

# AXCES: a strategy to show the scientific production of LACCEI

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**Abstract** – *The scientific production of an institution or organization is what allows it to give visibility to its researchers and present the contribution to the state of the art generated. This production is shown in various products such as papers, presentations, etc. LACCEI (The Latin American and Caribbean Consortium of Engineering Institutions) is a non-profit organization that, since 2003, organizes (among other activities) a multi-conference every year in which scientific articles on Engineering, Education and Technology are presented under a double-blind peer review process. The objective of this paper is to describe how LACCEI has implemented an institutional repository called AXCES that establishes the bases to recognize and measure the scientific impact following the philosophy of Open Access under the quality principles of the FAIR Data of the European Union and OpenAIRE Guidelines. The article presents a conceptual framework, the implementation process of AXCES and then a series of recommendations that should be taken into account in any process of scientific dissemination and popularization. The key contributions that were achieved in this work refer to a proposal that systematically presents scientific production, outlines the guidelines to guarantee machine-machine interoperability of scientific production that generates automatic bibliometric indicators, and presents recommendations for the generation and publication of scientific production. scientific results.*

**Keywords** – *web visibility, university education, scientific dissemination, institutional repository, AXCES, LACCEI, AGORA.*

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## I. INTRODUCTION

Scientific production refers to processes and products of different people and/or associations/institutions to materialize and make scientific knowledge visible, as well as a set of documents, products and/or resources that are made available to readers from various disciplinary communities [1]–[2].

In the last decade, many institutions and authors have decided to follow the guidelines of the Open Access (OA) philosophy, recognized as a new way of communicating science that proposes a varied use of the production of epistemically qualified knowledge without economic, technological or economic restrictions, nor legal. The only limit in this philosophy is linked to respect for copyright [3]–[5]. From this perspective, scientific preservation and dissemination is guaranteed, which will have a direct impact on the web visibility of the works of researchers, students, professors, graduates, etc. and, therefore, of the institutions themselves [6].

To guarantee preservation and dissemination, Institutional Repositories (IR) have been developed, seen as a set of digital files (also known as items or resources), described by means of metadata, representing scientific and academic products accessed by users through computer systems that [7]–[10], in turn, become an opportunity for institutions to disclose and preserve the intellectual activity that is generated there.

In a timely manner, Institutional Repositories conceived as a web application are capable of guaranteeing web visibility that will be determined through the number of links received by the resources and/or products [2], [6], [11], [12]. For a long time, the indicator "impact factor" or "web impact factor" [13] was considered vital to measure the impact of scientific production, however, this concept has been in decline for some years because the impact is confused, of the journal with the impact of its authors [14]. Although many of the indicators to measure visibility were born within the framework of the evaluation of scientific journals [15], in recent years, altmetrics have had a great boom because there is a relationship between the real impact of the authors and open social platforms.

It is worth noting that IRs are channels of scientific communication, but they are not publication channels. This means that the same validation mechanisms that have existed until now through peer review must be followed, but authors must emphasize showing their publications and primary data through the various forms that the internet offers today, for example, data and institutional repositories, academic social networks, Google Scholar and the like [9].

Undoubtedly, the fact of the increase in scientific production, was warned at the time by some philosophers such as Kuhn and Echeverría [16], [17], is a sign of the change of time that is being experienced with the so-called "Information

Age" [17]–[19]. It has been the Internet, the emergence of social networks and the philosophy of Open Access (OA) [20], [21] that have allowed scientific production (among other types of documents) to be more visible and accessible every day without legal, technical and access restrictions.

For this reason, LACCEI<sup>1</sup> (The Latin American and Caribbean Consortium of Engineering Institutions) has promoted the generation of scientific production in Latin America and the world since its foundation in 2003. LACCEI is a non-profit organization made up of institutions that offer programs in Engineering, Technology or Education and that collaborate academically or in research with other institutions globally. Currently, it has more than 220 participating institutions from three continents in 25 countries and has held an annual academic-scientific multi-conference for 20 years.

In 2005 (Rio de Janeiro), The OAS (Organization of American States) selected LACCEI as part of the "Engineering for the Americas - EftA" action plan to advance the accreditation and quality assurance of engineering programs in the Americas. Then, in 2016 (San Jose - Costa Rica), the OAS officially hosted the I OAS Engineering Summit for the Americas parallel to the LACCEI International Multiconference and named LACCEI as the "**Engineering Center of Excellence for the Americas**", an important credential that allows it to strengthen the quality of education in Engineering, Academic Leadership and Student Competencies, in addition to connecting Latin America with the world [22].

Additionally, LACCEI has made strategic alliances with different institutions such as: CONFEDI, ASIBEI, ACOFI, GEDC, ASEE and IEEE, among others and, in 2022, formed the Multi-Society Global Colloquium on Engineering Education<sup>2</sup>, made up of 7 societies from around the world: AEEA, ASEE, CEEA/ACEG, CSEE, JSEE, KSEE, and, LACCEI.

In short, LACCEI's mission is to be the leading organization of engineering institutions that will celebrate innovation, inspire collaboration in engineering education and research, and foster partnerships between academia, industry, and government for the benefit of humanity, society and nations<sup>3</sup>. The LACCEI initiatives are: "Capacity development in engineering accreditation", "Diversity and STEM Women", "Engineering Pedagogy", "Student Chapters", "Council of Deans of Engineering of LACCEI" and "Permanent Committees". The permanent committees are: Learning Engineering and Online Laboratories, Technological Development and Innovation, International Accreditation, Internationalization and Interculturality, Women in STEM,

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<sup>1</sup> <https://laccei.org/>

<sup>2</sup> <https://laccei.org/blog/global-colloquium/>

<sup>3</sup> <https://laccei.org/blog/mission-and-goals/>

Prospective and Future Studies, Entrepreneurship and Innovation.

As mentioned before, one of the most relevant actions carried out annually by LACCEI is the multi-conference with the presentation of scientific and academic articles on various thematic areas that are subjected to a double-blind review process (peer review), that is, the evaluators (at least two per paper) do not know the identity of the authors of the papers and the authors do not know the identity of the evaluators in the process. In 2022 the twentieth edition will be held, with the reception of approximately 850 papers (Full Paper, Work in Progress, Guest Paper and Student Competition). The proceedings are published with ISBN and ISSN numbers and are archived with online access. The Full Papers (FP) include DOI and Scopus indexing, and the FP and all other papers published in the proceedings are indexed in AXCES and Google Scholar.

For this reason, the objective of this paper is to describe how LACCEI has created an institutional repository, called AXCES, with the purpose of establishing the bases to measure the scientific impact (from the peer reviewed papers of the multi-conferences) of LACCEI in the Engineering, Education and Technology from the philosophy of Open Access and following the OpenAIRE Guidelines<sup>4</sup> for Repository Administrators and the quality principles guide known as FAIR Data of the European Union [23], which although it is oriented towards scientific data can be used to consider what is quality data or information in any discipline. The work was structured with a section where the current state of the repository is contextualized, then the strategy to make scientific production visible under Open Access and FAIR is exposed.

## II. AXCES

AXCES<sup>5</sup> is an institutional repository managed jointly by LACCEI and AGORA Meetings, non-profit organizations whose purposes coincide in promoting collaboration between national and international entities for the advancement of education, practice, research and innovation in science, engineering and technology. AXCES was implemented with the free software platform known as DSpace in version 6.3.<sup>6</sup> and provides all the necessary functionality to preserve, disseminate and manage digital collections such as books, articles, photos, videos, theses and others. Data in DSpace is organized as items that belong to a collection, and collections belong to a community. As of April 2022, there are 5,860 repositories of which 39.96% (2,338) use DSpace [24], making DSpace the leading software type for repositories.

DSpace allows its resources or items to comply with the quality principles guide, FAIR Data of the European Union [23], that is, to provide data that computers (or rather algorithms) can Find, Access, Interoperate and Reuse without any or minimal human intervention. In other words, the principles refer to Findable because of the vast amount of data that can be found through the metadata that identifies, describes, and locates it. Accessible because large volumes of data can be retrieved using standardized communication protocols and the metadata is persistent even when the data is no longer available. Interoperable because the multitude of data in this era must be interchangeable with at least two systems or software components. Reusable because all recovered and transformed data can be reused because its origin and the conditions of its reuse are known [23], [25].

The scientific articles that have been presented at LACCEI for 19 years are the product of research. Table I shows the number of scientific articles that have been presented throughout the LACCEI multi-conferences and shows a total of 4,211 scientific articles that have been published with peer review under a distribution and own publication license, which allows access to that production.

TABLE I. PAPERS BY CONFERENCE

Multiconference	Num.
LACCEI 2004 - Miami, USA	131
LACCEI 2005 - Cartagena, CO	102
LACCEI 2006 - Mayagüez, PR	149
LACCEI 2007 - Tampico, MX	170
LACCEI 2008 - Tegucigalpa, HO	253
LACCEI 2009 - San Cristóbal, VE	425
LACCEI 2010 - Arequipa, PE	146
LACCEI 2011 - Medellín, CO	233
LACCEI 2012 - Panama, PA	161
LACCEI 2013 - Cancun, MX	259
LACCEI 2014 - Guayaquil, EC	236
LACCEI 2015 - Santo Domingo, RD	163
LACCEI 2016 - San Jose, CR	359
LACCEI 2017 - Boca Raton, USA	186
LACCEI 2018 - Lima, PE	243
LACCEI 2019 - Montego Bay, JA	293
LACCEI 2020 - Virtual (AR)	335
LACCEI 2021 - Virtual (AR)	336
LEIRD 2021 - Virtual (PR)	33
<b>Total</b>	<b>4211</b>

<sup>4</sup> <https://guiasopenaire4.readthedocs.io/es/latest/introduction.html>

<sup>5</sup> <http://axces.info/>

<sup>6</sup> <https://duraspace.org/dspace/>

The LEADIRS II manual [26] and the guidelines published by some authors for the creation of repositories [27], [28], establish the following steps for an implementation of a repository:

- Put the concept of Repositories in context.
- Develop a service plan: needs assessment; have a plan; policies to manage content collection, distribution and maintenance; a cost model based on this plan.
- Form the work team (computer specialists, librarians, graphic designers, others).
- Choose the right technology.
- Get the repository up and running.
- Spread the service.

These steps are basic and may vary, however, they mark a logical line for planning. In this work, the AXCES service plan will be presented: installation and software, institutional policies, configuration, type of documents and desired cataloging processes.

#### A. Installation of AXCES

According to the DSpace 6.3 Manual<sup>7</sup>, version installed four months ago, the minimum suggested configuration is presented to have a development environment and adequate maintenance of the implemented repository:

- Any modern processor / CPU.
- 8 GB of Random Access Memory (RAM).
- 20 GB of Storage (20,000 items or less).
- Sistema Operativo Unix-like.
- Oracle Java JDK 8 or OpenJDK 8.
- Apache Maven 3.0.5+
- Apache Ant 1.8+
- PostgreSQL 9.4 or superior
- Tomcat 8.x
- Eclipse (IDE).
- GIT.

#### B. AXCES Configuration

The most basic modules to consider are:

- XMLUI, which is the user interface in XML.
- Metadata, deposit process and workflows.
- Repository communities and collections.
- Authority control for some metadata.
- Types of documents to use.
- OAI-PMH, interoperability protocol.
- Discovery for searches.
- Repository users and groups.
- Google analytics and Google search console.

#### C. AXCES Document Types

The types of documents that AXCES will have are all the scientific articles published (4211) in the LACCEI conferences

since 2003, scientific articles of incorporations of journals of member institutions and administrative and scientific dissemination documents of LACCEI and AGORA Meeting<sup>8</sup>, all following the FAIR Data guidelines:

- Papers from scientific journals, validated by peers.
- Scientific conference papers, validated by peers.
- Records: written account of what happened, discussed or agreed in the institution.
- Newsletter and/or magazine articles.

The following metadata is present in these types of documents under its own scheme, respecting the Dublin Core standard, a metainformation standard most widely used worldwide<sup>9</sup>:

- Title - Subject.
- Document type.
- Full text.
- Date.
- Persons who subscribe or authors.
- Who transcribed the document.
- City.
- Location.
- Abstract.
- Keywords.
- Persistent identifier (eg DOI).
- Idiom
- ISBN and ISSN, if applicable.
- Institution.
- Country.
- License of use and distribution.
- Creation date.

#### D. Cataloging of AXCES

The cataloging process must be controlled by librarians, personnel trained to understand existing standards and adapt them to the typology of items present in the DSpace repository. They are the ones who will approve each one of the deposits made through the different permitted channels, such as: self-archiving by researchers (not yet enabled), deposits by catalogers (not yet enabled) and automatic deposits made by the technical part of the repository [28]:

- Self-archiving. Researchers or authors are free to deposit their work through an upload form on the repository portal. Once complete, this repository must be approved by authorized librarians in accordance with repository policies. This approval is necessary to guarantee the non-incorporation of unwanted content.
- Deposits by own catalogers. AXCES is designed to deposit resources that can be collected by different means and that are defined in the repository policies, therefore, catalogers (librarians) enter the

<sup>7</sup> <https://wiki.lyrasis.org/display/DSDOC6x/Installing+DSpace>

<sup>8</sup> <https://virtual.agorameetings.com/>

<sup>9</sup> <https://guidelines.openaire.eu/en/latest/literature/index.html>

corresponding metadata for each of the resources found, that is, these items do not need of approval and will be enabled immediately to be shown to the public on the portal.

- Automatic deposits. Designed to deposit the different resources in accordance with an institutional policy that regulates it. This has been the main way of incorporating items into AXCES, since a process of scraping the LACCEI proceedings must be carried out, adapt them to the AXCES metadata schema and then import the resources via the console to the desired collection.

#### *E. Política institucional*

AXCES aims to collect, preserve and disseminate academic and scientific publications and documentation that adhere to the principles of Open Access to achieve greater visibility, ensure access, guarantee long-term preservation and increase impact. AXCES is managed jointly by LACCEI and AGORA Meetings, two non-profit organizations with social objectives of promoting collaboration between national and international entities to advance education, practice, research and innovation in science, engineering, and technology. Both organizations may occasionally or permanently invite other entities or individuals to publish their material in AXCES.

AXCES' management policies are regularly reviewed and published on this page. These are the current policies: content policy, deposit policy, data access policy, and, copyright policy<sup>10</sup>:

- **Content Policy**

Academic or scientific papers may be published in AXCES, as well as datasets reported in congresses, events, magazines or other publications and other activities organized by LACCEI, AGORA Meetings or other authorized entities, as long as they have gone through a review process by peers or approved by the respective editorial committees.

All resource metadata records in the repository are disseminated based on interoperability protocols under the Dublin Core format and similar others with a permanent link (DOI, URI, Handle, CrossRef, among others). The guidelines for information cataloging and interoperability are the standards used in Europe and the US in order to have common infrastructures.

- **Deposit Policy**

AXCES has a single method of submission, which is the publication of the resources generated in events and publications organized and/or sponsored by LACCEI and AGORA Meetings.

All the publications found in the repository have been reviewed to ensure their internationally standardized description. However, the AXCES administration reserves the right to veto any resource published or to be published.

First and foremost, the authors affirm to be the owners of the economic rights of the published resources and therefore assume all responsibility for infringements of copyright law. The repository agrees to remove a resource from circulation in the event of an infringement of intellectual property rights.

- **Data Access Policy**

All types of repository resources can be viewed and downloaded without legal, technical or access restrictions, always in respect to the conditions set forth in the resource use licenses. The authors or holders of the intellectual property of each resource accept at the time of publication an exclusive distribution license (copyright transfer to LACCEI), which enables the repository to fulfill its task of preservation and provides a license of use that explains to the public permitted uses.

- **Copyright Policy**

The authors of the resources will grant LACCEI permission to include their production in AXCES through an exclusive license (copyright). These resources may be viewed and downloaded freely and free of charge by any user, without the need for registration or prior authorization, always in respect to the conditions set forth in the user licenses attached to them. The authors or holders of the intellectual property of each resource accept at the time of publication, an exclusive distribution license. This license will allow AXCES to:

- Store and electronically reproduce the resource.
- Distribute and publicly communicate copies of the resource worldwide.
- Modify its format for digital preservation purposes to keep the content in perpetuity.
- Keep more than one copy for backup and preservation purposes.

#### *F. Communities and Collections*

DSpace está organizado en comunidades que pueden corresponder a entidades que permiten organizar los recursos en subgrupos, por ejemplo: departamentos, laboratorios, oficinas, centros de investigación, universidades, eventos, revistas, entre otros [2]. En síntesis, la comunidad es la categoría más amplia y puede contener subcomunidades y/o colecciones, pero no puede contener ítems o recursos. En caso de eliminar la comunidad se eliminarán todas las subcomunidades, colecciones y recursos que contenga. La colección es la categoría dentro de las comunidades donde los recursos son contenidos y no pueden contener otras categorías. La estructura de comunidades y colecciones que se utiliza en AXCES, tomó en cuenta las siguientes restricciones por la definición del modelo de datos de DSpace:

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<sup>10</sup> [http://axces.info/docs/Browse-and-search\\_Tutorial-LACCEI.pdf](http://axces.info/docs/Browse-and-search_Tutorial-LACCEI.pdf), document made by the authors.



- Communities can contain subcommunities and collections.
- Collections can only contain documents or resources.
- A collection can belong to only one community.
- Documents or items can only be contained in collections.
- A document can belong to several collections, although only one collection is the owner.

It is also noted that the collections allow the creation of user groups to establish access rights, although the collections are generally public. This means that the community and collection structure that is chosen will restrict the possibilities in terms of user and group access control. The recommended community and collection structure in AXCES is as follows:

- Bulletins
  - Monthly editions
- Journals
  - LACCEI and Members Journals
- Magazines
  - Quarterly editions
- Other publications
  - Other conferences, documents, awards, etc.
- Proceedings
  - 2018 LACCEI - Lima, Perú
  - 2019 LACCEI - Montego Bay, Jamaica
  - 2020 LACCEI - Virtual Edition
  - 2021 LACCEI - Virtual Edition
  - 2021 LEIRD Conference

#### G. Searching and Browsing

DSPACE is designed to carry out searching and browsing processes<sup>11</sup>, understood as techniques that are very similar to other platforms such as Amazon, where the DSPACE module known as Discovery (based on Apache Lucene), allows you to configure and implement such processes that in versions prior to DSPACE 4.0. were only possible with code customization. The browsing process allows you to go through a list of items in some specified order by Community/Collection, Title, Author, Subject, Date, etc [29]–[31]. Instead, the searching process is understood as a standard search operation (like Google) where a user specifies his complete query before starting the operation [29]–[31]. If the results are not satisfactory, the user can start the query again.

For both of the above processes, DSPACE offers faceting search, where a user can modify the list of displayed search results by specifying additional "filters" (located on the right hand side of DSPACE by default) to be applied on the search results list. In DSPACE, a filter is a content condition applied to specific facets, and for each selection a user makes, a filter is added. Those active filters can be modified or removed in the 'filters' section of the search interface.

<sup>11</sup> <https://wiki.lyrasis.org/display/DSDOC6x/Discovery>

### III. RECOMMENDATIONS

AXCES, the institutional repository of LACCEI and AGORA Meetings, enables the community of Latin American researchers related to engineering to show and increase the web visibility and impact of their scientific productions. Therefore, below are some recommendations to improve web visibility and scientific production:

#### A. Guidelines in the publication process

According to various authors [32]–[34] and the experience of the authors, the following guidelines are mentioned:

- The articles must be unpublished and original (they must not be published).
- They must be written in clear, precise and accessible language.
- Abstracts should not be less than 250 words and should be of the IMRD [35] structure.
- The maximum of keywords must be six (6) words.
- There must always be an English version of the title, abstract and keywords.
- All authors must have an institutional affiliation.
- Citations and references must follow a citation style, for this, the use of Zotero is recommended.
- Identification of the authors by some public profile, for example ORCID.
- The scientific production must have a unique persistent identifier, for example DOI.
- Adhere to the code of ethics and good practices.

#### B. Community of researchers and their profiles

LACCEI has begun to develop a scientific information management system that allows the large number of researchers who have passed through the consortium over 20 years to be brought together on a single platform. To do this, it has analyzed different tools and platforms and its results together with its conclusions will soon be published. However, Elsevier's Pure platform<sup>12</sup> stands out as an innovative and very useful platform for the community in general, an example of which is the implementation at the Universidad Pontificia Bolivariana de Colombia<sup>13</sup>.

#### C. Scientific public profiles for LACCEI

LACCEI is offering advice and support in the creation of public profiles for researchers in:

- Google Scholar Profile
- ORCID
- Scopus Profile
- Autores Redalyc

#### D. Open Access

LACCEI, for 20 years, has been publishing its proceedings openly without access, legal or technical

<sup>12</sup> <https://www.elsevier.com/solutions/pure>

<sup>13</sup> <https://investigacion.upb.edu.co/>

restrictions. For this reason, the repository was implemented to facilitate interoperability with the entire community, however, since 2010 the proceedings are published with the labeling standards so that they can be automatically indexed by the Bots, as is the case with Scopus, Google Scholar and Dimensions.

#### E. Normalization of authors, affiliations and countries

The standardization of the metadata of scientific publications is a fundamental element. For this reason, AXCES has carried out an in-depth review of the consortium database and we have detected inconsistencies in the presentation of the authors' names, authors' surnames, institutional affiliations and the name of the countries. Every day AXCES advances in the standardization of all this data in order to offer more exact information on the LACCEI proceedings.

#### F. Categorization by UNESCO nomenclature and by SDG

A good practice is the categorization of scientific production through international standards, for example: the UNESCO nomenclature of science and technology [36], [37] and the 17 Sustainable Development Goals (SDGs) that clearly define the world that is desired according to the signature of 193 member states of the United Nations (UN) in 2015 [38].

#### G. Institutional anti-plagiarism policies

LACCEI has begun to carry out a first control of all the presentations of writings to be submitted to a double-blind peer review, for this reason, these tools are presented for the detection of originality of writings:

- PLAG.ES<sup>14</sup>.
- Hazing (Publish or Perish)<sup>15</sup>.
- Plagiarisma.net<sup>16</sup>.
- Plag.co<sup>17</sup>.
- PlagScan<sup>18</sup>.
- Dupli Checker<sup>19</sup>.
- Grammarly<sup>20</sup>.
- iThenticate de Turnitin<sup>21</sup>.
- Originality report de Google Classroom<sup>22</sup>.
- Copyleaks<sup>23</sup>.

## IV. CONCLUSIONS

AXCES.info, the institutional repository managed jointly by LACCEI and AGORA Meetings, was created with the aim of maximizing LACCEI's web visibility and offering the scientific community a tool with which to interoperate and

make scientific production more accessible. has developed over time and uninterruptedly for more than 20 years in contribution to Engineering, Education and Technology in Latin America and the world. Therefore, the objective of this work was to establish the bases to measure the scientific impact of LACCEI in Engineering, Education and Technology, an objective that was achieved and allowed to present a series of recommendations for the production and dissemination of research results in the area. of engineering.

In addition to the recommendations presented, it is important to highlight the training and advice that must exist in these processes, which LACCEI has begun to offer from the example but also through face-to-face and virtual workshops aimed at the scientific community but also at the community in general as an information literacy policy, in this way, they can count on tools that facilitate the desired queries and searches.

Open science must also be a fundamental element in the generation of knowledge, since it is a movement that allows showing the entire publication process, from the beginning of the research to its publication [39], and this process will generate scientific products that will have impact and visibility. For this reason, LACCEI will begin to develop initiatives in tune with this movement, taking as a starting point Bosman-Kramer's research on the stages of research [40], the UNESCO open science recommendation, and AXCES as a basis for the research presented. Examples that can help complement these initiatives are the platforms OSF<sup>24</sup>, Elsevier's Pure and the SEDICI repository of the National University of Plata<sup>25</sup> as examples of well-constructed platforms from the technological aspect but also from the conceptual and respecting the international standards of Documentary Sciences and Information [41].

## REFERENCES

- [1] Y. Piedra-Salomón y A. Martínez-Rodríguez, «Producción científica», *Cienc. Inf.*, vol. 38, n.º 3, 2007, Accedido: 8 de marzo de 2015. [En línea]. Disponible en: <http://cinfo.idict.cu/index.php/cinfo/article/view/112>
- [2] J. Texier, «La visibilidad web y recomendaciones para la producción científica de la Universidad Nacional de Chilecito», octubre de 2020. <http://eprints.rclis.org/40761/> (accedido 22 de mayo de 2022).
- [3] F. Martínez Arellano, «Aspectos éticos del Acceso Abierto», en *Uso ético de la información: implicaciones y desafíos*, Mexico: Universidad Nacional Autónoma de México. Instituto de Investigaciones Bibliotecológicas y de la Información, 2017, pp. 43-62. [En línea]. Disponible en: <http://148.202.167.116:8080/xmlui/handle/123456789/3906>
- [4] P. Suber y R. Melero (traductora), *Acceso Abierto. Traducción de Open Access*. Universidad Autónoma del Estado de México, 2015. Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://digital.csic.es/handle/10261/121428>
- [5] R. Feltrero, «Acceso abierto: posibilidades y retos

<sup>14</sup> <https://my.plag.es/>

<sup>15</sup> <https://harzing.com/>

<sup>16</sup> <http://plagiarisma.net/>

<sup>17</sup> <https://plag.co/>

<sup>18</sup> <https://www.plagscan.com/en/>

<sup>19</sup> <https://www.duplichecker.com/>

<sup>20</sup> <https://www.grammarly.com/plagiarism-checker>

<sup>21</sup> <https://www.turnitin.com/es/productos/ithenticate>

<sup>22</sup> <https://support.google.com/edu/classroom/answer/9335819?hl=en#zippyv>

<sup>23</sup> <https://copyleaks.com/>

<sup>24</sup> <https://osf.io/>

<sup>25</sup> <http://sedici.unlp.edu.ar/>

- epistemológicos para las publicaciones científicas en la red», *Arbor*, vol. 185, n.º 737, Art. n.º 737, jun. 2009, doi: 10.3989/arbor.2009.i737.316.
- [6] J.-I. Badell, C. Rovira, y M. Térmens, «Estudio de visibilidad web 2013 de los museos de Cataluña», *Ibersid Rev. Sist. Inf. Doc.*, vol. 8, n.º 0, pp. 43-48, oct. 2014.
- [7] C. A. Lynch, «Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age», *ARL*, 2003. <http://www.arl.org/resources/pubs/br/br226/br226ir.shtml> (accedido 28 de octubre de 2013).
- [8] H. Van de Sompel, S. Payette, J. Erickson, C. Lagoze, y S. Warner, «Rethinking Scholarly Communication», *-Lib Mag.*, vol. 10, n.º 9, sep. 2004, doi: 10.1045/september2004-vandesompel.
- [9] J. Texier, «Los repositorios institucionales y las bibliotecas digitales: una somera revisión bibliográfica y su relación en la educación superior», Cancun, Mexico, oct. 2013, p. 9. Accedido: 12 de abril de 2015. [En línea]. Disponible en: <http://eprints.rclis.org/19925/>
- [10] J. Tramullas y P. Garrido, «Software libre para repositorios institucionales: propuestas para un modelo de evaluación de prestaciones», *El Prof. Inf.*, vol. 15, n.º 3, pp. 171-181, 2006.
- [11] M. D. Gomez, G. Fontanarrosa, P. E. Ortiz, y J. P. Jayat, «Pequeños mamíferos predados por la Lechuza de Campanario (*Tyto alba*) en la ecorregión del Chaco Seco en el noroeste argentino», *El Hornero*, vol. 27, n.º 2, pp. 127-135, 2012.
- [12] J. Berrocal, C. Figuerola, y Á. Zazo, *Cibernetría: nuevas técnicas de estudio aplicables al Web*. 2003. Accedido: 8 de marzo de 2015. [En línea]. Disponible en: <http://e-derecho.cl/gestiondelconocimiento/>
- [13] P. Ingwersen, «The calculation of web impact factors», *J. Doc.*, 1998, doi: <http://dx.doi.org/10.1108/EUM0000000007167>.
- [14] A. Noruzi, «The web impact factor: a critical review», *Electron. Libr.*, vol. 24, n.º 4, 2006, doi: <http://dx.doi.org/10.1108/02640470610689188>.
- [15] C. R. Sugimoto, S. Work, V. Larivière, y S. Haustein, «Scholarly use of social media and altmetrics: A review of the literature», *J. Assoc. Inf. Sci. Technol.*, vol. 68, n.º 9, pp. 2037-2062, 2017, doi: 10.1002/asi.23833.
- [16] T. Kuhn, *La estructura de las revoluciones científicas*. Editorial Fondo de Cultura Económica, 1962.
- [17] J. Echeverría, «De la filosofía de la ciencia a la filosofía de las techno-ciencias e innovaciones», *Rev. Iberoam. Cienc. Tecnol. Soc. - CTS*, vol. 10, n.º 28, p. 10, 2015.
- [18] M. Castells, *The Rise of the Network Society: The Information Age: Economy, Society, and Culture Volume I*, 2nd Edition with a New Preface. Wiley-Blackwell, 2009.
- [19] J. De Souza-Silva, J. Cheaz Peláez, y J. Calderón Romero, *La cuestión institucional, de la vulnerabilidad a la sostenibilidad institucional en el contexto del Cambio de Epoca*. Costa Rica: Servicio Internacional para la Investigación Agrícola Nacional - ISNAR, 2001.
- [20] B.-C. Björk y D. Solomon, «Open access versus subscription journals: a comparison of scientific impact», *BMC Med.*, vol. 10, n.º 1, p. 73, jul. 2012, doi: 10.1186/1741-7015-10-73.
- [21] P. Suber, «Ensuring open access for publicly funded research», *BMJ*, vol. 345, 2012, doi: 10.1136/bmj.e5184.
- [22] OAS, *General cooperation agreement between the General Secretariat of the Organization of American States and the Latin American and Caribbean Consortium of Engineering Institutions*. p. 6.
- [23] European Commission, *Turning FAIR into reality - Publications Office of the EU*. 2018. doi: 10.2777/1524.
- [24] OpenDOAR, «OpenDOAR - Home Page - Directory of Open Access Repositories», 2022. <https://v2.sherpa.ac.uk/opensoar/> (accedido 2 de febrero de 2022).
- [25] T. Tanhua, S. Pouliquen, y J. Hausman, «Ocean FAIR Data Services», *Front. Mar. Sci.*, vol. 6, 2019, Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://www.frontiersin.org/article/10.3389/fmars.2019.00440>
- [26] M. Barton y M. Waters, «Cómo crear un repositorio institucional. Manual LEADIRS II», *MIT Libr.*, 2004.
- [27] A. Bustos-González y A. Fernández-Porcel, «Directrices para la creación de repositorios institucionales en universidades y organizaciones de educación superior», *Univ. Rosario*, ago. 2008, Accedido: 28 de enero de 2013. [En línea]. Disponible en: <http://repository.urosario.edu.co/handle/10336/223>
- [28] J. Texier, M. R. De Giusti, A. J. Lira, N. Oviedo, y G. L. Villarreal, «DSpace como herramienta para un repositorio de documentos administrativos en la Universidad Nacional Experimental del Táchira», *Rev. Interam. Bibliotecol.*, vol. 36, n.º 2, pp. 109-124, nov. 2013.
- [29] C. W. Choo, B. Detlor, y D. Turnbull, *Information Seeking on the Web--An Integrated Model of Browsing and Searching*. 1999. Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://eric.ed.gov/?id=ED438801>
- [30] M. Dörk, C. Williamson, y S. Carpendale, «Navigating tomorrow's web: From searching and browsing to visual exploration», *ACM Trans. Web*, vol. 6, n.º 3, p. 13:1-13:28, oct. 2012, doi: 10.1145/2344416.2344420.
- [31] A. Hubmann-Haidvogel, A. Scharl, y A. Weichselbraun, «Multiple coordinated views for searching and navigating Web content repositories», *Inf. Sci.*, vol. 179, n.º 12, pp. 1813-1821, may 2009, doi: 10.1016/j.ins.2009.01.030.
- [32] I. López Navarro, «Estrategias de producción académica de los investigadores españoles en un contexto globalizado. Dificultades, motivaciones y pautas de publicación», 2015, Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://gredos.usal.es/handle/10366/128220>
- [33] J. Rey-Rocha y M. J. Martín-Sempere, «Pautas de publicación y citación de los científicos de disciplinas con carácter marcadamente territorial: El caso de la Geología en España», 2000, Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://digital.csic.es/handle/10261/11644>
- [34] M. S. Ramírez, «PAUTAS DE PUBLICACIÓN», *Univ. En Diálogo Rev. Extensión*, vol. 2, n.º 2, Art. n.º 2, dic. 2012, Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://www.revistas.una.ac.cr/index.php/dialogo/article/view/6351>
- [35] J. Swales, *Genre Analysis: English in Academic and Research Settings*. Cambridge University Press, 1990.
- [36] UNESCO, «Nomenclature for fields of science and technology», julio de 2021. <https://skos.um.es/unesco6/> (accedido 17 de julio de 2021).
- [37] J.-M. Ruiz-Martínez, M.-J. Baños-Moreno, y R. Martínez-Béjar, «Nomenclatura Unesco: evolución, alcance y reutilización en clave ontológica para la descripción de perfiles científicos», *Prof. Inf.*, vol. 23, n.º 4, Art. n.º 4, jul. 2014, doi: 10.3145/epi.2014.jul.06.
- [38] J. Texier y J. Atkinson, «La importancia de los Repositorios Institucionales para el seguimiento automático de los Objetivos de Desarrollo Sostenible», *Conf. Int. BIREDIAL-ISTEC*, 2021, Accedido: 22 de mayo de 2022. [En línea]. Disponible en: <https://submissions.istec.org/index.php/biredial-istec/article/view/151>



- [39] C. Lopes y J. Alonso-Arévalo, «El conocimiento es de todos y para todos ¿Qué es y qué implica la Ciencia Abierta?», *Desiderata*, n.º 12, pp. 72-82, oct. 2019.
- [40] J. Bosman y B. Kramer, «101 Innovations in Scholarly Communication: How researchers are getting to grip with the myriad of new tools.», *Impact of Social Sciences Blog*, 11 de noviembre de 2015. <http://blogs.lse.ac.uk/impactofsocialsciences> (accedido 22 de mayo de 2022).
- [41] M. Formanek, “Solving SEO Issues in DSpace-based Digital Repositories”, *ITAL*, vol. 40, no. 1, Mar. 2021.