Mexican Open Science Policy

Case Study: Open Institutional Repositories Program

1. Overview of the initiative

Name of initiative: Mexican Open Science Policy: Open Institutional Repositories Program.

Objective: To gather, preserve, and secure Open Access to scientific, technologic and innovation mainly public funded information resources, including databases.

Type (strategy, policy, bill of law,...): This is a national policy originated by a bill of law and a regulatory initiative enacted en may 2014 under the Mexican Law for Science and Technology (Mexican Law for Science and Technology, 2015).

Responsible policy making bodies: National Council of Science and Technology.


Target audience: Research Institutions (public and private).

Total duration of initiative (years): Ongoing since 2015.


Sectoral focus (if relevant): None yet.

Type of data concerned (data from research, public sector information, private sector information): Research data mainly from public sector research institutions. Private institutions are allowed to participate; however, none has made a request to this program so far.

Target audience (scientific community, business, civil society, general public): Mainly scientific community, but also general public.

Expected results:
1. More than 10 institutional data repositories developed and interconnected with the National Repository in 2019.
2. Institutional capacities for Research Data Management developed under the Open Repositories Program.
3. Above than 20 thousand datasets open access available within the National Repository in 2019.
2. Rationale, motives and key drivers

Regarding the National Council for Science and Technology, the main rationale for this initiative is to bolster the National Open Science Policy and to retrieve as much datasets as possible.

Interested research institutions may apply to one of the offered grants provided by under National Open Science Policy to develop a data repository. In order to participate for these grants, CONACYT expects a significant number of datasets within these repositories at the end of the project. Therefore, regarding the data providers, understood as research institutions, the main rationale is to obtain funding for their existing institutional open access to research data initiatives, and to effectively develop these projects.

Policy context prior to the initiative: legacy legislation and regulation with its observed strengths and weakness

1. Main challenges and policy gaps, which needed to be addressed.

A strong influence from international debates on these matters affected the 2014 reform of the law. When these law initiative became a project of law, references to consultation to the National Researchers System where implemented. Most of the participants (over 80%) approved the initiative.

2. Objectives as defined and expected results

The expected results at that time where only to develop Open Repositories and a National Repository. No institutional nor personal capacity building actions where considered. It was more a “build it and the will come” strategy. However, some of the original objectives have been re defined. One of the most important is the “capacity building” component. Now, this component is as much important as the “funding” component; which originally was the core element of the program.

Body (-ies) who initiated the strategic initiative (i.e governmental bodies/ agencies, practitioner institution or associations, other non-governmental stakeholders, international networks, or others)

For the enactment process of the law, only had the participation of the National Council for Science and Technology. Once the program was implemented, we had the participation of the research institutions who decided to participate in the Open Repositories Program. One of the areas of opportunity identified is the active involvement of the rest of the academic community. Even when every repository project has a manager who is part of the research institution, in many cases the appropriation of the project, do not reach out completely to the academic community (researchers, students, professors).

International references and good practices as drivers e.g. OECD recommendations, or examples set by other countries or supranational regions)

OECD and UNESCO documents about Open Science where used to design the program (OECD, 2015) (Swan, 2012). In addition, the program retrieved OpenAIRE technical framework for the program technical guidelines.
Some of the research work on Research Data Management developed for the Information Studies School of the University of Sheffield have been also referred to shape this policy (Cox, 2018).

The underlying motives for initiating the strategic initiative from a policy perspective (e.g. Lifting specific barriers of technical or behavioral nature, creating trust among stakeholders, creating initiatives for data sharing, building innovative infrastructure, or other)

Once the law was enacted, the main underlying motive was to create initiatives for research data sharing. CONACYT considered also important to develop institutional incentives, more than personal incentives in order to align the behavioral drivers in coordination with the institutions. This is why the grants are conditioned to retrieve a certain amount of databases for the National Repository at the end of the project.

Nowadays the main barrier is the behavioral element, since the traditional research practices still are the rule and a more collaborative driven research efforts are the exception. Based on a survey, we have identified that the two main arguments for these traditional practices to prevail are the significant lack of knowledge about copyright and publishing policies, and the unawareness of the benefits provided by a more open research model (Foro Consultivo Científico y Tecnológico, A.C., 2016).

Please describe how the following issues were covered (or not covered) within the initiative:

1. Data governance for trust -addressing privacy, confidentiality, quality and ethical issues
2. Discoverability / Findability, machine readability and data standards
3. Definition of responsibility and ownership
4. Business models for open data provision
5. Building human capital and institutional capabilities at public agencies, to manage, create, curate and reuse data

1. The National Repository retrieves the datasets registries from the Institutional Repositories. Every participant research institution designs its governance models for trust, privacy, confidentiality, quality and ethical issues. The Open Repositories Program respects them and replicate these policies on the National Repository.
2. The program uses the OpenAIRE metadata for data standard.
3. The research institutions hold responsibility and ownership, the National Repository only aggregates the registries, not the datasets.
4. The National Repository retrieves the datasets registries from the Institutional Repositories. No datasets are collected. Research institutions stablish the harvesting period. It can be weekly, monthly or quarterly.
5. Some efforts have been made to develop capacities like seminars and workshops. However, all of them are designed for open repositories managers.

3. Governance of the initiative

Governance structure of the strategic initiative: lead ministry or institution, working group or consortium.
CONACYT is the main institution working toward this sake. It has established an Open Science Committee as the main governance mechanism for the Open Science Policy. This is an internal organism integrated by CONACYT’s officers.

**Stakeholder consultation: who were the main stakeholders identified and how were they consulted (potentially in two or more circles, according to the degree of involvement).**

The main stakeholders are Research institutions, and CONACYT Research Public Centers; given they have developed or hosted an institutional repository. The consultation process triggers once the policy makers propose a major change in the policy.

**Decision making: who was the main decision maker and how was consensus created? was there a specific conflict resolution mechanism.**

The stakeholders are consulted in groups (Research Institutions and CONAYT Public Centers), and its comments are considered for the final decision. The Open Science Committee makes this decision. When the decision is to solve a more specific and technical issue, an internal analytic group provides the necessary information to the Open Science Committee to make a decision.

**The role and interaction of different levels of actors at local, regional, national and supranational level and political leadership.**

National and regional level – CONACYT and Research institutions holding participating institutional repositories.

International level – SCOAP3. There are many opportunity areas to link this program with other international initiatives and institutions regarding on open science.

**How the governance models chosen ensures that initiative continuously focuses on its strategic goal, while responsive to the changing context**

The Open Repositories Program governance is built under two main dimensions: legislative and organizational. The legislative dimension is built under three levels of normative: 1. The Federal Law, 2. General Guidelines, and 3. Technical Guidelines. This same structure is considered for the organizational dimension. The Congress is the only one capable to modify the first level. CONACYT’s internal governance organisms can modify the Second and the third level documents. The overall policy goals are considered within the first level legislative document (Mexican Law for Science and Technology, 2015). The second level document contains guidelines for the design and implementation of the policy (General Guidelines for Open Science, 2017). The more technical elements are considered by the third level document (Specific Guidelines for Open Repositories, 2017).

This governance model allows you to maintain the main policy goal, and to keep up to date the technical framework.

**The measures to improve transparency in the management of the initiative.**
The Open Science Committee takes all the policy decisions. The documentation coming from the sessions is publicly available within CONACYTs website.

4. Process

Please describe the major milestones of initiative, including preparatory work, such as needs assessment studies and analyses commissions externally or produced internally, main meetings with various stakeholders, adoption of intermediary and final documents, adoption of relevant legislation and regulations.

The initiative itself was born under a bill of law regarding Open Access. In July 2017, the concept evolved towards Open Science. All the secondary legislation was modify under this logic (General Guidelines for Open Science, 2017). The following milestone should be an evidence-based evaluation about the impact of the program.

Please describe the evidence base used in the process (studies, surveys)

Reference to consultation to the National Researchers System where implemented in 2015 about the perception of CONACYT’s Open Access initiative. Most of the participants (over 80%) approved it (Foro Consultivo Científico y Tecnológico, A.C., 2016).

Was regulatory impact analysis applied in the process, and if so, to what degree? If yes, what was the outcome of it? If not, ex-post assessment foreseen?

No regulatory impact analysis has been applied yet.

Idea generation and priority setting: how were the main ideas generated? How were priorities set among the ideas?

The main ideas where provided by the Law. In the implementation process many of these ideas where included. There was an external group of experts working for CONACYT as consultants for the policy design process. The personnel in charge of the implementation of the program came from tis firs group of consultants; so the main ideas and rationalities were institutionally retaining.

Few months after the implementation period, a group of software developers was included to work in the design and development of the platforms. From that moment, the main ideas and decisions related to the program come from the group of implementation and the software developer team implement and design the IT solutions (mainly based in open software solutions).

In order to make the best of the capacity build under this program, many of the decisions taken by the group of implementation are consulted with the research institutions participating in the program, given they are now a recently created group of experts in this subject.

Please describe potential delays or setbacks in the process, as well as the underlying reasons for these setbacks (e.g. opposition of key advocacy groups or political forces, lack of communication among stakeholders, etc.)

Political transition may generate a potential setback. This policy has enough resources nowadays; however, if it is not well received for the following administration, it may represent a big
challenge to get resources to continue. Also, to retain the institutional learning within the human resources who founded the program.

Stakeholder consultation process: at what points in time were key stakeholder groups consulted, and how was their feedback incorporated into the design of the initiative?

Stakeholders were consulted when designing the second and third level legislation. It was a two weeks process to consult and to retrieve all the comments within the new project.

5. Adoption and implementation of the initiative

What was contained in the final design of the initiative: main policies, regulations?

The Law determined the main elements. Regarding the implementation, the international context and the current CONACYT programs defined the final design.

Scope of the initiative: does it concern purely data resulting from research, or does it concern broader public sector information or private sector data?

It does considered data form any research institution regardless of its nature (public or private). It is relevant to mentioned that even when private institutions can apply for the grant we still have none participating with research data (only with research literature).

Beyond data, how are the following aspects taken into account:

- Metadata
- Software and algorithms for data interpretation

For metadata interoperability, we consider OpenAIRE data scheme. Also, we implemented OAI-PMH for the harvesting processes, and DublinCore and DataCite (depending the registry) for metadata management.

What were the expected results of the initiative?

- To foster an Open Science culture within researchers and academics.
- To create and foster a national open research data repositories community of experts
- Fully open access available and reusable research data and literature.

In that order. We believe that the third element is a result of the two firsts.

What were the key performance indicators foreseen in the initiative, and who was responsible for reaching the targets set?

No performance indicators have been yet retrieved.
Who was (were) the main implementing body (-ies) for the initiative, and who was responsible for reaching the targets set?

CONACYT is the main implementing body along with the participating research institutions.

Problems or challenges to managing the implementation of the initiative (e.g. delays, missed targets, or results that did not meet expectations) What corrective actions were implemented to put the initiative back to track?

Most of these initiatives are not based on a strong scientific open access culture. Awareness within academic communities might be the main challenge to be tackled. Also, a lack of evaluation mechanism that considered datasets as an element to measure research productivity.

6. International aspects

The international dimension of the initiative, i.e., reference to international recommendations and standards (such as OECD recommendations, engaging foreign partners, addressing international data flows.

OECD and UNESCO documents about Open Science where used to design the program (OECD, 2015) (Swan, 2012). Also, the program retrieved OpenAIRE technical framework for the program technical guidelines (OpenAire, 2014). Also, we implemented OAI-PMH for the harvesting processes, and DublinCore and DataCite (depending the registry) for metadata management.

Degree to which the international dimension influences the design and implementation of the initiative.

High. Most of our documents have been built under an international reference.

Potential arbitrage between national interests and international guidelines, if relevant.

A relevant contribution from this program to the state of art of Open Repositories is the one on the implementation of catalogues. More specifically for the use of “dissertation”, that it might have several varieties in our country (Specific Guidelines for Open Repositories, 2017).

In addition, we are reviewing specific metadata for climate data that should be interesting to include within our metadata schema (like temperature, or altitude).

International comparability of data and cross-country data.

None yet.

7. Monitoring and evaluation

The monitoring and evaluation framework of the initiative, including responsible organization, methodology, transparency and fund allocation
There are monitoring efforts coming from the funding instrument (an institutional fund) regarding project’s deliveries. Also, the Open Science Committee receives two reports each year on the status of the program. However, no evaluation framework has been designed yet.

The role of the evaluation in improving the design of the initiative, i.e. how can the result of evaluation lead to revisions in the policy design?

None yet. The following milestone should be an evidence-based evaluation about the design of the program.

Impact assessment on end users (if available): how does the initiative improve the access to data and re-use thereof?

None yet. The following milestone should be an evidence-based evaluation about the design of the program.

The limitations of and challenges for monitoring and evaluation, due to its complex, dynamic and long term nature.

To be discovered.

Please quote any monitoring or impact assessment documents available, and the main outcomes achieved.

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8. Lessons and challenges ahead

The degree of attainment of the objectives

The project is on its first stages of implementations (three years); however, most of the objectives have been attained (to build technical infrastructure to foster open research data management).

The National Open Science Policy lacks of its own resources. Its funding depends on the availability of resources of another program, which incentives are different that those coming from the National Open Science Policy ones. No matter how good achievements the Policy get, these indicators will not be an argument when looking for funding, unless it becomes a budgetary program by itself.

Main achievements of the initiative in terms of process and end results

The main achievement is to develop a single technical framework (OpenAire) for open research data management within the country.

More than 10 data repositories projects ongoing and over 27 thousand research data sets related.
A growing open repositories national experts’ community working and fostering the development of international efforts like DataVerse.

**The pitfalls that have been avoided.**

None identified.

**Lessons learnt from setbacks in the process**

No setback has been experienced yet.

**Challenges for the future**

To increase researchers’ awareness and to foster its participation in these initiatives. Most of our participating institutions are working without the contribution of their academic community.

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A political transition is around the corner. Even when this program has a big chance to survive, there is chance to be reshaped regarding the new official discourse.

**Transferability: how relevant is this case study for implementation in other OECD member and partner countries?**

The design of the process can be easily transferable; however, what we know is that there are no rule in implementation processes. It will deeply depend on the interaction of the main actors (agencies and data owners). We have already work with Panama and Paraguay National Councils in order to help them to develop their own National Open Science Policy. In addition, Mexico is promoting an Open Science agenda under the Iberoamerican Summit, as the regional leader on this matter. There are already at least two ongoing projects related to Open Science were Mexico is leading this group of countries.

**References**


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