OT) has not been previously examined by rigorous scientific studies. Its application is given in the ways in which the (OT) articulates the papers, which are the associated products and their characteristics.

An example of its use is mentioned in an investigation that takes a sample of 19,478 investigations in English and Articles of Review, published between 1997 and 2017, indexed in the data bases of (OT). We work from the descriptive analysis of the distribution of documents through countries, institutions and knowledge domains, using natural language processing techniques to identify the verbs and nouns in the summaries of these papers That are grammatically connected to phrases related to the (OT).

Figura No. 20. Plataforma de uso cienciométricos, fuente: recuperado de https://search.proquest.com

However, the application is not only given from the data recurrence. An investigation of Nylander, E., Österlund, L., & Kirk, A. (2018), explores the field of adult learning research, analyzing who cites who (IS), applying BILIOMETRICS, based on citation practices within the field of Adult Learning Research.

151,261 citations were taken among more than 33,000 different authors, whose works were published in five leading international journals in the field of adult learning during the period of time 2006 – 2014. Analyzing the composition of the dominant citation groups, we can build a telescopic view of the field of research based on an accumulation of bibliographic citations.

The results consist of two parts: 1) The dominant authors active in the field, from the so-called indicator of leadership in citations, remembering that the level depends on their position; and 2) mutual relationship, from which are derived two main structural oppositions inherent to the networks of appointments, one connected to the object of investigation (studying education or work) and the second to the level of analysis (cognition or politics).

Schneider, J. W. (2018), asserts that it is logically flawed in this elaborated response to Wu (in Scientometrics, 2018), and argues that the null hypothesis test (NHST) is logically

flawed. Wu (2018), disagrees with this claim filed at Schneider (in Scientometrics 102 (1): 411 – 432, 2015).

In this response, the claim was examined in more depth and showed that since NHST is based on a single conditional probability and is framed in a probabilistic framework of reasoning, it is by definition logically invalid. It was also argued that dismissing this logic fallacy, as most researchers do, and treating the value of p as a heuristic value for dichotomous decisions against null hypothesis, is a risky business that often leads to claims False positives.

According to Sotudeh, H., & Estakhr, Z. (2018), sustainability of open access Citation Advantage: The case of Elsevier Author-Pays hybrid journals, in the present study, was tended to investigate the sustainability of the citation, an advantage of the Author-Pays hybrid open access magazines. Through the application of a method of analysis of quotations, a sample consisting of 160,168 articles was explored in 47 hybrid open access magazines, financed by APC, published in the Periods 2007 – 2011 and 2012 – 2015.

In the study were selected two windows of Citation: 1) One covering from the years of publication of the journals up to 2013 (obtained from Sotudeh et al. en scientometrics 104 (2): 581 – 608, 2015); and 2) another covering from the years of publication of the magazines up to 2016 (Data date of collection in the present study).

The comparative analysis of the citation of the older articles (published in 2007 – 2011) on the two quotations mentioned, Windows stated that they held their citation advantage as opposed to toll-access ones. The benefit of the citation was also confirmed for the most recent articles of OA financed by APC (published in 2012 – 2015).

Therefore, the passage of time did not seem to affect the citation gap between the OA and toll-free items financed by APC, and the advantage of the citation of APC-funded OA articles was apparently a sustainable phenomenon. In addition, the number of articles of OA

financed by APC increased compared to that of the toll-blocked articles. Also, APC-funded OA articles showed citation advantages in almost all fields.

Data Analytics: Ways to manage knowledge

Elsevier's platform allows to recognize the value of information recognizing its contribution, from the results of the analysis of the information, allowing as in the higher level educational institutions it is necessary to improve the thematic search by Communities of interest.

There are relationships that promote products by areas such as health, open science and promote the empowerment of results according to the use in the information science market. Its use in applied scientometrics identifies groups of highly experienced authors that consolidate results by data conglomerates.

According to Beauregard, M., Trent, N. L., & Schwartz, G. E. (2018), Towards a post-materialistic psychology: Theory, research and applications where it is related as the development of the platforms requires a new look of work making part of the science its use and Migration.

Figura No. 21. Elsevier gestor de publicaciones, fuente: recuperado de https://www.elsevier.es/corp/publica-con-elsevier/

Authors such as Rhaiem, M., & Bornmann, L. (2018), relate their work in the use of the reference spectroscopy (RPYS), with publications in the area of academic efficiency studies: What are the historical roots of this research topic? In this study, we explored the historical roots of the relatively new topic in scientometrics of academic efficiency assessments.

Not everything is in reality or in the subjective gaze, there are also processes of intervention that merit the proper use of the contributions of the scientists, which is the technique of the year of publication of reference spectroscopy (RPYS), is an argument that It allows you to enter the analysis of the frequency with which references are quoted in the publications of a specific research field. This recurrence in specialized areas of science, converts aspects such as efficiency and effectiveness of the paper in an aspect of competitiveness.

The study is based on the work done for a systematic review of empirical articles on technical efficiency in the production of academic research: 60 papers (published between 1992 and 2012) and 1314 citations, the results indicated that 5 peaks They are clearly identifiable until the year 2000, which correspond, respectively, to the years 1957 (the founding article of Farrell), 1978 (Proposition of a new promising approach the analysis of data envelope (DEA) by Chares et al.), 1988 (model Research-Multi-exit teaching and quality integration indicators), 1990 (DEA at the service of the research Evaluation Exercise) and 1997 (Introduction of weight restrictions in the DEA).

However, there are other models that support this importance in the use of data. The work of Bornmann, L., & Leydesdorff, L. (2018), which counts the highly quoted paper instead of the paper with H citations, applying the standardized citation count and "As with like " which are presented on social networks, this aspect relates the Direct traffic and organic traffic. These practical problems in the use of the H index in order to evaluate the investigation establish different measurement criteria of the field of study, for example, discuss the differences of the H-index between the bibliometric databases.

The purpose is not to refrain from using the H-index, it is to propose and to verify aspects of the measurement that are outside of the indicators of science, but they encourage the scenarios of search of relational knowledge, instead, you can use indicators Standardized.

The H-index or Hirsch, named after Jorge E. Hirsch, is one of the few currently available author-based metrics, which offers a perspective on the productivity and impact of the citation of a scientist, researcher, or scholar. There are four more commonly used tools for calculating the H index, which depend on separate databases: Scopus, Web of Knowledge, Google Scholar and RESEARCHGATE.

Using the H index of the authors applied to the Cienciométricas sources concerned, it is very clear to note that the scores vary widely, and that it is not clear which of these sources is a reliable or accurate source of information.

For any purpose, as the use and application of author-based metrics increases, even for official academic purposes, it is increasingly important to know which source of the H-index is most accurate. Although this is not a review of the H-index, some perspectives are provided from the H-index-related literature to place this case study within a broader context of the weaknesses and criticisms of using the H-index as a metric to evaluate the Scientific result.

Models such as ABM Author-based metric, GS, Google Scholar, H-Index, Hirsch Index, MS Scientist, researcher, or academic, WoS, Web of science that are presented as metrics for science.

Figura No. 22. Fuentes de métricas de ciencia, fuente: recuperado de http://ec3.ugr.es/layout.php?id=inicio

However, Da Silva, J. A. T., & Dobránszki, J. (2018), raises a response to the "Multiple versions of H-index: Preventive use for formal academic purposes ", the authors highlight the practical risks of using H-index, how academic data and Bibliometrics information may be misrepresented, making the letters to the editor a resource of objectionable value.

For example, commentaries offered in letters from Judit Bar-Ilan, Rodrigo Costas and Thomas Franssen, as well as Lutz Bornmann and Loet Leydesdorff, to offer an additional vision and critique, this form of open debate on a subject that can potentially affect Many academics are an excellent initiative of scientometrics, and it extends the possibilities of maintaining discussion forums, based on magazines instead of magazine clubs or informal blogs.

We continue to believe that H-index has a certain value offering, a crude measure of productivity, but not when used alone. How the accuracy of the different H-indexes is calculated and how H-index productivity is associated with academic quality are issues that deserve further research. Finally, we confirm that the search function of the database of the

science Web for the compound names confusing the counting of this.

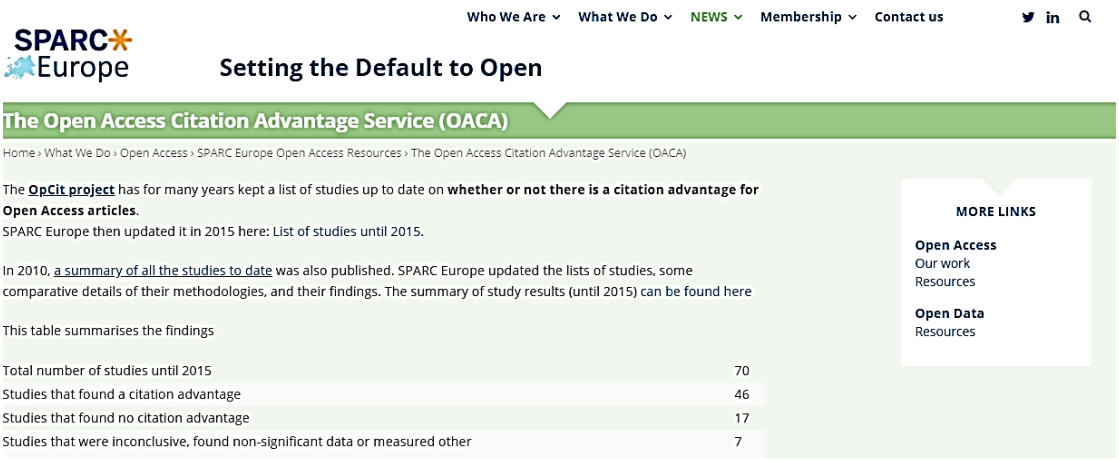


Figura No. 23. Índice H aplicado a la cienciometría. fuente: https://sparceurope.org/what-we-do/open-access/sparc-europe-open-access-resources/open-access-citation-advantage-service-oaca/

For Lin, A. J., Hsu, C. L., & Chiang, C. H. (2016), in his bibliometric study of electronic commerce Research in information systems and journals, he intended to investigate the contribution of information systems and articles in the E-commerce literature. As the search began with the review of the works published in the ten most important magazines in the world in this area, this study bibliometric examines the existing literature on information systems and international business, examined a Sample 853 articles published in ten leading business/management journals during the period 1991 to 2014.

The results provide a global perspective of the field, identifying the works that have had the greatest impact, the intellectual interconnections between the authors and the published works, and the main traditions or research topics that have been Explored in information systems, generating structural and longitudinal analyses that reveal changes in the intellectual structure of the field over time. This document concludes with a discussion of the accumulated knowledge and suggestions for future research pathways.

The scientific research in the university contexts becomes the strategic axis in which, the world classifications establish their models of measurement in science, technology and innovation. Research is an inherent process in the role of universities in addressing the difficulties they serve, in Latin America, has become a missionary function, along with the academy and the so-called social projection or university extension.

According to the contribution of Márquez, Rubiano (2011), there are mechanisms that allow the interaction between the university, the company and the state, where the challenges revolve around the visibility and participation of the development focused as contribution of the institutions in the A country's wealth generation. In the case of Colombia, its poverty rates are high, while its science indexes are low, establishing a manifest need for relevant investigative academic proposals.

Martín-Martín, A., Orduna-Malea, E., & López-Cózar, E. D. (2018), did a study on a novel method to represent the academic disciplines through the quotes of Google Scholar, the case of Applied Bibliometrics, describes a procedure for To generate a structure of a scientific community, specific and its results based on the information available in: Google Scholar citations (SGC), method of multifaceted analysis of disciplines through academic profiles (MADAP), the community International researchers working in Bibliometrics, Scientometrics, Informetria, Webometrics and Altmetrics, was selected as a case study.

The records of the 1000 documents most cited by these authors, according to the SGC, were processed manually to fill any missing information and duplicate fields such as journal titles and book editors. The results suggest that it is feasible to use the SGC and the MADAP method to produce accurate representation of the community of researchers working in bibliometrics (both specialists and occasional investigators) and their publication habits (Major publishing sites such as magazines and book editors).

In addition, the extensive coverage of Google Scholar documents (especially books and book chapters) allows a more thorough analysis of the documents published in a specific discipline that were previously possible with other citation indices. Finally, shedding light on what until now had been a blind spot in most dating analyses.

Ratifying this argument, Prost, H., & Schöpfel, J. (2018), in its study on the data of: "Grey communities: an empirical study on bases and repositories ", this study explores the grey communities outside the service of the Grey Literature Network (GREYNET) and

Identifies potential members of GreyNet compared as a society specializing in grey literature as a particular field of library and Information Sciences (LIS).

Its relevance is related to its ability to enforce the terminology and definition of grey literature in research and publications, and its impact and scope, can be assessed through the proportion of experts dealing with grey literature and They are related to GreyNet, from five databases (Web of Science, Scopus, List, Pascal and Francis), and of open repositories.

We selected 2,440 papers on Grey Literature, published between 2000 and 2012 by 5,490 authors, for the whole sample describes the characteristics of publication, the preferred journals and the number of publications per author, for a sub-sample of 433 Authors strongly committed to grey literature, we present data on geographical origins, workplace, scientific domain and profession.

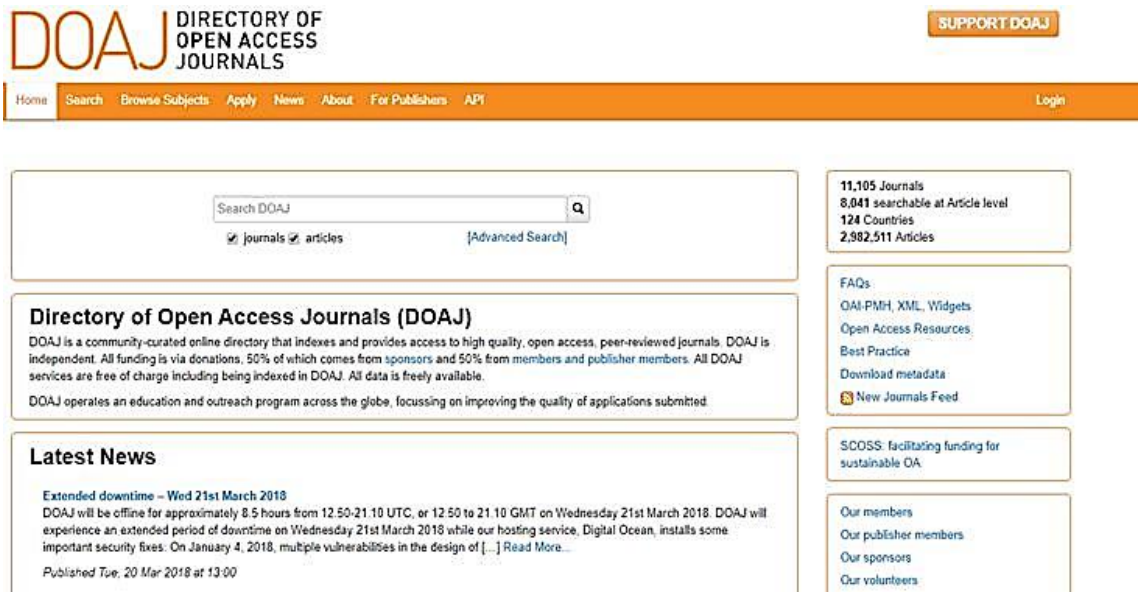


Figura No. 24. Directory of open Access journals, Fuente: recuperado de https://doaj.org/

For Konur, O. (2017), the Cienciométrica evaluation of global research is the backbone of science, its update on the pioneering study of WoS, assessed global research in the spine using scientometrics methods based on a sample of 13,115 published works in 5 journals of the Science spine from 2004 to 2013.

This research is based on the pioneering study and provides up-to-date and comprehensive information on the review method of ' articles ' and ' reviews ', published in ' English ' in the journals indexed by the ' Web of Science '.

We analyzed information on the types of documents and number of documents, authors, countries, funding entities, institutions, years of publication, journals, categories of topics of the "Web of Science " and ten classics of the first citation. Results: A large sample of 166,962 paper was recovered, the “exams " and “procedural documents " formed 5.8 and 2.8% of the sample, respectively, ' FEHLINGS ', ' Vaccaro ', ' Takahashi ', ' Lenke ', and ' Gokaslan ', were the most prolific authors, generating markups to consolidate the cloud brand since the recurrence of terms.

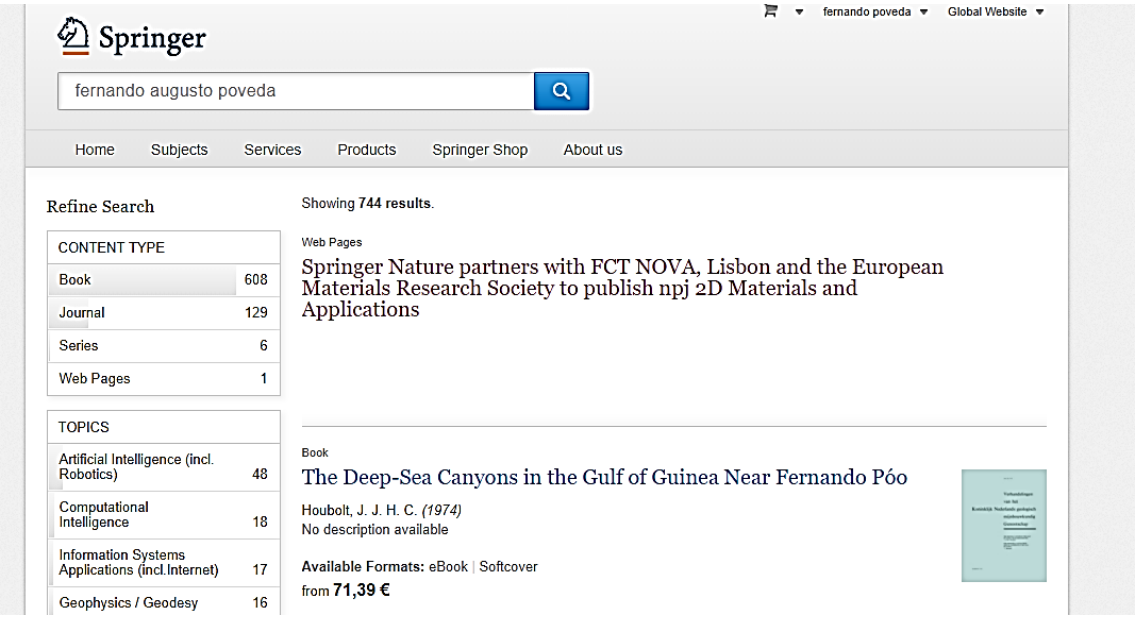


Figura No. 25. Springer gestor de publicaciones, fuente: recuperado de http://www.springer.com/

Impact and Cienciometric indicators

According to the above description, the following parameters to relate allow the scientific researcher in training to understand the key aspects to be established in their associativity dynamics, but with an approach to visibility International, for Elsevier, by Thomson Reuters, there are aspects such as collaboration, where the institution of higher

education, institutions, research centers relate aspects of global collaboration, from the articulation of publications, Citations, individual authors who manage to evaluate scientific participation by geographical areas, evaluating the characterization and start-up of researchers and their recognition.

Indicators to take into account for scientific and technological exercise; The technological impact component recognizes the innovative knowledge that corresponds to the technological development, patents, registries, software's for the case of the research component, it evaluates the excellence with the leadership of each author, institution in The scientific advance credits of each discovery, the standardized impact, on scientific production in recent years, the team or pool of scientific talent visible in the world, is an indicator that positions each scientific unit, the leadership in the Published articles, speaking about the position of each author, international collaboration in projects, editions and specific co-editions, the development of the related areas in the first quartile, the excellence in the developments, for the component of the society is It verifies the organic traffic and the direct traffic present in the means of scientific divulgation, verifying the pages of visibility and its role in the social appropriation of the science, the Web links that enter to consult the results.

Logic of scientometrics in journals by Scopus Quartiles (Q)

To start doing the analyses Scientometrics have specific fields for the search of each topic, relating as from the journal ranking (journal ranking), country ranking (ranking by country), scientometrics tools that are appropriate for the Decision-making, these aspects relate how the revisions that researchers establish in the management of science should be adjusted.

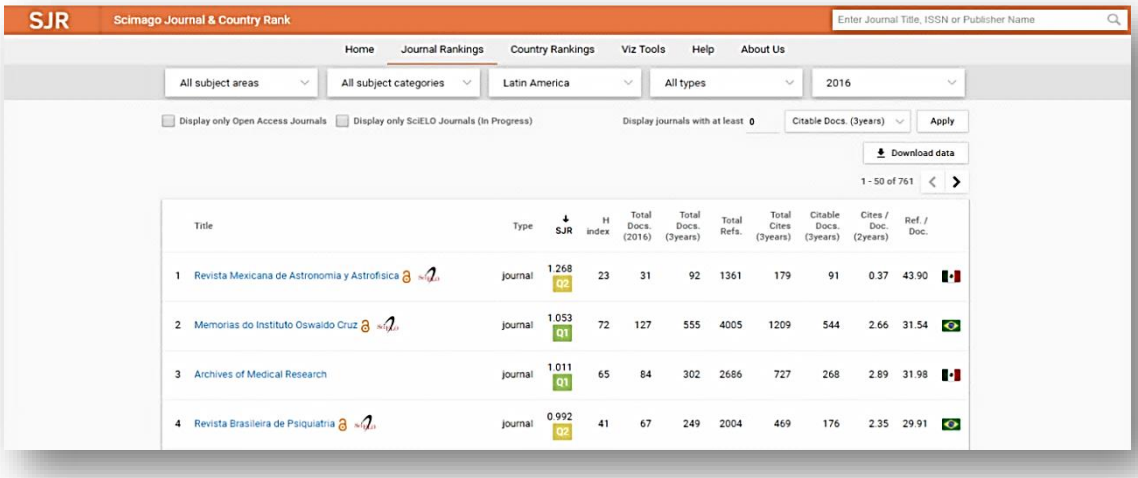


Figura No. 26. Análisis Journal SCIMAGO, fuente: recuperado de http://www.scimagojr.com

Whenever it is possible to take a look from the scientometrics to the scientific indexed journals in the world it should go to databases that refer aspects of affinity and discernment, the use of Scimago Journal & Country Rank, allows to evaluate the status of the journals Scientific and as a year are codified according to their rigor, when working with the ranking identifies the name of the same, the database and access to their information, country (country) where it is located, thematic area and category in which the production is registered CI Entífica of the journal (subject area and category), it is important to emphasize that these areas define the quartile in which the magazine is because it is the relation by category created, the value of the publisher (publisher) that can be given by a university, center of Research, company, institution.

The type publication that is already in place, articles, books, conferences, seminars, the ISSN or international standard Serial number, a standardized international issue of serious publications that is the number that identifies the publication In the Bibliometric universe, coverage that starts with the publication start date if it has an end date that gives it antiquity if it has a number followed by ongoing (in progress), it establishes its active validity for the analysis and indexing is not the Date of foundation if not the categorization date.

A component such as scope which is a brief description that relates the data of the journal Date of Foundation, relates the publication preferences, as their requirements and

indications for the authors, there is the source (source) of the Journal, is the direct link to the magazine, the index H which is a number that is represented on the right side of the measurement, corresponds to the development of the citations in Scopus, according to the triangulation of the relation of citations in Scopus journals (1:3). Figure No. 27.

*Figura No. 27.*Análisis Journal SCIMAGO. Fuente: recuperado de http://www.scimagojr.com

Quartiles according to SCOPUS classification

The set of magazines has been classified according to its JRS and divided into four equal groups, four quartiles. Q1 (green) comprises the fourth of the magazines with the highest values, Q2 (yellow) the second highest values, Q3 (orange) the third highest values and Q4 (red) The lowest values, this explanation has cost the work to publishers who use their Expertise in defining the profile of the journal, which each year make it clear which is the quartile that identifies the area to which the scientific articles are bet, as dialogues between categories, for example figure No. 28. Provides categorization for each category, depending on the color we can establish what is the quartile per year, in the 2016 is interpreted by the yellow color that is counted in Q2 quartile, in the 2010, 2011, 2012, 2013 presents the color orange for Q3 quartile , in both categories, but we can count that in the 2006 the magazine obtains Q3 in the category astronomy and astrophysics and Q2 in the category space and planetary science, that can be given in the magazine, so that in that year were more important the articles of the second CA Tegoia, this duality is presented in the acceptance of scientific journals.

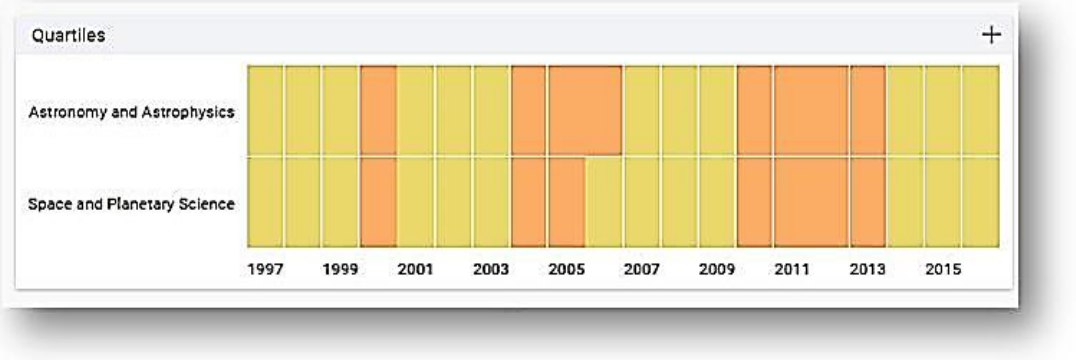
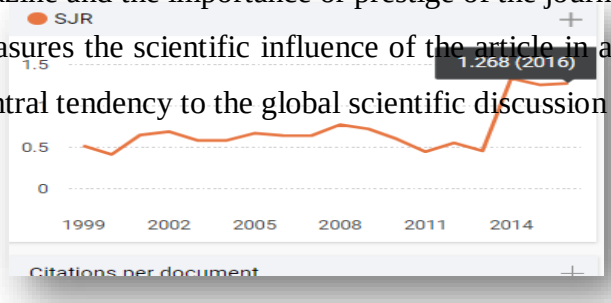


Figura No. 28. Análisis Journal SCIMAGO, fuente: recuperado de http://www.scimagojr.com

The JRS

The JRS is a prestige indicator independent of the size that classifies the magazines by its "average prestige per article ". It is based on the idea that ' all citations are not created equal '. JRS is a measure of scientific influence of the journals that account for both the number of citations received by a magazine and the importance or prestige of the journals in which such citations come from it measures the scientific influence of the article in a Half daily, it JRS expresses which is the central tendency to the global scientific discussion of an article in a daily media evaluated.



Year	SJR
2013	0.455
2014	1.328
2015	1.25
2016	1.268

Figura No. 29. Citas por documento SJR. Fuente: recuperate de http://www.scimagojr.com

The measurement is appropriate to the evolution of the total number of quotes and self-quotations of the magazine received by the published documents of the magazine during the three previous years, the self-citation of the newspaper is defined as the number of citation of a magazine quoting the Article to articles published by the same magazine.

Cites	Year	Value	Cites	Year	Value
Self Cites	2013	10	Total Cites	2013	56
Self Cites	2014	11	Total Cites	2014	173
Self Cites	2015	12	Total Cites	2015	157
Self Cites	2016	6	Total Cites	2016	179

*Figura No. 30.*Citas y auto citas por documento SJR. Fuente: recuperado de http://www.scimagojr.com

There is a measure of the evolution of the number of total citations per document and external citation per document (e.g. withdrawn from the journal's Self-quotations) received by the published documents of a journal during the preceding three years, the External citations are calculated by subtracting the number of auto-quotations from the total number of citations received by the journal documents.

Cites	Year	Value
External Cites per document	2013	0.505
External Cites per document	2014	1.82
External Cites per document	2015	1.593
External Cites per document	2016	1.901
Cites per document	2009	0.898
Cites per document	2010	0.952

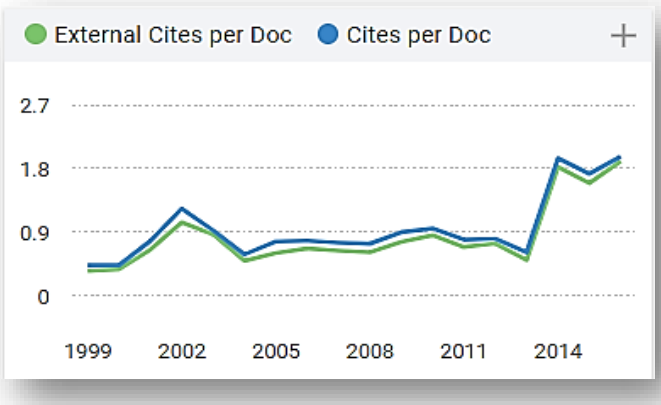


*Figura No. 31.*Citas externas y citas por documento SJR. Fuente: recuperado de http://www.scimagojr.com

It also gives the relationship of international collaboration that has the articles that have been produced by researchers from several countries, the graph shows the relationship of the documents of a journal signed by researchers from more than one country; This includes more than one country address, where each related aspect is established where the journal is located.

Documents	Year	Value
Non-citable documents	2015	0
Non-citable documents	2016	1
Citable documents	2014	89
Citable documents	2015	91
Citable documents	2016	91

*Figura No. 32.*Colaboración internacional por documento SJR, fuente: recuperado de http://www.scimagojr.com

Not all articles in a journal are considered primary and therefore, quotable, this chart shows the proportion of articles in a journal, including substantive research (research papers, conference papers and Reviews) in three years is the window of observation of documents other than research articles, reviews and conference documents.

Year	International Collaboration
2014	47.06
2015	38.46
2016	38.71

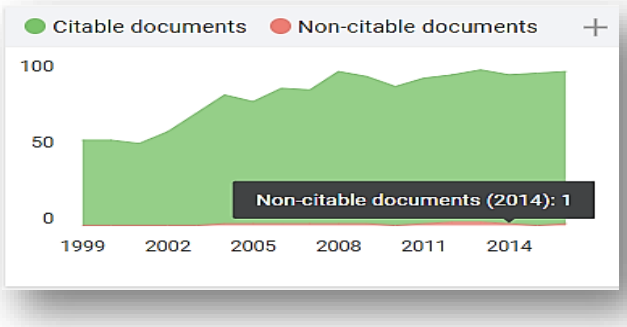


*Figura No. 33.*Documentos citados y no citados SJR, fuente: recuperado dehttp://www.scimagojr.com

Relation of the articles of a magazine, grouped in three years of the observation window, which have been quoted at least once against those not mentioned during the following year, this measurement relates the development of which aspects are considered in the science.

Documents	Year	Value
Uncited documents	2011	51
Uncited documents	2012	47
Uncited documents	2013	62
Uncited documents	2014	49
Uncited documents	2015	53
Uncited documents	2016	66
Cited documents	2014	41
Cited documents	2015	38
Cited documents	2016	26

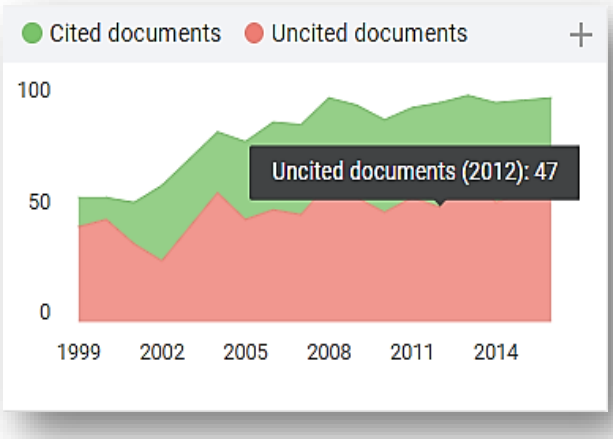


Figura No. 34. Documentos citados y no citados SJR. Fuente: recuperado de http://www.scimagojr.com

It can be measured with the indicator that counts the number of citations received by the documents of a magazine and divides them by the total number of documents published in that magazine, the graph shows the evolution of the average number of times that the documents published in A magazine in the last two, three and four years has been cited in the current year, the two-year line is equivalent to the Daily Impact Factor ™ (Thomson Reuters) metric.

Cites per document	Year	Value
Cites / Doc. (2 years)	2014	2.526
Cites / Doc. (2 years)	2015	2.061
Cites / Doc. (2 years)	2016	0.373

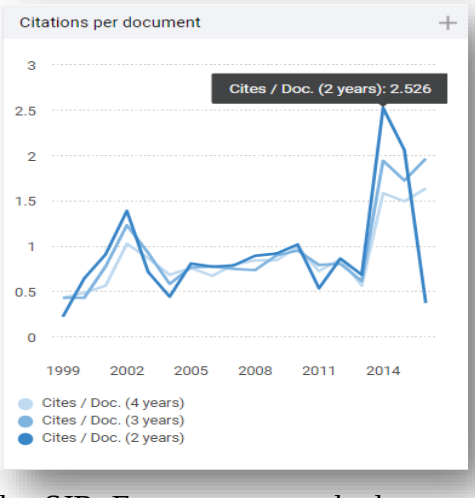
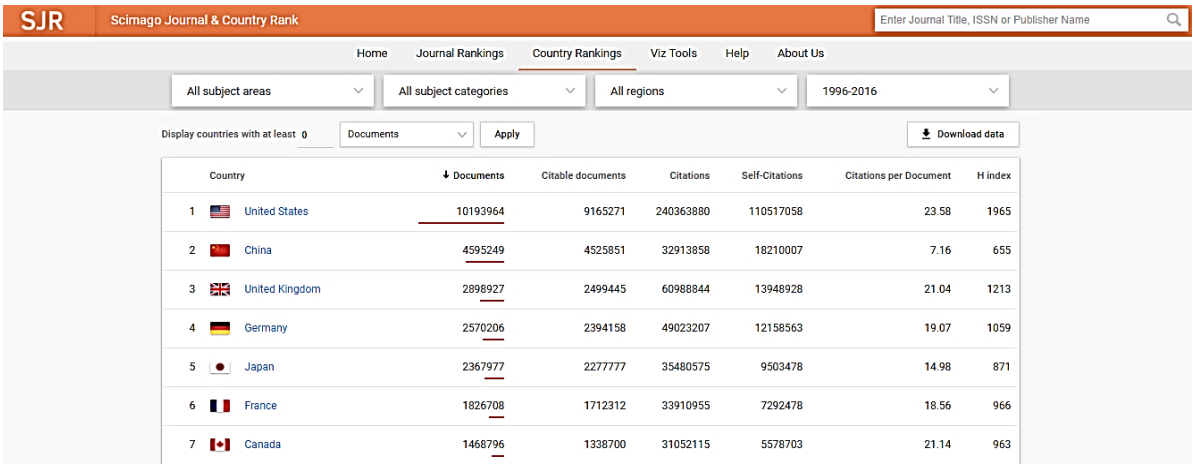


Figura No. 35. Documentos citados y no citados SJR. Fuente: recuperado de http://www.scimagojr.com

How to apply scientometrics by country-country rankings

For the exercise of measurement and scientometrics by countries, according to the laboratory of Scimago provides an example of how you can analyze country to country, will give the example with the ranking 2018, where the first country is United States, but the development of the example will be given with the P Rimer Country of Latin America, where it will identify the extent of the determinations that make science and technology play an important role in the world.



	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1	United States	10193964	9165271	240363880	110517058	23.58	1965
2	China	4595249	4525851	32913858	18210007	7.16	655
3	United Kingdom	2898927	2499445	60988844	13948928	21.04	1213
4	Germany	2570206	2394158	49023207	12158563	19.07	1059
5	Japan	2367977	2277777	35480575	9503478	14.98	871
6	France	1826708	1712312	33910955	7292478	18.56	966
7	Canada	1468796	1338700	31052115	5578703	21.14	963

Figura No. 36. Ranking por países, SJR. Fuente: recuperado de http://www.scimagojr.com

For the example of Brazil, the H-index of country production is recognised, the number of published documents, citations and citations per document the average, in all areas of knowledge, with its specific categories, which are measures according to the availability of the Science.

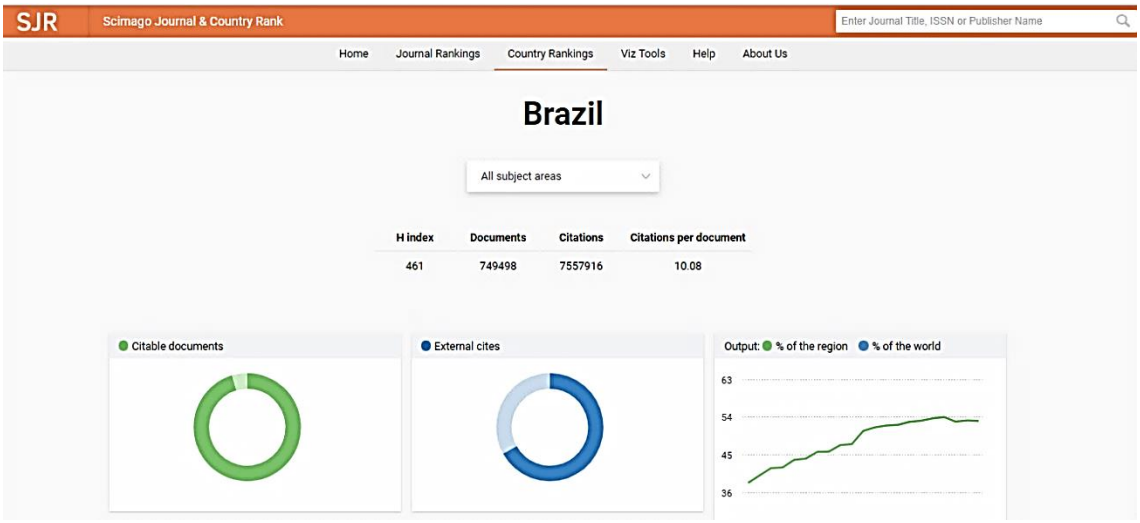
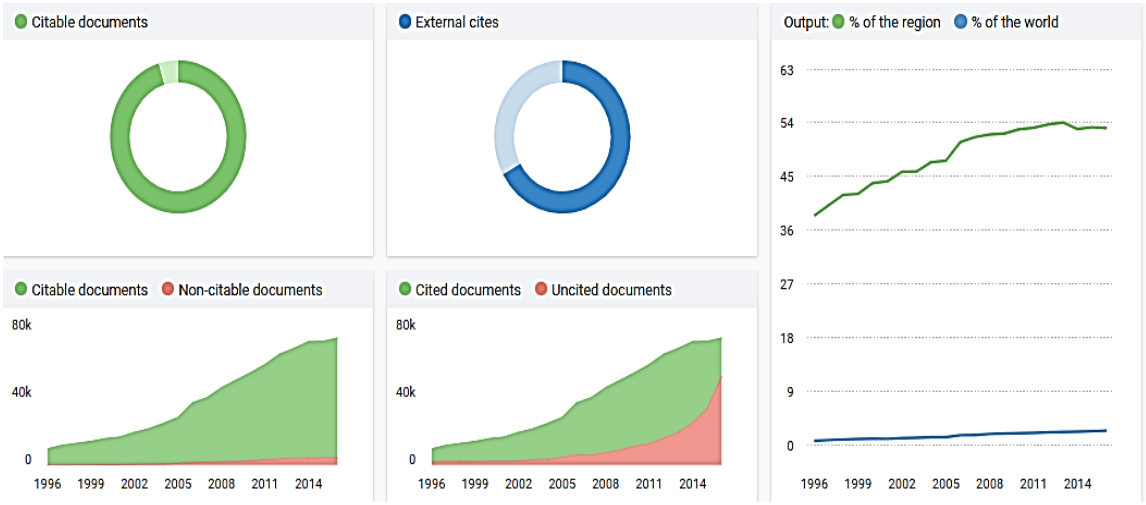


Figura No. 37.Ranking por países ejemplo Brasil, SJR. Fuente: recuperado de http://www.scimagojr.com

The relationships of its indicators provide vital information for decision-making, the look of countries that want to invest their capital in those significant advances, however,



education plays an important role, research and science are Aspects that are taken into account.

Figura No. 38. Análisis por países ejemplo Brasil, SJR. Fuente: recuperado de http://www.scimagojr.com

In Figure 39, it is determined how each country has the same relation per journal, the difference is given in the accumulated by zones, like the external quotations, which is the exit relation in the region and how it behaves with the measurement in the world, which are quoted and not quoted documents, this argument achieves the positioning of each country determining the position in the world.

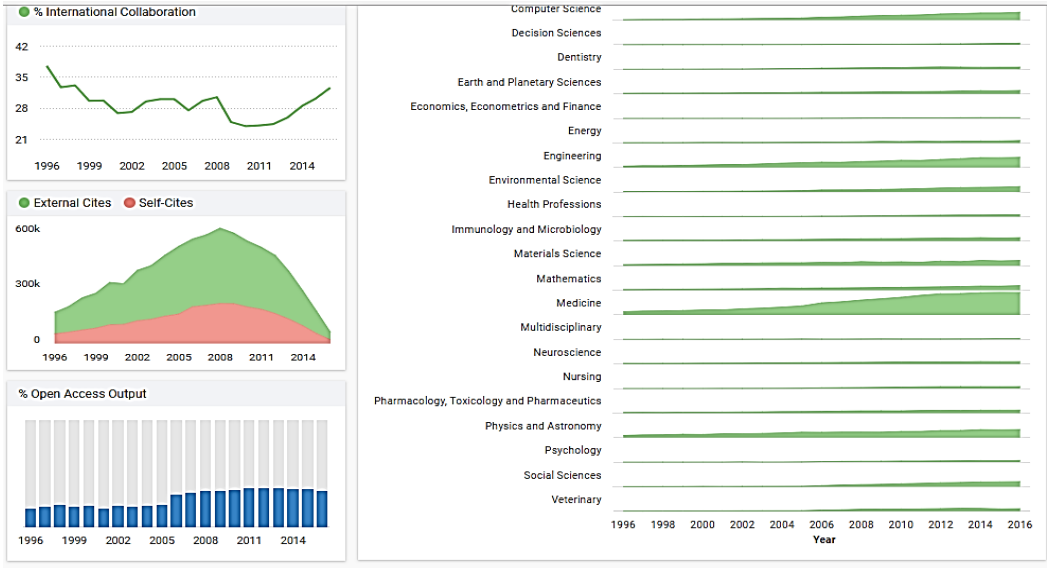


*Figura No. 39.*Análisis por países ejemplo Brasil, SJR. Fuente: recuperado de http://www.scimagojr.com

International collaboration relates the increase in the publications, the areas in which the progress is determined are subject to the work aspects of the researchers, the internal appointments and self-appointments, the increase of open access as a means of Scientific divulgation.

Science Form

The form of science is a project of visualization of information whose objective is to reveal the structure of science. Its interface has been designed to access the Bibliometric indicator database of the SCImago Journal & Country Rank portal. The form of science shows a very intuitive image of the interconnection of the different thematic areas by the position of the journals. Individual journal profiles can be accessed from this interface. Hassan-Montero, Y.; Guerrero-Boat, V.; Moya-Anegón, F. (2014). Graphical interface of the Scimago Journal and Country Rank: An interactive approach to access the Bibliometric information. The information professional, May-June, v. 23, N. 3, pp. 272-278.

Figura No. 40.Forma de la ciencia, SJR. Fuente: recuperado de http://www.scimagojr.com

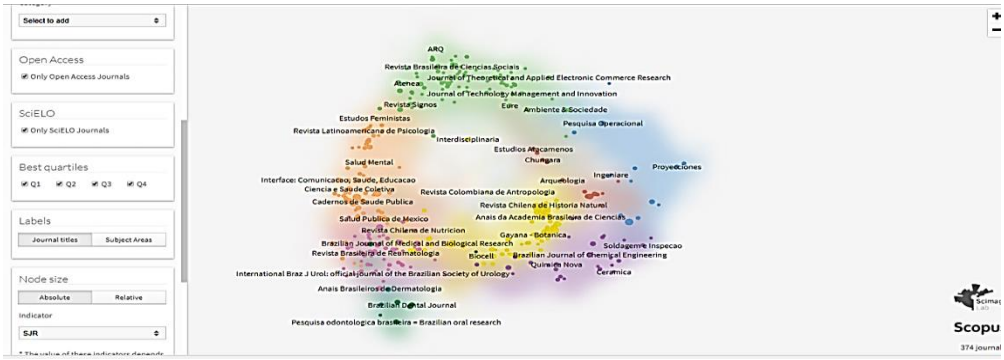


Figura No. 41. Forma de la ciencia Latinoamérica, SJR. Fuente: recuperado de http://www.scimagojr.com

The form of science differs when allocated by region, this figure shows the condensation of Latin America that reflects how low-level compared to World science publications, clear difference in developed countries.

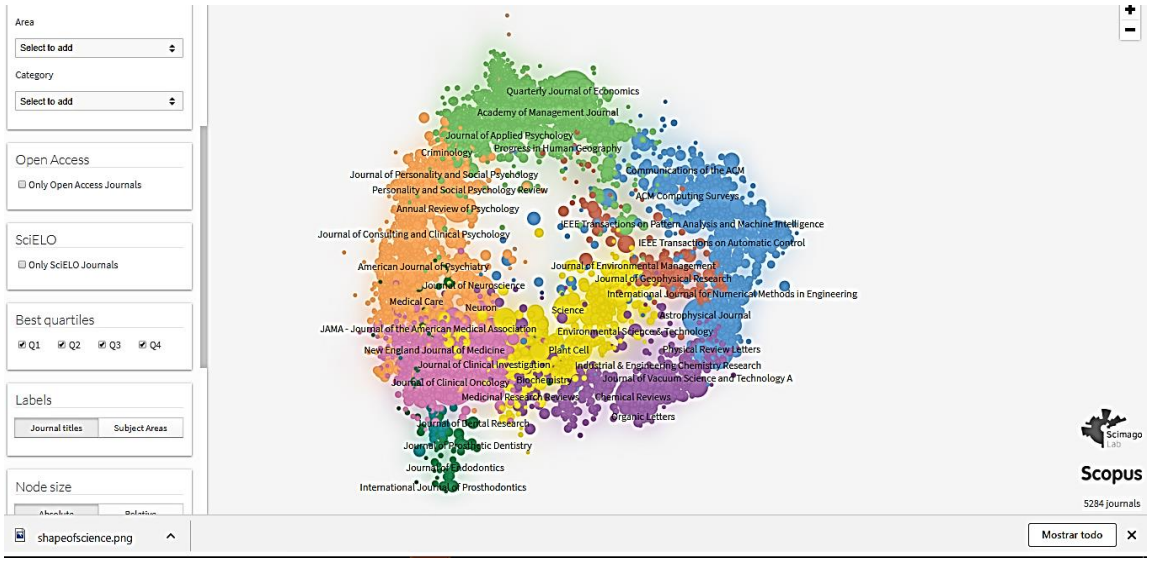


Figura No. 42.Forma de la ciencia Norteamérica, SJR. Fuente: recuperado de http://www.scimagojr.com

The influence referenced in this development of the form of science realizes what is the role of the discoveries and developments, the sharpness of the form we realize the level of priority, the science South American is considered the third science, the graphic gives Realize that the contributions of the form decrease in the figure 41con with respect to the 42 that if it focuses the impact of the contributions of each one.

Subject Bubble Box

This tool allows you to build real-time maps, bubble chart maps, according to your preferences. You can select a country and a two-year period between 1999 and 2016. At the top of the table, there is a set of indicators available (documents, quotable documents, cites, Self-cites, cites per document, H Index, % of documents quoted), which you can select according to your preferences and make charts with three Variables: X-axis, y-axis, and z-axis of bubble size. You can choose between two types of maps: Map of thematic areas and map of thematic categories. Clicking on one or more theme areas bubbles in the thematic areas map can filter topic categories. By placing the mouse over the bubbles you can see the full name of the field and the underlying values for the indicator chosen for the z-axis during that period.

*Figura No. 43.*Cuadro de burbuja, SJR. Fuente: recuperado de http://www.scimagojr.com

For the application of this tool you select the country to which the analysis is required by graph, you can make relationships in the X and y axes, where you can counteract the H index of each production, the documents and quotations, the% of documents, these graphs Allow recognition in specific areas for research centers is the analysis of the relevant aspects of work in science and technology.

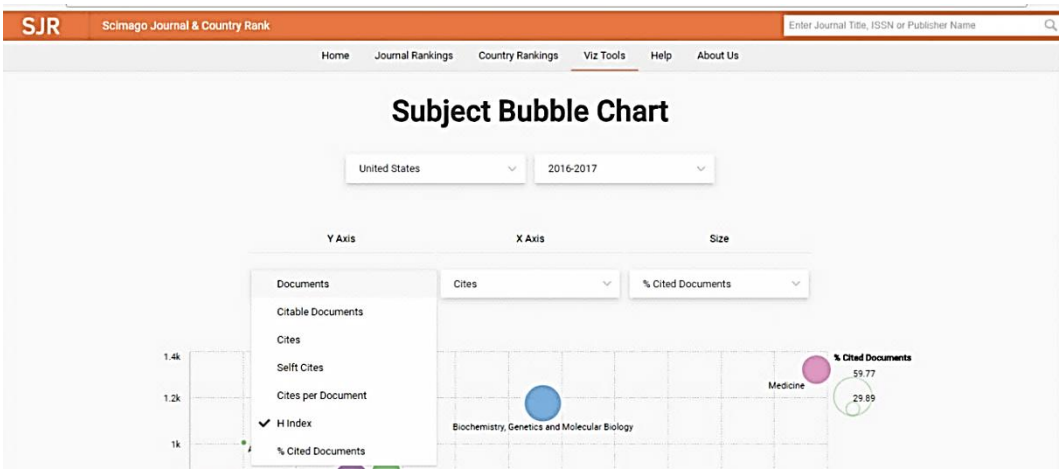


*Figura No. 44.*Cuadro de burbuja ciencia, SJR. Fuente: recuperado de http://www.scimagojr.com

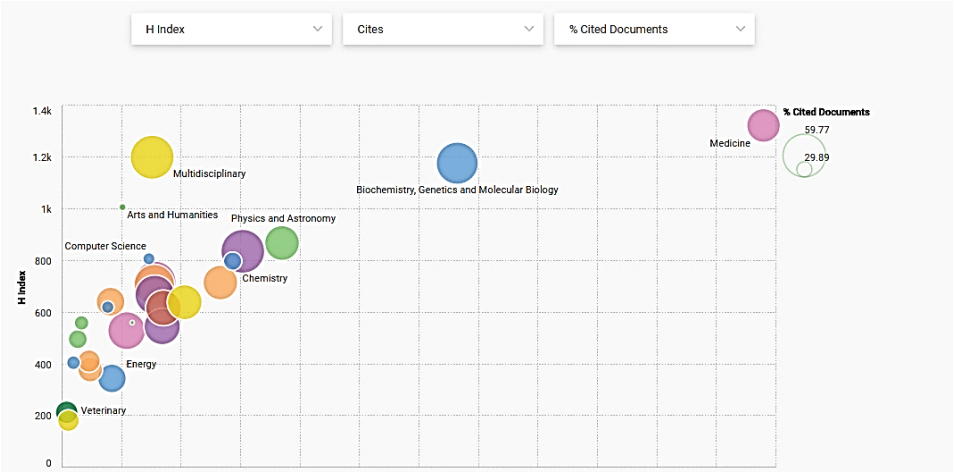


Figura No. 45. Cuadro de burbuja de la ciencia, SJR. Fuente: recuperado de http://www.scimagojr.com

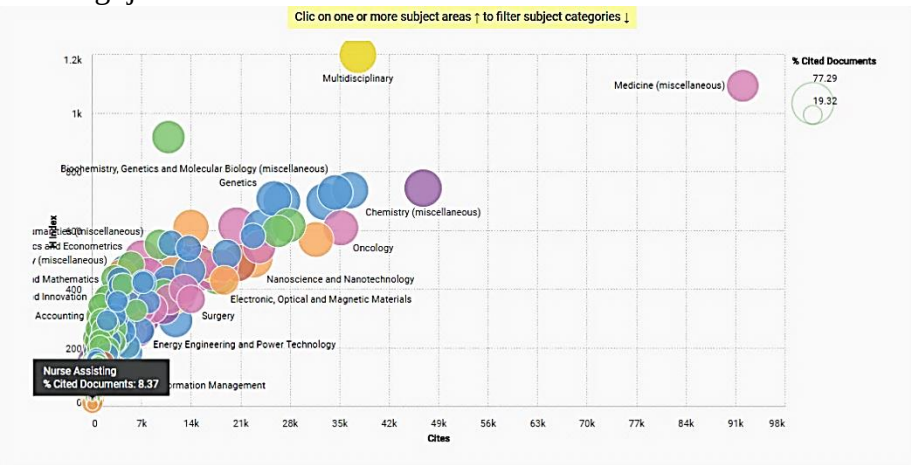


Figura No. 46. Cuadro de burbuja de la ciencia, SJR. Fuente: recuperado de http://www.scimagojr.com

The graphs allow to relate the condensation that is presented in each application zone This example establishes which is the advance by area of the knowledge.

World Report

The World Report provides detailed information for the analysis of the world and of each of the eight major geographical regions. This page provides numerous indicators and displays trend charts and charts (1996-2015) for all or one of the 27 main thematic areas and for all or one of the regions that match the selected options. The indicators provided are: H index, documents, quotable documents, citations, self-quotations and citations by document. The report also shows the evolution during the period 1996-2015 of cited and uncited documents, quotable documents and a quotable, % open access and unopened exit, citation, outsourcing and self-citation, country data (documents, H Index and citation for Document) and documents by thematic area. When you put the mouse on the charts, you can see the underlying values.

Figura No. 47. Reporte mundial, SJR. Fuente: recuperado de http://www.scimagojr.com

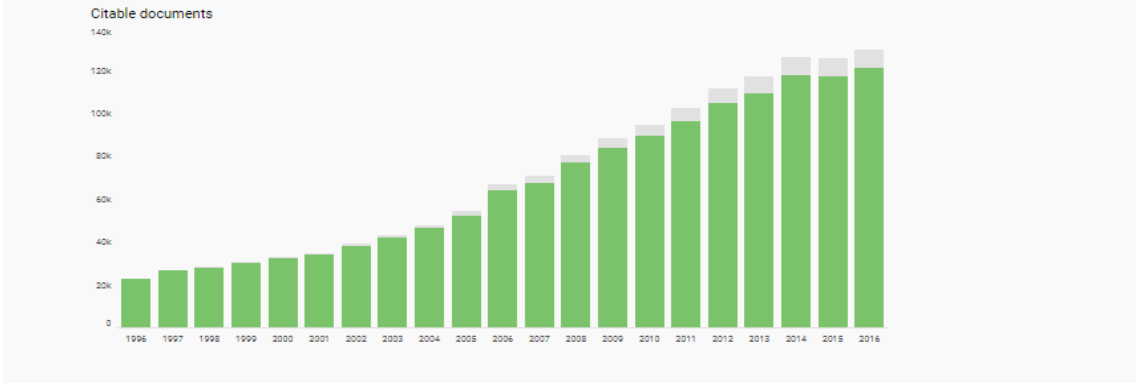


Figura No. 48. Reporte mundial, SJR. Fuente: recuperado de http://www.scimagojr.com

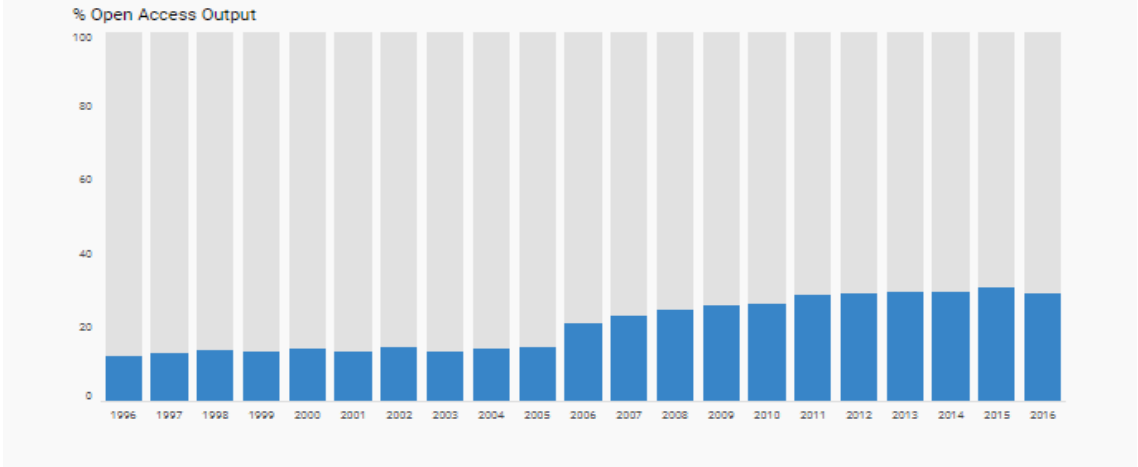


*Figura No. 49.*Reporte mundial, SJR. Fuente: recuperado de http://www.scimagojr.com

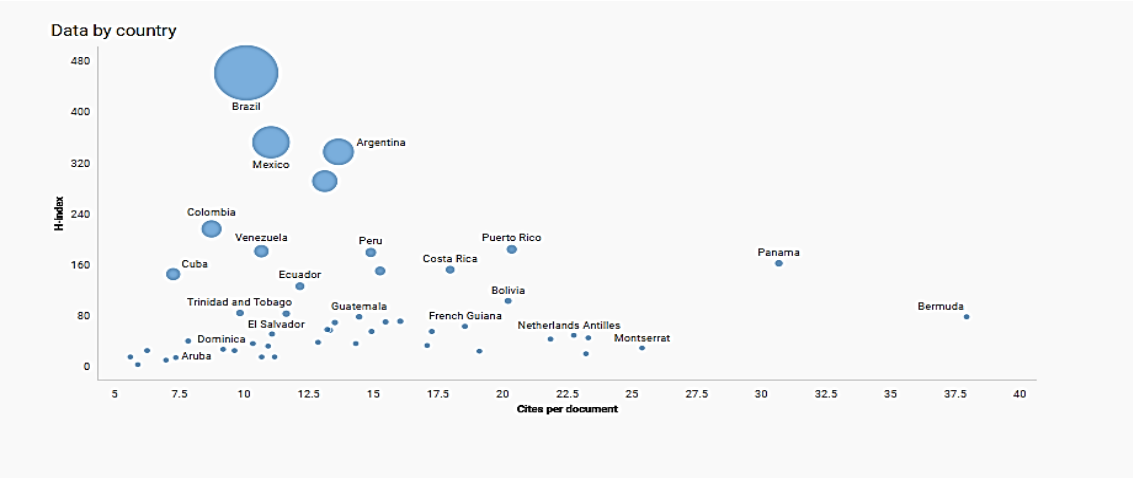


Figura No. 50. Reporte mundial, SJR. Fuente: recuperado de http://www.scimagojr.com

General Aspects of Science Available to Consult on the Web

Web of Science: Master Journal List web of Science is a database of scientific information, (WOS) by Thomson Reuters facilitates access to a set of databases in which quotations of articles of approximately 22,599 scientific journals of current are appearing Principal of which 13,885 belong to the main collection and encompass all fields of academic knowledge. It allows access to the previous publications of a given research published through the access to its bibliographic references quoted, or also, to the publications that cite a certain document to discover the impact of a scientific work About current research.

Finally, it allows you to connect to the full text of primary publications and other resources and access them through a search system.

Scopus: Scopus is a database comprising summaries and references of about 35,414 journals of which 13,000 are publications assessed by specialists, as well as approximately 1,000 conference proceedings. Its disciplinary coverage is as follows: Chemistry, physics, Mathematics, engineering, Life and health sciences, social and economic sciences, and psychology. https://www.scopus.com/home.uri

EBSCO: EBSCO is a search platform that offers databases in full texts, indexes and academic periodicals that cover different areas of science and humanities. It includes 13,200

full-text journals of which 9,900 are refereed academic publications. Your collections are available through EBSCOhost. https://www.ebsco.com/

BEIC: BEIC Biblioteca Electrónica de Información Científica es un instrumento de acceso a la información. Este programa conjunto entre CINCEL y CONICYT entrega acceso gratuito a la Universidad del Bío-Bío, a través de Internet a un conjunto seleccionado de 5.940 revistas en texto completo. http://www.beic.cl/

Pages for the Evaluation of Journal Titles And Scientific Information

Scopus: Title comparer, Scopus includes option to search and analyze scientific journals, you can and choose a maximum of 10 journals to analyze and compare.

Elsevier's Https://www.scopus.com/freelookup/form/author.uri journal Finder helps you find magazines that might be more appropriate for the publication of your scientific article from the title and summary of an article to be published, the comparison includes Variables such as impact factor, response time, access, use licenses, embargo period.

https://journalfinder.elsevier.com/journal Suggester of Springer, from a summary, description of research or an example text allows to choose between 2,600 publications of Springer the magazine that best suits the topic of investigation, delivering Impact factor and response time information. https://journalsuggester.springer.com/matching endnote, coincidence is an option provided by the Endnote bibliographic manager that allows you to find the best journals for a researcher's manuscript from the title and summary of an article to Publish, the comparison includes variables such as Impact factor, Journal category and quartile in Journal of Citation report. Https://endnote.com/product-details/manuscript-matcher

Scimago: Indicators scientometric Scimago Journal & Country Rank is a portal that includes scientific indicators that evaluate and analyse the scientific journals contained in the Scopus database (Elsevier). https://www.scimagojr.com/Google Academic: indicators/statistics, Google Scholar Metrics is a portal that provides scientific indicators that

evaluate and analyse the academic publications contained in Google Academic. Http://guiasbus.us.es/indicesdeimpacto/googlescholarmetrics

REDALYC Indicators Scientometric, is a portal that delivers scientometric indicators of Iberoamerican journals indexed in REDALYC. Http://www.redalyc.org/IndicadoresHomeBasic.oaJournals Elsevier: Impact, Reach and Response Time Journal Insights provides additional indicators of academic journals Elsevier: Impact, speed and scope. https://journalinsights.elsevier.com/journals/1072-7515

Altmetrics are indicators of academic activity in social networks and social tools. Elsevier provides altmetrics of indexed publications in Science Direct. https://universoabierto.org/tag/altmetrics/page/7/MIAR: An information matrix for journal analysis updated annually, the MIAR database gathers key information for journal identification and analysis. These are grouped into large scientific areas – subdivided into more specific academic fields –. The system creates a correspondence matrix between the journals, identified by their ISSN and the databases and repertoires that index or include them. In addition, the link to the websites of the editors and institutions responsible for the repertoires and sources is indicated, provided that it is available. Http://miar.ub.edu/idioma/es POP Publish or Perish, is a program that looks for and analyzes academic appointments using Google Scholar.

Https://harzing.com/resources/publish-or-perishScholarometer, the software that searches for and analyzes academic appointments and also includes the universal H-factor. http://scholarometer.indiana.edu/Chisel, a corporation that gives access to electronic scientific information through the creation of a library of international scientific Journals (BEIC) and other information resources for the institutions of Higher education and legal persons who develop scientific and technological research.

http://www.beic.cl/Dataciencia, this tool allows to visualize, quantify and characterize the Chilean scientific production segmented in four main categories: researchers, territory (regions), institutions and scientific journals. All this from the Thomson

Reuters Web of Science (WOS) database that contains the national scientific production of the period 2008-2016. http://www.dataciencia.com/System of scientific information, are system of services, platforms and contents of the program of scientific information of CONICYT. http://informacioncientifica.cl/

Identification of Researchers Worldwide

ResearcherID.com allows to create an online profile to show the history of academic publications, is a resource available for free to the global academic research community and multidisciplinary. After registering, the system assigns to the investigator an individual ID number that will accompany him during the course of his career, irrespective of the changes in the names or the affiliation of his institution.

Http://www.researcherid.com/Home.action?returnCode=ROUTER. Unauthorized & Init = Yes & SrcApp = CR ORCID, provides a persistent digital identifier of the researcher that distinguishes him from others and, being integrated with the main tasks of investigation, like the sending of manuscripts and concessions, links them Automatically to professional activities, ensuring that the work of the investigator is recognized.

https://orcid.org/SCOPUS ID, SCOPUS author identifier is an author ID and profile integrated in Elsevier's SCOPUS database. It is created automatically for any author whose work is included in Scopus, and allows to group in a unique way the different names by which an author can be known. Https://www.scopus.com/sources?zone=&origin=NO%20ORIGIN%20DEFINED

Scientific Social Networks

ResearchGate is an online research and collaboration platform, an academic social network aimed at students, professors, scientists and researchers of all subjects. https://www.researchgate.net/Academia Edu, Academia.edu is an online research and collaboration platform, is a free academic social network that aims to connect

scientists, offer them a platform to share their work Research and facilitate the follow-up of the articles that are relevant to their fields of study. https://www.academia.edu/Mendeley,is a bibliographic reference manager and a thematic social network. As a thematic social network, an online collaboration tool that allows the connection of researchers, scientists, students, professors, librarians and information managers.

https://www.mendeley.com/System of scientific information, are system of services, platforms and contents of the program of scientific information of CONICYT. http://informacioncientifica.cl/

Indicators, definitions

The impact Factor of a journal is the average number of times that magazine articles published in the last two years were cited in the year of the Journal of Citation report. Http://images.webofknowledge.com/WOKRS522_2R1/help/es_LA/WOS/hp_full_record.html#dsy7956-TRS_journal_information The impact Factor is calculated by dividing the number of citations of the year from the Journal of Citation report. By the total number of articles published in the previous two years. An impact Factor of 1.0 means that, on average, articles published one or two years ago were once cited. An impact Factor of 2.5 means that, on average, articles published one or two years were quoted two and a half times. The works in which it is quoted can be articles published in the same magazine or of the works that come from different magazines, minutes of lectures or books indexed by Web of Science.

The H index or Hirsch index is a cienciométrico indicator that is calculated based on the distribution of appointments that have received the scientific work of a researcher. An author has an H index of "H" when "H" of his published articles have received "H" citations at least each, and the rest of his articles have received "H" at most. https://platinoulloa.wordpress.com/2015/08/13/el-indice-h-o-indice-de-hirsch/ISSN, ISSN (International standard number of serials), number of serials identifier in different media. Http://www.issn.org/es/ISBN, the ISBN (International Standard number of books), number identifier of books in different media. https://www.isbn-

international.org/Doi, the Digital object identifier (DOI ®) is a system for permanently identifying and exchanging intellectual properties in the digital environment.

https://www.doi.org/keywords, thesauruses Unesco Thesauruses, is a controlled and structured list of terms for thematic analysis and the search for documents and publications in the fields of education, culture, natural sciences, social and human sciences, communication and information. Continuously expanded and updated, its multidisciplinary terminology reflects the evolution of UNESCO's programmes and activities. http://vocabularies.unesco.org/browser/thesaurus/es/DECSDescriptors of the VHL information and knowledge for health, the structured and trilingual vocabulary DECS-descriptors in health sciences was created by BIREME to serve as a unique language In the indexing of articles of scientific journals, books, Annals of Congresses, technical reports, and other types of materials, as well as to be used in the search and retrieval of scientific literature issues in the sources of information available in the Virtual Health Library (VHL) such as LILACS, MEDLINE and others. Http://decs.bvs.br/E/homepagee.htm

Indexing criteria

MeSH Medical Subject headings, biomedical information headings developed by the U.S. National Library of Medicine (NLM). https://meshb.nlm.nih.gov/OECD thesaurus, OECD macro-thesaurus (Organization for Cooperation and Development), comprises descriptors (keywords) designed for index books and documents covering the field of economic development and Social. Https://repositorio.cepal.org/handle/11362/29059 's thesauruses, a thesaurus controlled terms of the area engineering, technology and science that is based on material presented in journals, conference proceedings, standards and/or documents of the IEEE organization (The Institute of Electrical and Electronics engineers). https://www.ieee.org/publications/services/thesaurus.html

Thesaurus of Art and architecture, is the controlled vocabulary of art and architecture developed by the Getty Research Institute (GRI), an operating program of the J. Paul Getty Trust, and translated into Spanish by the centre of documentation of patrimonial assets

(dependent on the Directorate of Libraries, Archives and museums-DIBAM). http://www.aatespanol.cl/taa/publico/buscar.htm

Thesaurus Agrovoc of agriculture, forestry, Fisheries and food security, AGROVOC is a controlled vocabulary that covers all areas of interest of the United Nations Organization for the Food and Agriculture (FAO), including food, nutrition, agriculture, fisheries, forest science and the environment. It is published by FAO and a community of experts is in charge of its edition. HTTP://AIMS.FAO.ORG/ES/AGROVOC

Eric Thesaurus, the Eric Thesaurus (Education Resources Information Center) is a list of terms that represent research topics in the field of education. The descriptors of the Eric Thesaurus are assigned to each document in the Eric Digital Library to describe its contents. Since October 2015, the ERIC thesaurus contains a total of 11,721 terms. There are 4.520 descriptors and 7.068 synonyms. There are also 133 unused terms that are no longer used as descriptors, but remain in the thesaurus to assist in the search for old records. https://eric.ed.gov/FAOTERM,FAO's terminological Portal, stores, manages and maintains concepts, terms and definitions related to FAO's various fields of activity. http://www.fao.org/faoterm/collections/faoterm/es/Toiletscientific articles, toilet is the English acronym of Academic Search Engine optimization, that is to say, optimization of the scientific article using keywords that allow you to have good Internet positioning. https://openjournalsystems.com/academic-search-engine-optimization/

Latindex: Latindex indexing criteria, Regional online information system for scientific journals in Latin America, the Caribbean, Spain and Portugal. Latindex considers 33 editorial characteristics.

To enter the catalogue, the magazine must fulfil the eight obligatory characteristics and at least 17 of the other characteristics, for a minimum of 25 fulfilled. The eight obligatory characteristics are: mention of the Editorial body, content, minimum age 1 year, identification of the authors, place of publication, entity editor, mention of the director, mention of the direction. Http://www.latindex.org/latindex/editImpresas scielo org: indexing criteria Scielo

org, scientific Electronic Library Online, considers the following characteristics to index a journal on the platform: Scientific character, peer arbitration, Editorial board, periodicity according to thematic area, duration, punctuality, summary, keywords and title in English, normalization, affiliation of authors, appointments received.

http://www.scielo.org/php/level.php?lang=es&component=44&item=2Scielo Chile: Indexing criteria Scielo Chile considers 34 obligatory criteria in which the verification of eligibility criteria of the application is included, formal criteria Evaluation and evaluation of the content. Some elements are: ISSN, antiquity, periodicity, editorial Committee, external authors, punctuality of publication, refereed Journal, scientific character, url or address of the magazine on the Internet, number of articles published each year according to thematic area, Demand for originality, historical access to content, metadata, search engines. http://informacioncientifica.cl/scielo/criterios-scielo/Web of Science (ISI): Indexing criteria. The evaluation of the journals contained in the Web of Science (ISI) takes into account many qualitative and quantitative factors.

No factor is considered in isolation, but by combining and interrelating data; So the editor can determine all the strengths and weaknesses of the magazine. Some of the criteria considered are: regular periodicity, peer review process, editorial content, internationality, articles titles and completely descriptive summaries, titles of articles in English, summaries, and words Keys are essential, analysis of quotations (measures of complete quotations, factor of impact, and index of immediacy, register of publications of the authors and of the members of the editorial body). Http://www.csuc.cat/es/isi-web-of-knowledge Scopus: Indexing criteria, it evaluates the policy of the journal, the contents, the relevance of the magazine, the regularity and the electronic version. Some elements considered are to have ISSN, regular publication according to stated periodicity, publication of at least one number per year, minimum age of two years, originality and relevance of the articles, peer review, ethics in the Publication. Http://guiasbus.us.es/revistas-wos-scopus/criterios_Scopus

Ibero-American databases: Criteria of entry, compilation of criteria for indexing of various databases of Ibero-American journals. http://redc.revistas.csic.es/index.php/redc/article/view/990/1536REDALYC:

Indexing criteria, REDALYC (network of scientific Journals of Latin America and the Caribbean, Spain and Portugal). For the evaluation is considered the permanence, scientific content, periodicity, Editorial management, visibility of the content, use of the technology. Some criteria considered are: antiquity, scientific content, demand of originality, peer review, compliance with the periodicity, full title, printed and/or electronic ISSN, publishing institution, Exogeneidad of evaluators and the Council Editorial, evaluation times, articles published annually, abstract in the original language, abstract in a second language, preferably English, key words in the original language.

Key words in a second language, preferably English, use of an electronic manager, incorporation of protocols of Inter-operability in AA, search of Contents/CAV, individual download of contents, has its articles marked in the format XML-JATS, Collection integrity, author IDs, usability. http://www.redalyc.org/redalyc/media/redalyc_n/estaticasredalyc/Criterios/criterios.html Dialnet: Indexing criteria resource platform and documentary services that indexes magazines, theses, congresses and other documents. Coordinated by the University of La Rioja and Fundación Dialnet the indexing criteria required are: The journal must be registered in the Latindex catalog, the Publisher must authorize the hosting of the full texts on the Dialnet servers, must have of the contents of the summaries in electronic format accessible by OAI-PMH. Prioritizing the electronic editing system OJS. https://dialnet.unirioja.es/servlet/articulo?codigo=5733982 software for Anti plagió free software Science Articlechecker, allows checking in Google search engines and Yahoo, independently.

You can detect complete webs using the URL. https://articlechecker.com.cutestat.com/Antiplagiarist, is a free software that compares several documents to detect suspicious similarities. Supports files with the following formats: HTML, DOC, TXT, WPD and others. https://antiplagiarist.softonic.com/

Copyscape, search for online copies of a Web page, through its URL and online documents on the net. https://www.copyscape.com/DupliChecker, compares the text entered

with documents on the Web. https://www.duplichecker.com/Paper Rater, this is a very complete and free tool. In addition to determining the authenticity of a document, it is able to revise and analyse its grammatical structure. https://www.paperrater.com/The Plagiarism Checker, allows to perform a search through Google through large blocks of text. https://www.grammarly.com/plagiarism?network=g&utm_source=google&matchtype=e&gclid=EAIaIQobChMItJrYmZSi2wIVDT0MCh01aAOgEAAYASAAEgKeLvD_BwE&placement=&utm_content=56705358246&utm_campaign=Search&utm_medium=cpc&utm_term=plagiarism+ Checker Plagiarism Detect, retrieves documents from the network where matching phrases appear with those of a specific text or file.

To use it we must create an account in your system. https://plagiarismdetector.net/Plagiarisma, can be used from the Web, or by downloading for Windows. It requires that we register. Http://plagiarisma.net/es/Plagium, searches for documents equal or similar to the text entered. It allows to search in different languages. http://www.plagium.com/Tin Eye, tool to perform a search of images, from an image. It is useful to know if someone has used one of your images on the network without your permission. https://www.tineye.com/Viper plagiarism Checker. It allows you to add one or more documents for verification. https://plag.co/Google and Google Scholar, because there are more and more books uploaded to Google Books or Google scholars, it allows to detect entrecomillando plagiarism through a specific phrase. http://guides.library.jhu.edu/c.php?g=185441&p=1663574

Other Sources of Information

DBPL: Computer Science Bibliography, this service provides open bibliographic information about major journals and procedures in computer science. DBLP is a joint service of the University of Trier and Schloss Dagstuhl. https://dblp.uni-trier.de/.

Semantic scholar, is an academic semantic search engine that offers trends in scientific publications using artificial intelligence techniques to provide highly relevant results and

new tools to filter them in an easy way. It is a product of the non-profit organization Allen Institute for Artificial Intelligence (AI2) in
Seattle. https://www.semanticscholar.org/This new tool (https://www.semanticscholar.org/) can track millions of papers but currently only includes those related to computer science, about 3 million of articles in open access. For the year 2016 they plan to include papers on medicine.

CiteSeerX, CiteSeer is a public search engine and digital library focused on academic and scientific publications. CiteSeer's goal was the active search and capture of academic and scientific documents on the WEB to be indexed using the autonomous method of quotation analysis; And thus allow searches by appointment or by the classification of documents based on the analysis of quotations. The site is hosted at the College of Information Science and Technology at Pennsylvania State University and stores more than 700.000 documents most of these related to the fields of computing, computer science and engineering. Http://citeseerx.ist.psu.edu/index;jsessionid=345FD7581F4C555576BFA3F5E96097BC Bibsonomy, Bibsonomy is a system for sharing and organizing markers and literature lists. https://www.bibsonomy.org/

REPEC research papers in economic, is a collaborative effort of hundreds of volunteers in 89 countries to improve the dissemination of research in economics and related sciences. The heart of the project is a decentralized bibliographic database of working documents, journal articles, books, book chapters and software components, all of which are maintained by volunteers. The data collected is then used in a variety of services that serve metadata collected or improved by users.

So far, more than 1,800 files from 89 countries have contributed to about 2 million of research units of 2,300 journals and 4,300 editions of articles of work. About 48,000 authors have registered and 75,000 email subscriptions are served each week. See below how you can be part of this initiative. http://repec.org/ECLAC: ECLAC Library (Economic Commission for Latin America and the Caribbean) brings together available digital resources such as digital repository, catalogue, books and electronic journals, newspapers, research

guides). Https://www.cepal.org/es/biblioteca.

REPEC research papers in economic, is a collaborative effort of hundreds of volunteers in 89 countries to improve the dissemination of research in economics and related sciences. The heart of the project is a decentralized bibliographic database of working documents, journal articles, books, book chapters and software components, all of which are maintained by volunteers. The data collected is then used in a variety of services that serve metadata collected or improved by users.

So far, more than 1,800 files from 89 countries have contributed to about 2 million of research units of 2,300 journals and 4,300 editions of articles of work. About 48,000 authors have registered and 75,000 email subscriptions are served each week. See below how you can be part of this initiative. http://repec.org/ECLAC: ECLAC Library (Economic Commission for Latin America and the Caribbean) brings together available digital resources such as digital repository, catalogue, books and electronic journals, newspapers, research guides). Https://www.cepal.org/es/biblioteca.

Capítulo

2

The Cienciometria Applied in the Technological Platforms of Latin America, a Tour of the Developed Countries

Chapter 2
A tour of the scientometrics platforms in Latin America

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Doctor © en Tecnology educational and education
Consultor Senior en Cienciometría e Investigación

The road of Scientometrics in Latin America has its emphasis on how it is connecting and making visible science advances, technology and innovation. Research developed, structurally recognizes the interaction of technological platforms in the implementation in third world countries, Niggli, U., Andres, C., Willer, H., & Baker, BP (2017), recognize the role in the agricultural, agroindustrial sectors in third world countries, with this is posible a potentially increasing the visibility of scientific researchers in Latin America and the Caribbean, what is the purpose of organizing and visualizing the journal in the World databases, Scopus, ISI, Redalyc, Scielo, Ebsco, Proquest, Directcience, Dialnet, Latindex, Publindex and management platforms of information such as SCIMAGO, Google data analytics, clarivate analytics, elsevier where articles are codified of primary, secondary and tertiary science are coded, with relevant relationships of researchers around the globe.

This chapter will have a particular analysis by each country, with an approach to its development, which is the importance of knowing the scientometric, bibliometric, webometric approaches that are articulated in the platforms, according to Hurtado, D., Lugones, M., & Surtayeva , S. (2017), there are global intent technologies that develop institutional policies in the periphery as the use of science achieves a significant advance.

In Latin America, research has become in a missionary function, along with the academy and the so-called social showing or university extension; Nevertheless; according to the contribution of Márquez Rubiano (2011). Universities that do research vs. institutions of higher education teaching that do research, Manzano-Arrondo (2012), from the argument of what is the role of the university and its commitment to society. The use of information and innovation systems, articulated to the purposes of the Organization for Economic

Cooperation and Development (OCDE), it measures technology development, patent search, registrations, technological product innovation and process.

The geo-reference of science, technology and the research allows an understanding of what is the role of these platforms whose measurement structure, the generation of new knowledge, technological development, the social appropriation of knowledge, and the strengthening of training in research.

*Figura No. 51.*Recorrido latinoamericano de la ciencia.
Fuente: Investigador F.A.P.A. 2018

The figure presents the most representative relationship of each of the platforms identified for the strengthening of science, technology, as each one has its dynamics and calls to deep the progress and developments that count to apply the scientometric indicators, this visibility is articulated with the global rankigs of science, innovation (patents, industrial registers, innovations, prototyping).

Technological Plattforms on technological Sciense in Chile

Chile is an American country located in the southwestern outside of South America. Its official name is Republic of Chile and its capital city is Santiago. http://www.plataformacientifica.cl/, CONICYT - National Commission of Scientific and Technological Research. http://www.conicyt.cl/

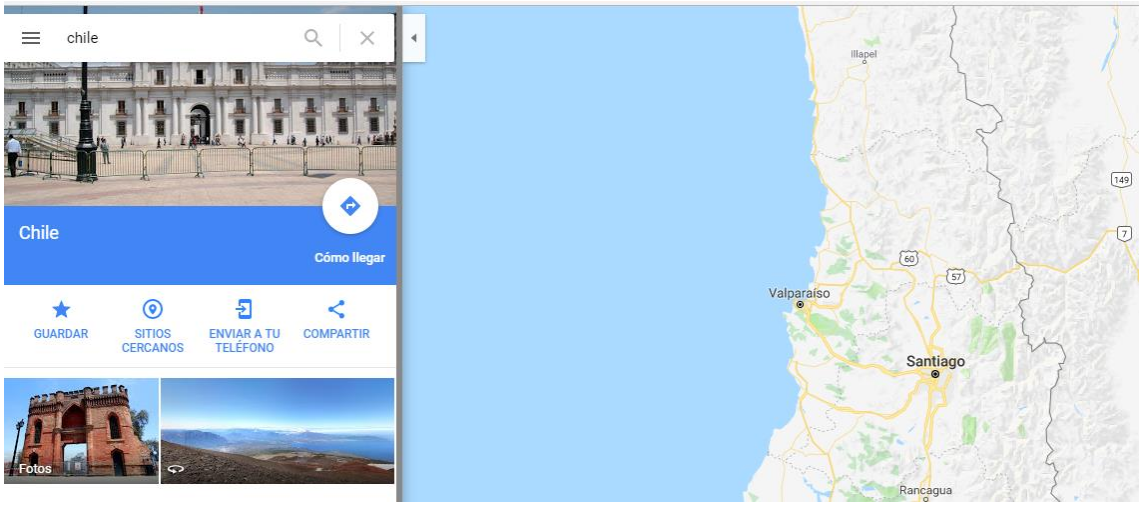


Figura No.52. Recorrido latinoamericano de la ciencia
Fuente: recuperado de http://www.conicyt.cl/

Figura No.53. plataforma científica chile
Fuente: recuperado de http://www.plataformacientifica.cl/

The scientific platform of Chile is a group of independent professionals, from journalism, science and art, working in the dissemination and Communication of Science. They come together to make visible the advances, offer alliances, collaboration, making a social

appropriation of the particular knowledge focused, to carry out actions, offer support and services in differents areas of scientific communication, through the Scientific Platform Agency. Contacts contacto@plataformacientifica.cl, Plataformacientifica.cl/agencia, Twitter: @PlataformaCyT, Facebook.com/PlataformaCientifica.

Figura No.54. plataforma CONICYT chile
Fuente: recuperado de http://www.conicyt.cl/

CONICYT, the National Commission of Scientific and Technological Research, it was born in 1967, Its mission was established in its organic statute of 1971, which indicates that CONICYT will advise the President of the Republic in the planning of scientific and technological development, will promote and foster the science and technology in Chile, orienting them preferably to the economic and social development of the country.

Relation of CONICYT and Foundecyt

In 1981 through Law (DFL 33/81) *El fondo de desarrollo científico y tecnológico (Fondecyt)* as a direct financing mechanism for scientific projects of researchers. This organ is administered by the Superior Council of Science and the Technological Development Council (the Councils). CONICYT: (a) provide the administrative support and the necessary infrastructure for the proper functioning of the Fondecyt and both Councils; (b) administer

the resources of the Fondecyt, in accordance with the instructions given by the Councils; (c) execute the agreements adopted by the Councils; (d) pay, when appropriate, fees or compensation to the members of the Councils. Fondecyt is administratively related to CONICYT through its Executive Director.

Technological plattforms on technological sciense in Colombia

Colombia, the Republic of Colombia, is an independant country located in the northwestern region of South America that is constituted in a unitary, social and democratic state of law which form of government is presidential, Administrative Department of Science, Technology and Innovation (CTEL) that depends on the Presidency of the Republic and leads the National System of Science, Technology and Innovation. www.colciencias.gov.co

Figura No.55. plataforma SNCTI Colombia
Fuente: recuperado de http://www.colciencias.gov.co/

The Administrative Department of Science, Technology and Innovation, COLCIENCIAS, formulates and promotes the short, medium and long term policies of the State in CTeI (Science, Technology and Innovation), for the training of human and infrastructure capabilities, the insertion and international cooperation and the social appropriation of the CTeI to consolidate a society whose competitiveness is based on knowledge, technological development and innovation.

Figura No.56. plataforma SNCTI Colombia

Fuente: recuperado de http://www.colciencias.gov.co/

Figura No.57. plataforma SNCTI Colombia

Fuente: recuperado de http://www.colciencias.gov.co/scienti

The access platform to the INSTITULAC. The Directory of Institutions for Latin America and the Caribbean known as INSTITULAC is part of the applications of the SCIENTI platform (COLCIENCIAS, 2015). Its purpose is to build a complete and organized computer base, where you can observe and find the information of the institutions to which the groups, researchers and journals are linked. Through this

application is allowed to endorse the research and information of groups, people and journals.

Directory of Latin American and Caribbean Groups (GRUPLAC). GRUPLAC is part of the IT platform of COLCIENCIAS SCIENTI-Colombia. “La Universidad tecnológica y pedagógica de Colombia” (2016) defines GRUPLAC as a software whose objective is to maintain a directory of research groups, institutions and researchers that actively participate in the development of new strategies in the science, technology and innovation field.

Technological plattforms on technological science in Argentina

Argentina - science and technology information system of the Republic of Argentina (SICyTAR), Ministry of science, technology and productive innovation presidency of the Nation. http://datos.mincyt.gob.ar/#/; http://sicytar.mincyt.gob.ar/#/;

Figura No.58. plataforma SICYTAR Argentina
Fuente: recuperado de http://sicytar.mincyt.gob.ar/#/

The Argentine Science and Technology Information Portal is the official gateway to information of public interest in science, technology and innovation in the Argentinian Republic. It is an initiative that promotes transparency, access to public information and accountability, linked to open government policies and is part of the Data Opening Plan established by the National Executive authority.

It is aimed at different users: curious citizens, scientists, entrepreneurs, government officials, journalists and computer scientists. This Portal is coordinated and administered by the sub-secretary of Institutional Evaluation, dependent on the articulation Scientific-Technological secretary of the Ministry of Science, Technology and Productive Innovation of the Nation, and involves all areas of the Ministry and agencies under its orbit that have information in science, technology and innovation.

Figura No.59. plataforma SICYTAR Argentina

Fuente: recuperado de http://sicytar.mincyt.gob.ar/#/

Technological plattforms on technological Science in Ecuador

Secretari of higher education, sciense, techonologic and innovation. http://www.senescyt.gob.ec/conocimiento/ http://www.dicyt.com/ecuador

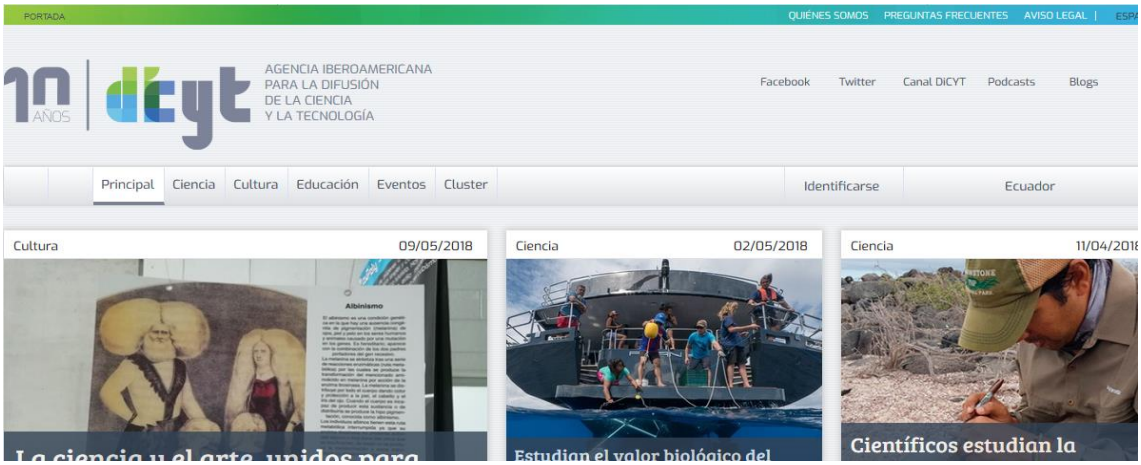


Figura No.60. plataforma SENESCYT/FUNDACYT Ecuador

Fuente: recuperado de http://www.senescyt.gob.ec/conocimiento/

Technological plattforms on technological science in Brazil

Ministery of sciense and technologic. http://lattes.cnpq.br/

Figura No.61. plataforma LATTES Brasil

Fuente: recuperado de http://cnpq.br/

Figura No.62. plataforma CNPq Brasil

Fuente: recuperado de http://cnpq.br/

Technological plattforms on technological sciense in Uruguay

Uruguay, ministery of education and culture, technological, sciense and innovation direction for the development http://www.dicyt.gub.uy/innovaportal/v/204/1/mecweb/centros-de-investigacion-e-innovacion.html?leftmenuid=204

Figura No.63. plataforma Uruguay

Fuente: recuperado de http://www.asiap.org/AsIAP/index.php/ptu

Figura No.64. Plataforma Tecnológica Uruguaya

Fuente: recuperado de https://www.opp.gub.uy/que-es/item/1528-laboratorio-tecnologico-del-uruguay-latu

Figura No.65. plataforma Uruguay

Fuente: recuperado de https://www.opp.gub.uy/que-es/item/1528-laboratorio-tecnologico-del-uruguay-latu

Technological plattforms on technological sciense in Paraguay

Paraguay, the National Council of Science and Technology (CONACYT), through the Organization of Ibero-American States (OEI), in the framework of the Paraguayan Program for the Development of Science and Technology (PROCIENCIA).

Figura No.66. plataforma Paraguay

Fuente: recuperado de http://www.conacyt.gov.py/

Figura No.67. plataforma Paraguay

Fuente: recuperado de https://www.dei.uc.edu.py/index.php/proyectos-de-investigacion

Technological plattforms on technological sciense in Bolivia

Bolivia, viceministry of sciense and technology of Bolivia.

Figura No.68. plataforma Bolivia

Fuente: recuperado de http://www.cienciaytecnologia.gob.bo/contenido/Direcci%C3%93nGeneralDeCienciaYTecnologia

Technological plattforms on technological sciense in Peru

Peru, national council of sciense, technology and technologic - innovation.

https://portal.concytec.gob.pe/;

Figura No.69. plataforma Perú

Fuente: recuperado de https://portal.concytec.gob.pe/index.php/noticias/1223-el-concytec-informa-sobre-las-plataformas-dina-y-regina

Figura No.70. plataforma Perú

Fuente: recuperado de http://www.americasistemas.com.pe/plataforma-tecnologica-peruana/

Technological plattforms on technological sciense in Venezuela.

Ministery of the popular autority for the university education, sciense and technology, national fund of technologic – sciense and innovation (FONACIT), http://www.fonacit.gob.ve/

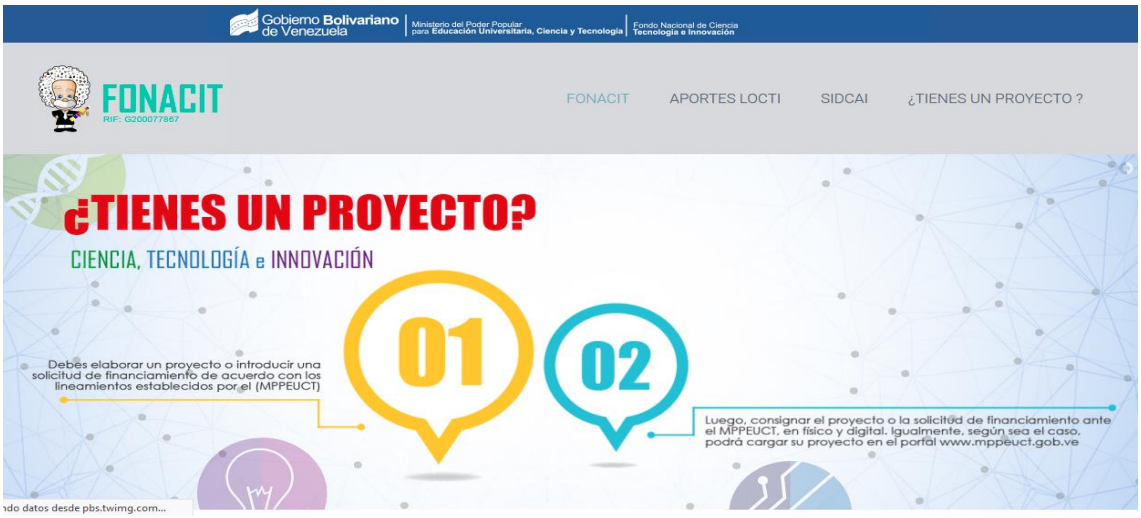


Figura No.71. plataforma Venezuela

Fuente: recuperado de http://fonacit.gob.ve/

Technological plattforms on technological sciense in Panama.

SENACYT, national secretary of Sciense, Technology and Innovation.

http://www.senacyt.gob.pa/ http://www.senacyt.gob.pa/direccion-de-gestion-de-ciencia-y-tecnologia/

Figura No.72. plataforma Panamá

Fuente: recuperado de http://www.senacyt.gob.pa/ http://www.senacyt.gob.pa/direccion-de-gestion-de-ciencia-y-tecnologia/

Plataformas tecnológicas en ciencia tecnología de Costa Rica

Ministery of technologic – sciense and tele-comunications of costa rica.

http://www.micit.go.cr/;

Figura No.73. plataforma Costa Rica

Fuente: recuperado de http://talentocr.conicit.go.cr/vivo/

Figura No.74. plataforma Costa Rica

Fuente: recuperado de http://eccti.or.cr/

Plataformas tecnológicas en ciencia tecnología de Honduras

Honduran institute of Sciense and Technology, http://www.senacit.gob.hn/

Figura No.75. plataforma Honduras

Fuente: recuperado de https://www.senacit.gob.hn/

Plataformas tecnológicas en ciencia tecnología de Nicaragua

Nicaraguan council of sciense and technology

http://conicyt.gob.ni/

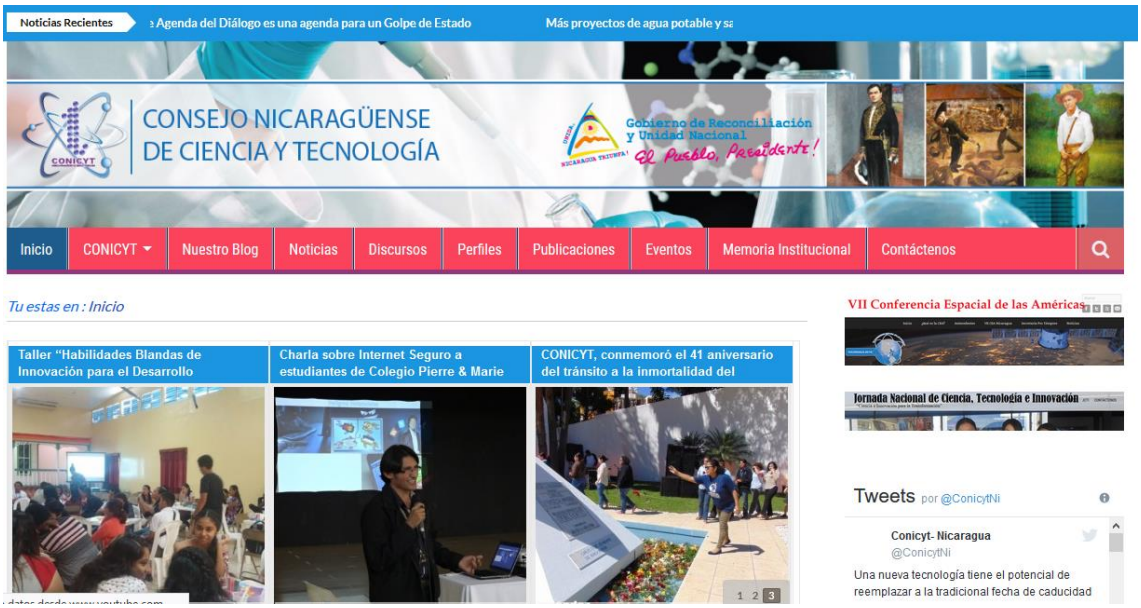


Figura No.76. plataforma Nicaragua

Fuente: recuperado de http://conicyt.gob.ni/

Plataformas tecnológicas en ciencia tecnología de Guatemala

National secretary of sciense and technology, agricultural sciense and technology institute ICTA. http://www.icta.gob.gt/; http://senacyt.concyt.gob.gt/portal/

Figura No.77. plataforma Guatemala

Fuente: recuperado de http://ncp.gt/

Plataformas tecnológicas en ciencia tecnología de Cuba

Cuban ministery of sciense and technology and environment, CITMA https://www.ecured.cu/Ministerio_de_Ciencia,_Tecnolog%C3%ADa_y_Medio_Ambiente_(Cuba)

Figura No.78. plataforma Cuba

Fuente: recuperado de https://www.ecured.cu/Ministerio_de_Ciencia,_Tecnolog%C3%ADa_y_Medio_Ambiente_(Cuba)

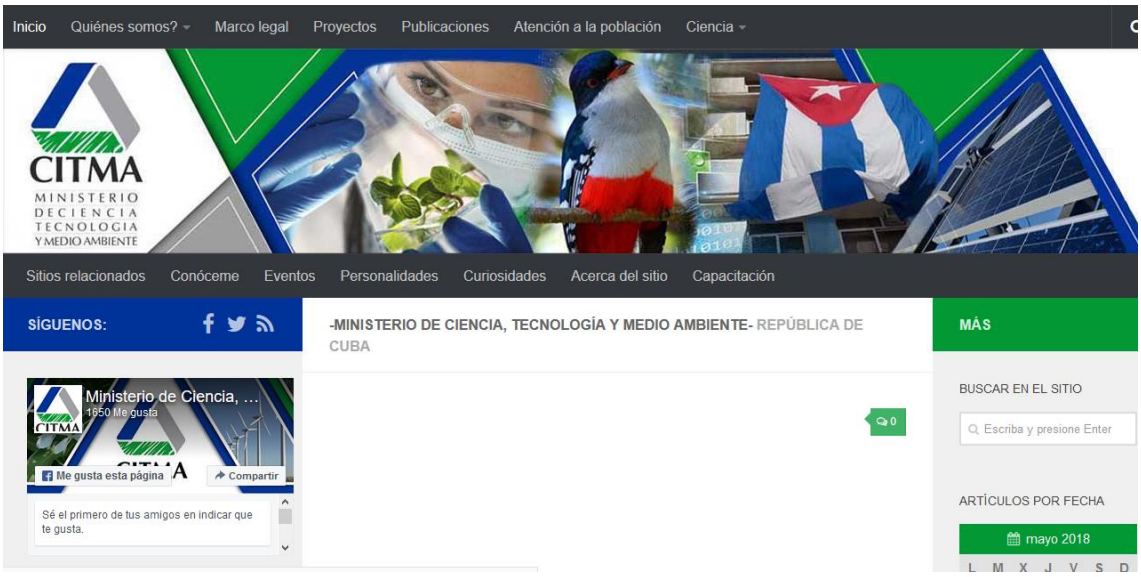


Figura No.79. plataforma Cuba

Fuente: recuperado de http://www.citma.gob.cu/

Plataformas tecnológicas en ciencia tecnología de República Dominicana

Ministery of higher education sciense and technology http://mescyt.gob.do/

Figura No.80. plataforma República Dominicana

Fuente: recuperado de http://mescyt.gob.do/

Plataformas tecnológicas en ciencia tecnología de Puerto Rico

Fideicomiso of sciense and technologic of researchhttps://www.cienciapr.org/es/tags/fideicomiso-de-ciencia-tecnologia-e-investigacion

Figura No.81. plataforma Puerto Rico

Fuente: recuperado de https://www.cienciapr.org/es/tags/fideicomiso-de-ciencia-tecnologia-e-investigacion

Countries Scientometrics Rankings and indicators

Rendon & Almanza (2015), identify the scientometrics as the appropriate way to determine the impact of the scientific research of a region. Ranking Scimago Instititions rankings, http://www.scimagoir.com/?top=10pc

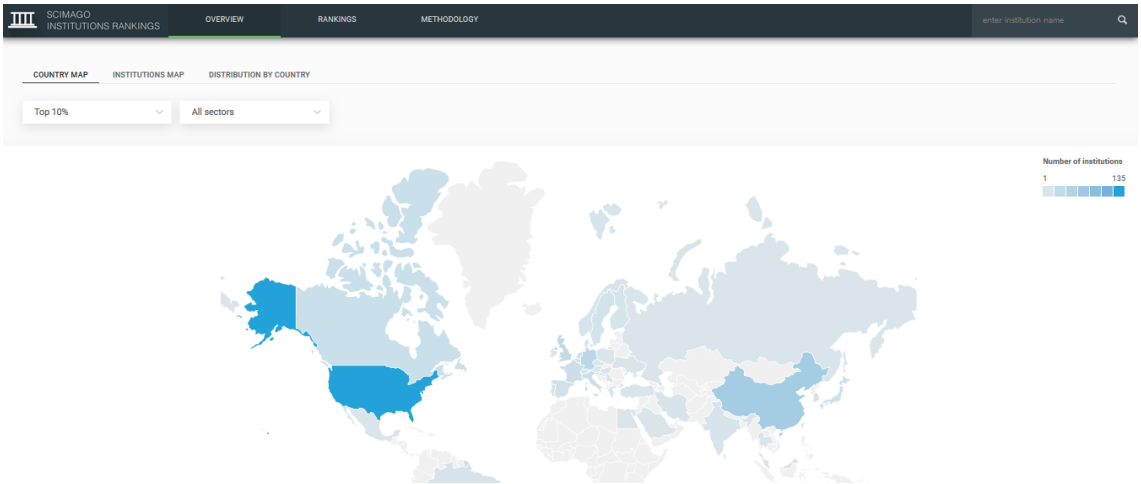


Figura No.82. Cienciometría de los países

Fuente: recuperado de http://www.scimagoir.com/?top=10pc

QS University Rankings: Latin America 2016 – a ranking of the 300 top universities in the Latin American region.

https://www.topuniversities.com/university-rankings/latin-american-university-rankings/2016

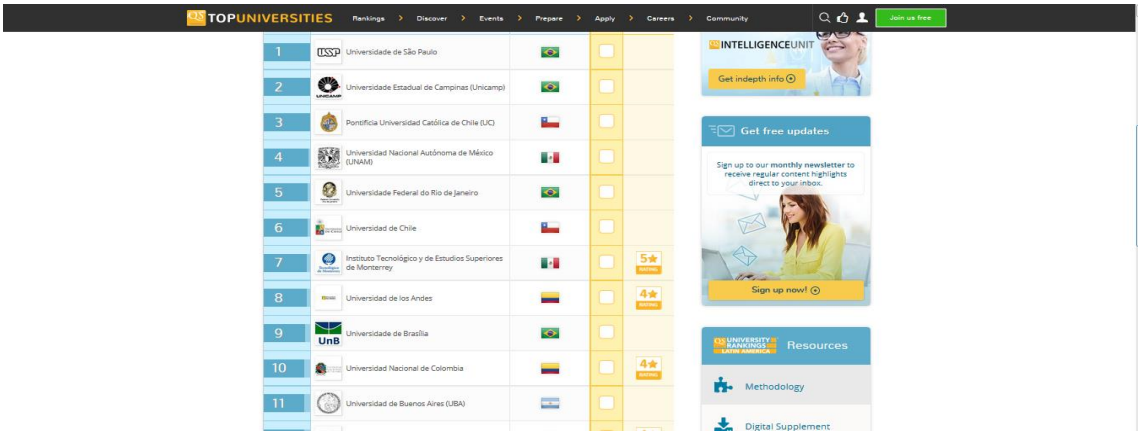
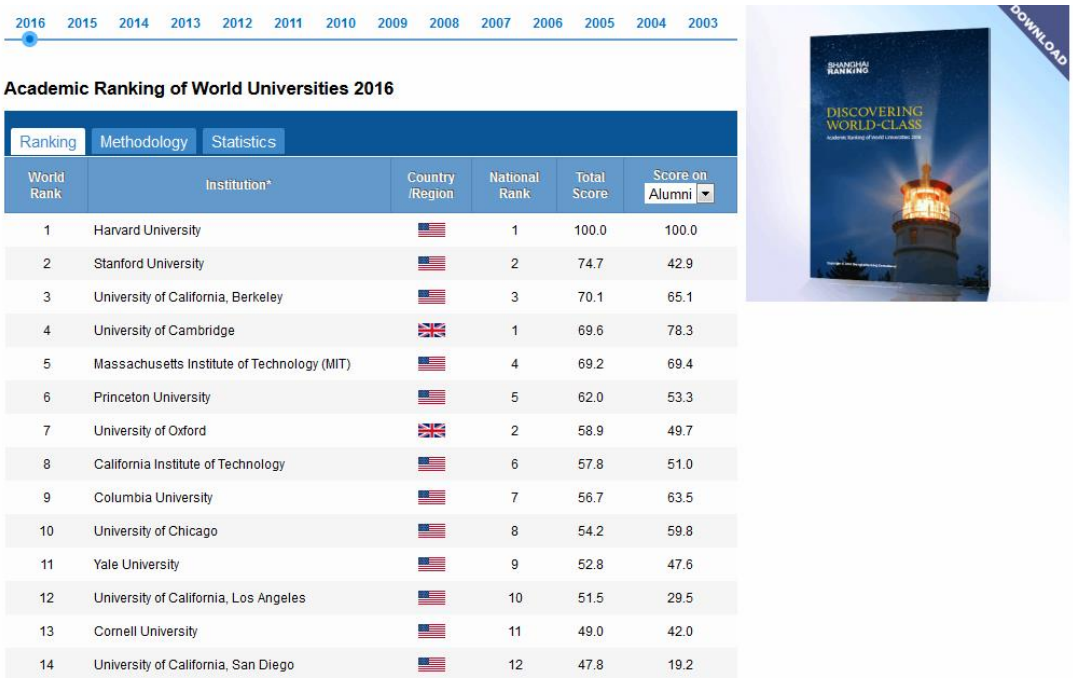


Figura No.83. University Rankings

Fuente: recuperado de https://www.topuniversities.com/university-rankings/latin-american-university-rankings/2016

Ranking de Shanghai, http://www.shanghairanking.com/ARWU2016.html;



World Rank	Institution*	Country /Region	National Rank	Total Score	Score on Alumni
1	Harvard University		1	100.0	100.0
2	Stanford University		2	74.7	42.9
3	University of California, Berkeley		3	70.1	65.1
4	University of Cambridge		1	69.6	78.3
5	Massachusetts Institute of Technology (MIT)		4	69.2	69.4
6	Princeton University		5	62.0	53.3
7	University of Oxford		2	58.9	49.7
8	California Institute of Technology		6	57.8	51.0
9	Columbia University		7	56.7	63.5
10	University of Chicago		8	54.2	59.8
11	Yale University		9	52.8	47.6
12	University of California, Los Angeles		10	51.5	29.5
13	Cornell University		11	49.0	42.0
14	University of California, San Diego		12	47.8	19.2

Figura No.84. Academic Ranking

Fuente: recuperado de http://www.shanghairanking.com/ARWU2016.html

According to José Joaquín Brunner (2014), a researcher from Chile who has generated great variaty research and academic processes for Latin America, Colombia has a decrease in almost 300% of the scientific production with international visibility, compared With its predecessor country Brazil, which is ten times lower in its investment and represents 50% of the scientific production of Latin America.

According to the UNESCO tool to verify the investment of PIB http://www.uis.unesco.org/_LAYOUTS/UNESCO/research-and-development-spending/?SPSLanguage=EN#!lang=es; This product presents data from the UNESCO Institute of Statistics (UIS), which is the only organism that generates internationally-benchmarked R & D and innovation indicators for countries of all levels of development. Data are compiled through international surveys and joint initiatives with regional organizations.

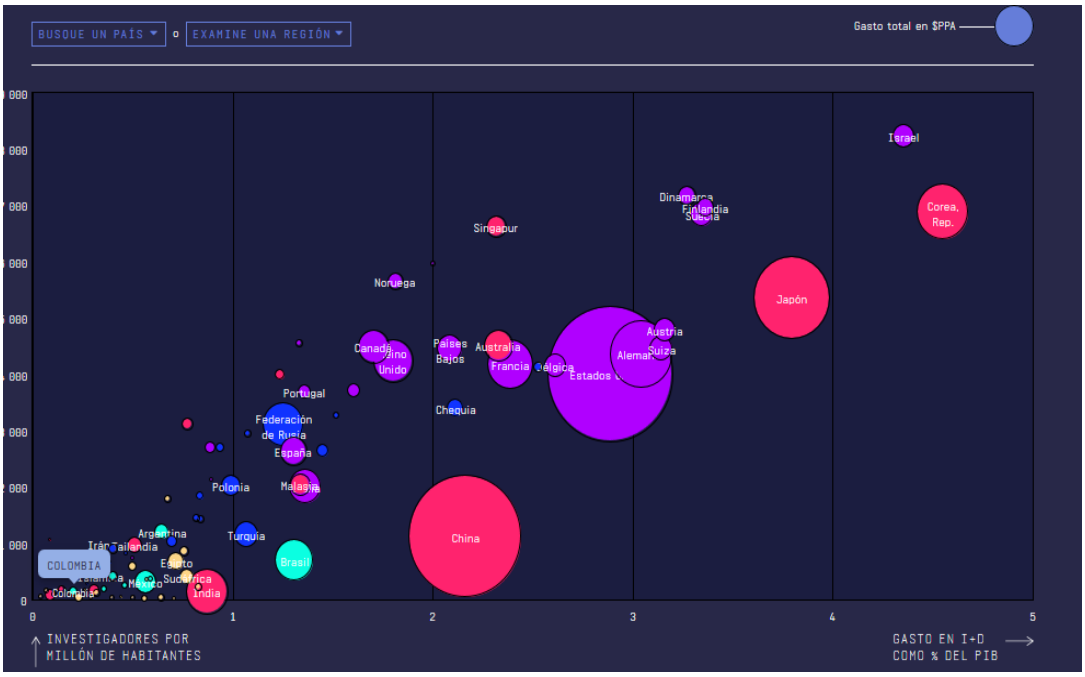


Figura No.85. Ranking de UNESCO

Fuente: recuperado de http://www.uis.unesco.org/_LAYOUTS/UNESCO/research-and-development-spending/?SPSLanguage=EN#!lang=es

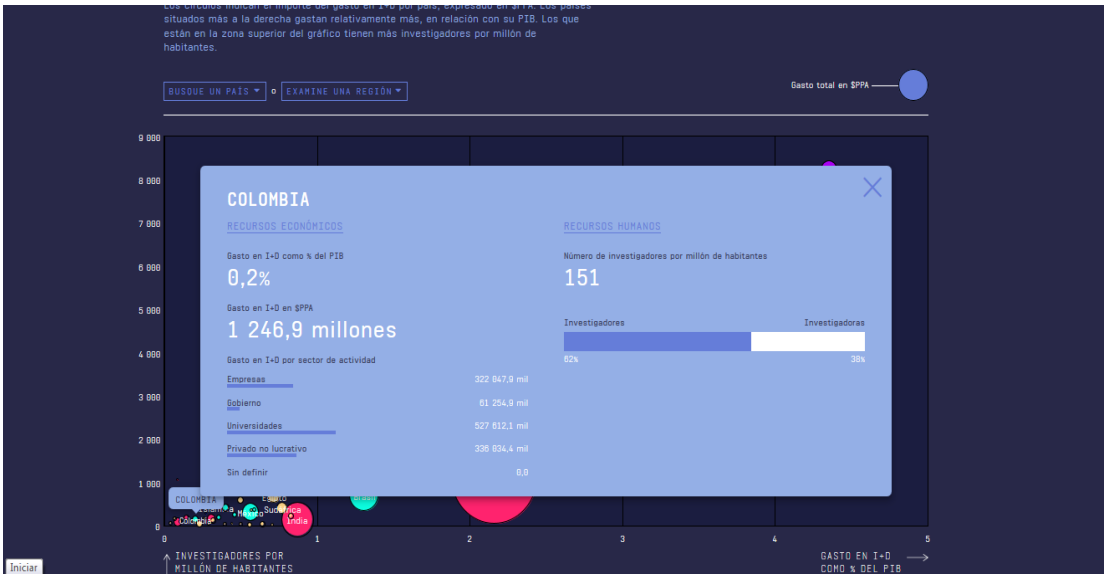


Figura No.86. Ranking de UNESCO Fuente: recuperado de http://www.uis.unesco.org/_LAYOUTS/UNESCO/research-and-development-spending/?SPSLanguage=EN#!lang=es

Gasto en investigación y desarrollo (% del PIB); http://www.indexmundi.com/es/datos/indicadores/GB.XPD.RSDV.GD.ZS/map/south-america

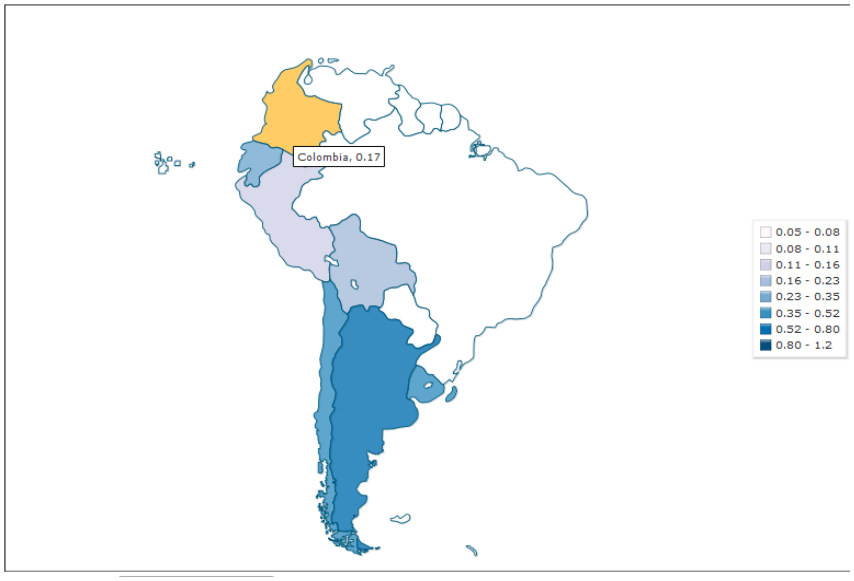


Figura No.87. INDEX MUNDI Fuente: recuperado de **http://www.indexmundi.com/es/datos/indicadores/GB.XPD.RSDV.GD.ZS/map/south-america**

Capítulo

3

Innovation and Productivity

Chapter 3.

Concepts of innovation, entrepreneurship and global technology

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In education, social sciences, e intercultural
Doctor in management and educative policies©
Innovation, research and technology advisor in

Innovation and productivity are two linked concepts to the development of countries in the world, from the generation of solutions to common problems, presenting science initiatives as it is argued in the document prepared by the consultants of Scientometrics and researching Consulting Group, who highlight the work that generates tacit knowledge and explicit knowledge of social processes, any incremental process linked to the concept of research, development and Innovation R & D + I.

Research as a basis for delivering procedures and approaches to the observed phenomena, the development proposed by an applied or located research and the innovation that can be generated with the experimental research, as it can be consolidated the Collaboration of the public concept and the development of applied governments, looking for the sustainable development that allows to improve and to present the value added from the expertise of the territory, generating products and services as the models of management and of Practicality, Geof Mulgan (2006), recognizes that Praxis establishes into innovation a motivation that relates activities and services from communities social needs, resulting in organizations with social goals marked that it will favor specific communities.

According to Mulgan, G., Tucker, S., Ali, R., & Sanders, B. (2007), there are components to be taken into account as: the social entrepreneurship generated in each context, the design that helps to understand the specific needs of the technologies and models to be applied, the Technology that will be adjusted to the development of alternatives that are required in these communities, becoming in new of public policy dynamics, cities with an

appropriate urban developments that can show the way, it must follow for large and small Cities, social movements and communities that generate a particular development that can be taken and reproduce in any coontext. (Social entrepreneurship, Design, Technology, Public policy, Cities and urban development, social movements, Community development).

On the other hand, the Stanford Social Innovation Review (2009), relates innovation to organizational productivity, seeking sustainability from the value created in the set of actions based on the society, achieving the greatest participation of Individuals, where each leader contributes in the construction of his model, making remarkable the management of multiple logics in alliances for the rising of social innovation, Westley & Antadze quoted in Volten, A., & de Fuentes, C. (2016) in his work on the management of Multiple logics in alliances for the rising up of social innovation (managing multiple logics in partnerships for moving up social innovation. European Journal of Innovation Management), recognize the particularities of the systemic approach, such as productivity and social innovation facilitate the understanding of products generated from routines and resources, with the identification of their Social dynamics, respect for the social and common beliefs, the durability and the wide range impact that the understanding of their subsystems can provides.

Von Neuman Bertalanfy (1955), in his work on the organismic view on the theory of evolution, recognizes entropy, Nega-entropy, synergy and interactions of social systems as a phenomenological approach when these ones are interpreted achieves a community can Present their social alternatives marked from the real need ensuring that relevant developments, which ones can become components of higher production.

De acuerdo con las definiciones sobre innovación de la Comisión Económica para América Latina y el Caribe CEPAL (2014), la innovación fomenta la interacción de las comunidades, invitando al contexto para que establezca los lineamientos de innovación necesarios que desde su origen sean garantes de un éxito previo, partiendo del fortalecimiento de las cadenas de valor, mejorando los canales de distribución existentes, pero con productos y servicios desde la necesidad llamados a la medida, logrando una productividad adecuada, reconociendo variables generadas con el análisis de su historia, no es fomentar el

consumismo, si no gestionar el conocimiento con la participación científica y académica, obligando a la definición de índices sintéticos relacionados con la economía y su relación con la productividad, buscando que los beneficiarios reales aporten al desarrollo de la región.

Taking into account the Economic Commission for Latin America and the Caribbean (ECLAC) (2014) innovation definitions, innovation encourages the interaction among communities, inviting the context to establish the necessary innovation guidelines, From the beginning they are guarantors of a previous success, starting from the strengthening of the value webs, improving the existing distribution channels, but with products and services from the real communities necessities called to the measure, achieving an adequate productivity, Recognizing variables generated with the analysis of its history, it is not to promote consumerism, it just that to manage knowledge with scientific and academic participation, forcing the definition of synthetic indexes related to the economy and its relationship with Productivity, looking for the real contributions and developments of the region.

This position leads to get short, medium and long-term results, social innovation, governance and community building. SINGOCOM (2003), relates this phenomenon to the impact on governance and local development, as government agencies contribute to social inclusion from local reading, such as management and power relations with a look Specific look for equity and social justice, which articulated give to the political leader's inputs and insights to make their management a bastion of social and applied development.

Innovation and productivity are necessary for the territory, should be based on the generation of knowledge which achieves an exchange, whether cultural, political, economic and social, establishing scenarios for the social appropriation of knowledge, which From the use of specific knowledge, grouped by the large areas and sub-areas articulated in the Organization for Economic Cooperation and Development-OECD, articulated in the Oslo Handbook for the collection and interpretation of innovation data, and the Frascati Manual on the measurement of scientific and technological activities.

All that allows the dialogue of knowledge in science, technology and innovation, involving vulnerable sectors with opportunities to promote from the base of the pyramid,

initiatives, capacities that achieve a direct approach to the problem, seeking Always the human development, its social well-being, improving the conditions of quality of life, solving problems of basic necessities.

All this allows social inclusion, fostering from the practice an ancestral learning that achieves a collective construction of knowledge that will facilitate generating the social capital that the context really should apply, the innovation part of focusing the Current practices, improving their processes, the management models, the products and services, making the solution of problems effective, interpreting the systemic changes, allowing a social transformation, making sustainable, allowing the replication of Good practices achieving scalability, viable models that exchange and transfer knowledge; From being, what you have, how you interpret it, how you we look for it; Doing, what is the appropriate means to achieve it, how much should be invested, which agents should participate; The knowledge, what are the necessary characteristics, which are the experts that in the first instance contribute to this purpose, how it is achieved its impact, its proper behavior, what commitments are generated with this applied knowledge.

El modelo de *The Young Foundation, Nesta Innovating Public Systems* (2010), sobre la innovación social como modelo de desarrollo y productividad para regiones específicas, permite establecer los pasos necesarios para lograr un avance en la innovación, desarrollando la estrategia denominada la **espiral de la innovación social**, la cual logra hacer de los retos y oportunidades una puesta que a través de la evaluación de propuestas coherente, con la mirada y validación de los estamentos, logra la experimentación adecuada.

Cómo hacer de este modelo un enfoque sostenible con posibilidad de ampliación y escalabilidad, siempre buscando que estos modelos cuenten con entornos favorables para el desarrollo en cada país donde se implemente, buscando comprometer a los ciudadanos, comunidades, sector público y privado, sector social, logrando la articulación de enfoques y acciones que logren dinamizar las estrategias, siempre inicia con el reconocer las potencialidades locales y como se desarrollan estas en pro del mejoramiento de la sociedad.

The model of the Young Foundation, Nesta innovating Public Systems (2010), on social innovation as a model of development and productivity for specific regions, allows to establish the necessary steps to achieve a progress in innovation, developing the Strategy called the spiral of social innovation, which manages to make the challenges and opportunities a setting that through the evaluation of proposals coherent, with the look and validation of the classes, achieves the appropriate experimentation.

How to make this model a sustainable approach with the possibility of enlargement and scalability, always looking for these models to have favorable development environments in each country where it is implemented, seeking to engage citizens, communities, Public and private sector, social sector, achieving the articulation of approaches and actions that manage to dynamize the strategies, always starts with the recognition of the local potentialities and as they develop these in favor of the improvement of the society.

Innovation can be applied to several fields, in this case, the focus is placed on companies, that is why to define the concept of innovation, Peter Drucker, who is considered one of the most important theorists in business administration, in his article The Discipline of Innovation (2000), defines it as "the effort to create an intentional change focused on the economic or social potential of a company" (Drucker, 2000), considered that rarely an innovation arose from a flash of inspiration and that by the Contrary, it was in the light of a cold analysis of seven types of opportunities, four of them exist within the companies which are: unexpected events, inconsistencies, process needs and sectoral and market changes. The other three are outside of the same in the social and intellectual environment and correspond to demographic changes, perception changes and new knowledge.

An important argument according to Rodríguez, A., Nieto, M. J., & Santamaría, L. (2018), it is given in international collaboration and innovation in intensive professional and technological knowledge Services (international collaboration and innovation in professional and Technological knowledge-intensive services), recognizing external opportunities, on the other hand, begin with demographic changes; These have not been taken into account even

by the more developed countries, but they are important and can be determined by the social and economic conditions of the population in the long term. followed by changes in perception; These do not alter the facts, but they do change their meaning, if one understands the importance of handling the emotions when innovating there is a great ground fertilized and finally an innovation based on a new knowledge.

Presentation of OECD Business Innovation manuals

Innovation is a common statistical issue in the world powers, its data allow the Scientometrics look at the state in which the nations are, observing and measuring the progress in each aspect, in the member countries of the Organization for the Economic Cooperation and Development (OECD), however, if there are guidelines within the Oslo Handbook, which was given thanks to the Frascati manual.

The Frascati Manual published for the first time in 1963, deals exclusively with the measurement of human and financial resources devoted to research and experimental development-R & D (OECD, 2002). Research and development are economic activities, however, they have some characteristics that differentiate them from the large family of scientific and economic activities of which they are part, so the OECD articulates the Frascati Manual dealing To meet the specific needs identified. He published four more manuals to deepen the activities related to R & D, such as the innovation present in the Oslo Handbook.

According to the Oslo Handbook (2006), in the 1980s and 90s a considerable workload was devoted to the development of analytical models and frameworks for the study of innovation, the first experimental surveys were applied and the results obtained and the need for a coherent set of concepts and tools, led in the year 1992 to the first edition of the Oslo Handbook, which deals essentially with technological innovation of products and processes in the manufacturing sector (TPP).

This handbook had a great impact and became a benchmark for large-scale surveys aimed at examining the nature and incidences of innovation in the business sector, the second edition of the Handbook published in 1997 broadened the definition of Concepts and methodology, integrating the experience gained on the occasion of the surveys, the progress of innovation, as well as a wide range of sectors.

It has improved the guidelines to be followed to improve innovation indicators. The first and second editions used the definition of the concept from the technological perspective of the process and the product, this meant a very superficial focus on the technological development of new products and new production techniques for the Companies, therefore the discussion on organizational and non-technological innovation was included in an annex, which gave way to the next version.

The third edition of the Oslo manual published in the Year (2006), it is inspired by a considerable amount of data and experiences acquired through the Oslo handbooks of the years 1992 and 1997, this expands the framework of innovation measures in three ways: First, it emphasizes the role of links with companies and institutions in the innovation process. Second, it takes into account the importance of low-intensity R & D sectors such as services and industries with scarce technological content. Third, the definition of innovation is expanded in order to include two additional types. Organizational innovation and marketing innovation.

The organizational innovation in the services is given in an informal way, with an incremental and technological nature, in order to configure a framework in which this wide range of services is better accommodated, the innovations in this field influence Considerably in the results of a company, since they improve the quality and efficiency by favoring the exchange of information and to equip the companies with greater capacity of learning and of use of new knowledge and technologies. Innovation in marketing implies the start of new marketing designs in order to improve the needs of consumers, to open new markets or to position a company's products by increasing sales.

Besides the sectors covered in the Oslo Handbook, it is important to take into account that this focuses mainly on the collection of data on innovation in companies: [...] does not cover important changes at the level of a sector of activity or in an economy, such as the emergence of a new market, the development of a new source of raw materials, semi-manufactured products or the organization of an industry. However, in some cases adding data from individual companies will be possible to establish estimates of large changes in an industry or an economy. (OECD, 2006, p. 23).

The manual defines four types of innovations: product, process, organizational and marketing as mentioned. Product innovation refers to when introducing a new good or service, or significantly improved in its characteristics or use, this definition includes the improvement of functional attributes.

Process innovation is the introduction of an improved or new process, this can be aimed at lowering costs, improving quality or distributing new or improved products, this innovation includes, for example: the ability to implement new Automated equipment in the manufacturing chain or installation of a computer-aided design for the development of a product.

A marketing innovation, implies the commercialization of a new method that generates significant changes in the design, packaging, positioning, promotion or rate of a product, orienting itself to satisfy the necessities of the consumers, to open New markets position a product in order to increase sales in a company. It must be a new marketing method for the company.

Finally, an innovation of organization is the introduction of a new organizational method in the practices, the organization of the place or the external relations of the company, can aim to improve the results of a company by reducing the costs Administrative or transaction improving the level of job satisfaction thus increasing productivity.

The manual also discusses the objectives and effects of introducing an innovation, "the objectives can refer to products, markets, efficiency, quality or aptitude to learn and introduce changes" (OECD, 2006, p. 123), by This is useful to identify the reasons why that companies have to innovate, they can succeed or not by implementing the different types of innovation, in addition they can have unexpected or additional effects of what had been raised, at the end of the Application of innovation or innovations through surveys, it is recommended to collect data on initial objectives and the effects produced, these data are quite useful to implement improvements, the surveys they use in the Oslo manual are made With questions from different areas of a company, such as costs and employment.

Companies also have obstacles to implementing innovations, such as economic factors such as high costs or insufficient demand, lack of qualified personnel or knowledge, legal factors; such as regulation or taxation, lack of infrastructure; Especially in the remote regions, for all these drawbacks that can be presented, it is recommended to gather data on the barriers to the innovation activities

An advice given in the Oslo manual, which greatly benefits companies, is to use methods of protection for their innovations, they can be formal as: patents, model registries, trademarks, confidentiality agreements and secrets. Commercial or may be informal as: Secrets not covered by legal agreements, complexity of product design, advantage in the time of introduction in relation to competitors.

However, at the end of the manual, the annexes propose guidelines for the elaboration of surveys in the different developing countries, recognizing the effort that took place in the region by creating in the year 2001 the Bogotá Handbook. It is said that in terms of the size and structure of markets and companies in developing countries there are common mistakes such as basing competitiveness on the exploitation of resources and on cheap labor, rather than on the efficiency or differentiation of products, this condition leads to an informal innovation organization and a limited number of research and development projects.

It is also talked of the innovation landscape in developing countries, including:

Macroeconomic uncertainty, instability, physical infrastructure (lack of basic services such as electricity or "outdated" communication technologies) institutional fragility, lack of social awareness of innovation, Business aversion to risk, shortage of entrepreneurs; The existence of barriers to the creation of companies, the absence of political instruments aimed at supporting companies and training in management. (OECD, 2006, p. 157).

It also touches on the issue of instability in micro and small enterprises because they are deprived of resources and support for innovation, also of the informal nature, because economies are based on casual practices and that context is not conducive to Innovation, the environments are not the most suitable for the company, since there is a predominance in companies of the state or powerful public institutiones, where the absence of competition discourages the innovation.

There is also a reduced power in decision-making with regard to innovation, it must be taken into account that most of the technology is coming from abroad especially from multinational companies which limits what local companies can do, In addition to this there are weak systems of innovation, the resources that are destined for these activities are insufficient and this generates a reduction in the potential of innovation that could have a company, another thing is that the flows of information within the National systems are discontinuous, this can be evidenced in the present work in which they had to resort to several sources in English, because the information has not been passed into Spanish, which can mean a gap for some people who do not find these Documents in your language and therefore do not read them, even though they intend, the barriers to the accumulation of capacities by the company are representative and difficult to overcome, especially those that refer to the qualified human capital, to the links Local and international and tacit knowledge that is incorporated into the usual organizational practices.

How to visualize and how to measure these advances in innovation and their relationship with productivity.

There are different platforms to access the measurement of innovation, its advances and its relation to productivity, within which will have year to year will explain some aspects that consultants Scientometrics recommends obtaining information for the Decision-making in countries that require it. The first is the Global Innovation Index annual report that airs from the Global Innovation Index infographic (© World Intellectual Property Organization WIPO 2012. Conception: Largenetwork). This index measures the degree of integration of innovation with the political, business, social, business-related scenarios, the Director General of WIPO, Francis Gurry, "The index contains a series of indicators that help to continuously evaluate the Innovation and the results of innovation policies. "

Mr. Gurry further emphasizes that "intellectual property stimulates investment in research and encourages innovators to be able to have a defined framework that allows them to trade with their intangible assets and to profit from the fruits of their innovation", the Global Innovation Index 2017 measures the results of 127 countries in terms of innovation, highlights the global nature of innovation and demonstrates that its capacity to support national economic development is often limited by deficiencies in, for example, Human capital, infrastructure or the degree of market development highlights once again the continuing gap in innovation between high-income economies and low-and middle-income economies, but offers promising prospects .

Global Innovation Index 2017 rankings

Country/Economy	Score (0–100)	Rank	Income	Rank	Region	Rank	Efficiency Ratio	Rank	Median: 0.62
Switzerland	67.69	1	HI	1	EUR	1	0.95	2	
Sweden	63.82	2	HI	2	EUR	2	0.83	12	
Netherlands	63.36	3	HI	3	EUR	3	0.93	4	
United States of America	61.40	4	HI	4	NAC	1	0.78	21	
United Kingdom	60.89	5	HI	5	EUR	4	0.78	20	
Denmark	58.70	6	HI	6	EUR	5	0.71	34	
Singapore	58.69	7	HI	7	SEAO	1	0.62	63	
Finland	58.49	8	HI	8	EUR	6	0.70	37	
Germany	58.39	9	HI	9	EUR	7	0.84	7	
Ireland	58.13	10	HI	10	EUR	8	0.85	6	
Korea, Rep.	57.70	11	HI	11	SEAO	2	0.82	14	
Luxembourg	56.40	12	HI	12	EUR	9	0.97	1	
Iceland	55.76	13	HI	13	EUR	10	0.86	5	
Japan	54.72	14	HI	14	SEAO	3	0.67	49	
France	54.18	15	HI	15	EUR	11	0.71	35	
Hong Kong (China)	53.88	16	HI	16	SEAO	4	0.61	73	
Israel	53.88	17	HI	17	NAWA	1	0.77	23	
Canada	53.65	18	HI	18	NAC	2	0.64	59	
Norway	53.14	19	HI	19	EUR	12	0.66	51	
Austria	53.10	20	HI	20	EUR	13	0.69	41	

For the analysis of the same one should take into account the region to which the country belongs, example World Bank Income Group Classification (July 2016): LI = Low income; LM = lower-middle income; UM = upper-middle income; and HI = High income.

Regions are based on the United Nations Classification: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia, East Asia, and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.

Example of data provided, rank income rank Region rank efficiency Ratio rank median: 0.62 Colombia 34.78 65 UM 16 LCN 5 0.52 100 Bahrain 34.67 66 Hi 44 NAWA 9 0.56 88 Uruguay 34.53 67 Hi 45 LCN 6 0.59 82 Georgia 34.39 68 um 17 NAWA 10 0.63 60 Brazil 33.10 69 um 18 LCN 7 0.52 99 Peru 32.90 70 UM 19 LCN 8.

people can perform the analysis and explore the interactive database of the indicators of the GDI 2017, you can select from the platform which is available in the link https://www.globalinnovationindex.org/analysis-indicator, in the articulated countries, the Which are measured according to the innovation indicators for products from the index of global innovation, the quotient of the efficiency of the innovation, the subscript of entry of innovation, the subscript of the output of the innovation, which is measured articulated by categories Q The EU when analyzed independently in each country generates a score, these related variables are:

Institutions that develop science and technology, their political environment, political stability and the absence of violence/terrorism important measurement factor due to the impact on productivity and development, the environment Regulation of Government effectiveness, regulatory quality, rule of law, redundancy cost, business environment, ease of starting a business, ease of resolving insolvency, ease of payment of taxes.

Human Capital and research, education, expense on education, public expense on education per pupil, secondary education verifies school life expectancy or desertion, the

possibility of non-link, evaluation in reading, mathematics and Science, student-teacher ratio, tertiary education, tertiary enrollment, number of graduates in science and engineering, tertiary-level entry mobility, research and development (d), researchers, gross D-expenditure (GERD), the Global D companies, average expenses top 3 Ranking of the university QS, score media Top 3 universities.

C. Infrastructure, information and communication technologies (ICT), ICT access, ICT use, online government service, online E-participation, general infrastructure, electricity output, logistical performance, gross capital formation, ecological sustainability, GDP per unit of energy consumption, environmental performance, environmental certificates ISO 14001.

b) Sophistication of the market, credit ease of obtaining credit, domestic credit to the private sector, portfolio of list of loans of the micro-financial institutions. Investment, facility to protect minority investors, market capitalization, venture capital offers, trade, competition and market scale, applied tariff rate, weighted average, local competition intensity, market scale Internal.

E. Business sophistication, knowledge workers, employment in knowledge-intensive services, enterprises offering formal training, GERD conducted by Business Enterprise, Gerd funded by the business enterprise, women employed with degrees Advanced, innovation links, University/industry research collaboration, cluster development status, Gerd foreign-financed, joint venture/strategic alliance agreements, patent families filed in at least two offices, knowledge absorption, intellectual property payments, high-tech imports, ICT services imports, foreign direct investment, net entries, research talent in business enterprise

Knowledge and technology products, knowledge creation, patent applications by origin, international applications PCT by Origin utility model applications by origin, scientific and technical publications, quotable documents H Index, Knowledge impact, GDP growth rate per person involved, new business density, Total computing expenses, ISO 9001 quality certificates, high-tech and high-tech output, dissemination of knowledge, receipts of

Intellectual property, high-tech exports, ICT services exports, foreign direct investment, net flows.

Creative outputs, intangible assets, brand-Name application class count by origin, industrial designs by origin, ICT and creation of business models, ICT and creation of organizational models, creative goods and services, exports of services Cultural and creative, national feature films produced, World market for entertainment and media, print and release, creative goods exports, online creativity, generic top-level domains (gTLDs), Level domains Country Code Superior (ccTLDs), Wikipedia annual editions, video uploads on YouTube.

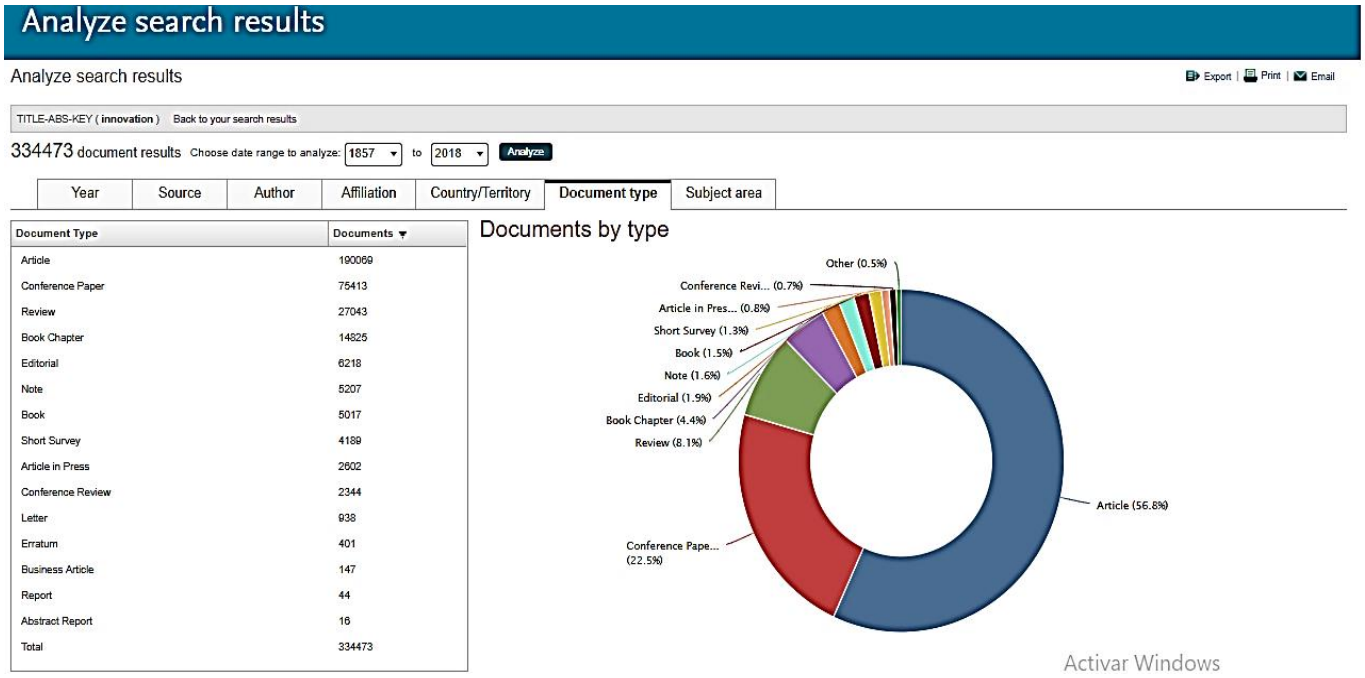


Figura No. 91. Analysis search results documents by type
Fuente: recuperado de https://www.scopus.

Other ways of adapting and measuring the advances provided in the available categories where innovation and productivity of the countries make a articulation and generate the appropriate statistics is given in the specialized databases such as Scopus, SCIMAGO, Clarived, Ednote, ORCID, Thomson Reuters, innovation and science observatories.

Innovation Visibility with Scopus

Scopus, as a mega database, allows for Scientometrics consultants the respective advance in the consultation, allowing to reference rapid metrics of impact of the generated research, allowing the discussions around each metric, its subsidiary, Authors, countries or regions where the journals are located, SCImago jorunal Rank (JRS) provides relevant information for the analysis of applied Scientometrics in the case of innovation, quality and reputation of the journal have a direct effect on the value of a subpoena. JRS also normalizes for differences in citation behavior between the topic fields. In addition, JRS is calculated by SCImago Lab and developed from Scopus data.

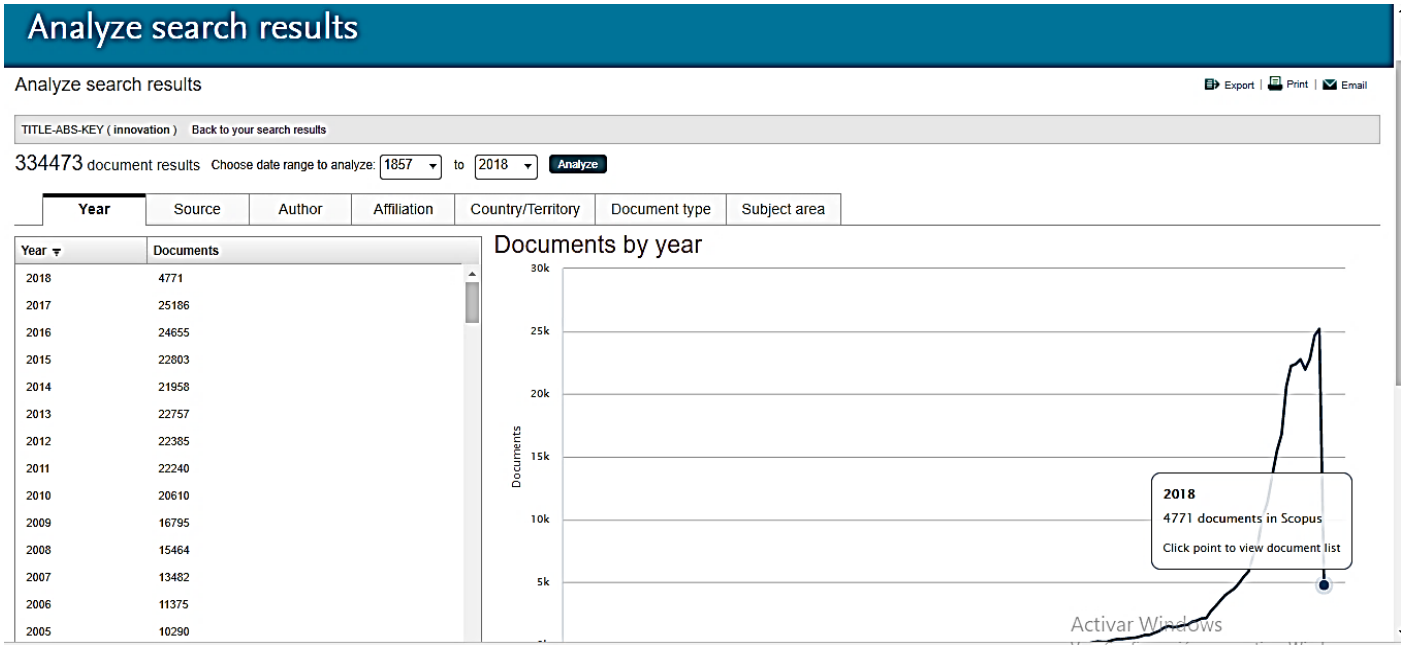


Figura No. 91. Analysis search results documents by type
Fuente: recuperado de https://www.scopus.

Figure 91, allows us to compare and observe the values of JRS for selected titles over time and compare the titles with each other, level of use, level of citation.

This figure can help answer questions like: Is there a diary that seems to be on the rise? ' or ' is the diary with the highest upward trend value, maintaining or appearing to be declining?

the graphics give a little more visual insight into the measurements over time compared to a table or a singular value.

You can even get closer in to see a smaller window of time. Note: You can also compare titles based on other metric values, such as SNIP (standard impact source by paper) and CiteScore.

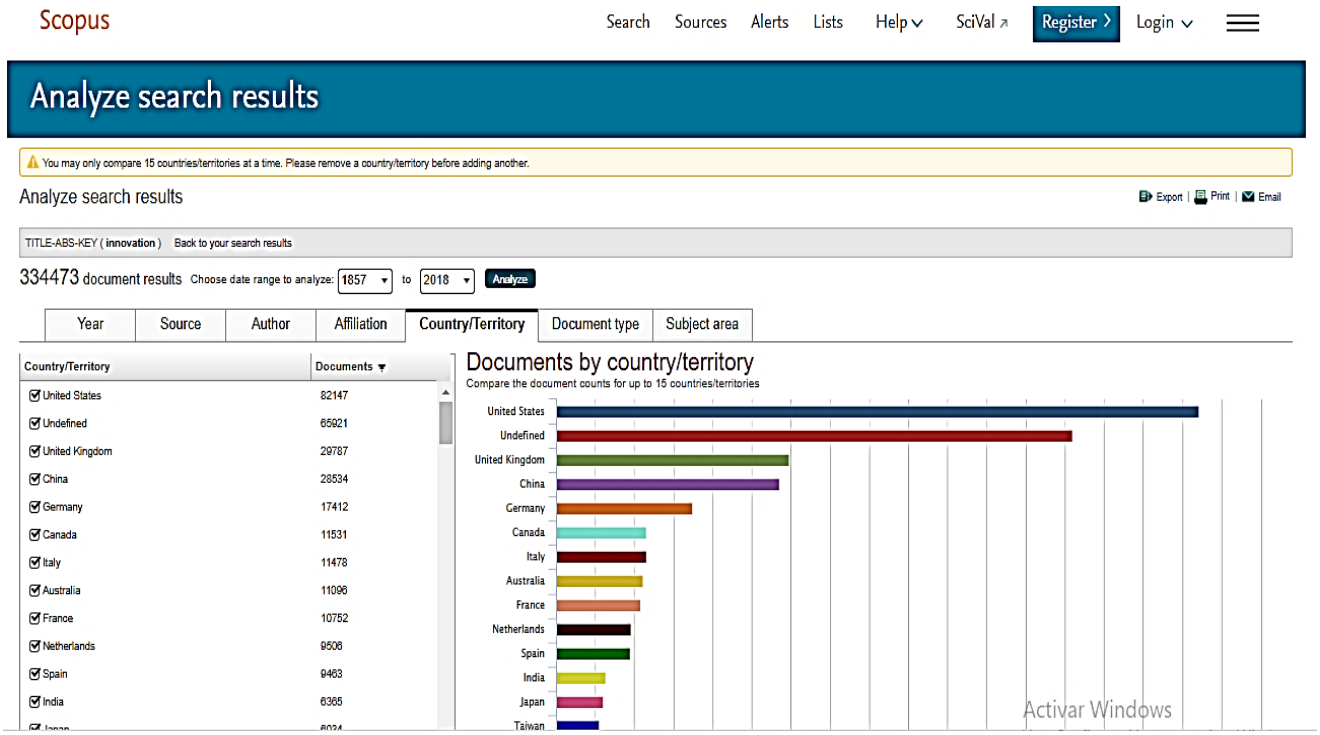


Figura No. 92. Analysis search results documents by country /territory
Fuente: recuperado de https://www.scopus.com

For the specific scientometrics it is important to recognize the place of origin and its statistics, figure 92 recognizes which are the countries that refer trends with greater application of the innovation in the world, it relates the country and what is the number of documents Published, the JRS values outside the platform Scopus and JournalMetrics.Scopus.com.

JRS is a metric available to the public and can also be achieved outside the Scopus platform, you can explain this procedure on the platforms:

Https://www.Elsevier.com/Solutions/Scopus/Features/Metrics

http://www.scimagojr.com/journalrank.php

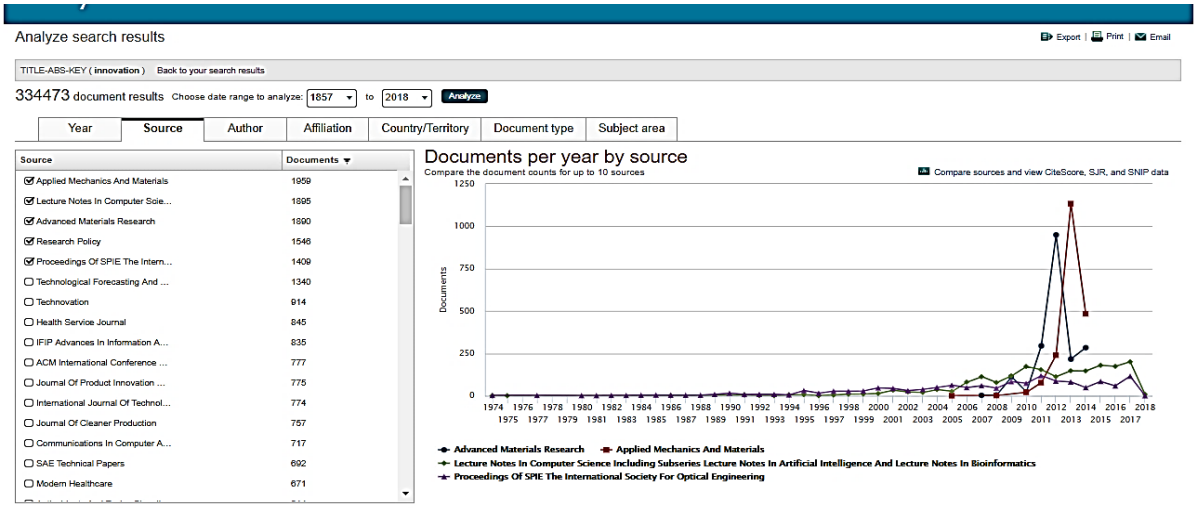
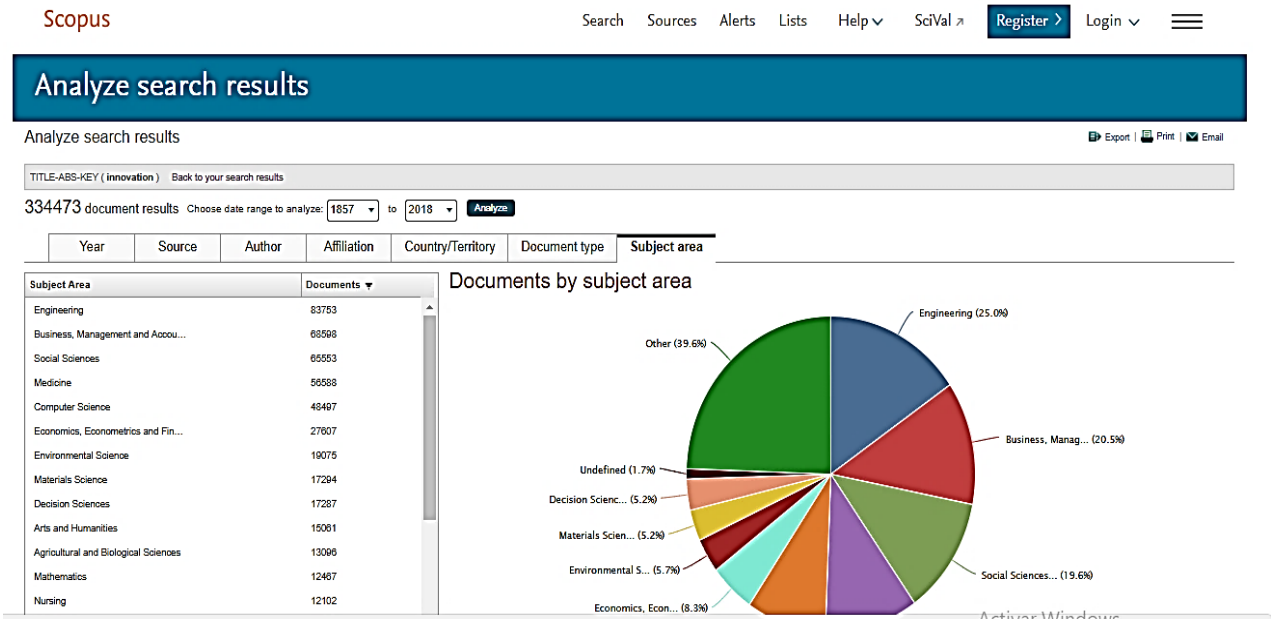


Figura No. 93. Analysis search results per year by source
Fuente: recuperado de https://www.scopus.com

Scopus, as a platform for Scientometrics, provides a distribution of frequencies that shows what are the areas that reflect their progress, figure 93 allows to relate by year and by resource, achieving that the meta bases is achieved to respond to each aspect that Achieve decision making.



Important to recognize that the specific sub-areas give us a particular relationship of where the greatest development is, however, it is crucial to achieve a visual approach, figure 94, which relates to where innovation advances are most pertinent and as It's their relationship to productivity.

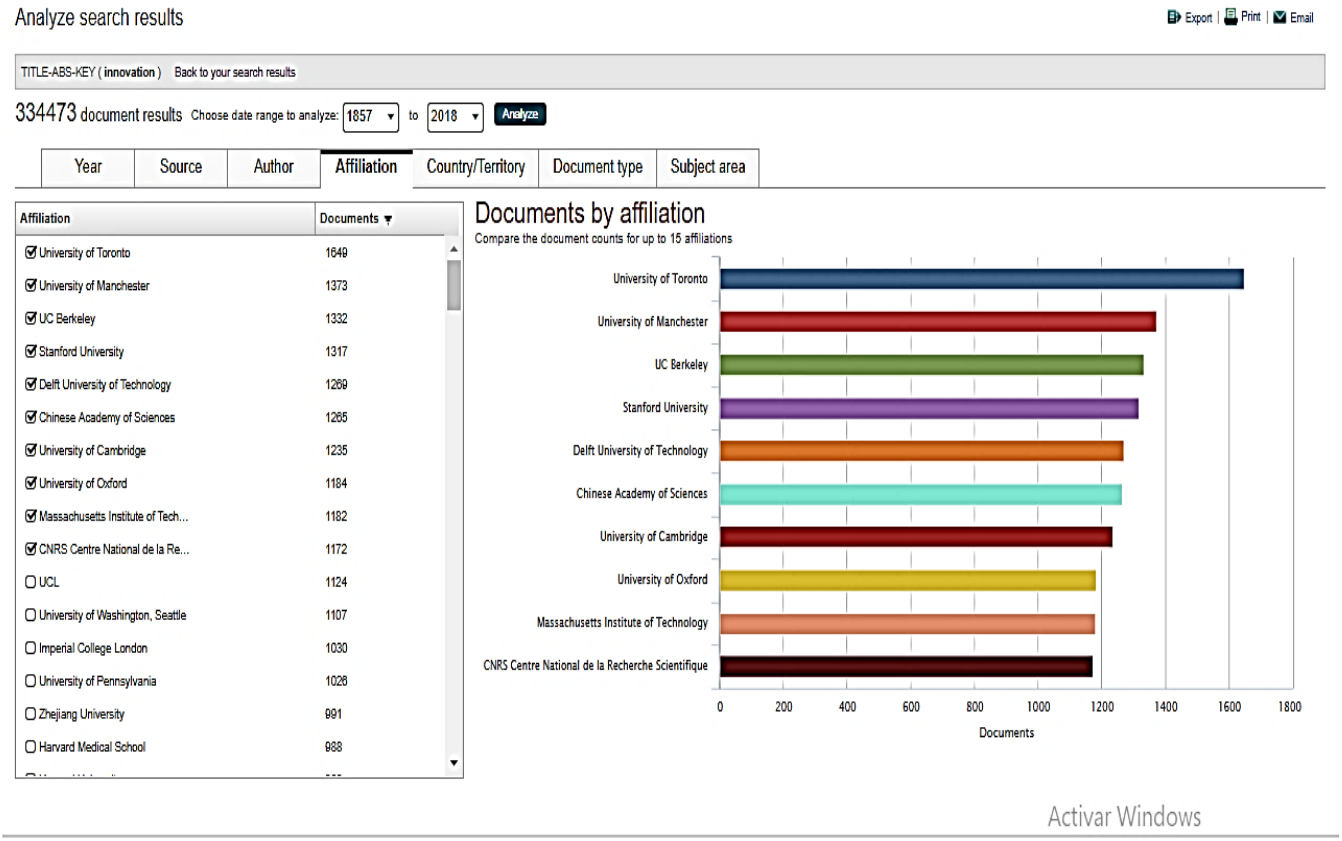


Figura No. 95. Analysis search results by subject area
Fuente: https://www.scopus.com

Figure 95, recognizes which are the institutions where you can refer to the importance of the development of innovation, these universities or research centers are recognized by their prestige and their contributions to the frontier of knowledge, Universities that are in the rankings QS, Shanghai, sapiens.

Shape of Science

The form of science is a project of visualization of information whose objective is to reveal the structure of science. Its interface has been designed to access the Bibliometric indicator database of the SCImago Journal & Country Rank portal.

The form of science shows a very intuitive image of the interconnection of the different thematic areas by the position of the journals. Individual journal profiles can be accessed from this interface. Hassan-Montero, Y.; Guerrero-Boat, V.; Moya-Anegón, F. (2014). Graphical interface of the SCImago Journal and Country Rank: An interactive approach to access the Bibliometric information. The information professional, May-June, v. 23, N. 3, pp. 272-278.

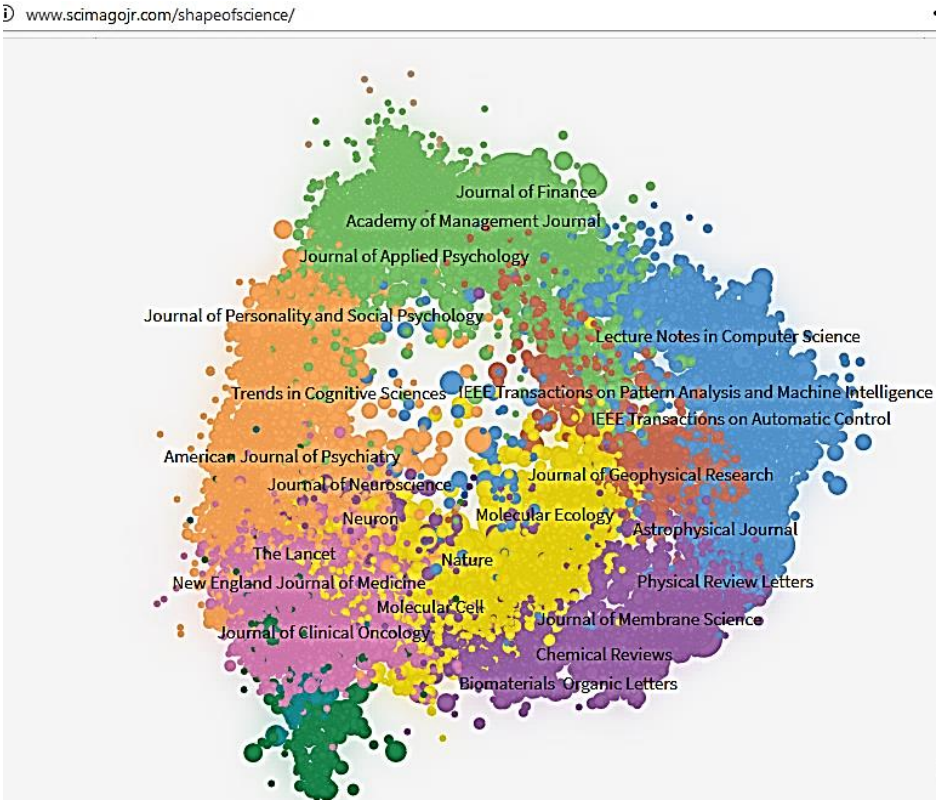


Figura No. 96. Analysis shapeofscience
Fuente: https://www.scimagojr.com/shapeofscience/

The journals found in the analysis of Figure 96, are given from the level of concentration that science represents in the case of innovation which are the most specific areas, as can be based on the concentration maps to focus the levels of adaptation In shapeofscience set the recognition parameters.

Elsevier's Scopus partners with CWTS and SCImago to offer a multi-dimensional assessment of the metric research journals to be powered by Scopus and freely available online with Elsevier, a leading global publisher of products and services Scientific, technical and medical information, its flagship product Scopus, has been successfully associated with the Center for Science and Technology Studies (CWTS) and the SCImago research group, endorsing two metrics of complementary journals, SNIP and SJR.

The metrics available free of charge online at www.journalmetrics.com, and integrated into Scopus, allowing researchers from around the world to analyze journals within the Abstract and Citation database.

SNIP, which represents the normalized impact of the source by paper, measures the impact of the contextual citation of a journal and was developed by CWTS. It allows the direct comparison of journals in different thematic fields, by counting the frequency in which the authors cite other documents, the speed of maturation of the impact of the citation, and the extent to which the database covers the bibliography of the field.

SJR is synonymous with SCImago Journal Rank, and was developed by the SCImago research group. It is a measure of the scientific prestige of the academic sources: value of the citations weighted by document. A magazine transfers its own prestige, or status, to another through the act of quoting it. In effect, this means that a citation from a source with a relatively high SJR is worth more than a citation from a source with a lower SJR.

Put SNIP and SJR side by side and apply them to the breadth and depth of the Scopus database, which covers the largest number of journal titles including local language titles from developed and emerging countries, the inclusive bibliometric analytics available to The papers. Its integration helps to meet the evolutionary needs of the scientific community by providing current, flexible and transparent data to empower users to build their own custom journal ranking systems.

Elsevier

Elsevier is a global information analytics business that helps institutions and professionals promote health, open science and improve performance for the benefit of humankind. Elsevier provides digital solutions and tools in the areas of strategic research management, clinical decision support, and professional education; including ScienceDirect, Scopus, SciVal, ClinicalKey and Sherpath. Elsevier publishes more than 2,500 digitized journals, including the Lancet and Cell, over 35,000 eBook titles and many iconic reference works, including Gray's Anatomy. Elsevier is part of RELX Group, a global provider of information and analysis for professionals and business customers in all industries. Www.Elsevier.com.

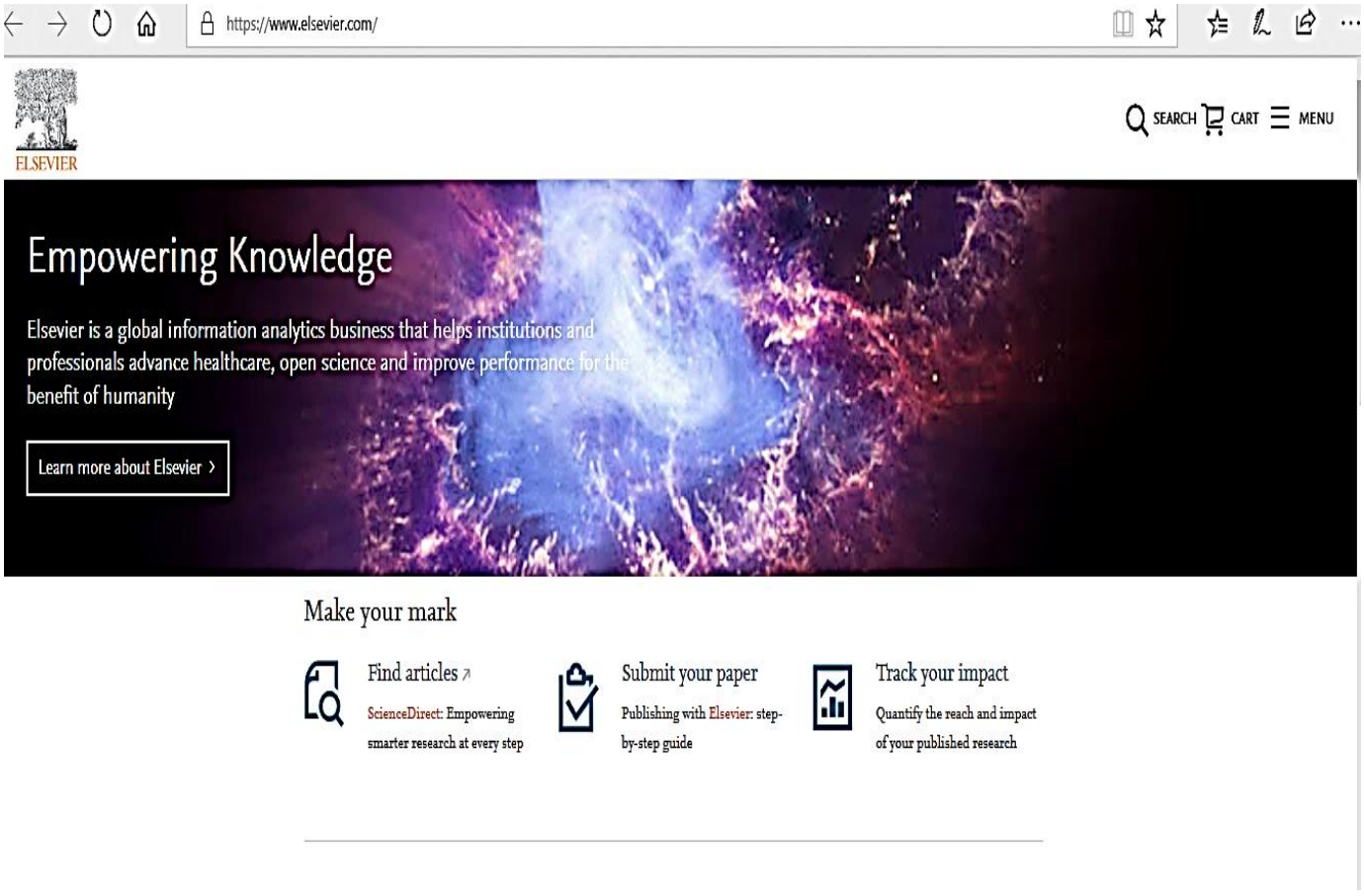


Figura No. 97. Elsevier
Fuente: recuperado https://www.elsevier.com/

Capítulo

Signs, Trademarks, Patents, Industrial Designs, Science Development and other Products

Chapter 4.
Signs, trademarks, patents, industrial designs, science developments and other products

PhD. Fernando Augusto Poveda Aguja
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Senior Consulter in Scientometrics and research

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Brands and other distinctive signs, are constituted in spaces of innovation that achieve a great section in the science, the technology and the innovation, one can speak of a sign like the object phenomenon or material action which, by nature or convention, represents or Replaces another, is the graphical or iconic representation that has an additional meaning, there are signs, letters or words, graphic sounds or forms that are used to represent innovation products or services, distinctive signs are protected and They represent a product of technological development for the countries, we have some like trademarks, commercial slogans, commercial names, commercial shows, appellations of origin.

Distinctive signs have the primary function of distinguishing and differentiating attributes that the community distinguishes them, recognizes their business origin and allows it to be an intangible asset, is the most valuable of the company, has a competitive advantage, Industrial, business brands are protected according to their registration, are protected for a certain class of products and services, identify the product and protect it in the territory where it originates, distinctive signs relate the trade slogan that It has a property of new knowledge, the trade name, the commercial teaches.

The distinctive signs are identifiers used in the market by the employer, the benefits that are given of this visibility is the identification of the trader or businessman, associate the image and quality of the products or services, authorize the use with contracts of License or authorization of the use or transfer or transference becoming resources.

The brand constitutes the value that is given to any sign that is distinguished as a product, is registered and is susceptible to graphic representation, the World Intellectual Property Organization (WIPO), defines it as a visible sign that allows to distinguish in a good or service of a company, its value lies in the prestige and reputation that determines the brand, WIPO, the role of industrial property in consumer Protection (Geneva 1983, p. 13).

The brand is an intangible good, an ideal sign to distinguish and differentiate. You can register signs as trademarks when applied in words or combination of words, images, figures or symbols, graphics, logos, monograms, portraits, labels, emblems, shields, sounds, colors, letters, numbers, a color delimited by a form or combination of colors, products, packaging or wrappings, combination of means signs.

In order for a trademark to be registered and therefore protected, three requirements are required: (1) which has a distinctive character which is the ability to differentiate a product or service from a similar one; (2) that is susceptible to graphic representation; (3) that is perceptible by the senses.

There are two types of distinctions: extrinsic and intrinsic. The extrinsic is the difference with products marketed by a person of similar or identical products of another person, focusing in front of the other signs, this look abroad. Inside or intrinsic, is the comparison of the products or services that the sign protects or will protect, and the material or graphic representation

Intrinsic it is considered that the sign should not be confused with the product that seeks to identify (the signs that suffer from this vice are considered generic marks) or with an essential characteristic of the same so-called descriptive marks, distinctiveness Extrinsic mark should not be confused with distinctive signs of third parties.

This confusion requires that the signs are identical or similar, that they are the same products or services, that belong to different classes that represent risk of confusion or

association between if the graphic representation is chosen that the sign is Susceptible to graphical representation this is required for record and file purposes.

There are different types of brands, the brand name, the figurative mark, the mixed brand, the three-dimensional mark, the sound mark, the olfactory mark. The nominative mark is composed of several letters that constitute a pronounceable whole has or does not mean, the nominative one uses acoustic or phonetic signs and the one make up several letters, integrated by a whole or a pronounced whole which can or does not possess Conceptual meaning, example Apple.

The figurative brand is constituted by images, by drawings, allegorical figures (emblems), by images of a specific or concrete object or by the graphic expression of an idea, the figurative mark differs from the denominative one in which it is not pronounced, Because the sign does not represent or has vocalization but is figurative or different from its name.

Figura No. 98. Marca de una empresa representativa
Fuente: Imagen tomada de https://pixabay.com/es/apple-fruta-manzanas-manzana-verde-1590131/

The mixed brand contains the graphic and denominative elements, in the matter of mixed marks there is always place to the existence of the predominant element, combination

of graphic and denominative elements from the use and set of these variables. The three-dimensional mark occupies the 3 dimensions of the space (high, wide, deep), it is a visible sign that can be used to differentiate in the market both the form and the products, their content and the physical support.

Sound brand, is the one composed by a musical melody or any other sound, effect of recording in the country of origin, the sound must be object of graphic representation, can be given through a pentagram or of any suitable graphic representation, language or code. The olfactory mark, is the one composed by an odour, the register of olfactory and sonorous marks is processed like a distinctive and susceptible record, examples in England registered the floral scent recorded Mark No. 2001416 to associate products, the United States is Recorded the cherry smell for sewing threads registration No. 1639128.

The marks and their classifications can be identified according to the International classification of Nice, they are presented in the following list which before applying and registering in the country must be articulated according to the specific necessities.

No	Descripción	Versión	Clase Niza
1	Productos químicos destinados a la industria, ciencia, fotografía, horticultura y silvicultura; resinas artificiales en estado bruto, materias plásticas en estado bruto; abono para las tierras; composiciones extintoras; preparaciones para el temple y soldadura de metales; productos químicos destinados a conservar los alimentos; materias curtientes; adhesivos (pegamentos) destinados a la industria	7	1
2	Colores, barnices, lacas; conservantes contra la herrumbre y el deterioro de la madera; materias tintóreas; mordientes; resinas naturales en estado bruto; metales en hojas y en polvo para pintores, decoradores, impresores y artistas.	7	2
3	Preparaciones para blanquear y otras sustancias para la colada; preparaciones para limpiar, pulir, desengrasar y raspar; jabones; perfumería, aceites esenciales, cosméticos, lociones para el cabello; dentífricos.	7	3
4	Aceites y grasas industriales; lubricantes; productos para absorber, regar y concentrar el polvo; combustibles (incluyendo gasolinas para motores) y materias de alumbrado; bujías, mechas.	7	4

5	Productos farmacéuticos, veterinarios e higiénicos; sustancias dietéticas para uso médico, alimentos para bebés; emplastos, material para apósitos; material para empastar los dientes y para moldes dentales; desinfectantes; productos para la destrucción de animales dañinos; fungicidas, herbicidas.	7	5
6	Metales comunes y sus aleaciones; materiales de construcción metálicos; construcciones transportables metálicas; materiales metálicos para vías férreas; cables e hilos metálicos no eléctricos; cerrajería y ferretería metálica; tubos metálicos; cajas de caudales; productos metálicos no comprendidos en otras clases; minerales.	7	6
7	Máquinas y máquinas herramientas; motores (excepto motores para vehículos terrestres); acoplamientos y órganos de transmisión (excepto aquellos para vehículos terrestres); instrumentos agrícolas que no sean manuales; incubadoras de huevos.	7	7
8	Herramientas e instrumentos de mano impulsados manualmente; cuchillería, tenedores y cucharas; armas blancas; maquinillas de afeitar.	7	8
9	Aparatos e instrumentos científicos, náuticos, geodésicos, eléctricos, fotográficos, cinematográficos, ópticos, de pesar, de medida, de señalización, de control (inspección), de socorro (salvamento) y de enseñanza; aparatos para el registro, transmisión, reproducción del sonido o imágenes; soportes de registro magnéticos, discos acústicos; distribuidores automáticos y mecanismos para aparatos de previo pago; cajas registradoras, máquinas calculadoras, equipos para el tratamiento de la información y ordenadores; extintores.	7	9
10	Aparatos e instrumentos quirúrgicos, médicos, dentales y veterinarios, miembros, ojos y dientes artificiales; artículos ortopédicos; material de sutura.	7	10
11	Aparatos de alumbrado, de calefacción, de producción de vapor, de cocción, de refrigeración, de secado, de ventilación, de distribución de agua e instalaciones sanitarias.	7	11
12	Vehículos; aparatos de locomoción terrestre, aérea o marítima.	7	12
13	Armas de fuego; municiones y proyectiles; explosivos; fuegos de artificio.	7	13
14	Metales preciosos y sus aleaciones y artículos de estas materias o de chapado no comprendidos en otras clases; joyería, bisutería, piedras preciosas; relojería e instrumentos cronométricos.	7	14
15	Instrumentos de música.	7	15

16	Papel, cartón y artículos de estas materias no comprendidos en otras clases; productos de imprenta; artículos de encuadernación; fotografías; papelería; adhesivos (pegamentos) para la papelería o la casa; material para artistas; pinceles; máquinas de escribir y artículos de oficina (excepto muebles); material de instrucción o de enseñanza (excepto aparatos); materias plásticas para embalaje (no comprendidas en otras clases); naipes; caracteres de imprenta; clichés.	7	16
17	Caucho, gutapercha, goma, amianto, mica y productos de estas materias no comprendidos en otras clases; productos en materias plásticas semielaboradas; materias que sirven para calafatear, cerrar con estopa y aislar; tubos flexibles no metálicos.	7	17
18	Cuero e imitaciones de cuero, productos de estas materias no comprendidos en otras clases; pieles de animales; baúles y maletas; paraguas, sombrillas y bastones; fustas y guarnicionería.	7	18
19	Materiales de construcción no metálicos; tubos rígidos no metálicos para la construcción; asfalto, pez y betún; construcciones transportables no metálicas; monumentos no metálicos.	7	19
20	Muebles, espejos, marcos; productos, no comprendidos en otras clases de madera, corcho, caña, junco, mimbre, cuerno, hueso, marfil, ballena, concha, ámbar, nácar, espuma de mar, sucedáneos de todas estas materias o de materias plásticas.	7	20
21	Utensilios y recipientes para el menaje y la cocina (que no sean de metales preciosos ni chapados); peines y esponjas; cepillos (con excepción de los pinceles); materiales para la fabricación de cepillos; material de limpieza; viruta de hierro; vidrio en bruto o semielaborado (con excepción del vidrio de construcción); cristalería, porcelana y loza, no comprendidas en otras clases.	7	21
22	Cuerdas, bramantes, redes, tiendas de campaña, toldos, velas, sacos (no comprendidos en otras clases); materias de relleno (con excepción del caucho o materias plásticas); materias textiles fibrosas en bruto.	7	22
23	Hilos para uso textil.	7	23
24	Tejidos y productos textiles no comprendidos en otras clases; ropa de cama y de mesa.	7	24
25	Vestidos, calzados, sombrerería.	7	25
26	Puntillas y bordados, cintas y lazos; botones, corchetes y ojetes, alfileres y agujas; flores artificiales.	7	26

27	Alfombras, felpudos, esteras, linóleum y otros revestimientos de suelos; tapicerías murales que no sean de materias textiles.	7	27
28	Juegos, juguetes; artículos de gimnasia y deporte no comprendidos en otras clases; decoraciones para árboles de navidad.	7	28
29	Carne, pescado, aves y caza; extractos de carne; frutas y legumbres en conserva, secas y cocidas; jaleas, mermeladas, compotas; huevos, leche y productos lácteos; aceites y grasas comestibles.	7	29
30	Café, te, cacao, azúcar, arroz, tapioca, sagú, sucedáneos del café; harinas y preparaciones hechas de cereales, pan, pastelería y confitería, helados comestibles; miel, jarabe de melaza; levadura, polvos para esponjar; sal, mostaza; vinagre, salsas (condimentos); especias; hielo.	7	30
31	Productos agrícolas, hortícolas, forestales y granos, no comprendidos en otras clases; animales vivos; frutas y legumbres frescas; semillas, plantas y flores naturales; alimentos para los animales; malta.	7	31
32	Cervezas; aguas minerales y gaseosas y otras bebidas no alcohólicas; bebidas y zumos de frutas; siropes y otras preparaciones para hacer bebidas.	7	32
33	Bebidas alcohólicas (con excepción de cervezas).	7	33
34	Tabaco; artículos para fumadores; cerillas.	7	34
35	Publicidad; gestión de negocios comerciales; administración comercial; trabajos de oficina.	7	35
36	Seguros; negocios financieros; negocios monetarios; negocios inmobiliarios.	7	36
37	Construcción; reparación; servicios de instalación.	7	37
38	Telecomunicaciones.	7	38
39	Transporte; embalaje y almacenaje de mercancías; organización de viajes.	7	39
40	Tratamiento de materiales.	7	40
41	Educación; formación; esparcimiento; actividades deportivas y culturales.	7	41
42	Restauración (alimentación); hospedaje temporal; cuidados médicos, de higiene y de belleza; servicios veterinarios y de agricultura; servicios jurídicos; investigación científica e industrial; programación para ordenadores; servicios que no pueden ser clasificados en otra clase	7	42
43	Productos químicos destinados a la industria, ciencia, fotografía, así como a la agricultura, horticultura y silvicultura; resinas artificiales en estado bruto, materias plásticas en estado bruto; abono para las tierras; composiciones extintoras; preparaciones para el temple y soldadura de metales; productos químicos destinados a	8	1

	conservar los alimentos; materias curtientes; adhesivos (pegamentos) destinados a la industria.		
44	Colores, barnices, lacas; preservativos contra la herrumbre y el deterioro de la madera; materias tintóreas; mordientes; resinas naturales en estado bruto; metales en hojas y en polvo para pintores, decoradores, impresores y artistas.	8	2
45	Preparaciones para blanquear y otras sustancias para la colada; preparaciones para limpiar, pulir, desengrasar y raspar; (preparaciones abrasivas) jabones; perfumería, aceites esenciales, cosméticos, lociones para el cabello; dentífricos.	8	3
46	Aceites y grasas industriales; lubricantes; productos para absorber, regar y concentrar el polvo; combustibles (incluyendo gasolinas para motores) y materias de alumbrado; bujías y mechas para el alumbrado.	8	4
47	Productos farmacéuticos y veterinarios; productos higiénicos para la medicina; sustancias dietéticas para uso médico, alimentos para bebés; emplastos, material para apósitos; material para empastar los dientes y para improntas dentales; desinfectantes; productos para la destrucción de animales dañinos; fungicidas, herbicidas.	8	5
48	Metales comunes y sus aleaciones; materiales de construcción metálicos; construcciones transportables metálicas; materiales metálicos para vías férreas; cables e hilos metálicos no eléctricos; cerrajería y ferretería metálica; tubos metálicos; cajas de caudales; productos metálicos no comprendidos en otras clases; minerales.	8	6
49	Máquinas y máquinas herramientas; motores (excepto motores para vehículos terrestres); acoplamientos y órganos de transmisión (excepto aquellos para vehículos terrestres); instrumentos agrícolas que no sean manuales; incubadoras de huevos.	8	7
50	Herramientas e instrumentos de mano impulsados manualmente; cuchillería, tenedores y cucharas; armas blancas; maquinillas de afeitar.	8	8
51	Aparatos e instrumentos científicos, náuticos, geodésicos, fotográficos, cinematográficos, ópticos, de pesar, de medida, de señalización, de control (inspección), de socorro (salvamento) y de enseñanza; aparatos para la conducción, distribución, transformación, acumulación, regulación o control de la electricidad; aparatos para el registro, transmisión, reproducción del sonido o imágenes; soportes de registro magnéticos, discos acústicos; distribuidores automáticos y mecanismos para aparatos de previo pago;	8	9

	cajas registradoras, máquinas calculadoras, equipos para el tratamiento de la información y ordenadores; extintores.		
52	Aparatos e instrumentos quirúrgicos, médicos, dentales y veterinarios, miembros, ojos y dientes artificiales; artículos ortopédicos; material de sutura	8	10
53	Aparatos de alumbrado, de calefacción, de producción de vapor, de cocción, de refrigeración, de secado, de ventilación, de distribución de agua e instalaciones sanitarias.	8	11
54	Vehículos; aparatos de locomoción terrestre, aérea o acuática.	8	12
55	Armas de fuego; municiones y proyectiles; explosivos; fuegos de artificio.	8	13
56	Metales preciosos y sus aleaciones y artículos de estas materias o de chapado no comprendidos en otras clases; joyería, bisutería, piedras preciosas; relojería e instrumentos cronométricos.	8	14
57	Instrumentos de música.	8	15
58	Papel, cartón y artículos de estas materias no comprendidos en otras clases; productos de imprenta; artículos de encuadernación; fotografías; papelería; adhesivos (pegamentos) para la papelería o la casa; material para artistas; pinceles; máquinas de escribir y artículos de oficina (excepto muebles); material de instrucción o de enseñanza (excepto aparatos); materias plásticas para embalaje (no comprendidas en otras clases); caracteres de imprenta; clichés.	8	16
59	Caucho, gutapercha, goma, amianto, mica y productos de estas materias no comprendidos en otras clases; productos en materias plásticas semielaboradas; materias que sirven para calafatear, cerrar con estopa y aislar; tubos flexibles no metálicos.	8	17
60	Cuero e imitaciones de cuero, productos de estas materias no comprendidos en otras clases; pieles de animales; baúles y maletas; paraguas, sombrillas y bastones; fustas y guarnicionería.	8	18
61	Materiales de construcción no metálicos; tubos rígidos no metálicos para la construcción; asfalto, pez y betún; construcciones transportables no metálicas; monumentos no metálicos.	8	19
62	Muebles, espejos, marcos; productos, no comprendidos en otras clases de madera, corcho, caña, junco, mimbre, cuerno, hueso, marfil, ballena, concha, ámbar, nácar, espuma de	8	20

	mar, sucedáneos de todas estas materias o de materias plásticas.		
63	Utensilios y recipientes para el menaje y la cocina (que no sean de metales preciosos ni chapados); peines y esponjas; cepillos (con excepción de los pinceles); materiales para la fabricación de cepillos; material de limpieza; viruta de hierro; vidrio en bruto o semielaborado (con excepción del vidrio de construcción); cristalería, porcelana y loza, no comprendidas en otras clases.	8	21
64	Cuerdas, bramantes, redes, tiendas de campaña, toldos, velas, sacos (no comprendidos en otras clases); materias de relleno (con excepción del caucho o materias plásticas); materias textiles fibrosas en bruto.	8	22
65	Hilos para uso textil.	8	23
66	Tejidos y productos textiles no comprendidos en otras clases; ropa de cama y de mesa.	8	24
67	Vestidos, calzados, sombrerería.	8	25
68	Puntillas y bordados, cintas y lazos; botones, corchetes y ojetes, alfileres y agujas; flores artificiales.	8	26
69	Alfombras, felpudos, esteras, linóleum y otros revestimientos de suelos; tapicerías murales que no sean de materias textiles.	8	27
70	Juegos, juguetes; artículos de gimnasia y deporte no comprendidos en otras clases; decoraciones para árboles de navidad.	8	28
71	Carne, pescado, aves y caza; extractos de carne; frutas y legumbres en conserva, secas y cocidas; jaleas, mermeladas, compotas; huevos, leche y productos lácteos; aceites y grasas comestibles.	8	29
72	Café, te, cacao, azúcar, arroz, tapioca, sagú, sucedáneos del café; harinas y preparaciones hechas de cereales, pan, pastelería y confitería, helados comestibles; miel, jarabe de melaza; levadura, polvos para esponjar; sal, mostaza; vinagre, salsas (condimentos); especias; hielo.	8	30
73	Productos agrícolas, hortícolas, forestales y granos, no comprendidos en otras clases; animales vivos; frutas y legumbres frescas; semillas, plantas y flores naturales; alimentos para los animales; malta.	8	31
74	Cervezas; aguas minerales y gaseosas y otras bebidas no alcohólicas; bebidas y zumos de frutas; siropes y otras preparaciones para hacer bebidas.	8	32
75	Bebidas alcohólicas (con excepción de cervezas).	8	33
76	Tabaco; artículos para fumadores; cerillas.	8	34
77	Publicidad; gestión de negocios comerciales; administración comercial; trabajos de oficina.	8	35

78	Seguros; negocios financieros; negocios monetarios; negocios inmobiliarios.	8	36
79	Construcción; reparación; servicios de instalación.	8	37
80	Telecomunicaciones.	8	38
81	Transporte; embalaje y almacenaje de mercancías; organización de viajes.	8	39
82	Tratamiento de materiales.	8	40
83	Educación; formación; esparcimiento; actividades deportivas y culturales.	8	41
84	Servicios científicos y tecnológicos así como servicios de investigación y diseño relativos a ellos; servicios de análisis y de investigación industrial; diseño y desarrollo de ordenadores y software; servicios jurídicos.	8	42
85	Servicios de restauración (alimentación); hospedaje temporal.	8	43
86	Servicios médicos; servicios veterinarios; cuidados de higiene y de belleza para personas o animales; servicios de agricultura, horticultura y silvicultura.	8	44
87	Servicios personales y sociales prestados por terceros destinados a satisfacer necesidades individuales; servicios de seguridad para la protección de bienes y de personas.	8	45
88	No definida	7	99
89	No definida	8	99
90	Servicios de restauración (alimentación); hospedaje temporal.	7	43
91	Productos químicos destinados a la industria, ciencia, fotografía, así como a la agricultura, horticultura y silvicultura; resinas artificiales en estado bruto, materias plásticas en estado bruto; abono para las tierras; composiciones extintoras; preparaciones para el temple y soldadura de metales; productos químicos destinados a conservar los alimentos; materias curtientes; adhesivos (pegamentos) destinados a la industria.	9	1
92	Colores, barnices, lacas; preservativos contra la herrumbre y el deterioro de la madera; materias tintóreas; mordientes; resinas naturales en estado bruto; metales en hojas y en polvo para pintores, decoradores, impresores y artistas.	9	2
93	Preparaciones para blanquear y otras sustancias para la colada; preparaciones para limpiar, pulir, desengrasar y raspar (preparaciones abrasivas); jabones; perfumería, aceites esenciales, cosméticos, lociones para el cabello; dentífricos.	9	3
94	Aceites y grasas industriales; lubricantes; productos para absorber, regar y concentrar el polvo; combustibles (incluyendo gasolinas para motores) y materias de alumbrado; bujías y mechas para el alumbrado.	9	4

95	Productos farmacéuticos y veterinarios; productos higiénicos para la medicina; sustancias dietéticas para uso médico, alimentos para bebés; emplastos, material para apósitos; material para empastar los dientes y para improntas dentales; desinfectantes; productos para la destrucción de animales dañinos; fungicidas, herbicidas.	9	5
96	Metales comunes y sus aleaciones; materiales de construcción metálicos; construcciones transportables metálicas; materiales metálicos para vías férreas; cables e hilos metálicos no eléctricos; cerrajería y ferretería metálica; tubos metálicos; cajas de caudales; productos metálicos no comprendidos en otras clases; minerales.	9	6
97	Máquinas y máquinas herramientas; motores (excepto motores para vehículos terrestres); acoplamientos y órganos de transmisión (excepto aquellos para vehículos terrestres); instrumentos agrícolas que no sean manuales; incubadoras de huevos.	9	7
98	Herramientas e instrumentos de mano impulsados manualmente; cuchillería, tenedores y cucharas; armas blancas; maquinillas de afeitar.	9	8
99	Aparatos e instrumentos científicos, náuticos, geodésicos, fotográficos, cinematográficos, ópticos, de pesar, de medida, de señalización, de control (inspección), de socorro (salvamento) y de enseñanza; aparatos e instrumentos para la conducción, distribución, transformación, acumulación, regulación o control de la electricidad; aparatos para el registro, transmisión, reproducción del sonido o imágenes; soportes de registro magnéticos, discos acústicos; distribuidores automáticos y mecanismos para aparatos de previo pago; cajas registradoras, máquinas calculadoras, equipos para el tratamiento de la información y ordenadores; extintores.	9	9
100	Aparatos e instrumentos quirúrgicos, médicos, dentales y veterinarios, miembros, ojos y dientes artificiales; artículos ortopédicos; material de sutura.	9	10
101	Aparatos de alumbrado, de calefacción, de producción de vapor, de cocción, de refrigeración, de secado, de ventilación, de distribución de agua e instalaciones sanitarias	9	11
102	Vehículos; aparatos de locomoción terrestre, aérea o acuática.	9	12
103	Armas de fuego; municiones y proyectiles; explosivos; fuegos de artificio.	9	13
104	Metales preciosos y sus aleaciones y artículos de estas materias o de chapado no comprendidos en otras clases;	9	14

	joyería, bisutería, piedras preciosas; relojería e instrumentos cronométricos.		
105	Instrumentos de música.	9	15
106	Papel, cartón y artículos de estas materias no comprendidos en otras clases; productos de imprenta; artículos de encuadernación; fotografías; papelería; adhesivos (pegamentos) para la papelería o la casa; material para artistas; pinceles; máquinas de escribir y artículos de oficina (excepto muebles); material de instrucción o de enseñanza (excepto aparatos); materias plásticas para embalaje (no comprendidas en otras clases); caracteres de imprenta; clichés.	9	16
107	Caucho, gutapercha, goma, amianto, mica y productos de estas materias no comprendidos en otras clases; productos en materias plásticas semielaboradas; materias que sirven para calafatear, cerrar con estopa y aislar; tubos flexibles no metálicos.	9	17
108	Cuero e imitaciones de cuero, productos de estas materias no comprendidos en otras clases; pieles de animales; baúles y maletas; paraguas, sombrillas y bastones; fustas y guarnicionería.	9	18
109	Materiales de construcción no metálicos; tubos rígidos no metálicos para la construcción; asfalto, pez y betún; construcciones transportables no metálicas; monumentos no metálicos.	9	19
110	Muebles, espejos, marcos; productos, no comprendidos en otras clases de madera, corcho, caña, junco, mimbre, cuerno, hueso, marfil, ballena, concha, ámbar, nácar, espuma de mar, sucedáneos de todas estas materias o de materias plásticas.	9	20
111	Utensilios y recipientes para el menaje y la cocina; peines y esponjas; cepillos (con excepción de los pinceles); materiales para la fabricación de cepillos; material de limpieza; viruta de hierro; vidrio en bruto o semielaborado (con excepción del vidrio de construcción); cristalería, porcelana y loza, no comprendidas en otras clases.	9	21
112	Cuerdas, bramantes, redes, tiendas de campaña, toldos, velas, sacos (no comprendidos en otras clases); materias de relleno (con excepción del caucho o materias plásticas); materias textiles fibrosas en bruto.	9	22
113	Hilos para uso textil.	9	23
114	Tejidos y productos textiles no comprendidos en otras clases; ropa de cama y de mesa.	9	24
115	Vestidos, calzados, sombrerería.	9	25
116	Puntillas y bordados, cintas y lazos; botones, corchetes y ojetes, alfileres y agujas; flores artificiales.	9	26

117	Alfombras, felpudos, esteras, linóleum y otros revestimientos de suelos; tapicerías murales que no sean de materias textiles.	9	27
118	Juegos, juguetes; artículos de gimnasia y deporte no comprendidos en otras clases; decoraciones para árboles de navidad.	9	28
119	Carne, pescado, aves y caza; extractos de carne; frutas y legumbres en conserva, congeladas, secas y cocidas; jaleas, mermeladas, compotas; huevos, leche y productos lácteos; aceites y grasas comestibles.	9	29
120	Café, te, cacao, azúcar, arroz, tapioca, sagú, sucedáneos del café; harinas y preparaciones hechas de cereales, pan, pastelería y confitería, helados comestibles; miel, jarabe de melaza; levadura, polvos para esponjar; sal, mostaza; vinagre, salsas (condimentos); especias; hielo.	9	30
121	Productos agrícolas, hortícolas, forestales y granos, no comprendidos en otras clases; animales vivos; frutas y legumbres frescas; semillas, plantas y flores naturales; alimentos para los animales; malta.	9	31
122	Cervezas; aguas minerales y gaseosas y otras bebidas no alcohólicas; bebidas y zumos de frutas; siropes y otras preparaciones para hacer bebidas.	9	32
123	Bebidas alcohólicas (con excepción de cervezas).	9	33
124	Tabaco; artículos para fumadores; cerillas.	9	34
125	Publicidad; gestión de negocios comerciales; administración comercial; trabajos de oficina	9	35
126	Seguros; negocios financieros; negocios monetarios; negocios inmobiliarios.	9	36
127	Construcción; reparación; servicios de instalación.	9	37
128	Telecomunicaciones.	9	38
129	Transporte; embalaje y almacenaje de mercancías; organización de viajes.	9	39
130	Tratamiento de materiales.	9	40
131	Educación; formación; esparcimiento; actividades deportivas y culturales.	9	41
132	Servicios científicos y tecnológicos así como servicios de investigación y diseño relativos a ellos; servicios de análisis y de investigación industrial; diseño y desarrollo de ordenadores y software.	9	42
133	Servicios de restauración (alimentación); hospedaje temporal.	9	43
134	Servicios médicos; servicios veterinarios; cuidados de higiene y de belleza para personas o animales; servicios de agricultura, horticultura y silvicultura.	9	44

135	Servicios jurídicos; servicios de seguridad para la protección de bienes y de personas; servicios personales y sociales prestados por terceros destinados a satisfacer necesidades individuales.	9	45
136	No definida	9	99
137	Productos químicos para la industria, la ciencia y la fotografía, así como para la agricultura, la horticultura y la silvicultura; resinas artificiales en bruto, materias plásticas en bruto; abonos para el suelo; composiciones extintoras; preparaciones para templar y soldar metales; productos químicos para conservar alimentos; materias curtientes; adhesivos (pegamentos) para la industria.	10	1
138	Pinturas, barnices, lacas; productos antioxidantes y productos para conservar la madera; materias tintóreas; mordientes; resinas naturales en bruto; metales en hojas y en polvo para pintores, decoradores, impresores y artistas.	10	2
139	Preparaciones para blanquear y otras sustancias para lavar la ropa; preparaciones para limpiar, pulir, desengrasar y raspar; jabones; productos de perfumería, aceites esenciales, cosméticos, lociones capilares; dentífricos.	10	3
140	Aceites y grasas para uso industrial; lubricantes; productos para absorber, rociar y asentar el polvo; combustibles (incluida la gasolina para motores) y materiales de alumbrado; velas y mechas de iluminación.	10	4
141	Productos farmacéuticos y veterinarios; productos higiénicos y sanitarios para uso médico; alimentos y sustancias dietéticas para uso médico o veterinario, alimentos para bebés; complementos nutricionales para seres humanos y animales; emplastos, material para apósitos; material para empastes e improntas dentales; desinfectantes; productos para eliminar animales dañinos; fungicidas, herbicidas.	10	5
142	Metales comunes y sus aleaciones; materiales de construcción metálicos; construcciones transportables metálicas; materiales metálicos para vías férreas; cables e hilos metálicos no eléctricos; artículos de cerrajería y ferretería metálicos; tubos y tuberías metálicos; cajas de caudales; productos metálicos no comprendidos en otras clases; minerales metalíferos.	10	6
143	Máquinas y máquinas herramientas; motores (excepto motores para vehículos terrestres); acoplamientos y elementos de transmisión (excepto para vehículos terrestres); instrumentos agrícolas que no sean accionados manualmente; incubadoras de huevos; distribuidores automáticos.	10	7

144	Herramientas e instrumentos de mano accionados manualmente; artículos de cuchillería, tenedores y cucharas; armas blancas; navajas y maquinillas de afeitar.	10	8
145	Aparatos e instrumentos científicos, náuticos, geodésicos, fotográficos, cinematográficos, ópticos, de pesaje, de medición, de señalización, de control (inspección), de salvamento y de enseñanza; aparatos e instrumentos de conducción, distribución, transformación, acumulación, regulación o control de la electricidad; aparatos de grabación, transmisión o reproducción de sonido o imágenes; soportes de registro magnéticos, discos acústicos; discos compactos, DVD y otros soportes de grabación digitales; mecanismos para aparatos de previo pago; cajas registradoras, máquinas de calcular, equipos de procesamiento de datos, ordenadores; software; extintores.	10	9
146	Aparatos e instrumentos quirúrgicos, médicos, odontológicos y veterinarios, así como miembros, ojos y dientes artificiales; artículos ortopédicos; material de sutura.	10	10
147	Aparatos de alumbrado, calefacción, producción de vapor, cocción, refrigeración, secado, ventilación y distribución de agua, así como instalaciones sanitarias.	10	11
148	Vehículos; aparatos de locomoción terrestre, aérea o acuática.	10	12
149	Armas de fuego; municiones y proyectiles; explosivos; fuegos artificiales.	10	13
150	Metales preciosos y sus aleaciones, así como productos de estas materias o chapados no comprendidos en otras clases; artículos de joyería, bisutería, piedras preciosas; artículos de relojería e instrumentos cronométricos.	10	14
151	Instrumentos musicales.	10	15
152	Papel, cartón y artículos de estas materias no comprendidos en otras clases; productos de imprenta; material de encuadernación; fotografías; artículos de papelería; adhesivos (pegamentos) de papelería o para uso doméstico; material para artistas; pinceles; máquinas de escribir y artículos de oficina (excepto muebles); material de instrucción o material didáctico (excepto aparatos); materias plásticas para embalar (no comprendidas en otras clases); caracteres de imprenta; clichés de imprenta.	10	16
153	Caucho, gutapercha, goma, amianto, mica y productos de estas materias no comprendidos en otras clases; productos de materias plásticas semielaborados; materiales para calafatear, estopar y aislar; tubos flexibles no metálicos.	10	17
154	Cuero y cuero de imitación, productos de estas materias no comprendidos en otras clases; pieles de animales; baúles y	10	18

	maletas; paraguas y sombrillas; bastones; fustas y artículos de guarnicionería.		
155	Materiales de construcción no metálicos; tubos rígidos no metálicos para la construcción; asfalto, pez y betún; construcciones transportables no metálicas; monumentos no metálicos.	10	19
156	Muebles, espejos, marcos; productos de madera, corcho, caña, junco, mimbre, cuerno, hueso, marfil, ballena, concha, ámbar, nácar, espuma de mar, sucedáneos de todos estos materiales o de materias plásticas, no comprendidos en otras clases.	10	20
157	Utensilios y recipientes para uso doméstico y culinario; peines y esponjas; cepillos; materiales para fabricar cepillos; material de limpieza; lana de acero; vidrio en bruto o semielaborado (excepto el vidrio de construcción); artículos de cristalería, porcelana y loza no comprendidos en otras clases.	10	21
158	Cuerdas, cordeles, redes, tiendas de campaña, lonas, velas de navegación, sacos y bolsas (no comprendidos en otras clases); materiales de acolchado y relleno (excepto el caucho o las materias plásticas); materias textiles fibrosas en bruto.	10	22
159	Hilos para uso textil.	10	23
160	Tejidos y productos textiles no comprendidos en otras clases; ropa de cama; ropa de mesa.	10	24
161	Prendas de vestir, calzado, artículos de sombrerería.	10	25
162	Encajes y bordados, cintas y cordones; botones, ganchos y ojetes, alfileres y agujas; flores artificiales.	10	26
163	Alfombras, felpudos, esteras, linóleo y otros revestimientos de suelos; tapices murales que no sean de materias textiles.	10	27
164	Juegos y juguetes; artículos de gimnasia y deporte no comprendidos en otras clases; adornos para árboles de Navidad.	10	28
165	Carne, pescado, carne de ave y carne de caza; extractos de carne; frutas y verduras, hortalizas y legumbres en conserva, congeladas, secas y cocidas; jaleas, confituras, compotas; huevos; leche y productos lácteos; aceites y grasas comestibles.	10	29
166	Café, té, cacao y sucedáneos del café; arroz; tapioca y sagú; harinas y preparaciones a base de cereales; pan, productos de pastelería y confitería; helados; azúcar, miel, jarabe de melaza; levadura, polvos de hornear; sal; mostaza; vinagre, salsas (condimentos); especias; hielo.	10	30
167	Granos y productos agrícolas, hortícolas y forestales, no comprendidos en otras clases; animales vivos; frutas y	10	31

	verduras, hortalizas y legumbres frescas; semillas; plantas y flores naturales; alimentos para animales; malta.		
168	Cervezas; aguas minerales y gaseosas, y otras bebidas sin alcohol; bebidas de frutas y zumos de frutas; siropes y otras preparaciones para elaborar bebidas.	10	32
169	Bebidas alcohólicas (excepto cervezas).	10	33
170	Tabaco; artículos para fumadores; cerillas.	10	34
171	Publicidad; gestión de negocios comerciales; administración comercial; trabajos de oficina.	10	35
172	Seguros; operaciones financieras; operaciones monetarias; negocios inmobiliarios.	10	36
173	Servicios de construcción; servicios de reparación; servicios de instalación.	10	37
174	Telecomunicaciones.	10	38
175	Transporte; embalaje y almacenamiento de mercancías; organización de viajes.	10	39
176	Tratamiento de materiales.	10	40
177	Educación; formación; servicios de entretenimiento; actividades deportivas y culturales.	10	41
178	Servicios científicos y tecnológicos, así como servicios de investigación y diseño en estos ámbitos; servicios de análisis e investigación industriales; diseño y desarrollo de equipos informáticos y de software.	10	42
179	Servicios de restauración (alimentación); hospedaje temporal.	10	43
180	Servicios médicos; servicios veterinarios; tratamientos de higiene y de belleza para personas o animales; servicios de agricultura, horticultura y silvicultura.	10	44
181	Servicios jurídicos; servicios de seguridad para la protección de bienes y personas; servicios personales y sociales prestados por terceros para satisfacer necesidades individuales.	10	45
182	NO DEFINIDA	10	99

Tabla 1.Clasificación internacional de Niza Fuente: Adaptado de http://www.wipo.int/classifications/nice/es/

The principles of the protection of the Law on the marks are three: the principle of registration, that of specialization, that of territoriality. If we speak the exclusive use of a brand is acquired by the registration of the same before the country of origin fulfilling the registration, the specialty when the mark and its protection will extend only to the class or the classes for which it was registered , the protection and the effects of industrial property

are confined to the territory of the State, the principle of specialty allows that the same sign can be used by different manufacturers in different kinds of products.

Records and industrial Designs

The industrial designs are commercial values that are assigned to a product, as well as its marketability, is the added value that adjusts the attractiveness of the records in industrial designs. In terms of industrial protection the creation is protected, not only in designs, drawings or industrial models, ornamental models, models of taste, or other denominations, is the particular appearance of a product that results from any meeting of lines or combination of colors, or of any two-dimensional or three-dimensional external form, line or contour, configuration, texture or material, without changing the destination or purpose of that product

The industrial design is the particular appearance of a product that results from the meeting of lines or combination of colors or of any form external, two-dimensional or three-dimensional, line, contour, configuration, texture or material without changing the destination or Purpose of this product. It is considered as industrial design the particular appearance of a product that results from any meeting of lines or combination of colors, or of any external form two-dimensional or three-dimensional, line, contour, configuration, texture or material, without Change the destination or purpose of that product.

Protection requirements

New industrial designs are recordable. An industrial design is not new if prior to the date of the application or the priority date *, it has been made accessible to the public, at any place or moment, by its description, use, marketing or any other means. An industrial design is not new by the mere fact that it presents secondary differences with respect to previous realizations or because it refers to another kind of products other than those realizations.

Adhere to protection

The right to register an industrial design belongs to the designer. This right can be transferred by act between live or via Successoria. Register holders may be natural or legal persons. If several people jointly create an industrial design, the right to register corresponds in common to all of them. If several people create the same industrial design, independently of each other, the registration will be granted to that or its successor that first submits the corresponding request or that invokes the priority of the oldest date. * validly invoked

Protection exclusion Cases

Are not registrable:

Industrial designs whose commercial exploitation must be necessarily preventable in order to protect morals or public order. For these purposes, commercial exploitation of an industrial design is not considered to be contrary to morality or public order only by reason of the existence of a legal or administrative provision prohibiting or regulating such exploitation.

b. Industrial designs whose appearance was dictated entirely by technical considerations or by the realization of a technical function, which does not incorporate any arbitrary input from the designer.

C. Industrial designs consisting only of a form whose exact reproduction is necessary to allow the product incorporating the design to be mechanically assembled or connected to another product from which it is a part. This prohibition does not apply in the case of products in which the design file in a manner intended to allow the assembly or the multiple connection of the products or their connection within a modular system.

Exclusive rights

The registration of an industrial design confers on its owner the right to exclude third parties from the exploitation of the corresponding design. In such a virtue, the registrant has the right to act against any third party who without his consent manufactures, imports, offers, enters into the trade or uses commercially products that incorporate or reproduce the industrial design. The registry also confers the right to act against those who produce or marketed a product whose design only presents secondary differences with respect to the protected design or whose appearance is the same.

Duration of protection

The registration of an industrial design has a duration of ten years, counted from the date of filing of the application for registration.

Scope of protection

The protection conferred to an industrial design does not extend to the elements or characteristics of the design dictated entirely by technical considerations or by the realisation of a technical function, that do not incorporate any arbitrary contribution of the designer.

The protection conferred on an industrial design does not include those elements or characteristics whose exact reproduction was necessary to allow the product incorporating the design to be mechanically mounted or connected to another product of which it is part . This limitation does not apply in the case of products in which the design is in a manner intended to allow the assembly or the multiple connection of the products, or their connection within a modular system.

The registration of an industrial design does not give the right to prevent a third party from doing trade in respect of a product that incorporates or reproduces that design, after that product has been entered into the trade by its owner or by another person with its consent or economically linked to it.

To this effect, it is understood that two persons are economically linked when one can exert directly or indirectly on the other a decisive influence with respect to the exploitation of the industrial design, or when a third party can exert such influence About both people.

Invention registers and utility models

Patents are considered an invention or intellectual creation, constitutes a material good nonexistent before this intellectual creation, the inventor acquires an intellectual property on its own creation, the investigation for the achievement of an advance Industrial entails financial and human rights, costs exclusively recognizes the marketing of the product and incorporates the invention, patents relate the research and technological development of the countries and become a value Determinant of progress and social well-being, the invention divulges its inventiveness and describes how it becomes executable, which satisfies the general interest and enhances the state of the art for the benefit of the whole society.

An invention is defined as the material solution that allows to relate technical development and intellectual effort, is considered a technical rule to solve a technical problem, the Law on inventions of OMPI for developing countries are defined In the terms fixed, the invention or patent is given of two types:

1. Product inventions, product inventions are those inventions that are of a tangible form, e.g. machines, equipment, apparatus, devices, the product may be independent in itself or part of another.

2. Procedural inventions, is when a procedure is given to the solution consisting of a sequence of stages conducive to the manufacture or preparation of a product, when the object of the invention is a product is because it consists of an object A material, substance or combination of elements, a machine, a device or a part thereof.

The invention consists of a procedure when its object deals with a mode of work constituted by a serious of operations or actions to obtain a result or, in other words, a succession of operations or actions to be carried out with certain subjects or Energies to get a result.

While the inventions are human creations in the field of the technique, the discoveries are the result of perceiving what is the finding of the subjects, energies, principles that exist in the nature that does not understand it human knowledge, J.A. Schumpeter defines innovation in the following terms: Innovation is the introduction of new products and services, new processes, new sources of supply and changes in the industrial organization, in a continuous and user-oriented way.

Innovation is the application of new ideas, concepts, products, services, practices, with the intention of being useful for the increase of productivity, innovation is a successful application of commercial form.

The right to the patent belongs to the inventor, must submit the patent application to the inventor himself or a third party who has assumed ownership of the right to invention, either because the inventor transferred his right to the invention through a contract or because Such transfer is made by law.

Invention Patent Concept-Requirements

Patents are granted for inventions, whether product or procedural, in all fields of technology, as long as they are new, have an inventive level and are susceptible to industrial application.

An invention will be considered new when it is not included in the state of the art. The state of the art shall comprise all that has been accessible to the public by a written or oral description, use, marketing or any other means before the date of filing of the patent application or, where appropriate, the recognized priority.

Only for the purpose of the determination of novelty, shall also be considered within the state of the art, the content of a patent application pending before the competent national office, whose filing date or priority was earlier than the date of Presentation or priority of the patent application being examined. The products or procedures already patented, included in the state of the art, are not subject to a new patent, simply attributing a different use to that originally covered by the initial patent.

An invention shall be deemed to have an inventive level, if for a person of the trade normally versed in the relevant technical matter, that invention would not have been obvious or had been evidently derived from the state of the art.

An invention shall be considered to be susceptible to industrial application, where its object may be produced or used in any type of industry, with the industry being referred to any productive activity, including services.

Patentability exclusions

No inventions shall be considered:

A.Discoveries, scientific theories and mathematical methods.

B. The whole or part of living beings as they are in nature, natural biological processes, biological material existing in nature or that which can be isolated, including genome or germplasm of any natural living being.

C. Literary and artistic Works or any other copyright protected.

D. The plans, rules and methods for the exercise of intellectual activities, games or economic-commercial activities.

computer programs or software as such; And

Forms of reporting

On the other hand, they are not patentable:

A. Inventions whose commercial exploitation in the territory of the respective country must be necessarily preventable to protect public order or morality. For these purposes, commercial exploitation of an invention shall not be deemed to be contrary to public order or morality only because of the existence of a legal or administrative provision prohibiting or regulating such exploitation.

(b) inventions whose commercial exploitation in the respective country must be necessarily preventable in order to protect the health or life of persons or animals, or to preserve plants or the environment. For these purposes, commercial exploitation of an invention shall not be deemed to be contrary to the health or life of persons, animals, or for the preservation of plants or the environment only for the purpose of the existence of a legal or administrative provision which Prohibit or regulate such exploitation.

C. Plants, animals and essentially biological procedures for the production of plants or animals other than non-biological or microbiological procedures.

D) The therapeutic or surgical methods for human or animal treatment, as well as the methods of diagnosis applied to humans or animals.

Patent holders

The right to the patent belongs to the inventor. This right may be transferred by act between Vivos or via Successoria. If several persons jointly made an invention, the right to the patent corresponds in common to all of them. If several persons make the same invention, independently of each other, the patent shall be granted to that or its successor which first submits the relevant application or invokes the earliest date priority.

In Colombia, unless otherwise agreed, rights to inventions and other industrial property rights generated under a contract for the provision of services or work are presumed to be transferred in favor of the contracting or employer respectively. . To operate this presumption, the respective contract is required to be in writing.

Exclusive rights

The patent gives its holder the right to prevent third parties who do not have their consent, perform any of the following acts: a) when the patent claims a product: i) manufacture the product; Offer for sale, sell or use of the product; or import it for any of these purposes; and, b) where a procedure is claimed in the patent: (i) to use the procedure; or II) to execute any of the acts indicated in subparagraph (a)) with respect to a product obtained directly through the procedure.

Limitations or exceptions

The exclusive rights of the patent holder do not apply in respect of the following cases:

(a) acts carried out in the private sphere and for non-commercial purposes.

Acts carried out exclusively for the purposes of experimentation, with respect to the object of the patented invention.

C. Acts carried out exclusively for the purposes of teaching or scientific or academic research.

(d) Employment, on board ships of the other countries of the Union (members of the Paris Convention), of means which constitute the object of their patent in the case of the vessel, in machinery, rigging, apparatus and other accessories, when such vessels enter into temporary or Accidentally in the waters of the country, with the reservation that these means are used exclusively for the needs of the ship.

(e) The use of means which constitute the object of its patent in the construction or operation of aerial or terrestrial devices of the other countries of the Paris union or of the accessories of such apparatus, where they penetrate temporarily or Accidentally in the country ¨.

f) When the patent protects a biological material other than plants, capable of reproducing, use it as an initial basis for obtaining a new viable material, unless such obtaining requires repeated use of the patented entity.

Likewise, third parties cannot be prevented from trading in respect of a patent-protected product, after that product has been entered into the trade in any country by the

patent holder, or by another person with its Consent or economically linked to it. This situation is known as the "exhaustion of the law."

Nor can the exclusive right to the patent be asserted against a third party who, in good faith and before the date of priority or submission of the application on which the patent was granted, was already using or exploiting the invention Or have made effective or serious preparations to do so.

Duration of protection

The patent has a term of twenty years counted from the date of submission of the respective application in the member country.

Utility Model Patent

The utility model is defined as any new form, configuration or disposition of elements, of any artifact, tool, instrument, mechanism or other object or of any part thereof, which allows for a better or different operation, utilization or Manufacture of the object that incorporates you or provides you with any usefulness, advantage or technical effect that you did not have before.

A patent is a title that recognizes to the holder the exclusive use and exploitation of its invention for a period of twenty years in the case of patents of invention and of ten in the utility models however, not all the creation of the human spirit is susceptible to R beneficiary of this exclusive right, the patent must be new, possess inventive level susceptible of industrial application, the entrepreneurs, seminars and congresses make visible the results, can be seen in databases, journal, information and ranking that provide the development of each related aspect.

Patent documents

Applying the scientometrics, bibliometrics appropriate to aspects and technical information, is applied to the applications conceived in each country. There are several types of documents published in patents, patent applications, the patent conceived.

The patent application is the original petition directed by the applicant to the offices of each country, is the first document released on the patent, the patent conceived is the patent document describing the invention after the different stages of Concession procedure, is the document of greater legal value defines the scope of the patent protection.

In order to obtain patent protection, inventions should be described sufficiently clear and complete so that a person who knows the subject understands and executes it, a patent document indicates the background of the invention is to say what is I knew before it was done (state of the art) and it establishes the difference between the previous technology and what the invention brings as new and as technological advance.

Search questionnaire on the web

Parts of the patent document, the first section selects whether it is an invention or a utility model. The applicant is the person or company that requests the protection of the invention, the representative or proxy refers to the development of the proposal from the legal representation, if it has an attorney-in-law, it registers its peculiarity, inventor Considered as the person who invents or develops the technological product, is the one who has the total protection, title of the patent that refers to the product that should be clear in its title of what is the proposal referenced in the development of each one.

The IPC International Patent Classification, the priority is the suggested response time for the review of the invention, also relates the country of origin that registers it, the application number and the date of acceptance of the application, these priority data will They give legal support so that a legal argument can be given in another country, the date of registration of the application also establishes its establishment and possible articulation with an international claim.

The following document of the patent, is the summary with the object and the purpose of the invention, this section should describe in detail and clearly in a concise way what it consists, what is the added value, what is the accompaniment to this register, in what way it You can associate as an innovator, you attach the graph, plans or lines that describe graphically what the product is, what it consists of, how we can retake it as a technological development.

An additional section speaks of the field of Invention, describes the state of the art with the procedures and utilities, as well as the claims that is the legal definition of the subject that the applicant considers to be his invention and for which he requests or has obtained protection, the claim is drafted in a single phrase expressed in legal terms defining the invention and its unique characteristics, the Relifes must be clear and concise and are based on the description of the product.

The publication of patents is in charge of industrial property offices, in the case of international patent applications, WIPO is the competent body. Physical publications, digital publications via the Internet, publications on digital media, patent documents are ordered according to a single classification system, the International Patent Classification IPC, this applies to more From 90 countries and 4 international industrial property organizations. The IPC is an instrument for the orderly arrangement of patent documents, for the consultation of patents, document databases are run by country, Internet-accessible databases are available, and patents are consulted in the form of text and images.

Technological searches at the national and international levels allow the precise determination of the state of the art in a specific sector, from the information of the applications as of the patents granted, also allows the search of industrial design and They allow to determine whether a specific design or a similar one is in process or has been granted or denied.

In this search the most relevant designs are related and the requesting information is referred to, the related drawings and the bibliographic data are appended, the headlines and

inventors that have the license in charge are identified, that they are interested for their Representation or marketing.

Certifications allow recognition if any person relates a right to an invention patent of utility model, industrial designs, schematics plotted on integrated circuits, in order to market a product or Procedure.

For the specific search it is applied in Web pages that deliver information by country or region, examples like the http://patft.uspto.gov/, Office of Patents and trademarks of the United States.

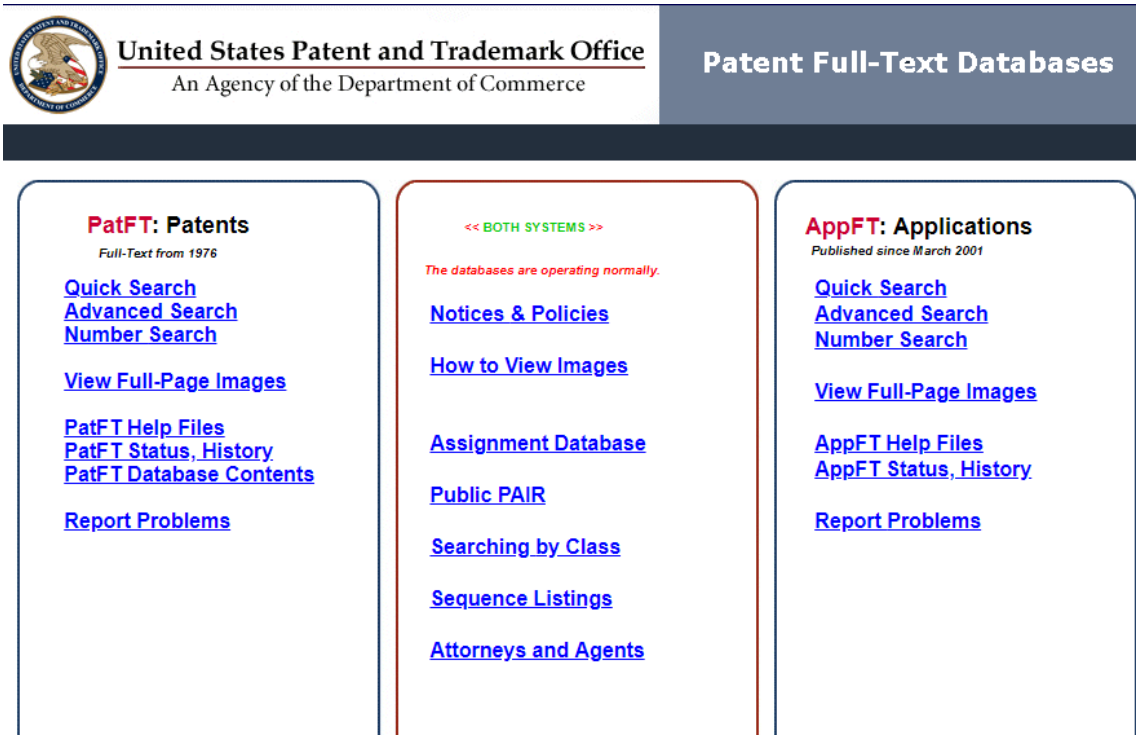

Figure No. 99. Patentes offices and brands in Estados Unidos

Source: recovery de http://patft.uspto.gov/

The European Patent Office

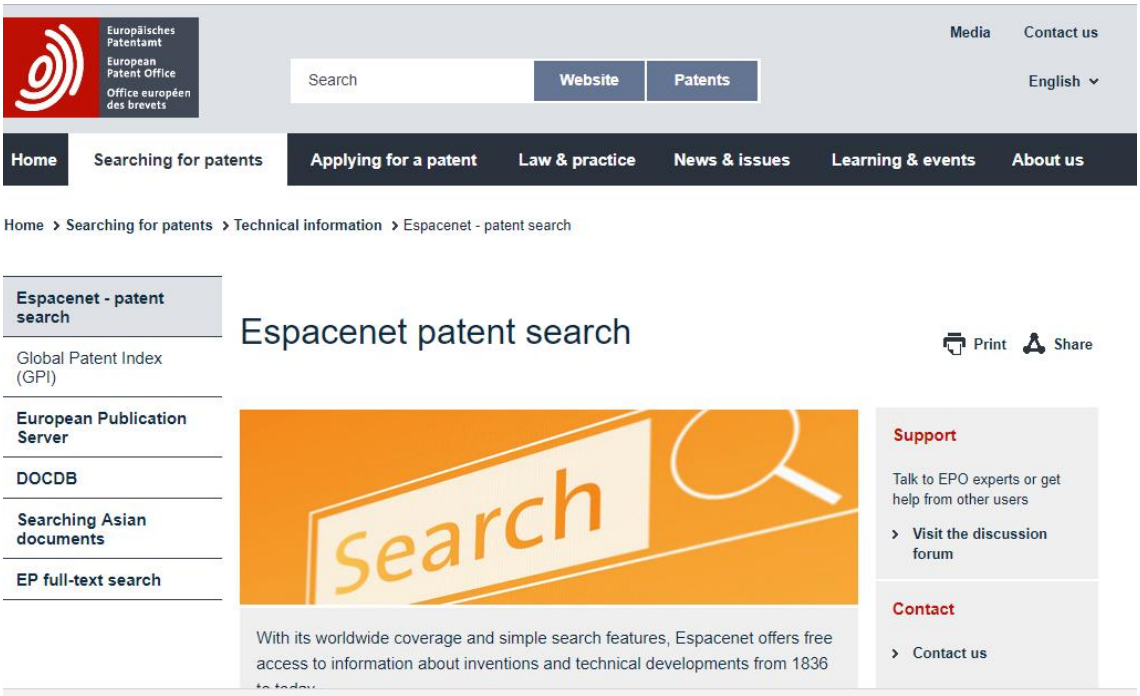

Figure No. 100. The europeasn patent office

Source: recover from

http://www.epo.org/searching-for-patents/technical/espacenet.html

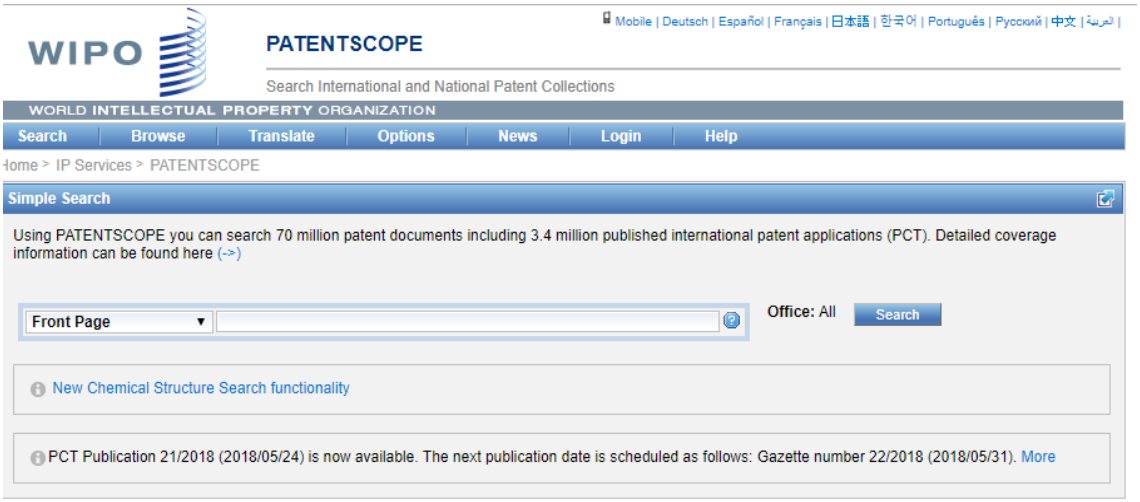

Figura No. 102. World Intellectual Property Organization

Source: recover from https://patentscope.wipo.int/search/en/search.jsf

Google patents

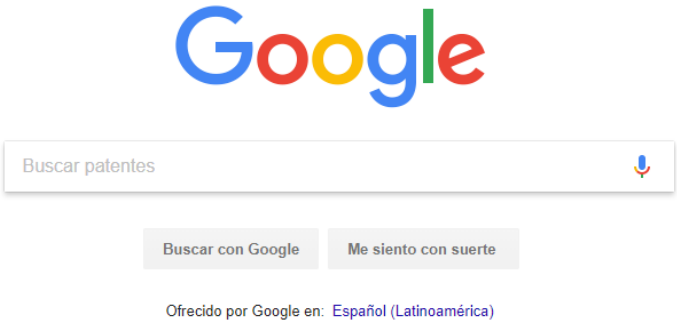

Figura No. 103. Google Patents

source: recovery from https://www.google.com/?tbm=pts

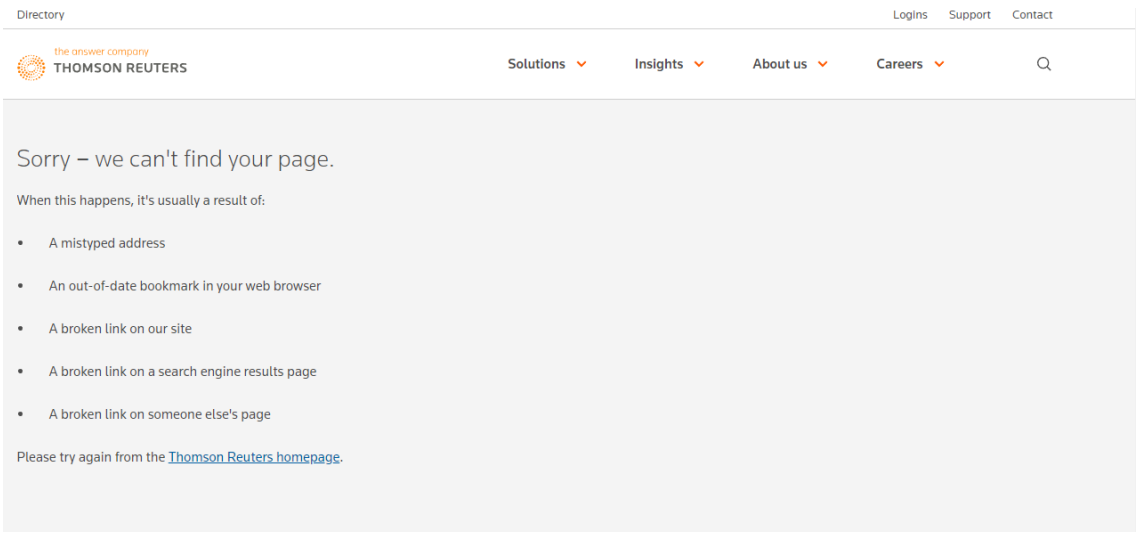

Figure No. 104. Thomson Reuters

source: recovery from https://www.thomsonreuters.com/products_services/legal/legal_products/a-z/derwent_world_patents_index/

Derwent World Patents Index

Delphion

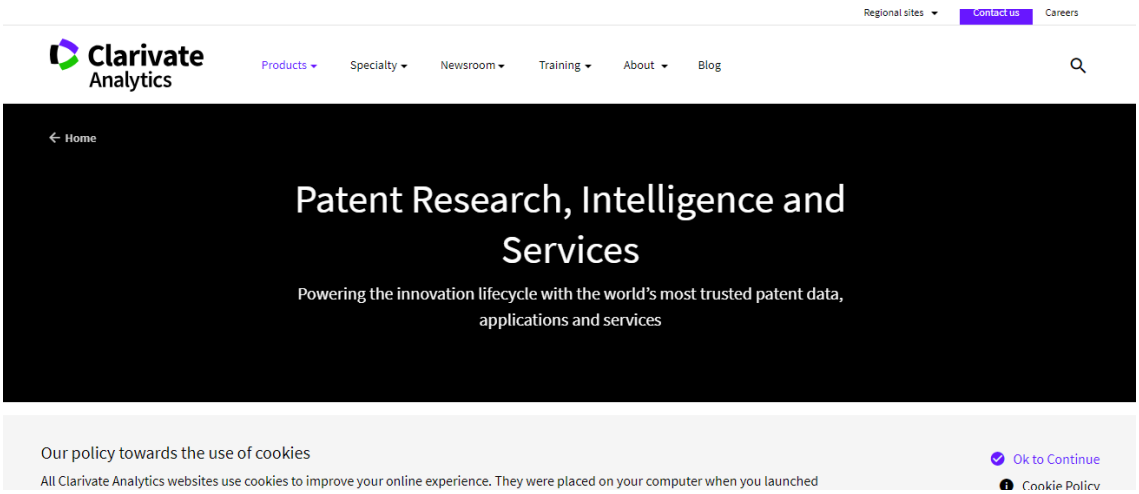

Figure No. 105. Clarivate Analytics source: recovery from https://clarivate.com/product-category/patent-research-intelligence-and-services/

MIcropatent

Figure No. 107. MIcropatent Source: recovery from http://www.wipo.int/portal/es/

WipsGlobal

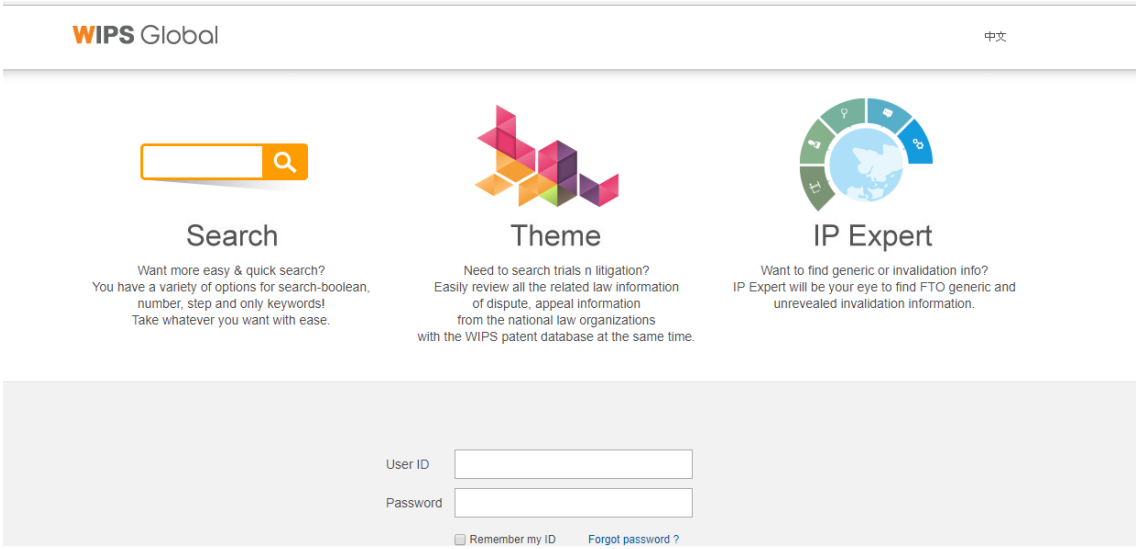

Figura No. 108. WIPS Global

Fuente: recuperado de http://www.wipsglobal.com/service/mai/main.wips

Questel

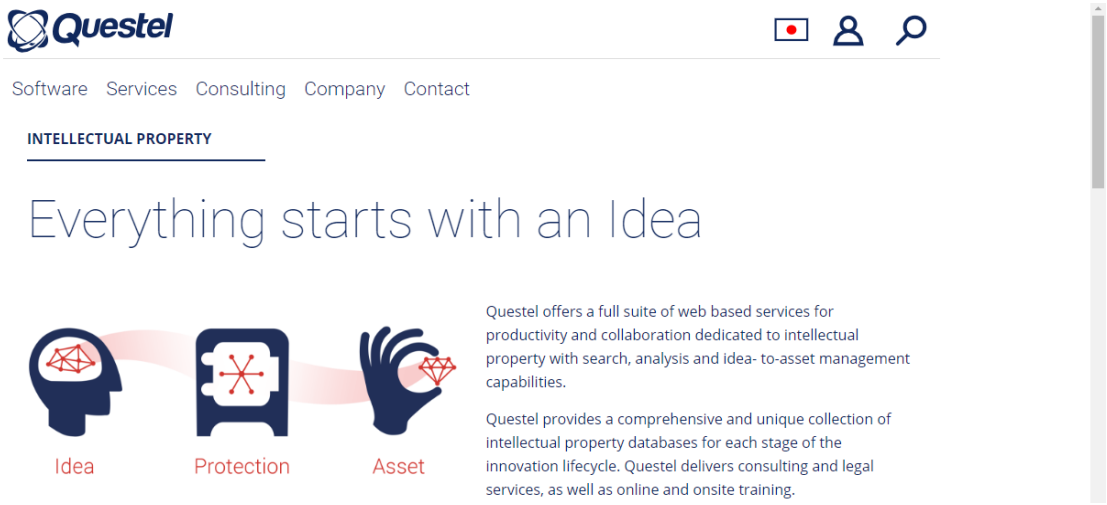

Figura No. 109. WIPS Global

Fuente: recuperado de https://www.questel.com/

STN

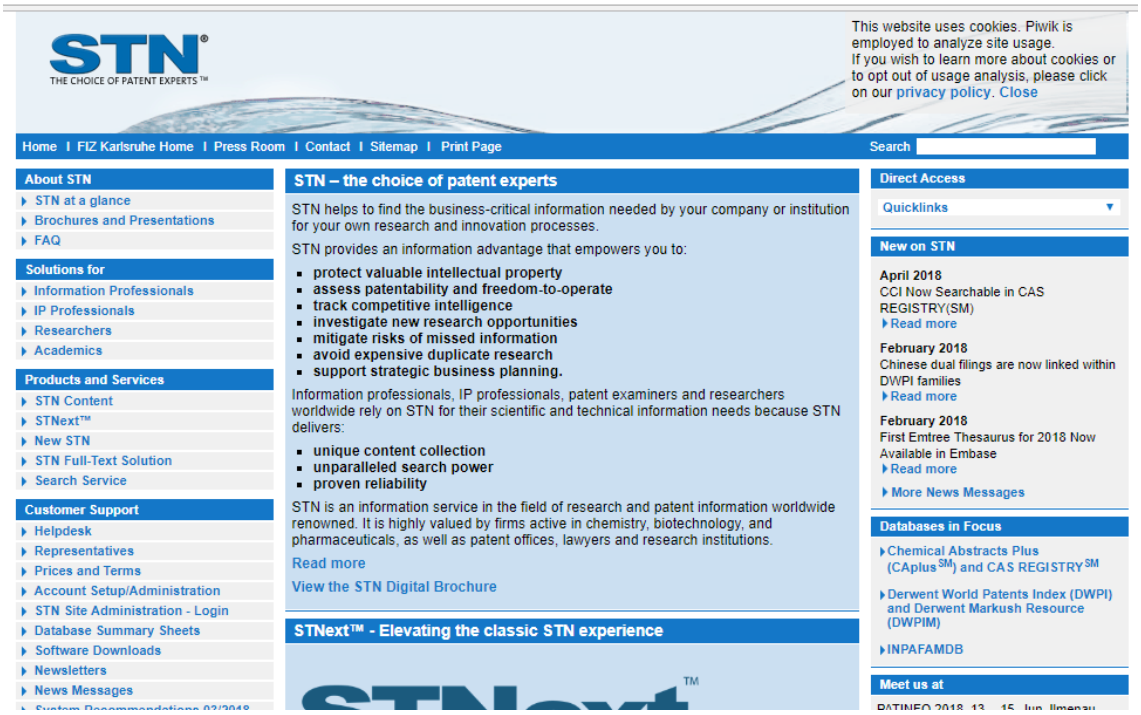

Figura No. 110. STN

Fuente: recuperado de http://www.stn-international.de/index.php?id=123

There are several types of patent documents published, basically they are:

- The patent application.
- The patent granted.
- The report on the state of the art.

In general, the purpose of using patent documentation is: to examine patent applications and to know whether the characteristics claimed satisfy the technical and legal conditions for deciding on their concession.

Obtain technological information that can be used by the public for commercial or research purposes.

The information contained in the patent documents generally covers:

- Identification data of the applicant and the inventor.
- Date of submission of priority application and publication.

Title of the invention.

¬ Summary.

¬ Characteristic drawing.

¬ Technical characteristics.

Examples of free databases available for the consultation of individuals via the Internet:
• Office of Patents and trademarks of the United States of America (USPTO):
• HTTP://WWW.USPTO.GOV/PATFT
• European Patent Office (esp @ dinet)
• http://www.epo.org/searching/free/espacenet.html
• typing
• http://lp.espacenet.com/
• World Intellectual Property Organization
• HTTP://PATENTSCOPE.WIPO.INT/SEARCH/EN/SEARCH.JSF
• GOOGLE Patent Search
• http://www.google.com/patents
• Examples of commercial databases:
• Derwent World Patents Index
• delphion
• Dialog
• Micropatent
• PatentCafe
• WipsGlobal
• Questel
• STN
• Scientific.thomsonreuters.com/derwent
• http://www.delphion.com
• http://www.dialog.com
• http://www.micropatent.com
• http://www.patentcafe.com
• http://www.wipsglobal.com
• http://www.questel.com

mong the many advantages that patent documents represent as a source of technological information, we can point out the following:
1. They are an instrument to plan the development of the industry itself, whatever that the knowledge of the applications of patents presented allows to know the lines of investigation of the competitors and, therefore, to prepare or to continue lines of Alternative research.
2. They are useful for knowing who owns a technology, as patent documents indicate the name and address of the applicant and the inventor.
3. Conclusions concerning the antiquity of the invention may be inferred from the date and

if it still enjoys legal protection.
4. They supply the latest technological information, as the fulfillment of the requirement of novelty, requires that there is no previous.
5. They reveal the information, not only of the usefulness of the invention, but also detailed information about their possibilities of practical application in the industry, in such a way that any medium technician of the corresponding technological sector can realize the Invention.
6. Indicate the state of the existing technique at the time of submission of the application and the technological advancement achieved to the sector to which it is concerned.
7. It is an orderly information because, as it was said, patent applications must meet some requirements that make them relatively uniform in the way they describe the invention.
8. Patent documents often contain information that is not divulged among other means.

Integrated circuit layout diagrams

An integrated circuit is defined as a product, in its final or intermediate form, whose elements, of which at least one is an active element and some or all interconnections, form an integral part of the body or surface of a piece of material , and that it is intended to perform an electronic function. The integrated circuit layout diagrams, also referred to as "topographies" for the layout of integrated circuits, are the creations of the electronics or microelectronics industry, and are defined as the three-dimensional layout, expressed in Any form, of the elements, being at least one of these active, and interconnections of an integrated circuit, as well as that three-dimensional disposition prepared for an integrated circuit destined to be manufactured.

Para que un esquema de trazado sea protegido cuando fuese original, es decir, debe ser resultado del esfuerzo intelectual propio de su creador de manera que dicho esquema no sea corriente en la industria de los circuitos integrados. No obstante, lo anterior, a pesar de que un esquema de trazado esté constituido por uno o más elementos corrientes en dicha industria, se le considerará original si la combinación de tales elementos, como conjunto, resulta no ser corriente.

In order for a plotting scheme to be protected when it is original, that is, it must be the result of the intellectual effort of its creator so that the scheme is not current in the integrated circuit industry. However, the foregoing, although a plotting scheme consists of one or more current elements in that industry, will be considered original if the combination of such elements, as a whole, turns out to be non-current.

The right to the record of the plotting scheme corresponds to its designer. However, the designer may transfer this right to the Registry to third parties by contract, or to his heirs. The registration of an integrated circuit layout scheme confers on its holder the right to prevent third parties from performing any of the following acts:

To reproduce, by incorporation in an integrated circuit or in any other way, the scheme of layout protected, in its entirety or a part of it that fulfils the condition of originality.

B. Commercialize, import, offer for sale, sell or distribute in any way the protected trace scheme, or an integrated circuit that incorporates that scheme; Or

C. Commercialize, import, offer for sale, sell or distribute in any way an item in which the protected integrated circuit is incorporated, only to the extent that it continues to have an unlawfully reproduced layout.

The granting of a breeder's certificate confer to its holder the right to prevent third parties from making without their consent the following acts in respect of the material of reproduction, propagation or multiplication of the protected variety:

Production, reproduction, multiplication or propagation;

Preparation for reproduction multiplication or propagation;

Offer for sale;

(d) Sale or any other act involving the introduction into the market of reproduction, propagation or multiplication material for commercial purposes;

e) export;

f) Import;

G. Possession for any of the purposes mentioned in the preceding literals;

H. Commercial use of ornamental plants or parts of plants as propagating material for the purpose of producing ornamental plants and fruit or parts of ornamental plants, fruit or cut flowers;

The conduct of the Acts indicated in the preceding literals with respect to the product of the harvest, including whole plants and parts of plants, obtained by the unauthorized use of the reproduction material or propagation of the protected variety, unless the Proprietor could reasonably exercise his exclusive right in connection with such reproduction or multiplication material.

Traditional knowledge

In Colombia, the concept of "traditional knowledge" can be understood as synonymous with the "intangible component", a term regulated in the legislation on access to genetic resources. According to the foregoing, it is understood by intangible component all knowledge innovation or individual or collective practice, with real or potential value associated with the genetic resource, or its derivative products or the biological re-course that contains them, protected or not by Intellectual property regimes.

Thus, in our country the traditional knowledge will correspond to any knowledge that has a community on aspects such as the use, management and conservation of the biodiversity, including among others: Knowledge in ethnobotany, Etnoecología, medicine Traditional and irrigation and cultivation systems. Communities possessing traditional knowledge associated with genetic resources (intangible component) have the right to be consulted previously in order to grant or not their prior informed consent for the conduct of activities of Access to such intangible component within its territory.

For access to the intangible component or traditional knowledge, an agreement is required between the community holding such traditional knowledge and the researcher who wishes to use it. The search for this Agreement or consent is made through a prior consultation with the community.

Access to Genetic resources

For access to genetic resources, it is understood that such resources are obtained and used either in ex situ or in situ conditions, as well as their derived products or, if applicable, of their intangible components for commercial use purposes, among others. The national or foreign natural or legal persons (including ex situ conservation centres) who require access to genetic resources or their derived products or are required to apply for permission to access genetic resources and/or their derived products, or To the intangible component.

Biopiracy is a practice whereby researchers or companies illegally use the biodiversity of developing countries and the collective knowledge of indigenous or peasant peoples to carry out commercially exploited products and services and/or Industrially without the authorization of its creators or innovators.

Biopiracy is considered to be the exploitation, manipulation, export and/or international marketing of biological resources that would be contrary to the standards of the Convention on Biological Diversity of 1992. It's a kind of modern piracy. It is not only the smuggling of diverse life forms of flora and fauna, but mainly the appropriation and monopolization of the knowledge of traditional populations in terms of the use of natural resources. This situation is not new in the Amazon or in other biodiversity-rich areas of the planet, especially in tropical areas.

Business Secrets

It is considered business secrecy any undisclosed information that a natural or legal person legitimately possesses, that can be used in any productive, industrial or commercial activity, and which is susceptible to be transmitted to a third party, to the extent that Such information is secret, has a commercial value for being secret and has been subject to reasonable measures to keep you secret.

The information of a business secret may be referred to the nature, characteristics or purposes of the products; (a) production methods or processes; Or, to the means or forms of distribution or marketing of products or provision of services. Whoever lawfully has control of a business secret will be protected against the disclosure, acquisition or use of such secrecy in a manner contrary to fair trade practices by third parties.

Test data

It is the undisclosed information presented for obtaining a sanitary registry of new pharmaceutical drugs (new chemical entities). In other words, it is the temporary protection given to the safety and efficacy information presented by the companies to show the health authority that a product is safe and effective.

When a health registry is requested before the INVIMA of a new chemical entity on which undisclosed information (test data) has been generated and whose generation has meant considerable effort, such undisclosed information may not be used directly or indirectly by third parties, as support for the approval of another application for a health record on the same chemical entity, for a term of 5 years.

In practice, the protection of test data is that, during the period of protection, no one other than the person who has delivered that information (studies of safety and efficacy of the medicinal product) to the health authority-generally the company that Developed the drug-you can make direct or indirect use of them to obtain a marketing permit.

In other words, a producer of generic drugs – who has not done the safety and efficacy studies and who generally does not have access to their results – must wait for the corresponding deadline to make use of these studies in order to Obtain their own health record on the medicinal product concerned. Intellectual property is not a static discipline, evolving continuously as new forms of human intellectual creations emerge that merit benefit from the regime of protection and incentive that intellectual property recognizes and It represents, integrated circuit layout diagrams, new plant varieties, business secrets, traditional knowledge, access to generic resources.

Chapter 5.
Conceptualization and influence of educational policy in access to science

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In the context of the social, political and economic transformations of the globalized society, education as an activity of socialization has redefined the boundaries of its action. In social terms, the relationships established with the different strata have been transformed and their role as a space for socialization. From a political perspective, in the transformation of the power relations framed in the permeable membrane that keeps it linked to the organization of the Socioic strata on which it has interference; And, at the economic level, becoming one of the guarantors of legitimately nuclear entities in the business activities linked to education as central input.

Within the framework of international policies managed from the edge of the Second World War, educational policies became a field of action from which organizations such as UNESCO, the World Bank, the OCDE and the BID. These four international organizations have a significant influence on the educational policies of Latin America. To take stock of the degree of interference of these international organizations, it is necessary to characterize the fundamentals and scopes of the proposed policy guidelines, with an emphasis on science education.

Policy Analysis from the field perspective

The international and national pacts that give account of the legal and political framework on which social and educational policies must be erected are the obligatory imprint to solve the network of complexities that for our country transcend to scenarios of The violence, conflicts and the organic inequities that require an early solution. The approach of analysis of public policies, to account for these scenarios in the educational field is configured as an opportunity to find varied readings of the social construction of this reality.

Thus, it is evident that the public education policy is, like many others, a scenario of tensions that reflects a vision of society, development and political project from which the positions of block of interest and hegemonies are generated that promote a form of a given social organization. Therefore, the educational policy as part of this field, is not alien to the game of weights and counterweights, tending to become dominant in the formulation of an idea of nation and country.

The educational field, as a complex network of practices, speeches, institutions, power relations, production of senses, is called to contribute to the construction of a better society, strengthened from the empowerment in the decision making Around the duty to be the educational sector and its related scenarios.

In this way, as mentioned Pulido (2012), it is necessary to interpret the role of the educational actors taking into account that:

"We must consider that the object of study of the educational policy is the own socio-educational reality in its multiple dimensions, without doubt that this affirmation can be attributable to the sociology of the education, the pedagogy, the history of the education, between others, (...) These theoretical fields construct and try to understand the educational reality from different angles of analysis. " (Tello, 2012, p. 290)

International organizations and educational policies

The analysis of educational policies in the twentieth century must go through a direct reference to the guidelines proferred from international instances. It is undeniable the role that the geopolitical perspective has had in the design and implementation of policies at all levels including infrastructure, housing, health, work and education in a very important way. Of great importance are the suggestions that, through international conventions, world forums, expert meetings, were given since the late 1950s to the tenor of the so-called Cold

War and the Alliance for Progress, and later in the shadow Of the Washington consensus promoted from the Austrian School of Economics.

The political orbit after the Second World War, leaves for the national states of Latin America a marked dependence of their educational policies to external agents, in the light of perspectives linked to the conceptual niches of countries of the first world. The political realism with which the so-called developed countries strengthen their axis of action on the peripheral countries brings with it the need to generate a framework of inquiry on the role that entities such as the World Bank (WB); The United Nations Educational Science and Culture Organization (UNESCO); The Organization for Economic Cooperation and Development (OCDE); The Inter-American Development Bank (IDB) and the Economic Commission for Latin America (CEPAL) have had public policy in this part of the hemisphere.

The influence of these multinational institutions has come with strength to permeate decisively the educational policies of the peripheral countries to such an extent that they have transformed the conception of these states in the configuration of quality policies Educational, the articulation of the different educational levels, the design of curricular proposals and even the forms of resources for the financing of public and private education.

Hence, education at its core, middle and upper levels, bring in after the nineties, the question of education and its relationship with technology, the conservation of the environment and the solution of problems related to the appropriation of Material and energetic resources with which to sustain the current production models.

Discursive fields of science teaching culture from international organizations

A preliminary assessment of the lines of action and direction of the different international organizations on the educational policies in the field of the natural sciences, can give an idea of the particular interests of each one of them. UNESCO, for example, ranks batteries in the social importance of research with the imprint of fostering interdisciplinary

spaces from teacher qualification and articulation between secondary education and higher education. In this way, the use of information technology and communication technologies is promoted in order to connect the generation of scientific knowledge with the cultural niches from which the specific topics to be solved emerge; In a kind of thought that articulates the technological and scientific production with the solution of concrete situations of the society.

On the other hand, the World Bank allocates resources in order to strengthen, from its perspective, the training and evaluation spaces. To this end, they urge developing countries to take successful experiences from international institutes of Science and technology linked to Asian States whose experiences could be replicated in the Western Hemisphere. Connected to this, they suggest the articulation with the business sector, from which economic and technological resources can be obtained with which to make science education more pertinent.

The OCDE talks about the relevance of scientific knowledge linked to the strengthening of statistical science education because of the dual need to promote information systems and incorporate quantitative perspectives into education in all its Levels. It is required for these goals of a process of flexibilization of the curricula to strengthen the teaching of the natural sciences in instances of formal and continuous education.

On the other hand, the BID aims to promote training in technical and technological education, strengthening research that fosters the apprehension of skills that are related to international standards that allow national mobility and International students.

In general terms, the interest of these international organizations goes, over three decades, from the perspective of knowledge and education as a social and economic value in itself, through the need to standardize the criteria of quality and use of technologies, to the role of educational institutions as facilitators of social equity and equality.

For this reason, they become common, institutional and temporal, the bets for the extension of the educational offer, the transition towards quality standards, evaluation and relevance, the monitoring and promotion of spaces of design and implementation to scale International, looking at the allocation of resources to educational proposals that replicate the guidelines proposed from these agencies. Here are some general traits of three decades of educational policies related to the field of natural sciences.

1990s: Appropriation of technologies as equity

In 1992, the report of the International Commission on Education for the 21st century is presented, as a result of the work of a working group led by Jacques Delors in the document entitled, Education contains a treasure trove. In this paper, developing countries are urged to "not neglect the classic engines of growth, and specifically the indispensable entry into the world of science and technology with all that implies adaptation of cultures and modernization of mentalities. " (p. 9) The Delors-led Commission positions the concept that "lifelong learning is based on four pillars: learning to know, learning to do, learning to live together, learning to be". (P. 34).

This leads to the strengthening of education in technologies from all educational levels as an integral part of training:

Mindful of the realities of current education, the Commission emphasized the need for qualitative and quantitative teaching, traditional (such as books) and new (such as information technology) resources, which is appropriate Use with discernment and promoting the active participation of the students. For their part, teachers should work as a team, especially at the level of secondary education, mainly to contribute to the indispensable flexibility of study programmes. This will avoid many failures, highlight some natural qualities of the students and therefore facilitate a better orientation of the studies and the trajectory of each one, according to the principle of an education taught throughout life. (p. 25 -26).

The criterion is not only educational; It transcends to the search for equity because, it is necessary to "disseminate the new technologies called of the information society in favour of all the countries, in order to avoid an even greater intensification of the differences between rich and poor countries" (p. 29).

For this reason, the Commission recommends, inter alia, the appropriation of the respective technologies and knowledge:

(...) Diversification and improved distance learning through the use of new technologies; Increased use of these technologies in the context of adult education, especially for the continuous training of teachers; The strengthening of each country's infrastructures and capacities with regard to development in this field, as well as the dissemination of technologies in society as a whole; It is in any case a matter of conditions prior to its use in the framework of formal education systems; The launching of programmes for the dissemination of new technologies under the auspices of UNESCO. (P. 38).

This requires a framework that must include, among others, "helping countries to enhance the international dimension of teaching (curriculum, use of information technology, international cooperation)", which can be given from the International support "through UNESCO, intellectual cooperation in the field of education: UNESCO chairs, associated schools, equitable sharing of knowledge among countries, dissemination of information technology, exchange of students, Teachers and researchers. " (P. 39).

Additionally, the importance of educational innovation in the field of support to the environment and the production of services is present:

This means that the Commission does not underestimate in any way the central function of the grey matter and of the innovation, the passage to a cognitive society, the endogenous processes that allow to accumulate the knowledge, to add new discoveries, to

put them in Application in the different fields of human activity, both health and the environment and the production of goods and services. (p. 15).

Taking into account that science and technology must be based on knowledge involving family, citizenship, production and the environment "In this perspective everything is ordered, whether it be the demands of science and technology, knowledge of oneself and of their environment, or of the creation of capacities that allow each one to act as a member of a family, as a citizen or as a producer. (p. 13).

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On the other hand, the UNESCO-PNUMAInternational Congress on Environmental Education and Training, held in Moscow in 1987, generates the document "Elements for an international action strategy in the field of environmental education and training for the decade of 1990 ".

As a general principle of the strategies, the conference in Tbilisi states that:

Although it is obvious that the biological and physical aspects constitute the natural basis of the human environment, the socio-cultural and economic dimensions, and the ethical values, define on their part the orientations and the instruments with which the man will be able to understand and To better use the resources of nature in order to meet your needs... Education must play a capital role with a view to creating awareness and better understanding of the problems that affect the environment. This education must encourage the development of positive behavioural behaviour with regard to the environment and the use of the nations of their resources. (Final report, Tbilisi Conference, 1977).

In this line, the 1987 Moscow Conference establishes strategic lines for the formative work in environmental education: access to information, research and experimentation, educational programs and teaching materials, training of staff, Technical and vocational teaching, education and public information, General university education, specialist training, and international and regional cooperation.

As an example, in the area of educational programmes, it is recommended to adopt an interdisciplinary approach... which is to deal with more property issues related to the environment that are already in the programme of the various disciplines, or to incorporate Environmental elements to some disciplines and in particular to the natural sciences. (p. 18).

Within the framework of Unesco's international environmental Education Programme, the document, environmental education: A module for the training of science professors and supervisors for secondary schools, provides some elements from which it is possible to demonstrate the Importance that these guidelines of international policy of environmental education which contain the recommendations of the Conference of Tbilisi in terms of the training of teachers. In this document, it raises the importance and scope of environmental education "in response to the urgent environmental problems facing humanity at the local, national and global levels. In explaining environmental education, its characteristics will be counterposed to those of the traditional teaching of sciences (and other subjects) in high school. (p. 12).

It raises the way environmental education tries to "give students opportunities to be actively committed to working towards the solution of environmental problems," the scientific method of problem solving is an integral part of East (P. 13).

Within the fields of work are specific suggestions on the following:

1. Energy (Types of energy, energy conservation law, and energy degradation law; 2. Ecosystem (energy flow in ecosystems, law of conservation of matter, cycle of nutrients in ecosystems and succession); 3. Resources (The nature of resources-inexhaustible, renewable, irreplaceable-; 4. Food (production and use of energy, and nutrition); 5. Pollution (contaminant, threshold, synergy, persistence and biological magnification); 6. Human population: growth and control (birth rate, mortality rate, fertility rate, marriage age, age structure and density, and distribution).

Pointing out that the training proposals should be more than theoretical, in local situations and problems. I mean:

"An efficient environmental education should be much more often related to current local situations than to more distant, chronic and example-type situations that can be included in large-scale and permanent curricular resources. Otherwise, we should not expect that the environmental resources produced in one country have great use in another's schools. The texts of traditional sciences have often had such flexibility, although lately it has been recognized the need to root the teaching of science more solidly in a cultural perspective of a nation. (p. 15).

Regarding the characteristic limitations of teacher training for this purpose, the document mentions that: the preparation of the science teacher with the concepts of environmental education and with the skills and strategies for its planning and Education is one of the requirements for the setting up of environmental education in schools. All educational systems have limitations that hinder innovation in curriculum and teaching. Identifying and controlling these pressing factors is important if teaching should become more environmental. Some of the limitations are quite outside the classroom teacher's

control. It is in this last type of limitation that science supervisors play a key role. They can alleviate the burdens on the teacher and the school and create conditions that make possible some of the new but very essential features of environmental education. (p. 15).

On the other hand, the World Declaration on Education for All and the framework for action to meet basic Learning Needs (Unesco, 1990), adopted by the World Conference on Education for All (Jomtien, Thailand, March 1990), is That within its fundamental objectives is the satisfaction of basic learning needs. From this place of enunciation, it is urged to use the educational opportunities to learn about different topics that include essential tools such as reading and writing, calculation, and problem solving, linked to a set of values Essential "necessary for human beings to survive, fully develop their capacities, live and work with dignity, participate fully in development, improve the quality of their lives, make informed decisions and continue Learning. " (Unesco 1990, p. 3).

Within its most relevant frameworks of action is the improvement of analytical, technological and management capacities. These comprise essentially competencies and technical skills linked to diverse topics among which can be found:

Both the management and supervisory staff as well as the planners, school architects, teachers of normal schools, specialists in curricula, researchers, analysts, etc., are important for any strategy of improvement of Basic education. However, many countries do not provide them with specialized training to prepare for the exercise of their duties; This is especially true in literacy and other basic education activities that are developed outside the school. A crucial prerequisite for effective coordination of efforts among these many participants will be an extension of the basic education perspective, as well as the strengthening and development of planning and management capacities at the Regional and local, in many countries, with broad responsibilities. (P. 27).

The document "Education and Knowledge: axis of productive transformation with equity", of CEPAL-Unesco (1996), raises a model of work in education linked to the

economic field with reference to the formation of human resources and the diffusion of technical progress, Which would require:

Contrasting the Latin American pattern with that of those countries that could be described as successful in their development process, in addition to their higher levels of dynamism and fairness, are clear differences in terms of the saving-investment process, to Human resources training and the dissemination of technical progress; Also the international insertion of the countries of the region absorb more direct investment from the outside, they register higher levels of external indebtedness and they reproduce styles of consumption from the developed countries in higher degree than in other Latitudes. (p. 15).

As part of the assurance that "the whole population is able to manage the knowledge and codes of modern society". From the edge of knowledge, they are a scenario of "understanding the world" as well as promoting interest in scientific work. In this regard, the following is mentioned: Teaching Science as "(...) Another measure to raise the quality of basic education is to improve the teaching of science, incorporating areas indispensable to the understanding of the modern world and society. The teaching of science is also a stimulus to scientific vocations. (p. 80).

The recommendation of CEPAL-Unesco (1996), transits in order to provide element of appropriation of technological knowledge as part of the strategy of "boosting creativity in the use and diffusion of science and Technology", in attention to that "the potential Technology of a country depends on its educational development. A country can use new technologies and create others if it achieves a high educational level and has the capacity to research. " (P. 84).

For this reason, in the educational field, it is required in Latin American countries a policy of science and technology that tends for "the acquisition of suitable foreign technology, the use and rational diffusion of the new technologies, the improvement and development of technologies and the formation of human resources for all of the above. In

the case of Latin America and the Caribbean, it is recommended to strengthen several aspects related to technological development. " (P. 84).

First, according to CEPAL-Unesco, "Our countries" could create more technology and sell it to other countries on the world market. Some countries in the region have established incentives for higher education institutions and technology centres to better develop their work. These incentives consist of better salaries or facilities for the sale or transfer of technology.

In this line of work, post-secondary training is weighted in technical and industrial processes with the idea that developing countries reach the level of "centre" countries, taking as reference an education aimed at strengthening the relationship with Business Centers:

It is advisable to strengthen or create postgraduate and laboratories in disciplines such as industrial design, production management, technological management and materials engineering, improve the management of public technological centers. This implies, among other things, training axis of productive transformation with management equity to its directors and middle managers, and encourage the participation of entrepreneurs in their boards of directors. At the same time as the technological supply of a country is strengthened, the transfer of foreign technologies must be streamlined and harnessed for development itself. This can be achieved by hiring technical services, offering credits to support technological modernization, and by encouraging technological management groups working at the enterprise or industrial branches level. (p. 84-85).

Decade of the 2000s: Science and inclusion

The World Conference on Higher Education-2009: The new dynamics of higher education and research for social change and Development Unesco, held in Paris in 2009, advises its affiliates to create public policies that promote Capacity building in the field of

science and technology including the field of education and the issue of poverty as a phenomenon to be eradicated from this imprint.

Some of the guidelines postulated by UNESCO (2009) have to do with:

I. Assist countries to formulate and implement policies on science, technology and innovation and to improve their means of action in the field, taking advantage, where appropriate, of what local and indigenous knowledge can bring; and to promote access to basic knowledge and services in the field of science and technology through cutting-edge technologies, especially in developing countries.

II. To reinforce the teaching of science and technology, as well as the creation of human and institutional capacities and the corresponding policies related to fundamental sciences, engineering and renewable energies, in particular through the International Program of Fundamental Sciences (PICF), in close collaboration with the International Centre Abdus Salam of Theoretical Physics (ICTP), the International Bureau of Education (OIE) of UNESCO, educational and scientific networks, centres of excellence and Non-governmental organizations, endeavouring especially to promote the elaboration of curricula, a teaching of science and quality engineering, the use of science to respond to current problems and the joint use of capacity Scientific and research, as well as South-South cooperation and triangular cooperation North-south-south.

III. Take advantage of the possibilities offered by scientific and technological applications for the eradication of poverty, sustainable development and other development goals, also to address global climate change, to integrate the issue of Equality between men and women and favouring underrepresented groups, especially by promoting the links between education, research and development.

Connected to the above, the UNESCO Report on Science (UNESCO, 2010), taking stock of the state of science on a global level, within the main messages of this document is the successful experience represented by some States They can benefit from the development and appropriation of scientific knowledge by saying that "lagging countries can grow faster than the technological leaders of the first hour, taking advantage of the reserve of unexploited technologies and benefiting from minors Risk Levels "(p. 29).

That involve a savings exercise, from their own initiatives "thanks to the development of wireless media in telecommunications and education (via satellite, etc.), energy (wind generators, solar panels, etc.) and health (telemedicine, Portable clinical scanners, etc.) ", exemplified in China and India who, through their educational commitment, have promoted" the rapid expansion of highly skilled e-labor; The many surplus workers in agriculture and small trade; The relative gain in the replacement of obsolete equipment by state-of-the-art technologies, and the indirect effects of investment in new technologies. " (p. 29).

For developing countries it is preponderant that, from the Triad, science, technology and innovation-CTI, efforts are being developed in the production of sustainable and ecological technology as part of the objective of innovation in development of "clean technologies", Whose benefits are exemplified in the case of some Arab and African States. So "it would be reasonable to argue that lagging regions or nations will always do well to improve their absorption capacity and eliminate any kind of" barriers "that impede the positive dissemination of technologies from the leading economies in this regard , whether they are from the north or the south. " (p. 29).

This puts at the center of the debate about the science, the capacity and the speed of socialization of the advances that is given in a differentiated way which generates a strongly marked inequity what n matter of education can mean an important challenge, since all The Levels – BASIC, medium and higher – should generate strategies that facilitate the appropriation of scientifically produced knowledge. From this we inferred that as Unesco (2010) States, globalization generates a gap that responds to a differentiated framework of production and appropriation of knowledge.

To this extent, Unesco states that:

"This globalizing trend affects research and innovation in a variety of ways. On the other hand, and contrary to a reasoning that is perhaps somewhat simplistic, globalization does not lead to a flat world, in which gaps in research and innovation capacities between

countries and regions are constantly being reduced. On the contrary, while there is clear evidence that a concentration of knowledge production and innovation is occurring in a wider range of countries than before in Asia, Africa, and Latin America, that knowledge is growing at a very high rate Differentiated within the countries. " (p. 30)

Decade of the 2010s, in this line of proposals, the report on national systems of science, technology and Innovation in Latin America and the Caribbean of UNESCO (2010), gives special preponderance to the formation of human resources:

The main input of any creative activity, especially those involving scientific research tasks, development of new technologies or implementation of productive innovations, is the availability of highly human resources Qualified. The results and impact of the science, technology and innovation activities will depend on the implementation of an appropriate CTI policy, the levels of human resources training, access to instruments, appropriate laboratories and resources To support the current expenditures that come from the actis. (P. 40).

With this panorama, the national systems Report, UNESCO (2010), prioritizes science education as part of policies at the basic levels of education:

Science education at the primary and secondary levels was recently recognized as a regional priority, both by Member States and by experts during the two regional fora on science, technology and innovation policy in the Americas Latin America and the Caribbean, organized by the UNESCO Regional Office of Science for Lac in the year 2009 (see text of the regional declaration in Appendix 1). These meetings recognized the need to implement long-term state policies in universal education with quality from the initial to the top level, which are sustained by significant permanent investments over time. Similar remarks were made recently at a meeting of MERCOSUR education ministers. (P. 43).

On the other hand, UNESCO (2016) carries out the third Regional study (stubborn) as a contribution to the design of public policies in the teaching of natural sciences, in order

to generate guidelines for the evaluation of the quality of education in The countries of Latin America and the Caribbean in order to improve quality standards from factors linked to "learning achievements". And, therefore, to promote the "identification of factors associated with these achievements, so that, from that knowledge, it contributes to the formulation of public policies." (p. 9).

The stubborn tests, evaluated the following cognitive domains: health, living beings, environment, Earth and the solar system, matter and energy; and cognitive processes: recognition and formation of concepts, understanding and application of concepts and scientific thinking and problem solving.

It is assumed that the evaluation not only provides a descriptive space for the advances in education, but also contributes to the decision making of educational policy.

In this regard, Unesco (2016) mentions the following:

The evaluation makes sense when it is able to generate information that serves to make decisions and to illuminate the actions of improvement. Designing educational interventions and implementing remedial without reliable data about student learning levels increases the risk of deflecting focus and not distinguishing those areas that really require support and improvement; In other words, there may be an effort and an investment of time, energy, and resources that are misaligned with the true needs of students, schools, and educational systems, transforming into efforts and investments that do not bear the expected fruits. On the other hand, an evaluation, however robust it is technically, but that does not generate quality information to be used by teachers and managers, is also an effort and an investment that does not generate impact. (p. 10).

Connected with the foregoing, UNESCO proposes from Macedo et al. (Cited in UNESCO, 2016) the use of natural sciences as a promoter agent of ethical and aesthetic solutions from a comprehensive view of "global problems", through the scientific use of knowledge. That is to say, it is a look of scientific thought in close relation to the explanation of the conflicts and the languages that are his own, in order to achieve a just society by turning

to the scientific and technological development as a vector of transformation "and As a strategy conducive to coexistence, participation and values education. " (p. 14).

To achieve this critical thinking about science, a teaching is proposed that has the following elements: analyzing and interpreting data; Classify Communicate Design and plan an investigation; hypothesis formulation; Formulating questions, experimenting or experimenting; Observe Predict Review and evaluate results; Take or collect data. (P.P. 17-18).

Connected to the traditional cutting capacities mentioned above, Unesco (2016) proposes others that can be equally useful: capacity to adapt to different situations, social skills, non-routine problem solving, self-management and development, systemic thinking. (p. 18).

As part of the conclusions of stubborn, a set of scientific skills necessary for the teaching of the natural sciences are weighted, among which would be those of:

(...) To incorporate in the school science a double glance: that of scientific knowledge and another on how that knowledge is developed by means of scientific research. With regard to the skills to be developed through the teaching of science, it is noted that not only are promoted the ones that are own to the sciences, but also those that train the students to participate in other areas of the school life and adult. Among the proper scientific skills are: analyzing and interpreting data, classifying, communicating, designing and planning an investigation, formulating hypotheses and questions, doing experiments, observing, predicting, evaluating results and working with data . But in addition to this type of skills can also develop additional, such as: ability to adapt to new situations, interpret different types of languages and communicate ideas, resolution of non-routine problems, thought Systemic, among others. (P. 58).

As specific conclusions of the study in relation to the skills measured, are shown among others announce:

(...) That the ability of scientific thinking and problem solving is the one in which the students show a better performance, above those of recognition of information and concepts and that of comprehension and application of concepts. Results that open an interesting field of research in the search for explanations to this and also to investigate more specifically about what are the kinds of achievements that students have in this area. Some possible explanations that could be used as hypothesis for such research would arise by placing focus on classroom practices. Probably, some of the concepts collected as an integral part of the national curricula are worked with different degrees. (p. 59) depth, taking into account that several are re-studied in later years in the areas of biology, physics or chemistry, during secondary education.

The study carried out by Valverde and Naslund (2010), sponsored by the Inter-American Development Bank, seeks a better understanding of the educational systems in Latin America and the Caribbean in the field of teaching natural sciences and mathematics. It is concluded in this report that "young people are not being properly prepared to have the tools in math and natural science needed in an increasingly interconnected world economy." (p. 1).

Therefore, it is responsible for "weak programs, inadequate learning materials and lack of teacher skills in mathematics and natural science." The study aims to demonstrate that the classrooms have structural flaws because they are characterized by the development of "memorization of routine computer operations and the mechanical reproduction of the concepts"; Likewise, teachers are indicated to give untruthful and erroneous information, with the attachment of not making a relationship between their low performance and that of their students. (p. 1).

For this reason, the BID proposes a framework set in priorities on: (i) educational goals and content standards; (ii) Curricular and material policies; (iii) teachers and pedagogical practices; and (iv) evidence-based interventions. These priorities are intended to

advance a conversation regarding future courses, strategies and programs in mathematics and natural science. (P. 37).

Researchers recommend an education in natural science and mathematics linked to the development needs of the 21st century, with the twofold aim of "providing all students with a basis in scientific numerical knowledge, and at the same time Arouse interest in the careers that involve mathematics and the natural sciences. " Also, to support the disciplinary rigour in the goals of mathematics and natural sciences in the interventions, demonstrating the significance of the content and the skills that are going to be taught. " This results in the need to "promote at the international level the fixation of benchmarks in terms of goals, strategies and techniques." (p. 38)

As for teaching materials, it is necessary to "promote a perspective of mathematics and Natural Sciences (numeracy perspective), favoring interventions and policies that exploit the complementarities between education in mathematics and Sciences. " Likewise, it is necessary to diversify the didactic material that is used, abandoning a little textbooks in favor of other means of audiovisual and technological cutting. It is also required to articulate more attractive curricular proposals for students and to give teachers the appropriate means for that purpose. (P. 40).

As for teachers and their pedagogical practices it is pointed out to the need for those who teach are disciplinary experts to embrace the recommendations of strengthening the development of scientific thinking. This implies a great investment in training for teachers to promote divergent thinking in the classroom, integrate students into the evaluation process, and involve adults as active apprentices. This means that complementary strategies are required to solvent the large deficit existing in mathematics and natural science teaching specialists. (p. 41).

The foregoing must go hand in side with a model of intervention based on evidence; This requires clarity on the part of educational systems in the way that studies and research carried out in the educational field will be used. In specific terms, it would be a question of:

requiring policy instruments to specify how empirical evidence will be collected, analysed and used to refine and improve interventions. How is the program going to learn from its strengths and weaknesses? This must be clearly stipulated in the design of any intervention. The initiatives that clearly prioritize the learning of evidence are also much more likely to have a strong commitment to rigorous evaluation and monitoring standards.

This has repercussions on how to evaluate that it ceases to be an adjective component of training to become a central part of the design of educational proposals that specifically account for the specific disciplinary standards for the apprehension of " "Required" skills and content.

In this regard, Valverde and Naslung-Hadley (2010), the educational system must:

Ensure that all interventions in mathematics and natural sciences are evaluated with rigorous methods and that the evaluation is part of the intervention design. The evaluation may not be something that is thought of later or a mechanical exercise that is done to comply, if you want it to be useful. There are pedagogical and disciplinary criteria that naturally govern the goals of content and skills in mathematics and natural sciences that an initiative proposes to seek. There are also professional standards that should govern evaluation and monitoring practices; Nothing can be learned from an initiative that is not evaluated. Although the experimental design is the ideal standard, other rigorous evidence-based designs could be used, including, for example, quasi-experimental designs.

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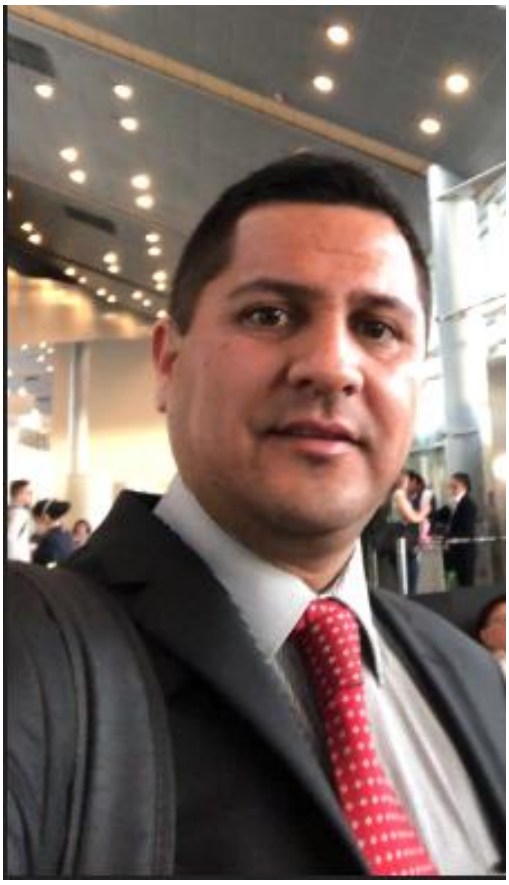

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