This project examined open access digital repositories in Mexico. The results are based on data drawn from repository websites and guided by three research questions:

1) How do Mexican repositories promote or encourage the development of national standards for preservation of digital information?
2) Are Mexican repositories and their content easily accessible within their host institutions and on the Web?
3) Can repositories serve to promote collaboration and establish connections between scholars?

Examining repositories revealed that nearly all rely on software and metadata developed outside of Mexico but that many do take a role in advancing the discussion about digital preservation. Repositories had mixed levels of web visibility, both within their own institution and on the web. Some of the larger repositories that draw from multiple institutions incorporate features that might promote collaboration, but this is less common among repositories focused solely on the research output of one institution.

Headings:

- Institutional repositories
- Open access publishing
- Scholarly publishing
A COMPARATIVE ANALYSIS OF OPEN ACCESS INSTITUTIONAL REPOSITORIES IN MEXICO

by
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A COMPARATIVE ANALYSIS OF OPEN ACCESS INSTITUTIONAL REPOSITORIES IN MEXICO

In 2002, Raym Crow published a position paper for the Scholarly Publishing and Academic Research Coalition that is often identified as one of the first discussions of digital institutional repositories (St. Jean, Rieh, Yakel, & Markey, 2011, p. 22). Crow defined institutional repositories as “digital collections that capture and preserve the intellectual output of university communities” and identified their two main purposes as to “provide a central component in reforming scholarly communication” and “serve as tangible indicators of an institution’s quality, thus increasing its visibility, prestige, and public value” (p. 2). In the decade following the paper’s publication, hundreds of institutions worldwide moved to start their own repositories. As of December 2012, the University of Nottingham’s Directory of Open Access Repositories (OpenDOAR) had 2217 listings, and the University of Southampton’s Registry of Open Access Repositories (ROAR) had 2993. As more institutions have moved to create repositories, substantial attention has also been devoted to the topic in the scholarly literature. A search for the term “institutional repositories” in Library and Information Science Abstracts (LISA), an international indexing service for journal articles in the Library and Information Science fields, brings up 1073 results; an identical search in Wilson’s Library Literature and Information Science FullText (Library Lit) brings up 318. In Library Lit, the oldest
record is Crow’s 2002 paper, and in LISA it is a brief announcement that includes a link to the paper.

While a number of factors have contributed to the development of institutional repositories, two are of central importance. The first is the rising cost of access to electronic information, which has been widely identified as one of the most pressing challenges facing libraries today (Bosch, Henderson, & Klusendorf, 2011; Rose-Wiles, 2011). Paying for subscriptions to electronic databases takes up an increasingly high percentage of library budgets each year. Many librarians have questioned a system where they provide resources to scholars conducting research at the universities they serve but are then expected to pay exorbitant prices to access the results of that research from publishers and vendors. There is also increasing concern about the widening divide between the electronic resources available at wealthy institutions and those with fewer resources. For some, open access repositories are a way to promote more equitable access to research and lessen the control that large publishing companies have over the intellectual output of scholars.

The second reason for the newfound emphasis on open access repositories is the widespread concern over the preservation of digital information. As Rothenberg observed over a decade ago, digital information is generally extremely volatile and much more difficult to preserve than paper records (1999). The dangers of both software and hardware obsolescence, physical deterioration of digital files, and the difficulty of organizing digital files so that they can be retrieved later all imply that the organization and preservation of digital information should begin as early in its lifespan as possible. Unfortunately, individual scholars rarely do a sufficient job of managing their own digital
files (Foster & Gibbons, 2005). Therefore, with an increasingly large amount of scholarly work being produced solely in electronic format, many institutions have decided to take proactive steps to ensure that the intellectual output of their faculty and students is preserved for future generations. Fulfilling this mission almost always involves creating some form of a digital repository.

In the scholarly literature, there are a large number of studies examining repositories in the United States and Western Europe. Less has been written about countries outside of these regions, and an even smaller portion of this work is available in English. This represents a crucial gap in the scholarship. In a world where collaboration is increasingly important and often takes place across international borders, the steps a researcher in one country takes to preserve and disseminate her research could very well affect the work of researchers in another area of the world. Becoming aware of practices in other countries also represents an opportunity to explore a new perspective on this important issue. Considering the steps taken to address the challenges of preserving and disseminating digital information in other areas of the world might shed light on efforts closer to home. This study analyzed Mexican institutional repositories and aimed to discover how repositories might serve to address some of the particular challenges associated with scholarly research and publishing in Mexico. The methodology was informed by the methods of data collection and frameworks for analysis found in several earlier comparative analyses of digital repositories (Mercer, 2011; Mondoux & Shiri, 2009; Xia & Opperman, 2009).
Literature Review

Since the publication of Crow’s seminal paper (2002), many different ideas have been proposed about IRs and their purposes. One of the most frequently cited and influential works on the topic is by Lynch (2003), who defines an IR as “a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members” (Defining institutional repositories, para. 1). This differs from Crow’s definition in two keys ways: it focuses on an IR as a “set of services” and emphasizes “dissemination.” In Lynch’s vision, IRs take on an active role in meeting needs of researchers and distributing their work, not just preserving it. As Davis and Connolly (2007) point out, Lynch also disagrees with Crow’s idea that IRs should challenge traditional modes of scholarly publishing, arguing that IRs can and should coexist with this model by serving as complementary, not competing, way of disseminating scholarship. Today there is no consensus as to the ideal purpose of a repository, and a wide variety of different models exist. In the current study, some appeared to align more with Crow’s vision of preservation while others were more outwardly oriented and focused on Lynch’s idea of dissemination.

This review will focus on empirical research studies of institutional repositories in Latin America, especially those that focus on Mexico. A review limited to Mexico would have produced too few results to provide meaningful background information and illustrate the range of prior related work. It will also include studies that do not focus on Latin America but address specific issues that are especially relevant to Mexican IRs. In general, a large portion of the literature on IRs consists of descriptive reports in which
librarians or archivists describe their own experiences developing or maintaining an institutional repository, and this is also the case for the literature on Latin America. While many of these reports might not meet the strictest definitions of empirical research, the ones that have been included in this review include empirical data such as statistics on repository use, survey results, or interview findings. Additionally, although digital libraries are not equivalent to institutional repositories, this review includes studies on digital libraries. Limiting the review to institutional repositories in Latin America brought up a relatively unsatisfactorily small number of results, especially in terms of empirical studies. Many of the studies on digital libraries addressed issues that are also relevant to institutional repositories and provided important background information on the larger context of scholarly research and access to electronic information in Mexico.

In general, research articles relevant to the study of institutional repositories in Mexico fall in to three broad categories: articles that analyze a specific issue affecting institutional repositories in the region of Latin America; articles that limit their scope to Mexico and take a more general view of IRs and open access; and case studies that focus on a particular institutional repository in Mexico. These different perspectives each bring their own advantages and disadvantages. Case studies of individual projects allow the authors to provide a high degree of specificity that illustrates the inner workings of projects but do not necessarily support generalizations (Choemprayong & Wildemuth, 2009). Additionally, many of these studies come from scholars describing their own experiences working on an IR and cannot be considered true disinterested scientific research. At the other end of the spectrum, studies that focus on the region as a whole are useful for their ability to identify general trends, especially as they relate to barriers and
opportunities for institutional repositories. However, they cannot take into account nuances relevant to specific countries or institutions.

One such region-wide study was carried out by Gómez Dueñas, who sought to create a comprehensive list of open access repositories in Latin America, compiled from directories and systematic web searches (2008). He gathered data on content, software, and accessibility and discussed some of the most important initiatives to promote open access in Latin America. In total, Gómez Dueñas identified 156 open access repositories in Latin America. Brazil had by far the most, with ninety-six, and Mexico had the second most, with twelve. His final list included only those repositories compliant with Open Archives Initiative (OAI) standards, a concept that comes up repeatedly in the literature on institutional repositories. The OAI “develops and promotes interoperability standards that aim to facilitate the efficient dissemination of content” (Cornell University Library). In other words, it creates guidelines to ensure that the content and descriptive information in digital repositories can be viewed by and shared with a wider community. Repositories meeting OAI standards can choose to register with the organization and appear in a publicly available listing, which is often used in conjunction with the OpenDOAR and ROAR directories as a starting point for studies on IRs, including those in Latin America. Several studies have noted that there is not a strong movement to establish standards for digital preservation in Latin America. This is perhaps one reason why standards developed in North America or Europe, such as OAI, are often used to evaluate Latin American repositories.

Voutssas investigated digital preservation efforts and found research on the subject severely lacking in Latin America (2012). He also stressed that digital
preservation is about more than technology and identified six factors – “cultural, technological, legal, methodological, economic and social” – that influence such programs and standards. Alonso-Gamboa and Russell also considered the intersection of culture and technology in an historical study that analyzed the development of scholarly journal databases in Latin America over the last forty years (2012). They identified some of the unique challenges facing scholarly publishing in Latin America today, such as lack of visibility both within and outside of the region.

A few preliminary studies do take a narrower focus and address institutional repositories in Mexico. Galina and Giménez conducted an exploratory study on open access journals in Mexico, gathering data on content such as size, document types, and supporting institution (2008). They also conducted a case study of a repository at the Universidad Nacional Autónoma de México (UNAM), which included two interviews with repository managers that were compared with interviews with repository managers in the United Kingdom. Similar to Voutssas, Galina and Giménez concluded that on a national level Mexico does not have a strong movement towards promoting open access and that national standards for repositories do not exist. Instead, the open access movement revolves around international collaboration or projects of individual institutions. The authors of a case study on Redalyc, an open-access repository for scientific journals from Latin America, Spain, and Portugal housed at the UNAM, also lamented the lack of national standards for disseminating or preserving digital information (Aguado-López, Garduño-Oropeza, Rogel-Salaza, & Zúñiga-Roca, 2012).

Aguado-López et al. also found that the goals of Redalyc include promoting the accessibility of Latin American journals and connecting scholars with common goals and
research interests. The idea of using new forms of technology to facilitate collaboration also comes up in a study on challenges facing digital humanities projects in Mexico (Galina-Russell, 2012). In this study, Galina-Russell conducted four focus groups with researchers involved in digital humanities projects. She found that most felt isolated and were eager for more connections with scholars working on similar projects. Echoing Voutssas’ findings on lack of planning or support for digital preservation, Galina-Russell found that few scholars had plans or funding for the long term maintenance of their projects. Incorporating these projects into the institutional repositories of their respective institutions would be an ideal solution for their preservation. However, it might be challenging to get institutions to take on this responsibility. In his case study of a digital humanities project, Priani Saisó found that many researchers identified a lack of institutional support as one challenge they faced (2012). Galina-Russell makes several suggestions that seem relevant in light of the concerns that Priani Saisó identifies, such as creating a working list of digital humanities practitioners and developing a Spanish-language guide to best practices for such projects.

Several studies have addressed the significant differences in patterns of scholarly communication among researchers from different disciplines. These studies address how researchers from different disciplines make use of new forms of technology such as digital publishing, social media, and institutional repositories, and how they typically disseminate their research and connect with colleagues. Studies have nearly all found that the way scholars adopt these new measures varies by discipline and is highly influenced by patterns of communication and collaboration that existed long before the internet. In case studies of humanities researchers, Collins, Bulger, and Meyer found that technology
was often used to “make pre-existing communication easier,” that some researchers still hesitated to trust digitized sources, and that many expressed little desire to use technology to ask new questions or explore documents in ways that had not been possible in the past (2012). Various other studies have addressed disciplinary differences in scholars’ needs in digital collections (Palmer, 2005), their tendency to post their research on the web (Rowlands, Nicholas, & Huntingdon, 2004) and their use of social media (Rowlands, Nicholas, Russell, Canty, & Watkinson, 2011).

Of particular interest is a study by Kingsley that connected patterns of scholarly communication of researchers in different disciplines to their use of institutional repositories (2008). After interviews with chemists, computer scientists, and sociologists, he concluded that each group would have different needs and expectations for an IR and that developers promoting repositories should emphasize the specific reasons the IR would be valuable to each group. He hypothesizes that the difficulty of meeting these diverse needs and appealing to scholars from different disciplines is one reason that interdisciplinary institutional repositories are often much less successful than subject based ones (p. 209). Ware and Mabe make a similar point, citing several examples of subject-based repositories that have found success by building on the specific “pre-existing culture” for sharing research and publishing in the discipline that they cater to (2009, p.50). In another study encouraging developers of IRs to think carefully about their purpose, Rodriguez-Armentia and Amat took a random sample of articles by Spanish authors that had been indexed by ISI. They did web searches to determine which were freely available and how they could be accessed and found that subject-based repositories provided quicker and more comprehensive access to articles than
institutionally-based ones. Their somewhat striking conclusion is that institutional repositories may be valuable for “long-term preservation, and especially institutional visibility” but that “the role of IRs as a unique mechanism to gain access to the research literature is less clear” (p. 207).

A study focusing solely on the UNAM also addressed the issue of accessibility and visibility of research. Interestingly, it also reached a somewhat pessimistic conclusion. Researchers chose ten of the university’s research institutes and analyzed the web visibility of the research output of each (Russell, Ainsworth, & Díaz-Aguilar, 2012). They carried out a detailed analysis of each institute’s website, considering factors such as content, ease of navigation, and language. The authors concluded that most institutes did not do an effective job of maintaining a strong web presence or making their research available digitally. Quijano-Solís and Novelo-Peña focused on usability of institutional repositories but also supported the point that lack of web visibility is an issue for researchers in Latin America (2005). The thirty five Mexican reference librarians involved in their study all had experience using digital repositories, but none mentioned using a repository developed at a Latin American country outside of Mexico.

Another significant area of research that is particularly relevant to this study centers around the topics of access to and dissemination of scientific information in less developed countries. These are two distinct issues that scholars have approached from a variety of different perspectives. A number of studies from North America and Europe address the issue of ensuring that researchers in all regions of the world have access to high-quality scientific information. For instance, in their report on scientific and scholarly journal publishing, Ware and Mabe identify several initiatives that allow researchers in
less-wealthy countries to access scientific literature at no cost or for significantly reduced prices (2009). Of course, many argue that one of the main benefits of the open access movement is that it makes such programs unnecessary – scientific literature is freely available to anyone on the web, regardless of their ability to pay or affiliation with a research institution.

Finding ways to disseminate research produced in less-developed countries is an entirely different issue that many feel is just as pressing. Almost two decades ago, Gibbs identified many of the challenges associated with this issue, and most of which are still relevant in one form or another today (1995). In particular, he discussed a self-perpetuating cycle that made creating strong scientific journals difficult in Latin American countries. Journals often had low impact factors and were therefore given little respect or attention internationally. To get their research published and assure it reached a wide audience, the best Latin American researchers published in international journals, making it nearly impossible for local journals to gain respect or attention and thereby increase their impact factor. This is a cycle that remains difficult to break. For some, the most concerning aspect of it is that potentially important research published solely in local journals is never noticed by the international scientific community (Gibbs, 1995).

Almost twenty years later, scholars are still working to address this problem. Some have identified specific issues facing scientific journals in Latin America, such as their dependence on government funding and lower levels of selectivity, while suggesting ways to improve their overall quality (Meneghini, 2012; Packer, 2009). Others have specifically addressed how language issues affect the lack of international attention given to Latin American journals. There is little doubt that English is the language of the
international scientific community, and this presents problems in countries where many researchers do not have strong enough English skills to produce papers that would be accepted by highly ranked journals (González-Alcaide, Alderrama-Zurián, & Aleixandre-Benavent, 2012). Meneghini and Packer also point out that making the most prestigious international research, often published in English, accessible to local researchers, healthcare providers, journalists, and consumers in Latin America can be a challenging process (2007). In many cases, this requires professors to follow “a continuous flow of English information, ideas, and terminologies while communicating and teaching in another language” (p. 114). Finally, other scholars have identified a potential conscious or unconscious bias among European and North American researchers or editors that causes them to give less consideration to articles from researchers working in poorer countries when choosing works to cite or publish (Gibbs; Gonzalez-Alcaide et al.; Stolerman & Stenius, 2008). All of these factors likely play some role in the lower levels of visibility for research emanating from Latin America, and some believe that institutional repositories might play a role in overcoming them.

**Research Design and Methodology**

**Purpose**

In sum, the literature identifies three key issues surrounding digital information produced at research institutions of higher education in Mexico. They are:

- A lack of national standards or significant research efforts to determine how digital information should be preserved.
- Low levels of web visibility of scholarly research.
• The lack of national networks or communities of researchers, especially for establishing best practices or strategies for creating and storing digital information. In general, scholars have not taken full advantage of web-based resources that might facilitate collaboration.

Much of the literature on institutional repositories indicates that they have the potential to address all three of these challenges. Therefore, this study sought to investigate how institutional repositories in Mexico are being used to establish standards for the preservation of digital information, increase the visibility of research, and facilitate communication between researchers. In doing so, it compared strategies employed by different types of repositories, such as those that focus on a particular subject and those that focus on the work of an entire institution, to determine if certain IRs address these issues more effectively than others.

**Research Questions**

This study investigated the following research questions:

1) How do institutional repositories in Mexico serve to promote or encourage the development of national standards for the preservation of digital information?

2) Are Mexican institutional repositories and their content easily accessible within their host institutions and on the World Wide Web?

3) Can institutional repositories serve as a way to promote collaboration and establish connections between like-minded scholars?

**Data Collection**

Two directories were consulted to establish a listing of repositories in Mexico: the Directory of Open Access Repositories (University of Nottingham) and the Registry of
Open Access Repositories (University of Southampton). These two major international listings allow for the registration of repositories that conform to certain open-access standards and are the starting point for dozens of studies on open access repositories. In both cases, the option to filter repositories by country was used. Many repositories are registered in both directories, so duplicates were eliminated before a final list was established. There were a relatively small number of Mexican IRs, so no sampling was necessary – it was possible to collect data on each one. Repository websites were used to collect quantitative data for the following variables:

- Repository type (institutional or subject-based).
- Number of documents held.
- Type of documents (examples include teaching material, dissertations, digitized historical documents, or journal articles).
- Operational platform (type of software used).
- Languages used on the repository website (for metadata or content).
- Language of the documents in the repository.
- Structure (how content was arranged).
- Search options for locating content in the repository.
- Type of metadata publicly available for each document, making special note of whether any controlled vocabularies or standardized syntaxes are used.
- Special features (unique components of a repository, such as special options for sharing documents or collaborating).

These data were collected during the week of December 17-24, 2012. See Appendix A for a sample of the chart used to record these data.
After collecting preliminary data, the web visibility and accessibility of Mexican IRs were investigated. A user might take several different paths to access the documents in a repository. These include beginning at an institution’s homepage and searching for the repository, doing a web search for the repository, or doing a web search for the subject and types of documents found in a repository. The following steps were taken to determine web visibility in each of these circumstances:

- To analyze the visibility of the repository within its host institution, searches were conducted from the institution’s homepage for “repositorio” and then for the specific name of the repository. Of the two searches, the highest result number that provided a link to the repository was recorded.
- To analyze the visibility of the repository outside of the institution, a Google search was conducted for the repository name. The result number that brought the user to the repository was recorded.
- To analyze the visibility and accessibility of the repository for a user searching for the general type of documents it contains, Google searches were conducted for the most prominent document type and subject represented in each collection. To remain consistent, whenever possible the terms for the searches were taken directly from the repository website. This also helped ensure that search terms reflected how creators of the repository chose to describe it. The first five pages of search results were examined to determine if any results led to the repository.

These data were collected during the period from December 25 – January 7. See Appendix B for a sample of the chart used to record these data.
Ethical Issues

This study did not involve any significant ethical issues. Whether or not to report a negative picture of a repository, such as disorganization or lack of web visibility, might be considered an ethical issue if the finding could potentially inhibit an IR’s ability to develop or attract new researchers. However, this is unlikely to be an issue. It is fairly widely accepted that IRs worldwide are still in the process of growing and developing best practices, so identifying flaws is hardly surprising. Additionally, while data about individual institutions is presented, most analysis for this study was done in the context of larger trends and patterns. When significant discussion is devoted to a particular IR, it is more likely to be because it has particularly innovative or positive features.

Limitations of the Study

The nature of institutional repositories makes basing an analysis of them on data freely available on the web an appropriate strategy. The information a repository makes available and how visible that information is often determines the success or failure of an IR. The potential weakness of a research study relying on this type of data is that it will not provide highly detailed information about a repository’s developmental history or strategies undertaken by its creators. These are certainly details that should be explored in more focused case studies. However, conducting a comparative analysis of the finished products and how they address some of the more pressing issues affecting researchers at Mexican institutions of higher education is also a worthwhile undertaking.

Data Analysis

Table 1 lists the data most relevant to each research question and the points it was used to evaluate. In all cases, special attention was paid to repository type and type of
documents held. This allowed for a comparison of different types of repositories, such as those with or without a specific subject focus, or those that focus on the humanities versus the sciences.

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Relevant Data</th>
<th>Points of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do institutional repositories in Mexico serve to promote or encourage the development of national standards for preservation of digital information?</td>
<td>Operational platform Available metadata Special features</td>
<td>Are there consistent standards for metadata? Is there a common or standard operational platform for repositories? Do the repositories post statements about long term goals or expectations? Is there more general information on open access or digital preservation?</td>
</tr>
<tr>
<td>Are Mexican institutional repositories and their content easily accessible within their host institutions and the World Wide Web?</td>
<td>Results of institutional search Results of Google searches for repository and subject</td>
<td>Are repositories easy to locate from the institution’s home page? Can the repositories be located by general web searches? Would a person doing a search for a specific kind of information come across the repository?</td>
</tr>
<tr>
<td>Can institutional repositories serve as a way to promote collaboration and establish connections between like-minded scholars?</td>
<td>Special features Structure</td>
<td>Do repositories incorporate any type of social media? Do they allow for browsing? How much information on authors is included? Is there evidence of collaboration between institutions?</td>
</tr>
</tbody>
</table>

**Expected Benefits**

This study represents an addition to the growing body of literature on institutional repositories. It addresses an area for which English-language scholars have little information: repositories in Mexico. The majority of work currently addresses IRs in Europe and North America, but research today often takes place across international
boundaries. Scholars collaborate or make use of sources in other countries, so it is important to know how data is managed and what types of sources are available for research in other locations. The conclusions of this study might be relevant to a researcher looking to identify potential collaborators at Mexican research institutes, a researcher wondering about the long-term security of documents submitted to a Mexican IR, or a researcher hoping to make use of documents in a Mexican repository.

The challenges associated with IRs have been well-documented. This study takes a unique approach by considering how repositories can serve as solutions to specific problems. The research questions were identified based on significant issues related to scholarly research and communication in Mexico, and it is important to know if IRs are currently serving to address these problems. If not, this study should allow institutions developing IRs to consider what changes might be made so that they do address the problems in the future. Finally, while the research questions address issues that are most significant in Mexico and Latin America, they are by no means irrelevant in North America or Europe. New perspectives on topics such as increasing the visibility of repositories or incorporating social media features should be of interest to librarians or archivists around the world currently developing or working to improve their own institutional repository.

**Results**

**Identifying Repositories**

Identifying the repositories to be included in this study was not a simple task, although ultimately twenty-three unique open access institutional repositories in Mexico were identified. First, the listings in OpenDOAR and ROAR directories were examined.
This revealed some surprising inaccuracies, mostly in the form of duplicate listings in ROAR. In six cases the same repository was listed three different times in ROAR and in two cases a single repository was listed twice. This study involved a small number of repositories, so errors were relatively easy to identify and correct. However, duplicate listings might present an issue in a larger study that did not individually examine each listing. Because of duplicates, ROAR listed thirty-two repositories for Mexico, which significantly overstates the number that actually exist. The ROAR listings are certainly a valuable resource for anyone interested in open-access repositories, but the possibility of duplicate listings is an issue that future researchers should keep in mind when using the directory as the basis for studies.

Figure 1: Example of a duplicate listing in ROAR. The repository EduDoc is counted twice in ROAR’s listings. Source: http://roar.eprints.org/

Another issue that appeared in ROAR was that several links were broken or out-of-date. This problem is likely difficult to avoid in any listing of repositories, especially when the repositories are still in the development process and do not always maintain a consistent web address. In this case, it was possible to identify the new links without too much difficulty, but developers of repositories should nevertheless think carefully before
changing their web address. Maintaining a consistent address could very well prove beneficial to repositories and their users by making them easier to identify and locate. For Mexican repositories, the listings in OpenDOAR proved to be more reliable than ROAR, as both out-of-date and duplicate listings were much less of an issue. This may be because the data had been collected more recently and because each listing in OpenDOAR is verified by a staff member, not collected through an automated process (University of Nottingham). When duplicates and old links were accounted for, ROAR and OpenDOAR had very similar lists of repositories. Two repositories that appeared in ROAR but not in OpenDOAR were eliminated because they did not appear to fall in the scope of this study. One simply appeared to be a listing of journal publications, without any content. The other appeared to be more of a virtual exhibit than a repository of documents.

In addition to the repositories listed on ROAR and OpenDOAR, four additional repositories were identified from the list of university repositories that contribute to the Universidad Nacional Autónoma de México’s (UNAM) institutional repository, the Red de Acervos Digitales (RAD). According to the RAD website, each school or research institute within UNAM is responsible for gathering documents, creating metadata, and maintaining its own repository and website (Universidad Nacional Autónoma de México). The institution-wide RAD harvests metadata from the various university sites and provides a single interface that can be used to search across them all. For the purposes of this study, both the smaller university repositories and the more expansive RAD were treated as individual entities in terms of data collection. This is consistent with the way OpenDOAR and ROAR list the repositories. It also makes sense from the
perspective of a user, who could very well locate and interact with documents exclusively from either an individual school’s repository or the larger institution-wide site. UNAM repositories had a large role in this study, which is not surprising given that the school is the source of over half of the scholarly research produced in Mexico each year (Galina & Giménez, 2008). Of the twenty-three repositories in this study, nine were associated with UNAM. See Appendix C for a complete listing of the repositories in this study.

**Repository Characteristics**

The first factor considered was the type of institution that hosted each repository, which was clearly displayed on all repository websites. Unsurprisingly, in all cases but one the repositories were sponsored by a university or a specific research institute within a university. In cases where an individual division or institute of a larger university hosted a repository, the name of the smaller division was recorded as the host institution. There was significant variety in the type of academic institutions that hosted repositories. Thirteen were university research institutes or departments devoted to a specific subject. The most common subject focuses were education, with five repositories devoted to it, and communications, with three. There was one repository each for departments representing the humanities, science, economics, and the social sciences. The final departmental or institutional repository was unique in that it was devoted solely to images from the field of biology. The one repository in this study that was not run by an academic institution was Artemisa en Línea, which is supported by the National Institute of Public Health. This was also the only repository that focused on the health sciences.

The remaining repositories were devoted to collecting the entire research output of their respective institution and therefore contained documents from more than one
academic discipline. The types of subjects represented in these repositories were slightly
different than those in the more discipline-specific IRS, and it was rare that all disciplines
were evenly represented in a repository’s collections. The sciences tended to have the
strongest presence, especially health sciences and computer science. There were far fewer
documents from the humanities, education, or mathematics. The representation of the
social sciences was more varied, with large collections in some repositories but smaller
ones in a few others. For instance, the Universidad Veracruzana, one of the larger
interdisciplinary repositories, reported 1198 documents from the health sciences and
1192 from economics but only six from the arts and 136 from the humanities. The article
collections of the Universidad Autónoma del Estado de Hidalgo (UAEH), which do not
include theses, featured 120 articles from the health sciences, 78 from science and
engineering but fourteen from the humanities and social sciences and only 6 from
business and economics. The Universidad Autónoma de Nuevo Leon displayed a similar
pattern, with the natural and health sciences having the heaviest representation in its
collections. An exception was the repository of the Universidad del Claustro de Sor
Juana, where research was largely from humanities disciplines.

Two repositories, Red de Revistas Científicas de América Latina y el Caribe,
España y Portugal (Redalyc) and Mexico’s Scientific Electronic Library Online
(SciELO), stand out from the other repositories in this study because they are not
centered on the research output of a single institution. Both are sponsored by Mexican
institutions of higher education but include collections that reach far beyond that
particular university. Each comprises multi-year runs of academic journals, including
thousands of articles from a wide range of disciplines. Redalyc features an international
collection of academic journals from across Latin America, the Caribbean, Spain, and Portugal as well as a few Spanish-language publications from Germany, Denmark, Poland, and the United States. It includes journals from both the sciences and social sciences. SciELO Mexico is limited to Mexican publications but is part of the larger SciELO network, which includes twelve Latin American countries, Spain, Portugal, and South Africa. SciELO describes itself as “a model for cooperative electronic publishing of scientific journals on the Internet” geared towards the needs of developing countries, especially those in Latin America and the Caribbean (SciELO, About SciELO – SciELO Model). The sciences are more heavily represented in its collections, but the humanities and social sciences also have a significant presence. Both SciELO and Redalyc note on their websites that they have received international recognition as successful models for open access repositories.

Not surprisingly, considering its broad collection focus, Redalyc had by far the most documents of any repository in this study, with 250,400 full text articles. While Redalyc displays the number of articles in its collection and notes that the full text of each is freely available, determining the number of documents available in a repository was not always this straightforward. When the number was not displayed on the site, the browse by title function was used. This listed the documents by title but also provided a number of total documents. As Table 2 shows, after Redalyc, the five largest repositories are all from schools or institutes that are a part of the UNAM. Of the five smallest repositories, which all contain fewer than one thousand documents, four are from the education field and contain teaching resources or educational research. The repositories
that fall in the middle of the spectrum, with several thousand documents each, are
generally repositories that contain research and teaching output of an entire university.

<table>
<thead>
<tr>
<th>Repository</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centro de enseñanza de lenguas extranjeras - Universidad Nacional Autónoma de Mexico (UNAM)</td>
<td>30</td>
</tr>
<tr>
<td>Interactive and Cooperative Technologies Lab - Universidad de las Americas Puebla (UDLAP)</td>
<td>110</td>
</tr>
<tr>
<td>Centro de Recursos para la Enseñanza y el Aprendizaje (CREA), Universidad de Guadalajara</td>
<td>263</td>
</tr>
<tr>
<td>Centro de Documentación sobre Educación - Instituto Tecnológico de Estudios Superiores de Occidente (ITESO)</td>
<td>489</td>
</tr>
<tr>
<td>Desarrolla, Aprende y Reutiliza (DAR), Instituto Tecnológico y de Estudios Superiores de Monterrey</td>
<td>558</td>
</tr>
<tr>
<td>Universidad Autónoma del Estado de Hidalgo</td>
<td>1135</td>
</tr>
<tr>
<td>Instituto de Investigaciones Económicas -UNAM</td>
<td>1187</td>
</tr>
<tr>
<td>Colpos Digitales, Colegio de Postgraduados</td>
<td>1280</td>
</tr>
<tr>
<td>Universidad Autónoma de Nuevo León</td>
<td>2415</td>
</tr>
<tr>
<td>Facultad de filosofía y letras - UNAM</td>
<td>2686</td>
</tr>
<tr>
<td>Repositorio del Claustro de Sor Juana</td>
<td>2989</td>
</tr>
<tr>
<td>Instituto de Investigaciones Sociales - UNAM</td>
<td>3527</td>
</tr>
<tr>
<td>Reposital - UNAM</td>
<td>3890</td>
</tr>
<tr>
<td>Colección de tesis digitales - UDLAP</td>
<td>4292</td>
</tr>
<tr>
<td>Documentación en Ciencias de la Comunicación</td>
<td>5570</td>
</tr>
<tr>
<td>Artemisa en Línea</td>
<td>7424</td>
</tr>
<tr>
<td>Universidad Veracruzana</td>
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</tr>
<tr>
<td>SciELO Mexico</td>
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<tr>
<td>Dirección General de Tecnologías de Información y Comunicación - UNAM</td>
<td>18,554</td>
</tr>
<tr>
<td>Facultad de Ciencias - UNAM</td>
<td>26,661</td>
</tr>
<tr>
<td>Irekani - UNAM</td>
<td>27,092</td>
</tr>
<tr>
<td>Red de Acervos Digitales -UNAM</td>
<td>56,955</td>
</tr>
<tr>
<td>Redalyc</td>
<td>250,400</td>
</tr>
</tbody>
</table>

These numbers include some documents that were listed in repository holdings but not freely available. Although the majority of repositories in this study appeared to contain mostly full-text, freely available documents, in a few cases listings included citations or documents that required an institutional sign-in to view. Due to the wide
scope of this study, it was impossible to determine the percent of documents in each repository that were freely available. Therefore, the totals for the number of documents reflect all documents listed whether the full text is freely available or not. It is important to note that free availability of content is not a requirement for the highly-regarded OAI standards that many use as a guide when developing and studying IRs. The OAI website states that their use of the word open is “from the architectural perspective – defining and promoting machine interfaces that facilitate the availability of content… openness does not mean “free” or “unlimited” access to the information repositories” (Cornell University Library, FAQs). In other words, their emphasis is on openly accessible metadata that provides information about the documents in a repository. This is distinct from the open access movement, which aims to promote the free availability of the documents themselves. In accordance with this emphasis on metadata, it is significant that Dublin Core is by far the most widely used type of metadata among Mexican IRs, and many give an explicit option in the document listing to view its full Dublin Core record.

Some diversity was evident in the types of documents held in IRs. Most repositories were not limited to one type of document and instead contained a mix, such as theses, articles, research reports, conference proceedings, and administrative documents. As discussed above, a few larger repositories were limited to journal articles, and in four cases the repository was primarily devoted to theses and dissertations. However, some repositories included more unique formats. Irekani was made up entirely of images from students and researchers at the UNAM’s Institute of Biology, and the repository of the UNAM’s Instituto de Investigaciones Sociales contained ethnographic
photographs from social sciences researchers. CREA was devoted to teaching resources or activities that instructors could directly incorporate into their day-to-day activities. A few repositories contained historic documents from as early as the sixteenth century, although most do not appear to contain significant collections of historic material. Unfortunately, the documents in one of the historic collections that might be potentially interesting to a wide range of scholars around the world – the writings of Sor Juana Inés de la Cruz – did not appear to be freely available.

Audio files did not appear to have much of a presence in the repositories. One exception was the IR of the UNAM’s Instituto de Investigaciones Económicas, which contained over 700 audio files drawn from a radio program on the topic of economics. Videos also appeared in some repositories but did not seem to be widely collected. A significant exception was the repository of the UNAM's Dirección General de Tecnologías de Información y Comunicación. It contained over two thousand video clips that included tutorials, faculty presentation, conferences, and university events. Another interesting use of video appeared in the repository for the UNAM’s Facultad de Filosofía y Letras, where videos were incorporated into a unique collection devoted to the work of recently deceased prominent philosopher. The main page of the collection provides a brief overview of the philosopher’s career and access to audio and video of his talks at conferences, complete texts of some of his books, and a collection of essays written in his honor. This user-friendly collection seems have been designed with researchers in mind - it offers summaries and images of the books and allows for them to be downloaded as complete documents or individual chapters. It is also an innovative way to preserve and make video segments accessible. Retrospective collections devoted to the work of a
single scholar did not appear frequently in the repositories in this study, but this collection illustrates the potential benefits of this approach.

Next, the software used to manage repositories was considered. Over half – thirteen total – used DSpace. Two made use of EPrints software, and the remaining repositories were a mix of HTML websites and locally developed platforms. Several studies of institutional repositories in the United States have also found DSpace to be by far the most popular platform for IRs, so its popularity is not surprising (Mercer, Koenig, McGeachin, & Tucker, 2011; Xia & Opperman, 2009). According to the creators of DSpace, its advantages include being freely available as open source software, “easy to install ‘out of the box’ and completely customizable” (DSpace). The standard set-up that DSpace provides means that many of the repositories in this study had very similar appearances, especially because repository creators made varying degrees of effort to customize their appearance. Some have added custom logos and text, while others have not even changed the language from English to Spanish for the built-in categories that DSpace provides to organize documents.

Figure 2: Standard DSpace interface for an IR. Many of the repositories in this study looked very similar to this one from the Facultad de Filosofía y Letras at the Universidad Nacional Autónoma de México. Source: http://ru.ffyl.unam.mx:8080/jspui/
Even with customization, most DSpace repositories have a very similar look and feel, which could have both positive and negative implications. The fact that multiple repositories have similar structures and search features could be beneficial in that it allows users who become comfortable navigating one repository to easily move to another. However, especially when little effort is put into customization, the common appearance makes each repository less memorable and distinctive. Repository websites that rely on a default set-up often make it difficult for a user to determine the purpose or focus of the repository, especially if there is no mission statement or explanation of the repository’s contents. Browsing DSpace repositories normally involves clicking through “Communities,” which each contain various “Collections.” It is not always readily apparent what these terms mean or how the various communities and collections relate to each other, and this varies across repositories.

One feature that DSpace and other IR software offers is the ability to make a repository homepage available in more than one language, and some repositories in this study took advantage of this feature. Six had an interface with features available in Spanish and English, four incorporated these two languages plus one or more others, twelve had interfaces only available in Spanish, and one was only available in English. As would be expected, the vast majority of documents in the repositories were in Spanish, but other languages were represented. The scope of the study made it impossible to get exact counts for the number of documents in different languages available in each repository. However, most repositories offered an option to search by language, so this feature was used to determine which repositories held documents in languages other than Spanish. Searches were conducted for English, Portuguese, and French language
documents in each repository. After Spanish, the next most common language represented was English, followed by an even smaller amount of documents in Portuguese. In all cases, foreign language documents were mixed throughout the collections of their respective repository – they were not organized into separate collections. Also significant is that five of the repositories appear to make a consistent effort to provide abstracts for articles in at least one language other than Spanish.

The special features incorporated into the IRs varied greatly. Many repositories were very basic presentations of documents and did not incorporate any extra features. Some, however, offered options to share documents through Facebook or Twitter, rotating displays of featured collections on the repository home page, options to export citations, and help pages for searching within the repository. In a few cases, download and use statistics for documents were publicly available, but in most cases viewing this information appeared to require an institutional sign-in. One repository, the Instituto de Investigaciones Sociales, offers a particularly innovative feature by providing pages for individual researchers that include the option to browse through the person’s work as well as a summary of their research interests. Other repositories had general statements about the purpose of IRs, information about the concept of open access, or more specific mission statements for their particular repository. Significantly, a very small number of repositories featured a page with links to other repositories in Latin America. Finally, it is important to point out that some repositories offered users affiliated with their institution the option to create an account that would allow them to sign-in and receive access to more features. This study focused on publicly available characteristics of repositories and did not examine any requiring a user to sign in.
Web Visibility

After examining their basic characteristics, the web visibility of each repository was investigated. See Appendix D for a complete listing of the results. First, web visibility was considered from the perspective of a person beginning at the home page of the host institution of each repository. Both browsing and searching options were investigated. In four cases, there was a direct link from the home page to the repository site; in seven cases, a user could reach the repository with just two clicks; in three cases, it required three clicks. The remaining repositories all required a user to click through a path that involved four or more links to reach the repository from the institution’s home page or did not provide a clear path to access it through browsing. Searching from the institution home page provided another path to accessing the IRs, although this method brought mixed results as well. For about half of the repositories – eleven cases – the first search result for the IR’s name or the term “repositorio” produced a page with a direct link to it, and in four other cases the first page of results included the link. However, searches from four host institution home pages produced no results for the repository, and four did not offer a search function.

Next, the general web visibility of each repository was considered. First, a Google search for the specific name of each site was conducted to determine how difficult it would be for a person who knew about the repository to find a way to access it. For twenty of the repositories, the very first result provided a link to the IR homepage, and links to the remaining three all appeared somewhere on the first page of results. Clearly, a person who knows the name of a repository should have no difficulty locating it on the open web. In fact, for the repositories in this study, a person would have a greater chance
of quickly locating a repository through a general web search than through a search of the host institution’s website.

Next, a search in Spanish was conducted for the general type of document that was most prevalent in each of the repository holdings. In cases where repositories held a variety of different document types from different disciplines, one was chosen as an example. Whenever possible, these search terms were taken directly from the repository website. Examples of search terms include “imagenes diversidad biologica mexico,” “recursos para enseñanza,” “investigaciones sobre educacion,” and “investigaciones tecnologias de informacion y comunicacion.” For repositories that were predominantly made up of digital theses, the search term used was “tesis digitales.”

These searches brought much more mixed results in terms of web visibility. For ten of the repositories – nearly half those included in the study – such a search did not produce any links to the target repository on the first five pages of results. Interestingly, these were not necessarily the smaller repositories – in some cases searches for the type of research housed in the larger, more well-developed repository did not produce a link to that IR’s site. For instance, “articulos salud mexico” did not produce any hits for Artemisa en Linea and “revistas academicas mexico” provided a link to a document held in SciELO but not links to the site itself. Seven searches produced a link on the first page of results, with five of those being the very first result. These included four subject-based repositories, Redalyc, a collection of digital theses, and the IR containing research and the original writings of Sor Juana. Searches for the types of documents in the remaining six repositories produced results on the second, third, or fourth pages of results. Finally, a
similar search was conducted in English for each repository, but none resulted in links to the IRs being investigated.

In sum, the data gathered in this study showed significant variability for many repository characteristics, such as web visibility, number of documents, use of languages other than English, or whether the repository focused on a single subject or was multidisciplinary. Some results were not surprising, such as the fact that among multidisciplinary repositories, the sciences were more heavily represented. Others were slightly surprising, such as the low levels of web visibility of some of the larger repositories and the fact that many were difficult to locate in their own institution. There were also areas where repository characteristics were much more consistent, such as the use of Dublin Core metadata and the use of either DSpace or EPrints repository software. Almost no repositories used locally developed platforms. Because many of these repositories are so new, many of the features that data were collected on should almost certainly be expected to change over the upcoming years. Understanding what types of changes take place and why they occur could be an intriguing subject of research, and the data collected in this study will offer a basis for comparison.

Discussion

Research Question 1: How do institutional repositories in Mexico serve to promote or encourage the development of national standards for the preservation of digital information?

The preservation of digital information is a complex, on-going process. Ideally, it involves action at a number of different steps, from the point at which a digital object is created to the moment when its active lifespan ends and it is archived or marked for
preservation. When it is ready for long-term preservation, continued maintenance is necessary to ensure that it remains accessible. The need for active preservation is a crucial point to keep in mind when the preservation of digital information is considered. In many cases, it would be no trouble to read a stack of papers left untouched in a box for one hundred years ago. This is not the case with digital information, where physical deterioration, hardware obsolescence, and software obsolescence are some of the issues that might result in a loss of access to electronic information in as little as a few years. Many of the repositories in this study contained a large amount of unpublished, born-digital material such as conference proceedings, administrative papers, theses, and research reports. If these documents remained with the organizations or individuals who produced them, it would be highly unlikely that serious efforts would be made to preserve them. Even if such efforts were made, the documents would likely be scattered across a number of different locations and be very difficult for other members of the research community to access. Coordinating efforts to preserve these documents is often seen as one of the most important purposes of institutional repositories.

One role institutional repositories play in preserving an institution’s research output is ensuring that consistent metadata is created to identify documents. In this study, Dublin Core was clearly the prevalent standard. Dublin Core is a set of fifteen basic metadata elements designed to be simple to implement, adaptable to a wide range of disciplines and material types, and flexible enough to be built on and expanded (Greenberg, 2010). For these reasons, it has become popular with institutional repositories and archives worldwide. At least in this case, the presence of an internationally accepted best practice for metadata means that a lack of national standards
in Mexico is not necessarily a problem. The way Dublin Core is incorporated into repositories, however, does bring up some points worth considering.

Many of the repositories in this study offered a link in the record of each digital object to its full Dublin Core record. Dublin Core elements generally appeared in English when a user clicked on the “view full Dublin Core record” for an item. In the brief record for each item, which is what users would initially interact with, terms are displayed in Spanish. In both cases, the values for each tag are normally in Spanish. Dublin Core is designed as an international standard to facilitate the sharing of metadata, so it makes sense that the actual tags for each item are in a standard language, which in this case is English. Additionally, the majority of repositories do not have abstracts available in more than one language, so having even a brief Dublin Core record with values displayed in English could potentially open up the articles to a wider audience.

However, relying on a standard based in a foreign language might also pose an added challenge for people responsible for creating the metadata. Many repositories seem to rely on the person who submits a document to create the metadata for it, and Dublin Core is designed to be simple enough to make this possible. Still, research has shown that university faculty are often hesitant to go to any extra trouble at all to submit documents to an IR. Having to work with another language to do so could potentially be seen as an added burden or discourage some from participating. It is certainly beneficial that even when tags are in English it is possible to enter values for each field in Spanish. Creating values to describe a document in English would likely pose more of a challenge than finding translations for the name of each field, and it would also make it significantly more difficult for Spanish-speaking users to search and evaluate the documents.
As in many other aspects of Mexican IRs, metadata creation involves balancing needs of local users with those outside the university. It must be simple enough to not turn away potential contributors but still provide useful information that will facilitate the use of documents among researchers outside of the institution. The fact that Mexican repositories generally appear to follow international standards for metadata instead of relying on local or regional standards seems to have positive implications for their potential to disseminate and share research internationally. As long as adequate effort is taken to adapt these standards to meet local needs, there is every reason to believe that both international and local users can be served adequately. Relying on standards developed elsewhere without adapting them to local needs, however, can cause difficulties. For instance, a common issue with a significant number of repository sites is that the “help” button on the home page directs the user to a standard DSpace help manual only available in English.

One strategy some host institutions take to make international standards more accessible to local users is to provide guides for everything from contributing to the repository to searching for documents. The most common types of guides are those that provide instructions on depositing documents into the repository. Some, such as the one provided by the Universidad Autónoma de Nuevo León, are detailed, multipage documents that include screenshots and walk users through each step of the process. Another particularly clearly written guide is available from the education repository CREA. The CREA website also provides clear and concise definitions of terms such as metadata, Dublin Core, and OAI, as shown in Figure 3. Other repositories provide similar introductions to topics such as digital preservation and institutional repositories.
The repository for the UNAM’s Facultad de Ciencias includes a SlideShare presentation introducing users to institutional repositories and related concepts. The central UNAM repository contains a section for frequently asked questions that addresses basic concepts such as what a repository is and what metadata are. The website’s “Help” link takes users to a page that includes a Spanish-language manual for using DSpace and a presentation on the importance of open access. While these are relatively simple steps, raising awareness and educating users about these concepts is a valuable service that IRs are ideally positioned to provide.

Figure 3: Excerpt from the Preguntas frecuentes section of CREA’s website
Source: http://www.crea.udg.mx/faq.jsp

Making the wider academic community aware of why digital preservation is an important issue and the role IRs play in addressing the challenges associated with it could be an excellent way for repository designers to illustrate their value to their university. Ideally, this would be done through presentations and other forms of outreach to students, faculty and administrators as well as the repository website. In addition to drawing attention to the idea of digital preservation, which a large number of academics and researchers never consider, this might encourage potential users to deposit documents in the IR or motivate the host institution to devote more funds to maintaining it.
In sum, repositories can play a number of roles to promote higher standards for the preservation of digital material. Rather than working to develop national standards, most seem to be relying on software, metadata, and even controlled vocabularies that are well-established internationally. This appears to work well when these standards are adapted to the particular needs of each repository, but this is not always done. A few repositories make use of DSpace but have made few modifications to the default settings. Many repository websites provide little information for potential users, lacking elements such as a mission statement, overview of the repository contents, or information about how to contribute. Perhaps this is better than not having a repository at all, but it is not the most effective way to appeal to potential contributors or researchers. It also does nothing to help educate the university community about the importance of preserving digital information, which is something that some of the more well-designed repositories in this study did make an effort to do.

**Research Question 2: Are Mexican institutional repositories and their content easily accessible within their host institutions and on the World Wide Web?**

Some understandings of institutional repositories emphasize their role in disseminating digital information as much as preserving it. In Latin America, repositories are often proposed as one way to draw more attention to the region’s research, which many believe does not receive the recognition it deserves internationally. Overall, this study found mixed results as to the accessibility of Mexican IRs. Again, this question must be considered from the perspective of both local and external users. The ease with which a user beginning on the homepage of an institutional website could locate its repository varied greatly. The homepages of four institutions provided a link to their
repository, and many other repositories could be accessed through browsing. When there was no link on the homepage, links to the repository were generally located either on the library website or a page describing the institution’s research. In some cases, searching was the quicker and more reliable way to locate repository websites. Making use of the home institution’s site search function provided a link to its respective repository on the first page of results in fifteen different cases. While this is certainly a positive point, nearly a third of the institutions either had no site search function or did not produce any hits in a search for the repository. This is concerning, because it means that even a user who specifically knew about the repository and made a direct effort to access it might not be able to do so.

As important as it is to ensure that repositories are discoverable through site searches, it is equally important that they be accessible through browsing. Because more people are becoming accustomed to doing quick searches for information instead of browsing, this might not initially seem like a significant issue. However, the only people searching for a repository will be the ones who already know that it exists. Outside of the library and information science fields, there is simply not a large awareness of what institutional repositories are, and even the term “institutional repository” is often confusing to people. It is not ideal if the best way to access a repository is by conducting a search for “repositorio,” as it is likely that only a minority of most university communities will know to do this.

The value of browsing, in this and other circumstances, is that it allows people to locate something even if it was not what they had initially set out to find. This is often referred to as serendipity in literature on information seeking, and it is valued for its
potential to inspire creativity and promote less well-known perspectives. Some researchers have expressed concern that digital environments reduce, or at least alter, the potential for serendipitous information encounters (Bates, 2007; Bawden, 2011). Although there are different perspectives on what should define success for an institutional repository, in almost any understanding of the matter a successful repository must continuously attract new users. If the repository’s primary purpose is preservation, attracting new contributors is essential, and if it is disseminating information then appealing to new researchers is equally important.

One way to allow for these encounters to take place is to ensure that IRs are accessible through browsing. A link to the repository website on an institution’s library home page could be beneficial if potential users conduct research using the library website. If they tend to begin online research from other points of access, it might be more useful to place the link on various departmental home pages or near other commonly-used resources. Whether or not they considered the importance of promoting serendipitous encounters is impossible to say, but several institutions make links to the repository available in places that might attract the attention of researchers who were doing research online using other sources. From the homepage of the Universidad del Claustro de Sor Juana (UCSJ), users can encounter the IR by selecting the “Biblioteca” [Library] drop down menu at the top of the page and then selecting the link for “Biblioteca Digital” [Digital Library], which goes directly to the institutional repository. Scholars in the information and library science fields have certainly emphasized the technical differences between the terms “digital library” and “institutional repository,” but the familiar words in the former mean it is likely to be easier to understand and more
appealing to most potential users, especially those in disciplines where repositories do not currently play an important role. Allowing for access to the repository through this path could promote greater use.

A repository that takes a similar approach is the Instituto Tecnológico y de Estudios Superiores de Occidente (ITESO) of the Universidad Jesuita de Guadalajara. From the institution homepage, a user clicks on “Biblioteca” and is taken to an about page for the library with a link to the main library page. Once on the library page, clicking on “Colecciones digitales” [Digital collections] brings up a list of resources, one of which is the repository. Again, the user never encounters the unfamiliar term “repositorio” [repository]. Even more beneficial is that the repository is presented in the context of a list of other digital resources that the library offers. A researcher would certainly not have to know that the repository existed, or even know what a repository was, to encounter it.

This is not the case at many of the institutions in this study – on most websites, locating the repository through browsing does involve clicking on a link with the term “repositorio.” The IR is often described in a separate section on the library web page, not as part of a list of the many digital resources that the library provides. This is not necessarily a negative strategy. In most cases, repositories do offer resources that are quite distinct from the other digital collections a library offers, and highlighting these differences may prove helpful to researchers. Additionally, actually making use of more technical terminology such as “repositorio” is probably the only way that more people will actually become familiar with it. In fact, the concept of open access repositories is more well-established in some scientific disciplines, so for researchers in these fields the
term “repositorio” may cause little confusion. From the homepage for the UNAM’s Facultad de Ciencias, for instance, a drop-down menu for “Investigación” [Research] gives an option for “Repositorio.” For potential users of this repository, this might represent a logical path for accessing it. For researchers in the humanities, this is unlikely to be the case. Interestingly, the repositories at the UCSJ and ITESO are not focused on the scientific disciplines, which makes the paths they present for accessing their respective IRs especially appropriate.

The visibility of an institutional repository to people outside of its host institution is also important to consider. In this case, browsing has the potential to play an equally important role in drawing attention to the repository from people who would not have thought to specifically locate it. In fact, the list of repositories to be included in this study was not generated by searching the web but rather by browsing the listings of two international directories of repositories. Registration in repository directories or guides to subject-specific resources is certainly a strategy that repositories should explore to increase their external visibility. However, this study only looked at visibility achieved through Google searches. As noted above, it found that in many cases a person who already knew about the existence of a repository would have a significantly easier time locating it through a Google search than through a search of the respective host institution’s website. Again, however, this is only significant for the people who are already aware that the repository exists and are specifically looking it.

If the primary purpose of a repository is preservation, it might be reasonable to conclude that its visibility on the open web is not a significant issue. However, there are indications that most of the repositories in this study consider dissemination of research
an important goal. The minutes of the September 26, 2012 committee meeting for the
UNAM’s Red de Acervos Digitales, which supports and harvests metadata from the
repositories of the school’s research institutes, shed interesting light on this matter (Wolf,
2012). The first section of the minutes is “Visibilidad” [Visibility] and the notes address
topics such as where the UNAM repositories stand in recent worldwide rankings of IRs
and specific strategies that can be undertaken to increase the visibility of their collections.
Other indications that Mexican repository creators value dissemination are the
Universidad Veracruzana’s listing of their repository under a link for “Difusión y
Extensión” [Diffusion and Extension], the presence of options to share repository
documents using Twitter or Facebook, and various repository mission statements.
EduDoc proposes to “promover la circulación de las ideas y enriquecer la discusión
téorica y práctica” [promote the circulation of ideas and enrich theoretical and practical
discussion] and the Universidad de las Americas Puebla says that the benefits of its
repository include “disponibilidad” and “servicios de búsqueda y navegación sobre la
colección” [availability and services for searching and navigating the collection].

Just as it did within their host institutions, the degree to which a repository was
visible to a person who had not necessarily set out to locate it on the open web varied.
One thing that was consistent across repositories, however, was that none appeared on the
first five pages of search results for an English-language search. This was even the case
when the search terms were very specific, such as “biological diversity mexico images,”
“sor juana research,” “scientific journals Latin America” “mexican academic journals”
and “ethnographic photography mexico.” This is not necessarily surprising because the
majority of the documents in all of the repositories were in Spanish. Still, even an English
speaker with a limited knowledge of Spanish conducting one of the above searches would have had a good chance of finding something of value in one of the repositories.

Considering the amount of international recognition they have received and the significant amount of English-language information available on their websites, it is especially surprising that “scientific journals Latin America” produced no hits for Redalyc and “mexican academic journals” produced no results for SciELO.

There is a widely identified concern that scientific research from Latin America does not receive the recognition it deserves among the international scientific community, and English is commonly accepted as the language of choice for this community. Based only on the results of the Google searches in this study, institutional repositories generally do not seem to increase the visibility of their institution’s research output on the open web among the English-speaking community. However, this should not be the only factor used to judge as to whether or not repositories play a role in accomplishing this goal. SciELO and Redalyc, larger repositories that draw material from many different institutions, are clearly taking innovative steps to make their research more accessible. Their efforts include selection criteria that promote high-quality journals and providing abstracts and other information in English. Future research studies might consider using methods other than Google searches to determine whether these and other repositories are increasing the web-visibility of their research among the international or English-speaking community. Factors to consider might include their inclusion on e-resource pages or subject guides at English-speaking universities, the presence of their articles in internationally recognized journals, or statistics about where and when articles from journals available in these repositories are cited.
As much as many Latin American researchers would like to increase the visibility of their work among the English-speaking world, at this point the main potential audience for the mostly Spanish-language documents in the repositories in this study is likely people searching for the material in Spanish. Of course, Spanish is spoken widely throughout the world, so increasing the visibility of research among Spanish-speakers would still represent a significant step towards promoting increased visibility of Mexican research internationally. This is perhaps a more realistic goal, especially for the smaller repositories in this study. The Spanish-language subject and document type searches in this study clearly brought up far more results than the English-language ones. Still, a significant number of repositories – ten – did not appear in the results for the searches based on the types of documents they held. In several cases, these searches were specific enough that it was somewhat surprising that they did not produce results for the repository in question: Artemisa en línea, a database for health-related articles edited in Mexico, was not among the results for a search of “articulos salud mexico” and EduDoc, which contains education research, did not appear for “investigaciones sobre educacion mexico.”

On the other hand, it is certainly a positive indication for their web visibility that thirteen repositories did appear on the first five pages of results for searches based on the type of content they contained. The seven repositories that appeared on the first page of results for their respective searches were quite diverse in size, ranging from CREA, a repository for teaching material with 263 documents, to Redalyc with over 250,000 documents. Interestingly, repositories from the field of education generally did very well in terms of web visibility. The repository for the UNAM’s Coordinación de Universidad
Abierta y Educación a Distancia, whose holdings include teaching material, course notes, conference proceedings, and presentations also came up on the first page of results for its search. The UNAM’s Centro de Enseñanza de Lenguas Extranjeras (CELE) and the Universidad de Guadalajara’s DAR came up on the second and third pages of the results for their respective searches. It is important to note that in all four of these cases fairly general search terms, such as “recursos para enseñanza” [resources for teaching] were used. Users could easily encounter these repositories and their holdings without any existing knowledge of repositories.

Especially because they are so visible on the open web, these repositories represent an extremely valuable resource for teachers in Mexico and around the world. Many teachers at the primary and secondary level do not have access to specialized subscription-based databases and are accustomed to doing web searches to find resources to support their work. Having collections of material gathered together, much of which can be immediately applied to the practical work of teachers, is a valuable service for these departments of education to provide. Much of the discussion surrounding institutional repositories is on how they can best meet the needs of students, faculty, and researchers at institutions of higher education. However, these education repositories indicate that they also have the potential to serve people outside of this community. Further investigations into this topic could prove interesting. Researchers might consider how often and for what reasons teachers make use of repositories, whether or not they contribute their own teaching materials, and whether any other types of repositories exist to serve the needs of people outside of academia.
Beyond the success of most of the repositories in the education field, few clear patterns emerged when considering the web visibility of repositories. It was clear that having a large number of documents did not increase a repository’s web visibility in the searches conducted for this study. In fact, of the ten repositories whose searches produced no results on the first five pages, six had over five thousand documents and were among the ten largest of the repositories in the study. It is perhaps true that the very general repositories devoted to collecting the research output of an entire university tended to have lower levels of web visibility, as did those containing mostly theses. Obviously, this study only offers a starting point for considering web visibility. More searches could be conducted for each repository, with both general and more specific search terms; search engines other than Google could be used; and the repositories’ presence in directories and guides available on the open web could be investigated. Still, general Google searches are a crucial aspect of the web visibility for any site, and this study indicates that many repositories could afford to make significant improvements in this area.

**Research Question 3: Can institutional repositories serve as a way to promote collaboration and establish connections between like-minded scholars?**

In general, this study found that creating repositories that could be used as avenues for collaboration or to facilitate connections between researchers seemed to be a low priority at Mexican institutions, although there were exceptions. Some repositories have incorporated unique features that might offer different strategies for facilitating connections between scholars, and these are worth discussing. One of the simplest ways to do this is for a repository to provide links from its site to other repositories, which might also serve to increase the visibility of each site. Surprisingly, very few repositories
in this study provided links to others. One of the few that does is the UDLAP’s Digital Thesis Collection, where links are provided on the “About” page. The Instituto Tecnológico y de Estudios Superiores de Monterrey’s DAR repository also contains a list of links to similar sites promoting freely available learning resources. These collections of links would certainly prove beneficial to researchers and might help lead to the serendipitous discovery of new resources. Positioning itself as one IR among many also might lend a degree of credibility to a repository. For a person with little familiarity with the concept, seeing the wide range of institutions that host IRs might help reinforce the importance of preserving scholarship and making it accessible electronically.

Especially considering the relatively low web visibility of many Mexican IRs, it seems that linking between sites could only serve to help everyone involved, and it is puzzling that more institutions do not offer similar collections of links. Many repositories are likely run by small staff or library employees with other responsibilities, so it is likely that they see their first priority as collecting and preserving their own institution’s work, an admittedly time-consuming and complex task. The number of broken links in the ROAR directory indicates that repositories appear to change web addresses with some frequency, so this would be an added burden for maintaining them. Still, creating a page of links to other repositories is a relatively simple task with potentially large benefits, and the fact that so few repositories do so seems like a missed opportunity for all involved.

Another unique feature that might promote collaboration between scholars are collections devoted to individual researchers, which make up a portion of the repository for the UNAM’s Instituto de Investigaciones Sociales. These collections feature an introductory page with the researcher’s photograph, an overview of their research
interests, and links to their work (Figure 4). Offering personalized pages might be seen as a way to entice researchers to contribute to the repository, but it also serves to promote the work done by the institution and draw attention to the interests and accomplishments of its faculty. This information could help a potential graduate student or collaborator get a quick idea of the type of research that goes on at the IIS, and it also provides another way to facilitate browsing the contents of the repository. Like creating links to other repositories, author pages would certainly represent extra work for repository creators. However, the IIS has set these pages up using the standard D-Space interface, so doing so would not be technically difficult and could have significant positive consequences.

![Figure 4: IIS author page. An author page from the repository of the Instituto de Investigaciones Sociales at the Universidad Nacional Autónoma de México. Source: http://ru.iis.sociales.unam.mx/dspace/handle/IIS/772](image)

The most common features that IRs employ to facilitate collaboration are built-in options to share documents via social media such as Twitter, Facebook, or Google (Figure 5 and Figure 6). How heavily these features are used is difficult to say, although randomly examining a few articles and their publicly displayed statistics suggests that the features were used infrequently for those articles. However, several studies have shown
that sharing scholarship via social media is becoming more widely accepted among academic researchers, so including these features seems worthwhile even if they are not currently heavily used (Priem & Light Costello, 2010; Rowlands et al. 2011). The options for sharing documents with social media featured by repositories in this study were almost all popular, mainstream applications such as Twitter, LinkedIn, and Facebook. None were social media features specifically intended for academic researchers or applications developed in Latin America.

Figure 5: Special features for articles in Redalyc. Included are options to share with social media, email, cite, or find related articles.
Source: http://Redalyc.uaemex.mx/

Figure 6: Special features for articles in Artemisa en Línea. Included in the boxes on the right side of the page are download statistics and options to share with social media.
Source: http://artemisaelinea.org.mx/
Using mainstream social media tools to promote academic research seems to be a common practice. In a survey of social media use among researchers that included over four thousand respondents representing a wide range of disciplines and over two hundred countries, Rowlands et al. found that “the most popular tools used in a professional research context tend to be mainstream anchor technologies or ‘household brands’ – Skype, Google Docs, Twitter, and YouTube” (2011, p. 194). Their conclusion was very much in line with the findings of this study: that “researchers seem to be largely appropriating generic tools rather than using specialist or custom-built solutions” (p.194). This approach seems to have largely positive implications for the ability of researchers to share work across countries and disciplines, as well as for the possibility of making their work available to an audience outside of academia.

A few other features of the repositories shown above in Figures 5 and 6 are worth mentioning. Redalyc allows users viewing an article the option to search for similar articles within Redalyc or on the open web. Unfortunately, it does not offer any information on how similar articles are identified, and sometimes clicking the link to find related articles does not actually locate any. Still, this is a potentially useful feature that is rarely used in Mexican IRs. A more commonly used feature that appears in Redalyc is one that allows users to export citations in a variety of different formats. While this might not directly promote collaboration, it does facilitate the process of working with articles and might make conducting research in a repository more appealing for users. Finally, Redalyc, Artemisa, and a few other repositories offer English-language abstracts for many of their articles. For disciplines that use English as a standard language for
international research, this certainly has the potential to create further pathways for collaboration.

Some of the repositories from the field of education are unique in that they create spaces for new types of communication by attempting to appeal both researchers and practitioners. CREA stands out even more in that it is a resource designed primarily with the needs of practitioners in mind. Even though their contents are freely accessible to anyone with an internet connection, the other resources in this study are generally directed towards a scholarly audience, which is expected and appropriate for university repositories. It is interesting that education repositories make an effort to go beyond facilitating scholarly communication among academics by indicating that teachers and students of education can benefit from their contents as well. It is easy to see how research or lessons developed at schools of education could be of interest to practitioners in the field who previously might have had a more difficult time accessing such work. Whether repositories from other disciplines might contain material that would be of interest to the general public, and whether they might consider promoting themselves this way, is an interesting question to consider. In many fields, there are few connections between academic researchers and practitioners. How repositories might serve to bridge this gap is a topic that merits further consideration.

In sum, most of the repositories in this study seemed to put a low priority on incorporating features that promoted collaboration or the creation of new connections among researchers. Some might argue that the mere existence of the repositories is the most important step that can be taken to accomplish this goal. On some level this is true – having documents freely available online is a huge improvement over having them
scattered across the hard drives of hundreds of computers at a university. However, just because information is available online does not mean that it is likely that it will be located or accessed. In this study, multidisciplinary repositories representing one university often did not offer features that would allow the repositories themselves to be used as grounds for promoting collaboration.

For a number of reasons, repositories that drew from the output of multiple institutions generally appeared more outward focused. They had more distinctive, user-friendly interfaces, incorporated different languages, had clearer mission statements, and tended to include social media features. Even these repositories, however, do not present themselves as places for informal collaboration by incorporating functions such as user comments or online message boards. While most content is freely accessible, only certain users can actually contribute. In some cases, such as with SciELO, the fact that there are standards for submissions is part of what has allowed the repository and its content to gain respect among the international community. For most of the other repositories in this study, users must simply be associated with the university or sponsoring institute and ensure that their submission meets certain technical standards. There are generally no mentions of a peer review process or standards for the academic quality of submissions.

There are a number of reasons why many of the institutionally focused repositories may not incorporate more special functions to help promote their research. It may simply be a question of time and resources – being run by small or part-time staff who can only afford to support the most basic features of a repository. It is also possible that they see their primary mission as preserving research, not disseminating it or promoting collaboration between researchers. The formal mission statement of the
UANL repository suggests this, describing itself as “un sistema que almacena y mantiene la información digital de la producción académica y científica de la universidad.” [a system that stores and maintains the digital information of the academic and scientific production of the university]. On the other hand, some repositories do not make their mission statements available, and it is possible that they do not have mission statements at all. In fact, several studies of repositories in the United States found that librarians often felt their university created its repository because it was an important trend to participate in, not because there were clearly established goals for the repository or a consensus as to how it would benefit the university community (Campbell-Meir, 2008; Rieh, St. Jean, Yakel, Markey, & Kim, 2008). This is more than likely the case for some of the repositories in this study. Whatever their intent, however, there seemed to be a fairly clear division between repositories that are currently best-suited to preservation and those that also play a role in dissemination.

**Conclusion**

In sum, the wide variations in some characteristics of Mexican institutional repositories are not surprising. It is important to remember that the concept of an institutional repository has literally only existed for a decade, and institutions everywhere are still in the process of figuring out the most effective ways to preserve electronic versions of the scholarship produced at their institution. In fact, there were actually significant consistencies across repositories. Many related to the first research question this study sought to address – how repositories can promote national standards for digital preservation. Both repository software and metadata standards were based on international, not national or regional standards, with DSpace software and Dublin Core
metadata being the most heavily used. This certainly has positive implications for international collaboration in the future, especially in regard to the frequently discussed concept of linked data. The presence of international standards also illustrates that developing national standards may be less important. Instead of working to develop national standards for the preservation of digital material, repository creators can focus on promoting the concept of digital preservation and making adaptations and creating guides that will allow international standards to meet their needs on a local level.

Many of the differences in Mexican repositories seem to stem from a question of resources: how much staff time and money schools have chosen to devote to maintaining repositories seems to vary a great deal. It is possible to make use of an installation of DSpace with very few modifications or special features, but it is also possible to use this or other software to develop a highly customized repository. In many cases, special features or additions to repositories do not appear to require an extremely high level of technical expertise, but rather a commitment to improvement and creativity. Still, social media or an engaging interface simply may not be priorities for some institutional repositories. These features are certainly much less important for repositories whose primary goal is preservation.

The purpose or mission of a repository is also strongly related to the second and third research questions this study sought to address. The second question looked at how visible institutional repositories were, both on the open web and on their own institutional website. This varied greatly, although in some cases repository visibility was fairly low. Even if a repository does not see disseminating scholarship as one of its primary purposes, it still must be sufficiently visible within its home institution for faculty to be
able to locate it and add content. For the many repositories that do consider dissemination
as part of their mission, low levels of web visibility are even more concerning. How these
might be improved is an important point for future research. Along these same lines,
whether or not repositories can serve to promote collaboration or establish connections
between scholars remains an open question. The most common strategy for doing this
seems to be to encourage users to share documents using social media tools such as
Facebook and Twitter. The fact that these are popular, non-specialized tools has positive
implications for international and interdisciplinary collaboration, but research habits of
scholars change slowly. It would be worthwhile to revisit this subject over the upcoming
years to see if more repositories begin to incorporate social media features and how
scholars choose to make use of these tools.

Repositories will undoubtedly undergo great changes in their second decade of
existence, so continuing research on this subject will be important. Institutional
repositories are just beginning to develop, so research has the potential to have practical
and long-lasting implications. It can provide insight into the most effective strategies for
developing repositories, help establish standards and best practices, and facilitate the
sharing of innovative ideas for improving repositories. This preliminary study identified a
few ways that Mexican institutional repositories enhance the process of scholarly
communication and address some of the most commonly identified concerns in this area
in Latin America. Some issues remain unresolved, such as how repositories can best draw
attention to Latin American research among an international or English-speaking
audience or how they can increase their visibility on the open web. It will be intriguing to
see how repositories attempt to meet these challenges in the upcoming decade.
http://dx.doi.org/10.1108/00012531211196684

http://dx.doi.org/10.1108/00012531211196693

http://informationr.net/ir/12-4/paper330.html


Bosch, S., Henderson, K., & Klusendorf, H. (2011). Under pressure, times are changing: periodical prices are on the upswing, and technology is advancing at a relentless pace. *Library Journal, 136*(8), 30-34. Retrieved from  
http://go.galegroup.com.libproxy.lib.unc.edu/psi.do?id=GALE%7CA254970793&v=2.1&u=unc_main&it=r&p=AONE&sw=w
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http://dx.doi.org/10.3145/epi.2012.mar.09


doi:10.1002/asi.21336

http://dx.doi.org/10.1108/10650750810914210


http://dx.doi.org/10.1108/00012531211196738


## Appendix A
### Preliminary Data Collection

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<th>Number of Documents</th>
<th>Type of Documents</th>
<th>Operational Platform</th>
<th>Languages</th>
<th>Structure</th>
<th>Search Options</th>
<th>Metadata Available</th>
<th>Special Features</th>
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<td>Artemisa en línea</td>
<td>Biblioteca Sor Juana Inés de la Cruz</td>
<td>Tales (Colección de Tesis digitales)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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## Appendix B
Web Visibility Data Collection

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<th></th>
<th>Irekani</th>
<th>Artemisa en línea</th>
<th>Biblioteca Sor Juana Inés de la Cruz</th>
<th>Tales (Colección de Tesis digitales)</th>
</tr>
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<td>Institutional website search: result number</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google search for repository: result number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Google search for document type and subject: result number</td>
<td></td>
<td></td>
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Appendix C
Repositories Examined

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<th>Repository</th>
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<tr>
<td>Artemisa en Línea (ARTículos Editados en México sobre Información en Salud)</td>
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</tr>
<tr>
<td>CC-DOC (Documentación en Ciencias de la Comunicación)</td>
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<td>Centro de Recursos para la Enseñanza y el Aprendizaje (CREA), Universidad de Guadalajara</td>
<td><a href="http://www.crea.udg.mx/index.jsp">http://www.crea.udg.mx/index.jsp</a></td>
</tr>
<tr>
<td>Colpos Digitales, Colegio de Postgraduados</td>
<td><a href="http://www.biblio.colpos.mx:8080/jspui/">http://www.biblio.colpos.mx:8080/jspui/</a></td>
</tr>
<tr>
<td>Desarrolla, Aprende y Reutiliza (DAR), Instituto Tecnológico y de Estudios Superiores de Monterrey</td>
<td><a href="http://catedra.ruv.itesm.mx/">http://catedra.ruv.itesm.mx/</a></td>
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<tr>
<td>EduDoc: Centro de Documentación sobre Educación, Instituto Tecnológico de Estudios Superiores de Occidente (ITESO)</td>
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<td>Interactive and Cooperative Technologies Lab (ICTL) - Universidad de las Americas Puebla (UDLAP)</td>
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<td>Irekani - Instituto de Biología, UNAM</td>
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<td>Redalyc: ReDe Revistas Científicas De América Latina y el Caribe, España y Portugal</td>
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# Appendix D

## Web Visibility of Repositories

### Browsing from Institution Homepage

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<td>2 Clicks</td>
<td>7: Irekani, Claustro de Sor Juana, UANL, SciELO, Reposital, Facultad de Ciencias - UNAM, FFYL -UNAM</td>
</tr>
<tr>
<td>3 Clicks</td>
<td>3: Tales, Colpos Digitales, CELE -UNAM</td>
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<td>4 or more Clicks</td>
<td>6: UAEH, DAR, CC-DOC, Universidad Veracruzana, RAD –UNAM, DGTI-UNAM</td>
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<td>No Clear Path</td>
<td>3: Artemisa en Linea, CREA, EduDOC</td>
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### Search for Repository Name from Institution Homepage

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### Google Search for site name

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